Scientific Programme

Friday, 20 September 2019

08:00AM - 3:30PM	**A14**	Affiliated Meeting, 105-106 **A14: Sleep Apnea Genetics International Consortium Meeting (SAGIC)**
1:00PM - 5:00PM		Administration, 116 - 116-117 **International Sleep Specialist Examination**

Scientific Programme

Saturday, 21 September 2019

		Administration, Admin 105 - 105
07:00AM - 08:00AM	**EC**	**WSS Executive Committee Meeting**
		Administration, SRR - 201
07:00AM - 5:00PM		**Speaker Ready Room**

Course, 118 - 118-120

08:00AM - 12:00PM **C07** **C07 Circadian clinical science**

Additional registration required

Summary
Advances in our understanding of the molecular mechanisms underlying circadian rhythms, and the fundamental discovery that circadian clocks are integral in the regulation of metabolism, inflammation, and neuronal plasticity throughout the central nervous system, and in most peripheral tissues, have greatly expanded our view of impact of circadian biology in health and disease. Circadian disruption is associated with, and possibly contributes to numerous diseases and disorders affecting nearly all systems of the body. The overall theme is to provide a larger view of circadian rhythm disorders as more than a subtype of "sleep disorders'", but highlight their bi-directional relationship with systemic disorders. This course will cover an update on the neural and systemic biology of circadian rhythms, challenges in clinical diagnosis and management, focusing on new data and a view of the future of circadian medicine. Through presentation on the genetics and physiology of circadian rhythms and their impact on the expression and disease development, as well as a discussion of circadian rhythm sleep-wake disorders, faculty will provide an update of this field and lead a discussion on clinical evaluation, novel diagnostic tools, and treatment approaches for circadian disorders.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Acquire knowledge of the state of the science in circadian rhythm regulation

•Become familiar with the impact of circadian dysregulation on the expression of disease and clinical outcomes

•Obtain and an update on new breakthroughs in this field, and identify and treat circadian rhythm sleep-wake disorders

Target Audience
Practicing clinicians, researchers and trainees at all levels

Chairs:

Phyllis Zee (United States)
Leon Lack (Australia)

08:00AM - 08:10AM **Introduction**

Phyllis Zee (United States)

08:10AM - 08:40AM **Regulation of circadian rhythms: Implications for health**

Phyllis Zee (United States)

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08:40AM - 09:10AM	**Consequences of living against the clock and social jet lag** Till Roenneberg (Germany)
09:10AM - 09:40AM	**Circadian rhythms and mental health** Kathleen Merikangas (United States)
09:40AM - 10:00AM	**Coffee break**
10:00AM - 10:30AM	**Novel insights of etiology and pathophysiology of circadian rhythm sleep-wake disorders** Gorica Micic (Australia)
10:30AM - 11:00AM	**New insights in the treatment of circadian rhythm sleep-wake disorders** Leon Lack (Australia)
11:00AM - 11:40AM	**Challenging circadian rhythm sleep-wake disorders** Robert Thomas (United States)
11:40AM - 12:00PM	**Conclusion / Question and answer** Phyllis Zee (United States) Leon Lack (Australia)

Affiliated Meeting, 109

08:00AM - 4:50PM **A01**

A01: Sleep disorders primary care education course

Summary
This one day course is predominately tailored to general practitioners who see patients with sleep disorders in their clinic. The course will cover a broad range of sleep-related topics in both adult and pediatric patients, focussing on the most common disorders seen by practitioners. In general, the format will include a brief 15 minute lecture by local and international experts in the field, followed by 11 minutes of questions from the audience. The course will be limited to 200 attendees.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the most important sleep disorders in children and adults

•Identify the main treatment options for the major sleep disorders in children and adults including pharmacologic and nonpharmacologic therapies

•Discuss basic sleep physiology and epidemiology

•Identify the indications for the major diagnostic tests used in sleep medicine

Target Audience
General practitioners (sleep disorders), other health professionals (e.g. nurses, nurse practitioners, pharmacists, respiratory therapists, sleep technologists, students, residents)

This Group Learning program has been certified by the College of Family Physicians of Canada and the British Columbia Chapter for up to 7.25 Mainpro+ credits.

Chairs:
James Lee (Canada)
Célyne H. Bastien (Canada)
Najib Ayas (Canada)

08:00AM - 08:10AM **Introduction**

Sleep physiology 101: Introduction to sleep

08:10AM - 08:32AM **What is sleep, what are sleep stages, and why do we sleep?**
Célyne H. Bastien (Canada)

08:32AM - 08:55AM **Normal sleep across the lifespan**
Julie Carrier (Canada)

“I can’t sleep.” Insomnia in primary care

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08:55AM - 09:21AM	**What's the cause? Understanding when you are dealing with different causes of insomnia** Rob Comey (Canada)
09:21AM - 09:47AM	**Essential principles of cognitive behavioral therapies for insomnia (CBT-I) in primary care** Charles Morin (Canada)
09:47AM - 10:02AM	**Coffee break**
10:02AM - 10:28AM	**Pediatric insomnia including delayed sleep-wake phase in adolescents** Shelly Weiss (Canada)
10:28AM - 10:54AM	**What drugs should I use for sleep? Pharmaceutical management of insomnia including cannabis and melatonin** Ram Randawa (Canada)
10:54AM - 11:20AM	**How to treat insomnia with comorbidities: A primary care approach (insomnia in medical and affective disorders)** Dieter Riemann (Germany)
11:20AM - 11:46AM	**When the clock is out of whack. Shiftworking and Jetlag- consequences and management** Diane Boivin (Canada)
11:46AM - 12:26PM	**Lunch break**
	Breathing deeply or not: Sleep-Disordered Breathing in primary care
12:26PM - 12:52PM	**Adult obstructive sleep apnea: Diagnosis and treatment from a local perspective** John Fleetham (Canada)
12:52PM - 1:18PM	**Adult OSA- a ticking time bomb for cardiometabolic disease?** Sanjay R. Patel (United States)
1:18PM - 1:44PM	**"I can't stand CPAP." How to improve CPAP adherence and alternatives to CPAP** Frank Ryan (Canada)
1:44PM - 2:10PM	**Children can get sleep apnea too. Pediatric sleep-disordered breathing in primary care** Rakesh Bhattacharjee (United States)
2:10PM - 2:26PM	**Break**
	Other things that go bump in the night
2:26PM - 2:52PM	**Restless legs syndrome** Diego García-Borreguero (Spain)
2:52PM - 3:18PM	**The role of sleep in Chronic Fatigue Syndrome and Fibromyalgia** Richard Arseneau (Canada)

3:18PM - 3:44PM		**Effects of substance abuse on sleep** Launette Rieb (Canada)
3:44PM - 4:10PM		**Let sleeping infants lie: Addressing the concerns of caregivers** Keyvan Hadad (Canada)
4:10PM - 4:36PM		**Pediatric potpourri: Hypersomnia, parasomnia and others** James Lee (Canada)
4:36PM - 4:50PM		**Conclusion**

Course, 122

08:00AM - 12:00PM C05 C05 Recent advances in RLS treatment

Additional registration required

Summary
This course will start with a quick summary of the current practice of RLS and then move to new concepts in diagnosis and management of RLS, with a special focus on iron therapy, opioids, α2δ agents, glutamate modulation, augmentation, long term outcomes including impulse control disorders, new guidelines, and update on pathophysiology including insights from genetics and animal models.

Chairs:
Richard Allen (United States)
Diego García-Borreguero (Spain)

08:00AM - 08:05AM	**Introduction** Richard Allen (United States) Diego García-Borreguero (Spain)
	Opioids
08:05AM - 08:35AM	**Biological differences of opiods: Low abuse potential of methadone** Sergi Ferre (United States)
08:35AM - 09:15AM	**USA Clinical guidelines/experience with opioid use in RLS** Christopher Earley (United States)
09:15AM - 09:55AM	**European guidelines/experience with opioid use in RLS including oxycodone/naloxone** Birgit Hogl (Austria)
	Iron
09:55AM - 10:40AM	**IV iron: choices, advantages and limitations** Richard Allen (United States)
	Experimental Treatments: Rationale and clinical experience

10:40AM - 11:20AM **Adenosine**
Diego García-Borreguero (Spain)

11:20AM - 11:40AM **Cannabinoid/Cannabis**
Imad Ghorayeb (France)

11:40AM - 12:00PM **Discussion – Questions to speakers**
Richard Allen (United States)
Diego García-Borreguero (Spain)
Sergi Ferre (United States)
Christopher Earley (United States)
Birgit Hogl (Austria)
Imad Ghorayeb (France)

Course, 214

08:00AM - 4:00PM **C01** **C01 Pediatric sleep**

Additional registration required

Summary
Growing recognition of the prevalence and impact of sleep disorders in children highlights the need for improved knowledge regarding diagnosis and treatment. The overall objective of this course is to provide the sleep medicine provider with comprehensive and updated knowledge and tools to understand, diagnose and treat pediatric sleep disorders.

Polysomnographic issues will be discussed within each presentation as appropriate.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the clinical presentation and epidemiology of common sleep disorders in children and adolescents

•Recall knowledge regarding diagnosis and treatment of sleep disorders in children and adolescents

•Apply the knowledge presented in the course to discuss brief clinical cases

Target Audience
Health care providers (intermediate level of knowledge of pediatric sleep disorders), professionals practicing sleep medicine: specialists, physicians in training, pediatricians, nurses, psychologists, other healthcare providers in the care of children and adolescents

Chairs:
Reut Gruber (Canada)
Oliviero Bruni (Italy)

Scientific Programme

08:00AM - 08:10AM	**Introduction** Reut Gruber (Canada) Oliviero Bruni (Italy)
08:10AM - 08:50AM	**Insomnia in infants and children** Judith Owens (United States)
08:50AM - 09:30AM	**Insomnia & DSPS in adolescence** Reut Gruber (Canada) Daniel Lewin (United States)
09:30AM - 09:50AM	**Coffee break**
09:50AM - 10:30AM	**SDB and OSA Part 1 - Clinical presentation, assessment, epidemiology, evaluation** Eliot Katz (United States)
10:30AM - 11:10AM	**SDB and OSA Part 2 - Treatment- surgical interventions, CPAP, oral appliances, positional therapy, weight loss** Sherri Lynn Katz (Canada)
11:10AM - 11:50AM	**Parasomnias** Shelly Weiss (Canada)
11:50AM - 12:30PM	**Pediatric Narcolepsy and other hypersomnia** Michel Lecendreux (France)
12:30PM - 1:30PM	**Lunch break**
1:30PM - 2:10PM	**Movement disorders - RLS PLMD Rhythmic movement disorder** Oliviero Bruni (Italy)
2:10PM - 2:50PM	**Sleep and mood, anxiety, PTSD, ADHD and other psychiatric disorders** Anna Ivanenko (United States)
2:50PM - 3:10PM	**Break**
3:10PM - 4:00PM	**Panel discussion, Q and A** Reut Gruber (Canada) Oliviero Bruni (Italy) Judith Owens (United States) Daniel Lewin (United States) Eliot Katz (United States) Sherri Lynn Katz (Canada) Shelly Weiss (Canada) Michel Lecendreux (France) Anna Ivanenko (United States)

Affiliated Meeting, 217-219

08:00AM - 11:45AM **A02**

A02: Sleep-circadian biomarkers workshop

Additional registration required

Summary
The goal of the workshop is to discuss sleep-circadian biomarkers and ways to facilitate international collaboration.
The sessions will be very interactive, with 4 Panel Leaders who will introduce each their topics of discussion and frame the issues and then lead breakout groups that include up to 4 additional discussants per breakout group.
Following the breakout there will be a brief presentation by each panel breakout leader, and then broader discussion which will include participants from all breakout groups, including discussants and broader audience members.
Finally, the Panelists will present the consensus, and/or key observations of the critical next steps for their panel's topic of discussion.

Panel Breakout 1: Biomarker development is an iterative process which starts with smaller samples of extreme cases, and moves to general populations. The sleep circadian field has begun to work on biomarker development for these use cases with deeply phenotyped small samples and has identified candidates for further omics developments. What kinds of extreme cases have been fruitful and what are the major limitations and needs for next steps?

Panel Breakout 2:
What resolution of time is desirable to pinpoint with a biomarker? Will circadian identification require multiple systems markers?

Panel Breakout 3:
Selecting methods, sharing expertise, experts and data – What has been standardized in the omics? What are current barriers? How can we identify individuals with the big data expertise and model development expertise that is needed? How can we share resources and harmonize data?

Panel Breakout 4:
How (much) to get involved in the contract process locally – from sponsors to academic institutions. What are barriers to data sharing and how can they be overcome so that progress towards useful biomarkers can be made available for international use?

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss use cases for a biomarker that could identify acute sleep deprivation

•Discuss use cases for a circadian biomarker

•Recognize opportunities to identify and access biomarker measurement and standardized analysis methods

•Identify the existing and critically needed resources and infrastructure, to move biomarker development forward on a world-wide scale

Target Audience

development with a particular focus on chemistry based approaches

Chairs:

Scientific Programme

08:00AM - 08:10AM	**Introduction** Janet Mullington (United States)
08:10AM - 08:50AM	**Consortia models for tech-transfer of biomarkers** Joseph P. Menetski (United States)
08:50AM - 08:55AM	**Introduction to Panel Objectives** Janet Mullington (United States)
08:55AM - 09:00AM	**Panel Breakout 1: Extreme cases to inform fitness for duty, sleep sufficiency** Clare Anderson (Australia) Simon Archer (United Kingdom) Monika Haack (United States)
09:00AM - 09:05AM	**Panel Breakout 2: The circadian use cases** Jeanne Duffy (United States) Phyllis Zee (United States) Kenneth Wright (United States)
09:05AM - 09:10AM	**Panel Breakout 3: Data analysis expertise – trials and tribulations** Raymond Ng (Canada)
09:10AM - 09:15AM	**Panel Breakout 4: IP – How to navigate your sources of support** Joseph P. Menetski (United States) Derk-Jan Dijk (United Kingdom) Allan Pack (United States)
09:15AM - 10:15AM	**Panel Breakout Sessions**
10:15AM - 10:30AM	**Break**
10:30AM - 11:30AM	**Panel Synopsis Presentations** Clare Anderson (Australia) Jeanne Duffy (United States) Joseph P. Menetski (United States)
11:30AM - 11:45AM	**Summary Statements**

Course, 220 - 220-222

08:00AM - 5:00PM **C02**

C02 Obstructive sleep apnea: Diagnosis and management

Additional registration required

Summary
The clinical management of obstructive sleep apnea is a rapidly evolving area, with new diagnostic and therapeutic tools becoming available. This course will begin with an overview of the pathophysiology and science underlying sleep-disordered breathing, including muscles, structure, function and imaging of the upper airway. More recently, it has been recognized that obstructive sleep apnea is a heterogeneous group of diseases and we will look at genetics and phenotyping of OSA, enabling a personalized approach to treatment. We will look at diagnostic tools, including those used by Gen Z – the wearables, and consider alternative management pathways with the involvement of primary care physicians. In the final session, the course will cover new and older treatments for OSA, including CPAP, oral appliances, nerve stimulation devices and recent advances in pharmacotherapies.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Define the key causes of obstructive sleep apnoea and understand the concepts of clinical and physiological phenotyping

•Recognize the importance of differences in the causes of obstructive sleep apnoea between individuals and the potential to use this information to develop personalised approaches

•Apply the latest knowledge in obstructive sleep apnoea diagnosis and management to inform treatment decisions

•Summarize the treatment approaches for sleep apnoea

Target Audience
Sleep physicians, scientists, allied health professionals and anyone with an interest in understanding the latest advances in obstructive sleep apnoea pathogenesis, diagnosis, management and treatment including personalised approaches.

Chairs:

Allan Pack (United States)
Danny Eckert (Australia)

08:00AM - 08:05AM **Introduction and welcome**

Allan Pack (United States)
Danny Eckert (Australia)

08:05AM - 08:35AM **Update on OSA epidemiology**

Naresh Punjabi (United States)

Scientific Programme

08:35AM - 09:05AM	**Anatomical phenotypes** Richard Schwab (United States)
09:05AM - 09:35AM	**Muscles of the upper airway, contribution to OSA pathophysiology** Jayne Carberry (Australia)
09:35AM - 10:05AM	**An update on physiological risk factors and their assessments** Scott Sands (United States)
10:05AM - 10:15AM	**Coffee break**
10:15AM - 10:45AM	**Different clinical subtypes** Allan Pack (United States)
10:45AM - 11:15AM	**Different physiological subtypes** Andrey Zinchuk (United States)
11:15AM - 11:45AM	**New approaches to PSG analysis** Diego Mazzotti (United States)
11:45AM - 12:45PM	**Lunch break**
12:45PM - 1:15PM	**Potential role of primary care physicians** Manuel Sánchez-de-la-Torre (Spain)
1:15PM - 1:45PM	**A comprehensive strategy based on telemedicine** Samuel T. Kuna (United States)
1:45PM - 2:15PM	**Update on consumer sleep technologies** Nathaniel Watson (United States)
2:15PM - 2:45PM	**Doing it better for less** Neil Freedman (United States)
2:45PM - 3:00PM	**Break**
3:00PM - 3:30PM	**Update on CPAP** Susheel Patil (United States)
3:30PM - 4:00PM	**Oral appliances** Peter Cistulli (Australia)
4:00PM - 4:30PM	**Hypoglossal nerve stimulation** Patrick Strollo (United States)
4:30PM - 5:00PM	**Pharmacotherapy for OSA** Luigi Taranto Montemurro (United States)

Course, 224

08:00AM - 12:00PM **C06**

C06 Polysomnographic measurements during sleep, beyond the AHI

Additional registration required

Summary
This course will focus on how we measure sleep, not on staging and scoring. We have failed to utilize technology available to us to digitalize EEG analysis and improve accurate detection and understanding of sleep depth and arousals. We will discuss how this may be done and used in the clinical sleep laboratory to improve our understanding of sleep and its disorders. The course will also look at information we can obtain from polysomnographic measures – EEG, flow, ECG, oximetry, beyond that of the analysis we do currently. New wearable devices will also be discussed.

Learning Objectives
Upon completion of this learning activity, participants should be able to:

•Identify an understanding of the additional information available on all channels of traditional polysomnography

•Recognize that current PSG analysis is superficial compared to possible computerised analysis available

•Recognize the dynamic changes in EEG, ECG, flow, oximetry, which can give additional information regarding phenotyping patient clinical presentation

•Demonstrate an understanding that future advances in this field are possible, and how that may influence our clinical practice

Target Audience
Sleep scientists, sleep measurement physiologists, sleep clinicians with a wish for a deeper understanding of PSG signals, researchers with an interest in automatic analysis of signals

Chairs:
Erna Sif Arnardottir (Iceland)
Kerri Melehan (Australia)

08:00AM - 08:10AM **Introduction**
Erna Sif Arnardottir (Iceland)
Kerri Melehan (Australia)

08:10AM - 08:45AM **Dynamic Scoring & EEG analysis**
Magdy Younes (Canada)

08:45AM - 09:20AM **Cardiopulmonary coupling**
Robert Thomas (United States)

09:20AM - 09:40AM **Coffee break**

Scientific Programme

09:40AM - 10:15AM	**Gaining more insight from the flow signal** Erna Sif Arnardottir (Iceland)
10:15AM - 10:50AM	**Getting more out of oximetry** Kerri Melehan (Australia)
10:50AM - 11:25AM	**Future advances in sleep monitoring** Walter McNicolas (Ireland)
11:25AM - 12:00PM	**Conclusion / Question and answer** Erna Sif Arnardottir (Iceland) Kerri Melehan (Australia)

Public Forum, 301-305

08:30AM - 4:30PM

Understanding Narcolepsy and Hypersomnia: Insights and perspectives

Register for the public patient forum on http://sleepexpo.org/attend/

Wake Up Narcolepsy Education Day at Sleep Expo 2019
In Collaboration with The Hypersomnia Foundation and World Sleep 2019

Summary
The number of patients presenting with symptoms of narcolepsy and hypersomnia disorders is increasing. This demonstrates a growing need to provide practitioners with an in-depth grasp of how these patients present and the trajectory of their symptoms. It also underlines the need for practitioners to be aware of specific treatment strategies and to understand when it is appropriate to refer patients to other sleep related specialists.

The overriding objective of the narcolepsy and hypersomnia education event is to provide an extensive and detailed knowledge base so that health care providers have the tools to make accurate diagnoses and informed decisions regarding treatment options.

The program will include the latest research, presented by leading experts in the field of narcolepsy and hypersomnias, as well as a panel discussion bringing together patient and practitioner perspectives related to the material presented.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the symptoms of narcolepsy and IH and the circumstances where a specific sleep disorder test may be indicated

•Make a differential diagnosis of narcolepsy and IH

•Be aware of pharmacological treatment options in the management of excessive daytime sleepiness

•Increase their understanding of the psychosocial, educational and economic impact of narcolepsy and IH

•Understand the particular challenges of treating and caring for students, adolescents and other patients facing life transitions while managing the symptoms of narcolepsy or hypersomnia

Target Audience
Health care providers with early or intermediate level knowledge of narcolepsy and idiopathic hypersomnia disorders, practicing sleep specialists, pediatricians, nurses, psychologists, sleep lab technicians, sleep advocates

08:30AM - 09:00AM

Registration and Coffee

Scientific Programme

09:00AM - 09:15AM	**Welcome & Introduction** Claire Crisp (United Kingdom) Diane Powell (United States)
09:15AM - 10:00AM	**Current research in excessive sleepiness disorders** Yves Dauvilliers (France)
10:00AM - 10:15AM	**Coffee break**
10:15AM - 11:00AM	**What sleepy mice tell us about sleepy people** Thomas Scammell (United States)
11:00AM - 11:45AM	**Transitional care: the journey from childhood to adulthood** Brian Murray (Canada)
11:45AM - 12:30PM	**Lunch break**
12:30PM - 1:15PM	**Living with narcolepsy** Kelsey Biddle (United States)
1:15PM - 2:30PM	**Managing depression associated with excessive sleepiness** Indra Narang (Canada)
2:30PM - 3:15PM	**Non-pharmacologic strategies to manage excessive sleepiness disorders** Shelly Weiss (Canada)
3:15PM - 3:30PM	**Break**
3:30PM - 4:15PM	**Panel discussion** Claire Crisp (United Kingdom) Thomas Scammell (United States) Yves Dauvilliers (France) Brian Murray (Canada) Kelsey Biddle (United States) Indra Narang (Canada) Shelly Weiss (Canada)

Scientific Programme

Course, 211

08:30AM - 5:00PM **C17a** **C17 Dental sleep medicine (part 1)**

Summary
Obstructive sleep apnea is a major health problem affecting over 10% of the adult population. The two most common and effective therapies used to treat sleep apnea are: (1) Continuous or Automatic Positive Airway Pressure (PAP), and (2) Oral Appliances. Dental Sleep Medicine is one of the fastest growing fields in dentistry, with large numbers of individuals with sleep apnea being treated with oral appliances. This one and a half day course will be focused on oral appliance therapy for the treatment of sleep apnea as well as touching on other areas in dental sleep medicine, like pediatric sleep apnea and bruxism. The course has been design to bring up-to-date and exciting information for new and experienced, clinicians and researchers in the field.
This is a clinically-focused and evidence-based continuing education program combining worldwide experts to bring to attendees the newest knowledge and its application to clinical practice.
The course will be divided in lectures on the first day and lectures with discussion panels for the second day.

Learning objectives
Upon completion of this CME activity, participants should be able to:

•Understand the the range of severity of sleep apnea and their relevance in the treatment choice and implications to cardiovascular disease.

•Discuss the role of oral appliance in specific populations such as pediatric, edentulous, and pregnant woman.

•Present current patient management approaches, focused on treatment efficacy and effectiveness

•Recognize scope of existing and emerging combination therapy approaches to OSA treatment, with a greater emphasis on combinations with oral appliance therapy.

•Have an up-to-date understanding of the latest controversies in dental sleep medicine, such as association with bruxism, small oral appliance titration, side effects and long term effectiveness

Target audience
Dentists, dental Assistants, and Physicians, Researchers, Sleep & Respiratory technologists and other health care professionals interested in dental sleep medicine

Chairs:

Fernanda Almeida (Canada)

08:30AM - 08:40AM **Welcome**

Fernanda Almeida (Canada)

Scientific Programme

08:40AM - 09:10AM	**Treatment of mild OSA, should I bother treating it?** Raphael Heinzer (Switzerland)
09:10AM - 09:40AM	**CV consequences of OSA, can we rely on PSG data, biomarkers or symptoms?** Sanjay R. Patel (United States)
09:40AM - 10:10AM	**Impact of oral appliance on CV and diabetes** Tea Galic (Croatia)
10:10AM - 10:30AM	**Coffee break**
10:30AM - 11:00AM	**Oral appliance in edentulous and almost edentulous patients** Marc Braem (Belgium)
11:00AM - 11:30AM	**Pregnancy and impact of OSA, can we use oral appliances?** Sushmita Pamidi (Canada)
11:30AM - 12:00PM	**Pediatric OSA and craniofacial characteristics – findings of the PDSA trial** Benjamin Pliska (Canada)
12:00PM - 12:30PM	**History of Oral Appliance Therapy** Gail Demko (United States)
12:30PM - 1:30PM	**Lunch break**
1:30PM - 2:00PM	**Mean Disease alleviation and compliance** Kate Sutherland (Australia)
2:00PM - 2:30PM	**Predictors of oral appliance therapy, are the answers all on the upper airway** Peter Cistulli (Australia)
2:30PM - 3:00PM	**Patient management before and after OA insertion** John Tucker (United States)
3:00PM - 3:30PM	**Break**
3:30PM - 4:00PM	**Periodontal disease as a comorbidity or side effects on oral appliance therapy** Fernanda Almeida (Canada)
4:00PM - 4:30PM	**Evaluating and applying the evidence around oral appliance therapy** Leslie Dort (Canada)
4:30PM - 5:00PM	**The past and the future of DSM, get your questions answered by Alan Lowe** Alan Lowe (Canada)

Administration, Admin 105 - 105

09:00AM - 4:00PM **ISRTP Training**

Affiliated Meeting, 216 - 215-216

09:00AM - 12:00PM

A16: International Sleep Science and Technology (ISSTA) Chair Rayleigh Ping-Ying Chiang

09:00AM - 12:30PM

Public Forum, 110

How to promote sleep and injury prevention

Register for the public patient forum on http://sleepexpo.org/attend/

Summary
Half Day Symposium addressing High School & University Students and Athletes of all Ages, Trainers & Teachers
Injury is the leading cause of child and youth death and disability in Canada, with sports-related injuries being the most common one in populations at school age. Studies, which have examined the effect of sleep deprivation on sport performance and injury risk among young athletes, show that the amount of sleep affects risk factors for injury, with less than 8-hours sleep increasing injury risk by 30 to 70%. While increasing sleep to more than 10-hours nightly improved sprint speed, shooting accuracy and (self-rated) physical and mental health of college-aged basketball players, sleep deprivation negatively affected the performance of cyclists and weightlifters. Knowing that student athletes tend to sleep 2-hours less each night compared to non-athletes, it is necessary to highlight the importance of sleep for good health and injury prevention among young athletes. However, most attempts to promote healthy sleep and sleep hygiene among children and youth over the past decade have led to somewhat disappointing results.
New emergent literature supports the idea that audiences targeted for health messages respond better to positive, gain-framed messages as opposed to loss-framed, fear-based messages. Targeting wakeful behaviors and the idea of vigilance as beneficial for sport performance may be an innovative way to open the discussion about the importance of sleep in health promotion and injury prevention. The concept of vigilance, defined as the ability of the body “… to respond to an effective stimulus with a more or less appropriate reaction”, refers back to the 1920s. Subsequently, new vigilance paradigms with focus on test performances and the ability to sustain attention to a task for a longer period of time were developed and are still partly applied. However, the concept of vigilance, as an ability to react appropriately to stimuli, has rarely been contextualized to healthy sleep promotion.
In this Satellite Symposium, a transdisciplinary faculty consisting of athletes of all ages, and students and community/university-based researchers, will share with interested lay-audience, high-school and university students, trainers and teachers, sleep/vigilance and injury prevention research. The faculty will review traditional and novel communication concepts, including, youth-led participatory action initiatives designed to raise awareness about the effects of sleep deprivation and low vigilance on sport performance. Particular emphasis will be given to self-exploration concepts, e.g. applicable in school-based Wake-A-Thon concepts. (Wake-A-Thons are a common practice in Canadian high schools, conducted not for sleep health awareness, but as a ‘sacrifice of one’s own sleep’ to fundraise for good causes.)

Learning Objectives
Upon completion of this CME activity, participants should be able to:

Have an in-depth understanding about the:

•Concept of vigilance and be able to rate their own vigilance;

•Interconnections of vigilance, sleep, athletic activities and injury

•Applicability of screening apps and devices for tracking sleep/wake-behaviors.
Target Audience

09:00AM - 09:03AM	**Occupational injuries & “alcohol intoxication = sleep deprivation”**
09:03AM - 09:18AM	**Sleep deprivation: The perspective from the emergency room and sleep medicine** Najib Ayas (Canada)
09:18AM - 09:21AM	**Athletic injuries & concussion**
09:21AM - 09:36AM	**Active and safe: The BC injury prevention campaign** Sarah A. Richmond (Canada)
09:36AM - 09:38AM	**Introduction by chair**
09:38AM - 09:53AM	**From sleep deprivation to vigilance: A new communications concept?** Gerhard Kloesch (Austria)
09:53AM - 10:09AM	**Student presentation: Communication of sleep health via vigilance games & scientific background of the games** Renee Boldut (Canada) Ruth Liu (Canada) Gemma Tomasky (Canada) Monica Hsu (Canada)
10:09AM - 10:15AM	**General discussion**
10:15AM - 10:45AM	**Break**
10:45AM - 10:47AM	**Introduction by chair**
10:47AM - 11:02AM	**Youth, sleep and drugs: Vigilance fluctuations** Pierre Philip (France)
11:02AM - 11:10AM	**Risk-taking-behaviors: What can we learn from children?** Mariana Brussoni (Canada)
11:10AM - 12:30PM	**Round-table: Do we need a new communications concept for messaging the importance of sleep & negative aspects of sleep deprivation?** Dan Small (France) Samantha Pritchard (Canada) Calvin Kuo (Canada) Angelika Schlarb (Germany) Pierre Philip (France) Najib Ayas (Canada) Gerhard Kloesch (Austria) Sarah A. Richmond (Canada)
	Affiliated Meeting, 106
1:00PM - 2:00PM	**#vigilance4injuryprevention position paper round table Chair: Osman Ipsiroglu**

Course, 118 - 118-120

1:00PM - 5:00PM **C10**

C10 Circadian basic science: Human circadian rhythms from OMICS to behavior

Additional registration required

Summary
This course will focus on an update on basic science aspects of circadian medicine, including mechanisms of photoentrainment, non-photic entrainment, circadian metabolic control, circadian mechanisms in oncogenesis, and advanced circadian measurements (metabolome, transcriptome). The course will review advances in the effects of photic and non-photic stimuli on circadian physiology and behavior, influences of aging, and treatment of circadian rhythm disorders. In addition, recent advances in circadian biomarkers, circadian time stamping and phase assessment with transcriptomes using few time points will be discussed. Misalignment between the endogenous circadian system and shifted rest-activity schedules is a major determinant of circadian disturbance and shift workers' maladaptation. Therefore, recent advances in studies of the human transcriptome, proteome, and metabolome during circadian misalignment will be highlighted with respect to elucidating mechanisms underlying dysregulated physiology with implications for shift workers. Also, findings from studies in actual shift workers will be discussed in regards to the clinical implications of disturbed circadian synchrony in humans
Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Differentiate between different omics strategies to develop circadian biomarkers for the assessment of circadian phase and for understanding dysregulated physiology during circadian misalignment

•Know some of the impact of aging on circadian rhythms, responses to light, and circadian rhythm disorders

•Describe health and cognitive consequences of circadian disruption and impact of light

•Understand advances in photic and non-photic entrainment and treatment of circadian disorders

Target Audience
Investigators and clinicians at all levels of experience interested in recent advances in circadian rhythms, age related circadian rhythm disorders, biomarkers, and mechanisms of circadian misalignment induced disruption in physiological and behavior with implications for shift work.

Chairs:

Kenneth Wright (United States)
Derk-Jan Dijk (United Kingdom)

Scientific Programme

1:00PM - 1:10PM	**Introduction** Kenneth Wright (United States)
1:10PM - 1:50PM	**Recent advances in photic and non-photic entrainment and treatment of circadian disorders** Christian Cajochen (Switzerland)
1:50PM - 2:30PM	**Aging effects on circadian rhythms and circadian rhythm sleep wake-disorders** Jeanne Duffy (United States)
2:30PM - 2:50PM	**Coffee break**
2:50PM - 3:30PM	**The human blood transcriptome as a window on circadian and sleep-wake status** Derk-Jan Dijk (United Kingdom)
3:30PM - 4:10PM	**What's behind the curtains of shift workers maladaptation?** Diane Boivin (Canada)
4:10PM - 4:50PM	**Circadian rhythms, metabolism, and cancer from omics to physiology** Kenneth Wright (United States)
4:50PM - 5:00PM	**Conclusion / Question and answer** Derk-Jan Dijk (United Kingdom)

Course, 122

1:00PM - 5:00PM **C09**

C09 Portable devices for clinical practice and sleep research

Additional registration required

Summary
Although the reference standard procedure in sleep medicine remains in-laboratory polysomnography, there is increasing interest in portable, in-bedroom, and wearable technologies. These technologies can also assess sleep in real-world environments. The most common target application of both traditional and portable technology is diagnosis, treatment, and follow up for sleep disordered breathing. This course will review technological developments and wearable devices used to monitor sleep-wake activity and sleep-related breathing. Presentations will review issues regarding advantages and disadvantages of portable or wearable devices to measure sleep in clinical and research contexts Validity, reliability, and usability of these devices will be discussed, including potential ways to integrate such technologies into sleep medicine and research.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Illustrate the use of actigraphy and sleep diaries in assessing chronobiology in sleep research

•Demonstrate the use of portable monitoring in sleep medicine and sleep research

•Employ the use of home sleep apnea testing and other equipment for the portable monitoring and treatment follow-up in sleep disordered breathing

•Compare the use and limitations of wearables (Smartphone, Smartwatches) for the diagnosis in sleep medicine

Target Audience
The course is of interest for sleep clinicians, sleep researchers, and professionals involved in the diagnosis and follow-up of patients with sleep disordered breathing

Chairs:

Max Hirshkowitz (United States)
Thomas Penzel (Germany)

1:00PM - 1:10PM **Introduction**

1:10PM - 1:50PM **Using actigraphy for sleep research (The Sleep Genome Project)**

Till Roenneberg (Germany)

Scientific Programme

1:50PM - 2:30PM	**Using non-polysomnographic technologies to diagnose sleep disordered breathing** Thomas Penzel (Germany)
2:30PM - 3:10PM	**Using AutoPAP to determine therapeutic positive pressures** Amir Sharafkhaneh (United States)
3:10PM - 3:30PM	**Break**
3:30PM - 4:10PM	**Sleep apnea treatment follow up: Technology, schedule, and rescue** Samuel T. Kuna (United States)
4:10PM - 4:50PM	**ANSI/CTA (American National Standards Institute / Consumer Technology Association) Standards for wearables and in-bedroom sleep trackers** Max Hirshkowitz (United States)
4:50PM - 5:00PM	**Conclusion / Question and answer**

Course, 216 - 215-216

1:00PM - 5:00PM **C08** **C08 Staging and scoring**

Additional registration required

Summary
The AASM Manual for the Scoring of Sleep and Associated Events reflects the best and most current evidence in sleep medicine. The American Academy of Sleep Medicine (AASM) is committed to ensuring that the Scoring Manual Editorial Board oversees the content and makes recommendations when content changes are indicated, need for clarification exists, there is new technology or the literature suggests that updates are needed. In this workshop, we will highlight the updated and new rules as per the AASM Manual Version 2.5, also will describe the tricky rules that can impact the diagnoses as per the previous versions

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•To be familiar with methodology of applying the tricky AASM updated and new rules for scoring sleep stages & arousals in adults

•To be familiar with the updated AASM Guidelines for Scoring Respiratory Events and the impact of the new rules on the scored parameters

•To be able to recognize isolated LMs and distinguish between scorable vs. non-scorable events

Target Audience
Doctors, sleep technologists & technicians

Chairs:
Thomas Penzel (Germany)

1:00PM - 1:45PM **Reviewing tricky AASM rules for scoring sleep stages & arousals**
Laurie Dull (United States)

1:45PM - 2:15PM **Group scoring session and cases discussion**
Laurie Dull (United States)

2:15PM - 2:45PM **Reviewing AASM rules for respiratory events**
Laurie Dull (United States)

2:45PM - 3:15PM **Break**

3:15PM - 3:45PM **Group scoring and cases discussion**
Laurie Dull (United States)

3:45PM - 4:15PM **AASM for scoring LMs**
Laurie Dull (United States)

4:15PM - 5:00PM **Group scoring and cases discussion**
Laurie Dull (United States)

Course, 224

1:00PM - 5:00PM **C15** **C15 Parasomnia**

Additional registration required

Summary
Clinical, videographic, and mechanistic aspects of the parasomnias will be presented, including REM-behaviors, sleep-related epilepsies, and recently described antineuronal antibody syndromes. Management challenges will be identified.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify pathophysiology of parasomnias

•Recognize clinical features, differential diagnosis, and treatment of NRME and REM parasomnias

•Review overlap of RBD and neurodegeneration

•Examine overlap between immune disorders and parasomnias

Target Audience
Doctors and health professionals in the field of sleep medicine

Chairs:
Aleksandar Videnovic (United States)
Rosalia Silvestri (Italy)

1:00PM - 1:10PM **Introduction**
Rosalia Silvestri (Italy)
Aleksandar Videnovic (United States)

1:10PM - 1:50PM **Neurobiological mechanisms of parasomnias - from pattern generators to sleep state dissociations**
Rosalia Silvestri (Italy)

1:50PM - 2:30PM **NREM parasomnias: Disorders of arousal across the lifespan**
Rosalia Silvestri (Italy)

2:30PM - 2:50PM **Coffee break**

2:50PM - 3:30PM **REM sleep behavior disorder: Epidemiology, clinical and PSG features**
Ambra Stefani (Austria)

Scientific Programme

3:30PM - 4:10PM	**RBD: On the intersection of sleep, neurology and neuroscience** Aleksandar Videnovic (United States)
4:10PM - 4:50PM	**Immune disorders and parasomnias** Erik K. St. Louis (United States)
4:50PM - 5:00PM	**Conclusion / Question and answer** Aleksandar Videnovic (United States) Rosalia Silvestri (Italy)

Administration, Admin 105 - 105

5:00PM - 7:00PM

Sleep Technologist Certification: Education, eligibility and examinations

Affiliated Meeting, 106

6:00PM - 7:30PM

A17: AAMS A Critical Review of Orofocial Myofunctional Therapy Chair: Marc Moeller

Scientific Programme

Sunday, 22 September 2019

Administration, SRR - 201

07:00AM - 5:00PM **Speaker Ready Room**

Affiliated Meeting, 116 - 116-117

08:00AM - 6:00PM **A03** **A03: International Restless Legs Syndrome Study Group annual meeting & course**

$165

Program Committee: Denise Sharon (USA), Federica Provini (Italy), Garima Shukla (Canada), Rochelle Zak (USA), Cornelius Bachman (Germany)

Summary
The International Restless Legs Syndrome Study Group (IRLSSG) will offer a full-day course on Sunday, September 22, 2019. Attendance is open to any sleep professional who is interested in RLS. A business meeting will be held after the course, which is only open to IRLSSG members.

Registration includes the sessions, lunch and networking dinner.

Target Audience:
Sleep specialists and internists interested in sleep disorders and in identifying and treating RLS with a more basic understanding of the disorder; RLS experts and researchers in the field; trainees interested in learning and developing the field

08:00AM - 08:30AM **Networking and coffee**

Denise Sharon (United States)
Garima Shukla (Canada)
Rochelle Zak (United States)
Cornelius Bachman (Germany)

08:30AM - 08:45AM **Welcome to Vancouver & introductions**

Denise Sharon (United States)
Allan O'Bryan (United States)

Animal models task force

Mauro Manconi (Switzerland)
Diego García-Borreguero (Spain)

08:45AM - 09:00AM **Critical review of outcome measures of the past models: Rationale and need of consensus**

Mauro Manconi (Switzerland)

Scientific Programme

09:00AM - 09:15AM	**Expert consensus guideline for an animal model of RLS: How to reach a consensus on outcome measures in animal models: Methods and preliminary results** Aaro Salminen (Germany)
09:15AM - 09:30AM	**Update on RLS animal models and iron** Richard Allen (United States)
09:30AM - 09:45AM	**State of the research on animal model KO for BTBD9** Yuqing Li (United States)
09:45AM - 10:00AM	**Animals models task force summary and update** Mauro Manconi (Switzerland)
10:00AM - 10:15AM	**Coffee break**
	RLS and PLM update Cornelius Bachman (Germany)
10:15AM - 10:35AM	**RLS: Leg movements identify arousal** Richard Allen (United States)
10:35AM - 10:50AM	**Preclinical validation of brain iron deficiency as the main initial pathogenetic mechanism in RLS** Sergi Ferre (United States)
10:50AM - 11:10AM	**Update on blood pressure and endothelial dysfunction in RLS** Yves Dauvilliers (France)
11:10AM - 11:30AM	**New MRI findings in RLS** Ambra Stefani (Austria)
11:30AM - 11:45AM	**A proteomic and system biology approach reveal novel biomarker signatures for RLS** Raffaele Ferri (Italy)
11:45AM - 12:00PM	**The lifespan course of short-interval, periodic and isolated leg movements during sleep** Raffaele Ferri (Italy)
12:00PM - 1:00PM	**Lunch break**
	Neurologic co-morbidities of RLS Rochelle Zak (United States)
1:00PM - 1:03PM	**Introduction** Garima Shukla (Canada)
1:03PM - 1:23PM	**Restless legs syndrome and Parkinson's disease - the dopaminergic connection and treatment challenges** Luigi Ferini-Strambi (Italy)
1:23PM - 1:40PM	**Restless legs syndrome in acute neurological conditions - lessons from stroke and acute neuropathies** Garima Shukla (Canada)

Scientific Programme

1:40PM - 2:00PM	**How RLS contributes to quality of life in Multiple Sclerosis** Mauro Manconi (Switzerland)
	Young Investigator Committee Arthur Walters (United States) Denise Sharon (United States) Rochelle Zak (United States) John Winkelman (United States)
2:00PM - 2:15PM	**Young Investigator Presentation: Periodic limb movement during sleep and the incidence of cardiometabolic outcomes: the HypnoLaus study** Camila Hirotsu (Switzerland)
2:15PM - 2:30PM	**Young Investigator Presentation: Evaluation of brain iron deposits in restless legs syndrome: The promising role of transcranial sonography** Celia Garcia-Malo (Spain)
2:30PM - 2:45PM	**Young Investigator Presentation: Are there correlation among: RLS, iron and IL6 in runners?** Sayonara B Fagundes (Brazil)
2:45PM - 3:00PM	**Young Investigator Presentation: Transcreal Sonography as a novel neuroimaging tool to determine brain iron deficiency in Restless Legs Syndrome: Results in a Chilean sample** Vivian Wanner (Chile)
3:00PM - 3:15PM	**Break**
	IRLSSG Projects Denise Sharon (United States)
3:15PM - 3:30PM	**Diagnostic accuracy of RLS screening tools** Stephany Fulda (Switzerland)
3:30PM - 3:45PM	**Update on PLMS scoring program certification** Stephany Fulda (Switzerland)
3:45PM - 4:00PM	**National RLS Opioid Registry: 1-2 Year longitudinal results** John Winkelman (United States)
4:00PM - 4:15PM	**Establishing RSD as a new diagnosis** Lourdes DelRosso (United States)
4:15PM - 4:30PM	**Video recordings and pictograms in children and adolescents with RLS** Osman Ipsiroglu (Canada)
4:30PM - 4:45PM	**Pediatric RLS and GP Task Force update** Arthur Walters (United States)
4:45PM - 4:50PM	**Ideas for projects from the attendees**
4:50PM - 5:00PM	**Outgoing Chair Summary** Diego García-Borreguero (Spain)

5:00PM - 5:15PM	**Break**
5:15PM - 6:00PM	**Business Meeting** Diego García-Borreguero (Spain)

Course, 118 - 118-120

08:00AM - 12:00PM **C11**

C11 Insomnia disorder: Assessment, diagnosis and management (part 1)

Additional registration required

Summary
Insomnia Disorder (ID) will be covered during 2 half days which could be taken together or attended separately. The first half (morning) will focus on 1) recent advances in understanding the pathophysiology of insomnia; 2) best practices in the assessment and diagnosis of insomnia; and 3) an introduction to the management of insomnia (both pharmacological and non-pharmacological), highlighting the potential advantages and risks associated with each approach. The presentations will explore primary insomnias as well as insomnia with co-morbid medical or mental issues. The second half (afternoon) will focus on best practices for the management of Insomnia Disorder using evidence-based approaches from clinicians working in the field. Cognitive Behavioral Therapies (CBT) will be discussed, including incorporation of practical, “real world” constraints associated with clinical practice. In the latter half of this session, a precision medicine approach to treating ID will also be discussed alongside a look into how ID may be treated in the future. The course aims to provide a comprehensive and in-depth understanding of ID along with practical tools and approaches suitable for use in the specialized sleep medicine setting but also in more general settings such as primary care and general psychiatry and psychology practices.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Apply appropriate criteria to diagnose Insomnia Disorder

•Describe the pathophysiology of insomnia, from normal sleep to persistent Insomnia Disorder

•Identify the relative strengths and weaknesses of traditional methods of assessing insomnia and treatment outcomes

•List the different approaches to the management of insomnia

Target Audience
Healthcare professionals (e.g. MDs, psychologists, nurses, occupational therapists, social workers, physical therapists), healthcare professionals who have an understanding of Insomnia Disorder but would like to explore how it is managed in 'real world' settings, those who practice Cognitive Behavioral Therapy for insomnia

Chairs:

Ruth M. Benca (United States)
Jason Ellis (United Kingdom)

08:00AM - 08:10AM **Introduction**

Scientific Programme

08:10AM - 08:55AM	**What is insomnia?** Jason Ellis (United Kingdom)
08:55AM - 09:40AM	**Assessment of insomnia: The sleep diary and beyond** Michael Grandner (United States)
09:40AM - 10:00AM	**Coffee break**
10:00AM - 10:45AM	**Treatment options for insomnia: Pharmacotherapy** Dalva Poyares (Brazil)
10:45AM - 11:30AM	**Treatment options for insomnia: Non-Pharmacological approaches** Sean Drummond (Australia)
11:30AM - 11:45AM	**Conclusion / Question and answer**

Course, 214

08:00AM - 5:00PM **C04**

C04 Year in review

Additional registration required

Summary
Integrating research and clinical practice (all day). This course will bring together basic science and clinical advances, putting together the best of a “year in review” and a “basic science/methods” update for the sleep physician. The span of topics will include technology, controversial areas, and recent (2-3 years) literature. Overlap with other course offerings will be minimized. The focus will be on areas where there has been substantial progress in the past few years. Controversies will not be avoided. By the end of the course, participants will be enabled to broader horizons of thought, and perhaps, action.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize areas of deficiency in sleep science and practice

•Obtain a cutting edge update on progress in the field

•Encourage broad thinking about sleep and its disorders, integrating technology, basic science, and clinical experience

Target Audience
Sleep medicine practitioners, trainees, and researchers

Chairs:

Robert Thomas (United States)
Liborio Parrino (Italy)

Scientific Programme

08:00AM - 08:10AM	**Introduction** Robert Thomas (United States)
08:10AM - 08:50AM	**New look at old data: Machine learning and other analyses** Robert Thomas (United States)
08:50AM - 09:30AM	**Update on obstructive sleep apnea** Allan Pack (United States)
09:30AM - 10:10AM	**Brain aging, sleep, neurodegeneration** Catherine McCall (United States)
10:10AM - 10:30AM	**Coffee break**
10:30AM - 11:20AM	**From the circadian world** Sabra Abbott (United States)
11:20AM - 12:00PM	**Sleep-related eating: Causes, consequences, and treatments** John Winkelman (United States)
12:00PM - 1:00PM	**Lunch break**
1:00PM - 1:50PM	**Neurocircuitry: Methods and updates** Antoine Adamantidis (Switzerland)
1:50PM - 2:30PM	**Sleep and cancer** Nathaniel Watson (United States)
2:30PM - 2:50PM	**Break**
2:50PM - 3:30PM	**Parasomnia and epilepsy** Marco Zucconi (Italy)
3:30PM - 4:10PM	**Sleep and pain** Gilles Lavigne (Canada)
4:10PM - 4:50PM	**Insomnia** Liborio Parrino (Italy)
4:50PM - 5:00PM	**Conclusion / Question and answer** Liborio Parrino (Italy)

Course, 216 - 215-216

08:00AM - 12:00PM **C12**

C12 Aging, neurodegeneration and sleep

Additional registration required

Summary
Aging per se is associated with many physiological alterations as sleep and circadian rhythms changes and other sleep disorders suggestive of hypothalamic dysfunction. It is increasingly recognized that sleep disorders are often present and a significant part of the neurodegenerative diseases (NDDs), which are more common among the elderly. Moreover, detecting and treating sleep disorders in these populations have a considerable interest as a potential way to impact the development and the course of NDDs. The course will give an overview from the sleep changes associated with the process of aging to the sleep abnormalities associated with different NDDs (i.e. Alzheimer disease, Parkinson disease, Lewy body dementia), starting from the concept that sleep abnormalities when noted to increase in severity beyond the expected fo age could be a marker, similar to cognitive changes, reflecting specific pathophysiological mechanisms of interest in NDDs.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe the major sleep modifications and their mechainsms with aging

•Correlate sleep alterations and characteristics in the NDDs with their pathophysiology mechanisms and the eventual role of sleep disorders in the starting and evolution of the different NDDs

•Discuss whether sleep initiate or drive (or both) disease progression or are only downstream events due to the sleep disruption by the increasing buildup of neuropathology

•Demonstrate the actual state of the art of the importance to recognize and diagnose sleep disorders in different NDDs and the possible effect of their treatment on the evolution and progression of the diseases

Target Audience
Clinicians and different sleep medicine experts interested in evaluating and treating sleep disorders in the elderly; researchers interested in the field of sleep and aging, and in the pathophysiology of the modifications possibly related to the neurodegenerative processes

Chairs:

Marco Zucconi (Italy)
Birgit Hogl (Austria)

Scientific Programme

08:00AM - 08:10AM	**Introduction** Marco Zucconi (Italy) Birgit Hogl (Austria)
08:10AM - 08:45AM	**Sleep and the aging brain** Sonia Ancoli-Israel (United States)
08:45AM - 09:20AM	**Is macro and microstructure alteration of sleep a risk for neurodegeneration?** Liborio Parrino (Italy)
09:20AM - 09:40AM	**Coffee break**
09:40AM - 10:15AM	**PLMS and sleep apnea: Are they a sign of neurodegeneration in the aging brain?** Marco Zucconi (Italy)
10:15AM - 10:50AM	**Sleep and risk factor for AD and taupathies** Madeleine Grigg-Damberger (United States)
10:50AM - 11:25AM	**Sleep and alpha synucleinopaties** Birgit Hogl (Austria)
11:25AM - 11:45AM	**Conclusion & discussion**

Course, 110

08:00AM - 12:00PM **C13**

C13 Cardiovascular and renal consequences of sleep apnea

Additional registration required

Summary
The hallmarks of obstructive sleep apnea (OSA) are (i) intrathoracic pressure swings (ii) repeated episodes of hypoxia/re-oxygenation and (iii) sleep fragmentation, with consequent sympathetic activation, inflammation and endothelial dysfunction. This course will discuss the pathophysiological mechanisms underlying the relationship between OSA and cardio-renal disease.
The areas to be covered include hypertension, coronary artery disease, cardiac arrhythmias, kidney and cerebrovascular disease.
The session will conclude with a critical review of the recent randomised trials and lessons for future trials in the research area.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•To understand the pathophysiological mechanisms in OSA that drive cardio-renal disease

•To understand the epidemiology of hypertension, coronary artery disease and atrial fibrillation in the OSA population and the evidence base for treating OSA

•To understand the aetiology of cerebrovascular disease and stroke in OSA populations

•To appreciate the lessons that have been learnt from large OSA treatment trials and what new trials may be on the horizon

Target Audience
MD, PhDs and multidisciplinary teams from all covered areas

Chairs:

Luciano Drager (Brazil)
Craig Phillips (Australia)

08:00AM - 08:10AM **Introduction**

Luciano Drager (Brazil)
Craig Phillips (Australia)

08:10AM - 08:40AM **Pathophysiology of CVD in OSA**

Virend Somers (United States)

08:40AM - 09:10AM **Hypertension and Resistant Hypertension in OSA (Epidemiology and RCT results)**

Manuel Sánchez-de-la-Torre (Spain)

09:10AM - 09:40AM **Coronary and Carotid Artery Disease (Epidemiology and Intervention results)**

Yuksel Peker (Turkey)

Scientific Programme

09:40AM - 10:00AM	**Coffee break**
10:00AM - 10:30AM	**Arrhythmias (Epidemiology and OSA Intervention results)** Reena Mehra (United States)
10:30AM - 11:00AM	**Kidney Disease (Mechanisms and Intervention studies)** Patrick Hanly (Canada)
11:00AM - 11:30AM	**Cerebrovascular Disease and Stroke** Najib Ayas (Canada)
11:30AM - 12:00PM	**Lessons from the Large Trials** Susan Redline (United States)

Affiliated Meeting, 217-219

08:00AM - 11:45AM **A04**

A04: Sleep-circadian informatics data harmonization

Additional registration required

Summary
The goal of the workshop is to discuss sleep-circadian informatics and data harmonization with a view towards facilitating the expansion of existing cohorts and merging datasets to enhance international informatics data sharing and collaboration.
The sessions will be very interactive, with 4 Panel Leaders who will introduce each their topics of discussion and frame the issues and then lead breakout groups that include 4 additional discussants per breakout group.
Following the breakout there will be a brief presentation by each panel breakout leader, and then broader discussion which will include participants from all breakout groups, including discussants and broader audience members.
Finally, the Panelists will present the consensus, and/or key observations of the critical next steps for their panel's topic of discussion.

Opening Speaker:
Dr. Melissa Haendel is the Director of Translational Data Science, Linus Pauling Institute, Oregon State University, and PI of a grant from the National Center for Advancing Translational Sciences to establish a National Center for Data To Health (CD2H). Dr. Haendel's work focuses on developing data integration technologies and implementation of platforms and tools for translational research. Dr. Haendel will discuss translational informatics projects including work in the development of ontologies, and data sharing.

Panel Breakout 1:
What are the most essential questions to include and how often should they be asked to be meaningful? What are some considerations for how to share the data? Are there tools, and support infrastructure that are necessary or that would be exceptionally helpful?

Panel Breakout 2:
What are the minimum technical standards for data collection (sensitivity, sampling rate, writing to memory, battery capacity, etc).

Panel Breakout 3:
What measures, and other data elements would be most critical to harmonize for polysomnography? Total sleep time, sleep onset latency, stages, efficiency, etc.

Panel Breakout 4:
Discussion of infrastructure needs – beginning with the example of the National Sleep Research Resource (NSRR)—currently has 170 TB of PSG/actigraphy data available to share with the world wide sleep community.
Discussion of General Data Protection Regulation (GDPR) principles for world-wide data sharing, Digital Object Identifier systems (DOI), etc.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify approaches for harmonizing data across studies and promoting collaboration

•Prioritize the data elements that are most important for enabling international collaboration in sleep- circadian science

Scientific Programme

08:00AM - 08:10AM	**Introduction** Eilis Boudreau (United States)
08:10AM - 08:50AM	**Translational informatics, development of ontologies, and data sharing** Melissa Haendel (United States)
08:50AM - 08:55AM	**Introduction to Panel Objectives** Eilis Boudreau (United States)
08:55AM - 09:00AM	**Panel Breakout 1: Questionnaires** Daniel J. Buysse (United States) Michael Grandner (United States) Andrey Zinchuk (United States)
09:00AM - 09:05AM	**Panel Breakout 2: Actigraphy** Till Roenneberg (Germany) Kathleen Merikangas (United States) Elizabeth Klerman (United States) Andrew Lim (Canada) Georg Dorffner (Austria)
09:05AM - 09:10AM	**Panel Breakout 3: PSG** Thomas Penzel (Germany) Susan Redline (United States) Emmanuel Mignot (United States) Philip de Chazal (Australia) Jessie Bakker (United States)
09:10AM - 09:15AM	**Panel Breakout 4: Infrastructure models and opportunities** Shaun Purcell (United States) Melissa Haendel (United States) Joseph P. Menetski (United States) Katie L. Stone (United States) Clete Kushida (United States)
09:15AM - 10:15AM	**Panel Breakout Sessions**
10:15AM - 10:30AM	**Break**
10:30AM - 11:30AM	**Panel Synopsis Presentations** Daniel J. Buysse (United States) Till Roenneberg (Germany) Thomas Penzel (Germany) Shaun Purcell (United States) Kathleen Merikangas (United States)
11:30AM - 11:45AM	**Summary Statements**

Course, 220 - 220-222

08:00AM - 4:00PM **C03** **C03 Sleep health in women**

Additional registration required

Summary
Women have a different experience of sleep and sleep disorders compared to men. This may be related to hormonal influences, anatomical and physiological reasons but also to social and environmental factors. These factors may influence disease presentation, natural course, and even response to, and compliance with, therapy. This course will discuss sleep patterns in women, social and biological differences that contribute to sleep disorders, and the impact of various life stages on sleep across a woman's lifespan. The course will cover the vast body of literature that has emerged in the last 10 years linking sleep to maternal and fetal outcomes in pregnancy, including the impact of sleep disordered breathing to gestational hypertension and diabetes and preterm birth, and the importance of maternal sleep to mental health postpartum. The course will also provide knowledge updates on areas such as the circadian influence and shift work on sleep in women, prescribing for sleep disorders across the lifespan, cardiovascular consequences of sleep disorders, and restless legs syndrome.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize contributions of sex to different patterns of sleep and sleep disorders

•Identify the role of sleep and sleep disorders in pregnancy in impacting the health of woman and baby and the use of pharmacotherapy in this population

•Recognize sex differences in circadian rhythms and shift work

•Recall different clinical presentations of women and how diagnosis and management may need need to be tailored to women

•Describe the changes in sleep associated with various stages of a woman's life

Target Audience
Clinicians, scientists, trainees, polysomnography technicians, allied professionals

Chairs:

Ghada Bourjeily (United States)
Yu Sun Bin (Australia)
Danielle Wilson (Australia)

08:00AM - 08:10AM **Introduction**

Ghada Bourjeily (United States)

Scientific Programme

08:10AM - 08:40AM	**Social contributions to sleep in women** Yu Sun Bin (Australia)
08:40AM - 09:10AM	**Insomnia in women** Hrayr Attarian (United States)
09:10AM - 09:40AM	**Women, circadian rhythms and shift work** Diane Boivin (Canada)
09:40AM - 10:10AM	**Normal sleep and insomnia in pregnancy** Lianne Tomfohr-Maden (Canada)
10:10AM - 10:40AM	**Coffee break**
10:40AM - 11:10AM	**Sleep disordered breathing and perinatal outcomes** Danielle Wilson (Australia)
11:10AM - 11:40AM	**Making sense of associations between sleep disturbances and perinatal outcomes** Margaret Bublitz (United States)
11:40AM - 12:10PM	**Treating pregnant women with sleep disorders** Ghada Bourjeily (United States)
12:10PM - 1:10PM	**Lunch break**
1:10PM - 1:40PM	**Sleep and mental health in women** Melinda Jackson (Australia)
1:40PM - 2:10PM	**Sleep and cardiovascular consequences in women** Reena Mehra (United States)
2:10PM - 2:40PM	**Sleep and menopause** Helena Hachul (Brazil)
2:40PM - 3:00PM	**Break**
3:00PM - 3:30PM	**Restless legs syndrome/Willis Ekbom disease in women** Mauro Manconi (Switzerland)
3:30PM - 4:00PM	**Sleep, circadian rhythms and fatigue in cancer** Sonia Ancoli-Israel (United States)

Technologist Program, 224

08:00AM - 4:45PM Technologist program: AAST

Chairs:
Michael Eden (United States)

08:00AM - 08:05AM	**Introduction**
08:05AM - 09:00AM	**Evolution of cardiopulmonary resuscitation** David Wolfe (United States)

Scientific Programme

09:00AM - 09:50AM	**Sleep and athletes: Performance and recovery considerations** Brendan Duffy (United States)
09:50AM - 10:20AM	**Cardiac recognition** David Wolfe (United States)
10:20AM - 10:40AM	**Coffee break**
10:40AM - 11:10AM	**Recognizing abnormal EEG activity during sleep** Marietta Bibbs (United States)
11:10AM - 12:10PM	**Medical mysteries** Julie Dewitte (United States)
12:10PM - 12:15PM	**General questions morning session** Michael Eden (United States)
12:15PM - 1:15PM	**Lunch break**
1:15PM - 1:45PM	**Year in review** Joel Porquez (United States)
1:45PM - 2:30PM	**Dental sleep medicine** Leslie Dort (Canada)
2:30PM - 3:00PM	**AASM scoring manual**
3:00PM - 3:20PM	**Break**
3:20PM - 3:50PM	**New technologies in sleep medicine** Brendan Duffy (United States)
3:50PM - 4:30PM	**Equipment overview and scoring software** Laurie Dull (United States)
4:30PM - 4:45PM	**General questions afternoon session** Michael Eden (United States)

Course, 211

08:30AM - 12:50PM C17b C17 Dental sleep medicine (part 2)

Summary
Obstructive sleep apnea is a major health problem affecting over 10% of the adult population. The two most common and effective therapies used to treat sleep apnea are: (1) Continuous or Automatic Positive Airway Pressure (PAP), and (2) Oral Appliances. Dental Sleep Medicine is one of the fastest growing fields in dentistry, with large numbers of individuals with sleep apnea being treated with oral appliances. This one and a half day course will be focused on oral appliance therapy for the treatment of sleep apnea as well as touching on other areas in dental sleep medicine, like pediatric sleep apnea and bruxism. The course has been design to bring up-to-date and exciting information for new and experienced, clinicians and researchers in the field.
This is a clinically-focused and evidence-based continuing education program combining worldwide experts to bring to attendees the newest knowledge and its application to clinical practice.
The course will be divided in lectures on the first day and lectures with discussion panels for the second day.

Learning objectives
Upon completion of this CME activity, participants should be able to:

•Understand the the range of severity of sleep apnea and their relevance in the treatment choice and implications to cardiovascular disease.

•Discuss the role of oral appliance in specific populations such as pediatric, edentulous, and pregnant woman.

•Present current patient management approaches, focused on treatment efficacy and effectiveness

•Recognize scope of existing and emerging combination therapy approaches to OSA treatment, with a greater emphasis on combinations with oral appliance therapy.

•Have an up-to-date understanding of the latest controversies in dental sleep medicine, such as association with bruxism, small oral appliance titration, side effects and long term effectiveness

Target audience
Dentists, dental Assistants, and Physicians, Researchers, Sleep & Respiratory technologists and other health care professionals interested in dental sleep medicine

Chairs:

Fernanda Almeida (Canada)
Leslie Dort (Canada)

Alternative, emerging and combination therapies

Scientific Programme

08:30AM - 08:50AM	**Phenotyping and its relevance to dental sleep medicine** Danny Eckert (Australia)
08:50AM - 09:10AM	**Oral appliance and oxygen therapy: Distinct or complimentary interventions?** Scott Sands (United States)
09:10AM - 09:30AM	**Cannabis , bruxism and OSA, where is the smoke?** Gilles Lavigne (Canada)
09:30AM - 09:50AM	**CPAP, position training and other combination therapies to OAT** Marijke Dieltjens (Belgium)
09:50AM - 10:20AM	**Discussion Panel: The pros and cons of combination therapy** Fernanda Almeida (Canada) Danny Eckert (Australia) Scott Sands (United States) Gilles Lavigne (Canada) Marijke Dieltjens (Belgium)
10:20AM - 10:40AM	**Coffee break**
	The latest questions on oral appliance therapy
10:40AM - 11:00AM	**Bruxism and OSA, association or causality? How to treat?** Ramesh Balasubramaniam (Australia)
11:00AM - 11:20AM	**Titration - is just a little too little?** Satoru Tsuiki (Japan)
11:20AM - 11:50AM	**Status of bite changes and management** Julia Cohen-Levy (France)
11:50AM - 12:10PM	**Long term effectiveness of OAT** Marie Marklund (Sweden)
12:10PM - 12:50PM	**Panel Discussion: Get your clinical question addressed by a researcher** Leslie Dort (Canada) Ramesh Balasubramaniam (Australia) Satoru Tsuiki (Japan) Julia Cohen-Levy (France) Marie Marklund (Sweden)

Affiliated Meeting, 122

08:50AM - 4:00PM **A05** **A05: The CSS/CIHR-ICRH Trainee Research Day**

No Additional Cost

Summary
This daylong event has been designed by trainees for trainees in sleep research. The program will be relevant to a wide range of trainees, and was planned to achieve scientific integrity, objectivity and balance. Participation is encouraged from trainees at all levels, from graduate students to fellows, working in basic and clinical research fields. The format of the program will include a mixture of data presentations by trainees and senior investigators, in addition to professional development sessions where attendees will get advice from experts on improving their scientific communication skills. The CCS/CIHR-ICRH Trainee Research Day will conclude with a social event and data blitz aimed at getting attendees to interact, network, and have fun. Sunday, September 22, 2019 from 8:50 to 16:00.

08:50AM - 09:00AM **Welcome and opening remarks**
Sara Pintwala (Canada)

Advocating science: Foundations, translation and application

09:00AM - 10:00AM **Keynote Address: Astrocyte and microglia responses to sleep loss**
Kazue Semba (Canada)

10:00AM - 10:15AM **Break**

10:15AM - 11:15AM **Answers that matter: A focus on knowledge translation in sleep science. Will there ever be pharmacotherapy for obstructive sleep apnea?**
Andrew Wellman (United States)

11:15AM - 11:20AM **Introduction to session**
Sara Pintwala (Canada)

11:20AM - 11:30AM **Overview of trainee funding opportunities**
Jonathan Charest (Canada)

11:30AM - 12:00PM **“Inside the mind” of the CIHR**
Ryan Perry (Canada)

12:00PM - 12:30PM **Lunch break**

12:30PM - 1:30PM **Lunch and learn: Graduate studies and career pathways**
Christina Whiteus (United States)
Lee Tunstall (Canada)

Afternoon session: Focus on students

1:30PM - 2:00PM **Trainee symposium**
Thierry Provencher (Canada)
HanHee Lee (Canada)

Scientific Programme

2:00PM - 2:15PM

Presentation for the CIHR Sex- and Genderbased Analysis Trainee Award winner

Orlane Ballot (Canada)

2:15PM - 2:30PM

Presentation for the CSS Student Abstract Award winner

Russell Luke (Canada)

2:30PM - 4:00PM

Social mixer and data blitz

Gemma Tomasky (Canada)
Emi Hasegawa (Japan)
John Feemster (United States)
Debajyoti Chowdhury (China)
Sanda Smieszek (United States)
Kati Karhula (Finland)
Kirusanthy Kaneshwaran (Canada)
Veronique Latreille (Canada)
Ashley Nixon (Canada)
Zhuo Fang (Canada)
Kari Lustig (Canada)
Maziar Hafezi (Canada)
Ryan Lukic (Canada)
Erlan Sanchez (Canada)

Public Forum, Foyer

09:00AM - 10:15AM

World Narcolepsy Day Facebook Live Event

Please note: Live Pronouncement filming will be taking place in Speaker Ready Room 201. A World Narcolepsy Day “selfie station” will be available outside of meeting rooms 109 and 110.

Public Forum, 301-305

09:30AM - 6:30PM

Sleep Expo 2019: Public Lecture Series

Register for the public patient forum on http://sleepexpo.org/attend/

Sleep Expo 2019 will be open to the public and will include the following programming:

•Sleep Disorder Lecture Series: Lecture-based presentations covering treatment options, diagnostic criteria and other current information. Expert lecturers will not provide an overview on the various sleep disorders, but delve into the recent changes that have been made in the field in the past 18-months, as well as where the next 18-months may lead. Topics covered will include insomnia, sleep apnea, restless legs syndrome, hypersomnia and other sleep disorders.

Scientific Programme

09:30AM - 10:00AM	**How to know if you have a sleep disorder** Steve Carstensen (United States)
10:00AM - 10:30AM	**Women and sleep: pregnancy to menopause** Melissa C. Lipford (United States)
10:30AM - 11:00AM	**The psychology of sleeping pills** Paul Glovinsky (United States)
11:00AM - 11:30AM	**My child can't sleep: Managing sleep disorders in infants to adolescents** Lourdes DelRosso (United States)
11:30AM - 12:00PM	**Parkinson's, dementia, and the elderly** Phyllis Zee (United States)
12:00PM - 12:30PM	**Break**
12:30PM - 1:00PM	**Sleep, insomnia, and depression** Charles Morin (Canada)
1:00PM - 1:30PM	**Why do I keep falling asleep? Narcolepsy management** Michael Thorpy (United States)
1:30PM - 2:00PM	**Why am I sleepy during the day? Hypersomnia management** David Rye (United States)
2:00PM - 2:30PM	**Restless Legs Syndrome causes and treatments** Richard Allen (United States)
2:30PM - 3:00PM	**Can my dentist help me sleep?** Fernanda Almeida (Canada)
3:00PM - 3:30PM	**Sleep apnea diagnosis and treatments** John Fleetham (Canada)
3:30PM - 4:00PM	**How sleep can affect your health** Virend Somers (United States)
4:00PM - 4:30PM	**Falling asleep at the wheel** Mark Howard (Australia)
4:30PM - 5:00PM	**Effect of sleep on sports performance and sports injury** Charles Samuels (Canada)
5:00PM - 5:30PM	**Sleep walking, night terrors, and nightmares** Antonio Zadra (Canada)
5:30PM - 6:30PM	**Discussion Group: Inaugural World Narcolepsy Day Forum** Matt O'Neill (United Kingdom) Julie Flygare (Canada) Claire Crisp (United Kingdom) Eveline Honig (Canada) Rebecca King (United States) Mark Patterson (United States)

Social Event, 1199 W Cordova St. Park - 1199 W Cordova St.

09:30AM - 11:00AM

The Great Canadian Sleepwalk: The road to good nights

Join a team of ‘sleepwalkers’ in a 5km walk to raise awareness about healthy sleep and raise funds for the Canadian Sleep Society or attend to cheer on the participants. The meeting point (and finish point) is in the Grass area beside TAPshack Coal Harbour at 1199 W Cordova St. On-site registration starts at 8:30am. Visit the-great-canadian-sleepwalk-2019 for details. *A registration fee will need to be purchased to participate. 199 W Cordova St. | 9:30am

Public Forum, Foyer

10:15AM - 5:15PM

Sleep Expo 2019: Author Tables

Register for the public patient forum on http://sleepexpo.org/attend/

•Sleep-related Author Tables: Authors of sleep-related books will provide an overview of their research, findings and content, as well as have a chance to answer reader questions in person. Books will be available for purchase at the tables

10:15AM - 10:45AM

Author Table: Sharon Moore, "Sleep Wrecked Kids: Helping Parents Raise Happy, Healthy Kids, One Sleep at a Time"

Sharon Moore (Australia)

10:45AM - 11:15AM

Break

11:15AM - 11:45AM

Author Table: Paul Glovinsky, "You Are Getting Sleepy: Lifestyle-Based Solutions for Insomnia"

Paul Glovinsky (United States)

11:45AM - 12:15PM

Break

12:15PM - 12:45PM

Author Table: Julie Flygare, "Wide Awake and Dreaming: A Memoir of Narcolepsy"

Julie Flygare (Canada)

12:45PM - 1:15PM

Break

1:15PM - 1:45PM

Author Table: Claire Crisp, "Waking Matilda: A Memoir of Childhood Narcolepsy"

Claire Crisp (United Kingdom)

Affiliated Meeting, Admin 105 - 105

12:00PM - 1:00PM

Asian Society of Sleep Medicine Business Meeting

Course, 118 - 118-120

12:45PM - 4:00PM **C14**

C14 Insomnia Disorder: Assessment, Diagnosis and Management

Summary
Insomnia Disorder (ID) will be covered during 2 half days which could be taken together or attended separately. The first half (morning) will focus on 1) recent advances in understanding the pathophysiology of insomnia; 2) best practices in the assessment and diagnosis of insomnia; and 3) an introduction to the management of insomnia (both pharmacological and non-pharmacological), highlighting the potential advantages and risks associated with each approach. The presentations will explore primary insomnias as well as insomnia with co-morbid medical or mental issues. The second half (afternoon) will focus on best practices for the management of Insomnia Disorder using evidence-based approaches from clinicians working in the field. Cognitive Behavioral Therapies (CBT) will be discussed, including incorporation of practical, “real world” constraints associated with clinical practice. In the latter half of this session, a precision medicine approach to treating ID will also be discussed alongside a look into how ID may be treated in the future. The course aims to provide a comprehensive and in-depth understanding of ID along with practical tools and approaches suitable for use in the specialized sleep medicine setting but also in more general settings such as primary care and general psychiatry and psychology practices.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Determine appropriate management of insomnia in the context of complex physical and psychological illness

•Describe how precision medicine may aid in the assessment, diagnosis and treatment of insomnia

•Discuss new innovation in the treatment of insomnia
Predict how science, and practice, could inform the treatment of insomnia in the future

Target Audience
All healthcare professionals who have an interest in learning more about Insomnia Disorder and how it is assessed and managed

Chairs:

Jason Ellis (United Kingdom)
Ruth M. Benca (United States)

Scientific Programme

12:45PM - 12:55PM	**Introduction**
12:55PM - 1:25PM	**Intensive sleep retraining** Leon Lack (Australia)
1:25PM - 1:55PM	**Treating insomnia in psychiatric disorders** Ruth M. Benca (United States)
1:55PM - 2:25PM	**Treating insomnia in chronic pain conditions** Michael Smith (United States)
2:25PM - 2:45PM	**Coffee break**
2:45PM - 3:15PM	**Precision medicine for insomnia** Célyne H. Bastien (Canada)
3:15PM - 3:45PM	**Where next with the treatment of insomnia?** Daniel J. Buysse (United States)
3:45PM - 4:00PM	**Conclusion / Question and answer**

Course, 216 - 215-216

1:00PM - 5:00PM **C16**

C16 Narcolepsy and other hypersomnias: Diagnostic approach and management

Additional registration required

Summary
The objectives of this half day course are to present current concepts regarding the assessment and diagnosis of narcolepsy and other hypersomnias of central origin, and to discuss the contemporary landscape of pharmacological and non-pharmacological treatment options. This course is directed towards practicing sleep medicine specialists and will focus on narcolepsy, idiopathic hypersomnia, periodic hypersomnia, and hypersomnia due to medical conditions in adults and children.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize typical and atypical presentations of central hypersomnias in children and adults

•Identify the possible pitfalls and limitations in the diagnosis of hypersomnia

•Describe the current and emerging treatment options of narcolepsy and other hypersomnias in children and adults

•Explain the psychosocial burdens and quality of life issues associated with narcolepsy and other hypersomnias.

Target Audience
Practicing sleep medicine specialists and physicians-in-training; Nurse practitioners, psychologists, social workers, and other healthcare providers involved in the care of patients with hypersomnias

Chairs:

Merrill S. Wise (United States)
Tomi Sarkanen (Finland)

1:00PM - 1:10PM **Introduction**

Merrill S. Wise (United States)
Tomi Sarkanen (Finland)

1:10PM - 1:50PM **Narcolepsy: presentation, assessment and diagnosis**

Tomi Sarkanen (Finland)

1:50PM - 2:30PM **Idiopathic Hypersomnia and other Hypersomnias: presentation, assessment and diagnosis**

Lynn Marie Trotti (United States)

2:30PM - 2:50PM **Coffee break**

2:50PM - 3:25PM	**Narcolepsy in Children** Merrill S. Wise (United States)
3:25PM - 4:10PM	**Treatment of Narcolepsy and Other Hypersomnias** Yves Dauvilliers (France)
4:10PM - 4:40PM	**Psychosocial, Academic and Vocational Aspects of Hypersomnia** Berit Hjelde Hansen (Norway)
4:40PM - 5:00PM	**Conclusion / Question and Answer** Merrill S. Wise (United States) Tomi Sarkanen (Finland)

Affiliated Meeting, 110

1:00PM - 5:45PM **A06**

A06: A critical review of orofacial myofunctional therapy & sleep disordered breathing: Phenotyping, clinical markers, and early intervention

Summary
Obstructive sleep apnea is increasingly common sleep disorder with heterogenicity in clinical presentation and pathophysiology. In recent years, four contributing causes or phenotypes have been identified and included airway collapsibility, impaired pharyngeal dilator muscle function, lowered arousal threshold and loop gain.

Increased understanding of the pathophysiology and phenotyping of SDB traits can improve the success rate of targeted treatment such as myofunctional therapy, alone or in combination with other treatments in mild and moderate OSA, highlighting the need for further research and the need to develop simple phenotyping tools for SDB related muscle function.

Orofacial myofunctional therapy (OMT) represents a novel,non-invasive strategy to treat sleep disordered breathing including OSA (Guilleminault 2013, Camacho 2015, Camacho 2018). Recent evidence has supported its usage in children with residual OSA following adenotonsillectomy (Villa 2015, Guilleminault 2017, Felicio 2018). Further, OMT may represent a novel paradigm of therapy that may prevent pediatric OSA (Sullivan 2017). Standardized treatment modalities, models for detection of orofacial myofunctional disorders, and clear understanding of the related phenotypes, however, are yet to be established.

This symposium will critically evaluate the recent evidence on OMT, while exploring what is known clinically that may be of immediate interest to those working in sleep medicine who wish to apply a precision medicine approach including ENT, orthodontic, pulmonary, and OMT intervention.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe how the maldevelopment of specific structural components of the craniofacial respiratory complex in early childhood can be associated with sleep and airway morbidity

•Appraise the relationship between mouth breathing patterns, tongue restriction, posture, and sleep disordered breathing

•Employ a clinical decision making model to help providers determine when to implement OMT in children suspected with OSA

•Appraise the potential of myofunctional therapy alone or in combination therapy targeted to muscle phenotype in a precision medicine model and evaluate the success.

Target Audience
Sleep specialists, sleep researchers, dentists, sleep technologists, sleep medicine instructors, otolaryngologists, allied health professionals, myofunctional therapists, public health specialists

Chairs:

Sharon Keenan (United States)

Scientific Programme

1:00PM - 1:15PM	**Introduction: The emerging area of myofunctional therapy; why sleep disordered breathing?** Marc Richard Moeller (United States)
1:15PM - 1:42PM	**Should the kids breathe through nose or mouth? Implications of early treatment of respiratory dysfunction** Takashi Ono (Japan)
1:42PM - 2:09PM	**Impaired pharyngeal dilator muscle function in OSA; a phenotype for new modalities of treatment** Venkata Koka (France)
2:09PM - 2:24PM	**Orofacial Myofunctional Therapy (OMT) for obstructive sleep apnoea** Brigitte Fung (Hong Kong)
2:24PM - 2:51PM	**Stick your tongue out: OMT and its place in pediatric OSA** Rakesh Bhattacharjee (United States)
2:51PM - 3:01PM	**The certification paradox: balancing excellence and access in orofacial myofunctional therapy** Darius Logmahnee (United States)
3:01PM - 3:21PM	**Break**
3:21PM - 3:48PM	**Need for orthodontic treatment under the age of seven: A predictor of increased risk for sleep related breathing disorders (SRDB)** Kevin Boyd (United States)
3:48PM - 4:10PM	**Oral dysfunction and sleep meet education: A collaborative four-part school-based model for screenings** Nicole Archambault (United States)
4:10PM - 4:32PM	**Oronasal abnormalities and dysfunctions in persistent sleep disordered breathing** Julia Cohen-Levy (France)
4:32PM - 4:52PM	**Orofacial Myofunctional Therapy in the mouth breathing patient: An interdisciplinary approach and its place in sleep medicine** Silke Weber (Brazil)
4:52PM - 5:07PM	**Pediatric OSA and the interdisciplinary team: the addition of myofunctional therapy to standards of care for the French Orthodontic Society** Mai Kahn Le Dacheux (France)
5:07PM - 5:17PM	**Dentists need more than drills: the American Dental Association embracing whole person health** Steve Carstensen (United States)
5:17PM - 5:35PM	**A call for changes to sleep education and sleep screening** Sharon Keenan (United States)

Affiliated Meeting, 217-219

2:00PM - 6:00PM **A07**

A07: Management of sleep related breathing disorder seminar: A surgical perspective

Summary
Obstructive sleep apnea (OSA) is a disorder characterized by upper airway collapse during sleep. Estimated prevalence of OSA is 24% in men and 9% in women. Awareness of cognitive impairment and cardiovascular morbidity associated with OSA has been increasing. Many diagnostic and treatment techniques to optimize treatment outcomes have been developed. It is essential for physicians to stay up-to-date on new technology and treatment approaches in order to provide optimal management of patients with OSA.
This Symposium will bring together experts in sleep surgery, both ENT surgeons and Faciomaxillary surgeons in a single platform from different parts of the world to discuss the various treatment options for OSA. The symposium will also feature lectures on the most current sleep apnea patient care by local and international experts. The goal is to educate the participants on the latest research and advancements in OSA treatment and also to get an overview of improving CPAP compliance.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe the pathophysiology of OSA, become familiar with current research on mechanisms of sleep apnea

•Recognize the common causes of CPAP intolerance and understand the role of adjunctive or alternative therapies in the treatment of OSA

•Discuss the most current OSA medical and surgical evaluation and treatment options

•Organize and implement a successful multidisciplinary approach to treat patients with OSA

Target Audience
ENT Surgeons, Sleep Physician, Faciomaxillary surgeons

Chairs:

Vikas Agrawal (India)
Vijaya Krishnan (India)

2:00PM - 2:15PM **Awake and Dynamic Assessment of OSAS patient for Sleep Surgery**

Nathan Hayward (Australia)

2:15PM - 2:30PM **Understanding the pathophysiology of OSAS with DISE and Dynamic MRI with 3D modelling imaging**

Vijaya Krishnan (India)

Scientific Programme

2:30PM - 2:45PM	**Effect of Dexmedetomidine and propofol on airway dynamics during DISE** Sandeep Bansal (India)
2:45PM - 3:00PM	**How do we improve the CPAP compliance** Dipankar Datta (India)
3:00PM - 3:15PM	**Summary of RCTs in Adult Sleep Surgery** Stuart MacKay (Australia)
3:15PM - 3:30PM	**Summary of Selected Major Observational Studies in Adult Sleep Surgery** Stuart MacKay (Australia)
3:30PM - 3:50PM	**Panel discussion** Vijaya Krishnan (India)
3:50PM - 4:10PM	**Break**
4:10PM - 4:25PM	**Surgical Anatomy of palate and tongue base to understand OSAS better** Vikas Agrawal (India)
4:25PM - 4:40PM	**Bony framework surgery for OSAS – Airway aesthetics and Dynamics** M. Baskaran (India)
4:40PM - 4:55PM	**Hypoglossal nerve implant – Is it the game changer?** Peter Baptista (Spain)
4:55PM - 5:10PM	**Holistic management of OSAS** Song Tar Toh (Singapore)
5:10PM - 5:25PM	**Surgical Tips and Pitfalls in the management of OSAS** Vikas Agrawal (India)
5:25PM - 5:40PM	**Which operation(s) should be selected for my patient?** Vijaya Krishnan (India)
5:40PM - 6:00PM	**Panel discussion** Vikas Agrawal (India)

Administration, 106

4:00PM - 6:00PM **Canadian Sleep Society Executive Committee**

Poster Abstract, Exhibition - Ballroom BCD

Poster session 1

SLEEP FRAGMENTATION, ACCELERATED AGING AND INCREASED ACTIVATION OF MICROGLIA, AND COGNITIVE IMPAIRMENT IN OLDER ADULTS
Kirusanthy Kaneshwaran (Canada)

MICROGLIA ELIMINATION CAUSED PROLONGED INCREASES IN SLEEP FOLLOWING BOTH PERIPHERAL AND CENTRAL INFLAMMATORY CHALLENGES IN THE MOUSE
Rachel Rowe (United States)

MULTIMODAL MRI REVEALS ALTERATIONS OF SENSORIMOTOR CIRCUITS IN RESTLESS LEGS SYNDROME
Ambra Stefani (Austria)

C-REACTIVE PROTEIN MODERATES THE ASSOCIATION BETWEEN SLEEP AND INCIDENT DEMENTIA: THE FRAMINGHAM HEART STUDY
Andree-Ann Baril (United States)

ADOLESCENTS' SLEEP TRAJECTORIES OVER TIME: SCHOOL STRESS AS A POTENTIAL RISK FACTOR FOR THE DEVELOPMENT OF CHRONIC SLEEP PROBLEMS
Serena Bauducco (Sweden)

USING AN INTERACTIVE WEBSITE AND ONLINE WEB CALCULATOR TO DISSEMINATE NORMAL POLYSOMNOGRAPHY PARAMETERS IN HEALTHY ADULTS
Mark Boulos (Canada)

FEASIBILITY OF SLEEP-CAFFEINE LOG AND INTERVIEW FOR ASSESSING CAFFEINE, TECHNOLOGY AND SLEEP BEHAVIORS IN EARLY ADOLESCENTS
Abigail Cirelli (United States)

SLEEP SPINDLE DECLINE IN AGING AND ITS RELATION TO RESTING-STATE THALAMOCORTICAL CONNECTIVITY – PRELIMINARY FINDINGS
Daniela Dudysová (Czech Republic)

SLEEP AND INFLAMMATION IN AGING INDIVIDUALS WITH MILD COGNITIVE IMPAIRMENT
Dominique Lorrain (Canada)

ESTABLISHING SLEEP RESEARCH PRIORITIES WITH AUTISTIC ADULTS
Georgia Pavlopoulou (United Kingdom)

MIDLIFE SLEEP DURATION AND SUBSEQUENT 12-YEAR CHANGES IN COGNITIVE FUNCTIONING IN THE WISCONSIN SLEEP COHORT
Paul Peppard (United States)

ACUTE SLEEP RESTRICTION AND CORTISOL REACTIVITY IN EARLY CHILDHOOD
Ambra Saurini (United States)

SLEEP PROBLEMS IN PEOPLE WITH INTELLECTUAL DISABILITY (ID); DIAGNOSIS AND TREATMENT
Annelies Smits (The Netherlands)

ALDOSTERONE RENIN RATIO IN OBSTRUCTIVE SLEEP APNEA AND HYPERTENSION
Rimawati Tedjasukmana (Indonesia)

AGE-RELATED CHANGES IN THE NAPPING CORTISOL AWAKENING RESPONSE (CAR) DURING EARLY CHILDHOOD
Taylor L. Teske (United States)

SLEEP QUALITY AND CORRELATION BETWEEN ANTHROPOMETRY AND ELDERLY WOMEN OF THE SENIOR UCS PROGRAM
Heloísa Theodoro (Brazil)

SLEEP AND MEDIA USE IN 3-6 YEAR-OLD CHILDREN: DIFFERENCES BETWEEN GOOD AND POOR SLEEPERS
Sachi D. Wong (United States)

HIGHER ACUTE STRESS AND SCREEN TIME BUT NOT SOCIAL JET LAG ARE ASSOCIATED WITH HIGH RISK OF SLEEP APNOEA IN INDIAN YOUNG ADULTS
Nasreen Akhtar (India)

PSYCHOLOGICAL FACTORS ASSOCIATED WITH SELF-AWAKENING ABILITY
Benedetta Albinni (Italy)

IMPACT OF NON-INVASIVE VENTILATORY SUPPORT IN AN OBSTRUCTIVE SLEEP APNEA COHORT OF PATIENTS: A 10-YEARS FOLLOW-UP STUDY ON CARDIOVASCULAR EVENTS INCIDENCE
Ana Catarina Alves Moreira (Portugal)

PREDICTIVE FACTORS OF OSA: THE ROLE OF METABOLIC SYNDROME
Adelina Anton (Romania)

SLEEP SLOW WAVES ARE ASSOCIATED WITH INCREASED THALAMIC ACTIVITY AND WITH A DELAYED DECREASED ACTIVITY IN PRIMARY SENSORY CORTICES
Monica Betta (Italy)

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EFFECTS OF SINGING BOWL EXPOSURE ON KAROLINSKA SLEEPINESS SCALE AND PUPILLOGRAPHIC SLEEPINESS TEST
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SLEEP CONSEQUENCES AND DEPRESSIVE AND ANXIETY SYMPTOMS IN A POPULATION OF COLLEGIANS WHO HAVE LIVED AN UNWANTED SEXUAL EXPERIENCE – EXPLORATORY STUDY
Roxane Brochu (Canada)

INTERVENTIONS TO ENHANCE SLEEP IN MILD COGNITIVE IMPAIRMENT AND MILD ALZHEIMER'S DEMENTIA: A SYSTEMATIC REVIEW
James Clynes (United Kingdom)

SURVEY OF SLEEP PATTERNS WITHIN AN ACADEMIC CLINICAL DEPARTMENT
Flavia Consens (United States)

CHARACTERISTICS OF SLEEP QUALITY MEASURED BY PITTSBURGH SLEEP QUALITY INDEX INA AND SLEEP PATTERN USING MUNICH CHRONOTYPE QUESTIONNAIRE IN PRIMARY BRAIN TUMOR PATIENTS
Nushrotul Lailiyya (Indonesia)

EFFECTS OF DIFFERENT MATTRESSES ON SLEEP QUALITY IN HEALTHY SUBJECTS: AN ECG-BASED STUDY
Yan Ma (United States)

RELATIONSHIP BETWEEN MENIERE´S DISEASE AND SLEEP DYNAMICS
Takenao Mihara (Japan)

THE EFFECTS OF MINDFULNESS ON ADHERENCE TO CPAP IN PATIENTS WITH ESTABLISHED CARDIOVASCULAR DISORDERS
Atul Pathak (France)

A PREDICTION MODEL BASED ON MACHINE LEARNING FOR PREDICTING THE OUTCOMES OF UPPP SURGERY IN OBSTRUCTIVE SLEEP APNEA PATIENTS
Jingyuan You (China)

ASSESSING PHYSICIAN-PATIENT COMMUNICATION AROUND SLEEP EXPERIENCE, HABITS AND BEHAVIORS THROUGH A NOVEL SLEEPLIFE® APPLICATION-A PILOT, FEASIBILITY STUDY
Jarod Baker (United States)

SLEEP AUTOSCORING BASED ON A SINGLE EEG CHANNEL: COMPARISON WITH VISUAL SCORING IN PATIENTS
Christian Berthomier (France)

IDENTIFYING COMMON SLEEP DISORDERS VIA A DIGITAL SURVEY USING MACHINE LEARNING PREDICTION MODELS
Mairav Cohen-Zion (Israel)

IMPROVED ALERTNESS AND SUSTAINED ATTENTION FOLLOWING ACOUSTIC SLOW WAVE SLEEP STIMULATION IN CHRONICALLY SLEEP-DEPRIVED ADULTS
Charmaine Diep (Australia)

BODY SLEEP - ESTIMATING SLEEP STAGES FROM TYPE 3 HOME SLEEP STUDIES USING FEATURE EXTRACTION AND RECURRENT NEURAL NETWORKS
Eysteinn Finnsson (Iceland)

END-TO-END MACHINE LEARNING ON RAW EEG SIGNALS FOR SLEEP STAGE CLASSIFICATION
Eysteinn Gunnlaugsson (Sweden)

IMPROVED SWEAT ARTIFACT TOLERANCE OF SCREEN-PRINTED ELECTRODES BY MATERIAL SELECTION - IN VIVO COMPARISON OF EEG SIGNAL QUALITY
Sami Myllymaa (Finland)

OBSTRUCTIVE SLEEP APNEA DISORDER SEVERITY CORRELATION WITH BODY FAT MEASURE BY BIOELECTRIC IMPEDANCE ANALYSIS
Hae Ree Park (Republic of Korea)

CLASSIFICATION OF IN-BED MOVEMENTS USING A MATTRESS-BASED SENSOR ARRAY
H.F. Machiel Van der Loos (Canada)

A SLEEP LAB AT HOME: AN EVALUATION OF TECHNOLOGY TO PROVIDE ACCESSIBLE AND RELIABLE AT-HOME SLEEP ASSESSMENT OF CHILDREN
David Wensley (Canada)

UTILITY OF SOMNOLYZER G3 IN JAPANESE SLEEP CLINIC
Hiroaki Yamamoto (Japan)

PREDICTORS OF SUBCLINICAL CORONARY ARTERY DISEASE IN PATIENTS WITH SEVERE OBSTRUCTIVE SLEEP APNOEA: A SINGAPORE SLEEP CENTRE STUDY

5:00PM - 6:00PM

Affiliated Meeting, Admin 105 - 105

ORANGE Annual Members Meeting Chair: Fernanda Almeida

6:00PM - 8:00PM

Social Event, BR A - Ballroom A

Opening Ceremony

Scientific Programme

Monday, 23 September 2019

07:00AM - 1:00PM

Administration, SRR - 201

Speaker Ready Room

08:00AM - 08:45AM **Morin**

Keynote, BR A - Ballroom A

K01: Insomnia: Public health burden and new trends in treatment development and dissemination

Summary
Insomnia is a prevalent public health problem associated with significant burden for the individual (e.g., increased risks of depression and hypertension) and for society (e.g., increased disability and absenteeism from work). There is solid evidence that cognitive behavioral therapy for insomnia (CBT-I) is effective, safe, and well accepted by patients. CBT-I is also recognized as first-line therapy for chronic insomnia in most clinical practice guidelines. Despite this strong research-based evidence and endorsement by the scientific and professional community, CBT-I is still not widely available as first-line therapy and remains underutilized by health care practitioners. Several innovative and cost-effective treatment delivery models (e.g., Internet-based therapy, telemedicine) have yielded promising results, but it has not yet solved the imbalance between supply and demands. This lecture will review the public health significance of insomnia, summarize the current state of evidence on insomnia therapies, highlight some paradoxes between research evidence and clinical practices, and outlines future trends for improving treatment access and optimizing outcome.

08:00AM - 08:02AM **Introduction**

Allison G. Harvey (United States)

08:02AM - 08:45AM **Insomnia: Public health burden and new trends in treatment development and dissemination**

Charles Morin (Canada)

Scientific Programme

Keynote, 118 - 118-120

08:00AM - 08:45AM **Cistulli**

K02: Oral appliance therapy for obstructive sleep apnea: Ready for prime time (a state of the art review of the field)

Summary
Oral appliances (OA) have emerged as the leading alternative to positive airway pressure (PAP) for Obstructive Sleep Apnoea (OSA) treatment. There is a strong evidence base demonstrating OA therapy improves OSA in the majority of patients, including some with more severe disease. They are generally well tolerated, and patients often prefer OA over PAP treatment. Despite the superior efficacy of PAP over OA, randomized controlled trials comparing the two indicate similar improvement in health outcomes such, as sleepiness, quality of life, driving performance, blood pressure, and other cardiovascular measures. The evidence base strongly supports the use of OA therapy in the management of OSA.

08:00AM - 08:02AM **Introduction**

Fernanda Almeida (Canada)

08:02AM - 08:45AM **Oral appliance therapy for obstructive sleep apnea: Ready for prime time (a state of the art review of the field)**

Peter Cistulli (Australia)

Symposium, BR A - Ballroom A

09:00AM - 10:30AM **S01**

S01: Opioids and sleep disordered breathing: From biomedical research to clinical practice

Summary
Over the last two decades, there has been a dramatic rise in opioid use, misuse, morbidity, and mortality worldwide. This alarming tendency can be explained by a combination of factors, of which the recognition of chronic (non-cancer) pain by the medical community, the encouragement of patients to seek treatment and more importantly, the promotion of opioids as a key treatment modality are prime considerations. Opioid use is associated with alterations in sleep architecture, respiratory depression and sleep-disordered breathing. Despite these risks, current evidence on the relationship between opioid use, respiration during sleep, and associated adverse long-term consequences is limited and controversial. This symposium gathering experts in biomedical research, clinical science, and epidemiology will cover the health impacts of opioid medications on sleep-disordered breathing (SDB), sleep quality, and the associated risks. Specifically, Dr. Gaspard Montandon (University of Toronto, Canada) will present the current knowledge related to the neural mechanisms regulating opioid-induced sedation and respiratory depression. We will then explore the impacts of opioid use and misuse in adults. Specifically, Dr. Atul Malhotra (University of California San Diego, USA) using a case-based format will outline the opioid effects on clinical parameters and on polysomnography (PSG). The recognition and diagnosis of those patients taking chronic opioids who are most at risk of SDB is often challenging being limited by both health care resources and patient willingness to undergo further investigation. Dr. Clodagh Ryan (University of Toronto, Canada) will present the results from a study evaluating clinical predictors of SDB in patients on chronic opioids attending a multidisciplinary patient clinic. The current prescription pattern of opioids in individuals at risk for SDB and the impact of the interaction between SDB and opioid use at a population level will be explored by Dr. Tetyana Kendzerska (University of Ottawa, Canada). We will finalize our symposium with the overview of current treatment modalities for SDB in opioid users by Dr. Sutapa Mukherjee (Flinders University, Austrailia).
Considering the current opioid epidemic, a clear understanding of the impacts of opioid drugs on respiratory health is critical. This symposium will provide the audience with an up-to-date overview of the pathophysiology of opioid-induced sleep and respiratory alterations and associated risks, and the clinical and epidemiological impacts of opioids on sleep and SDB as well as current treatment approaches.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Recall the mechanisms of opioid-induced changes on sleep and breathing
- Recognize the effects of acute and chronic opioid use on sleep architecture and respiration during sleep
- Describe the efficacy of clinical prediction tools (STOPBANG) and portable monitoring systems for the diagnosis of sleep apnea in opioid users
- Identify prescriptions patterns of opioids in individuals with suspected SDB and the relationship with positive airway pressure treatment prescription and long-term adverse health consequences
- Identify recommended treatment modalities for SDB in opioid users

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Pathophysiology of opioid-induced sedation and respiratory depression** Gaspard Montandon (Canada)
09:18AM - 09:34AM	**The effects of acute and chronic opioid use on sleep architecture and respiration during sleep: clinical and polysomnographic effects** Atul Malhotra (United States)
09:34AM - 10:06AM	**How do we predict sleep apnea in patients on opioids?** Clodagh Ryan (Canada)
10:06AM - 10:22AM	**The relationship between opioid use in adults with suspected sleep-disordered breathing, positive airway pressure treatment prescription and associated long-term consequences** Tetyana Kendzerska (Canada)
10:22AM - 10:30AM	**Conclusion**

Oral Abstract, 116 - 116-117

09:00AM - 10:30AM O01: Insomnia treatment and mechanisms

Chairs:
Allison G. Harvey (United States)
Simon Kyle (United Kingdom)

09:00AM - 09:15AM	**IS RESTRICTION OF TIME IN BED CENTRAL TO THE EFFICACY OF SLEEP RESTRICTION THERAPY FOR INSOMNIA? RESULTS FROM A RANDOMISED, CONTROLLED, DISMANTLING TRIAL COMPARING SLEEP RESTRICTION WITH BEDTIME CONSISTENCY** Leonie Franziska Maurer (United Kingdom)
09:15AM - 09:30AM	**SEQUENCED THERAPIES FOR PATIENTS WITH CHRONIC INSOMNIA DISORDER: FINDINGS DERIVED FROM SLEEP DIARY DATA:** Jack Edinger (United States)
09:30AM - 09:45AM	**EFFICACY OF A STEPPED CARE APPROACH TO OFFER COGNITIVE-BEHAVIORAL THERAPY FOR INSOMNIA IN CANCER PATIENTS** Josée Savard (Canada)
09:45AM - 10:00AM	**LONG-TERM EFFECTIVENESS AND SAFETY OF LEMBOREXANT IN ADULTS WITH INSOMNIA DISORDER: 12-MONTH RESULTS FROM SUNRISE-2** Margaret Moline (United States)

10:00AM - 10:15AM

A RANDOMIZED CONTROLLED TRIAL OF SUVOREXANT FOR TREATING INSOMNIA IN PATIENTS WITH ALZHEIMER'S DISEASE: EFFECTS ON OBJECTIVE SLEEP MEASURES

W. Joseph Herring (United States)

10:15AM - 10:30AM

EFFECT OF LEMBOREXANT COMPARED WITH PLACEBO AND ZOLPIDEM EXTENDED RELEASE ON SLEEP ARCHITECTURE IN OLDER ADULTS WITH INSOMNIA DISORDER

Gary Zammit (United States)

Symposium, 118 - 118-120

09:00AM - 10:30AM **S02**

S02: Sleep, sleep disorders and perioperative care

Summary
Hospitalized patients predisposed to upper airway obstruction and/or hypoventilation are at increased risk of adverse events due to the synergistic effects of medications used for anxiety, sleep, sedation, pain, and their underlying airway collapsibility. Unfortunately, sleep-disordered breathing and non-respiratory disorders remain mostly undiagnosed in the population and approximately 40% of patients with severe sleep-disordered breathing are not compliant with the use of PAP therapy. Understanding the important common ground between sleep and anesthesia and the insights behavior in one state may provide for behavior in the other state.

The panel will provide the evidence for the need of screening and evidence of PAP therapy in patients with obstructive sleep apnea and obesity hypoventilation syndrome. The management of patients with non-respiratory sleep disorders when they are hospitalized for acute medical conditions or surgery will be discussed. The impacts of hospitalization on sleep and the importance of sleep in recovery from surgery and illness will be evaluated.

This session has put together experts in this field and will present scenarios for best practice in an interactive with audience manner. This session will contribute to improving safety and outcomes in the hospitalized patient in sleep, sleep disorders and perioperative care.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify important common ground between sleep and anesthesia and the insights behavior in one state may provide for behavior in the other

•Appraise the evidence for need of screening and evidence of PAP therapy in patients with obstructive sleep apnea and obesity hypoventilation syndrome

•Evaluate the management of patients with non-respiratory sleep disorders when they are hospitalized for acute medical conditions or surgery

•Recall the impacts of hospitalization on sleep and the importance of sleep in recovery from surgery and illness

Target Audience
Sleep physicians, respirologists, neurologists, psychiatrists, ENT surgeons, anesthesiologists, dentists, trainees, sleep technologists, nurses, and allied health professionals

Chairs:

John Fleetham (Canada)

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Sleep and anesthesia: The physiological common ground** Clifford B. Saper (United States)
09:22AM - 09:42AM	**Obstructive sleep apnea, and obesity hypoventilation syndrome: Who should be assessed, and how should we optimize?** Frances Chung (Canada)
09:42AM - 10:02AM	**Narcolepsy, restless legs syndrome, and parasomnias: Non-respiratory sleep disorders in the perioperative environment** Dennis Auckley (United States)
10:02AM - 10:22AM	**Sleep in the hospitalized patient: An under-appreciated influence on recovery?** David Hillman (Australia)
10:22AM - 10:30AM	**Conclusion**

Dental Symposium, 109

09:00AM - 10:30AM **S03**

S03: Prognostic value of the different available methods for upfront prediction of treatment outcome with non-CPAP therapy towards a more personalized treatment of obstructive sleep apnea

Summary
Obstructive sleep apnea (OSA) is increasingly recognized as a complex and heterogeneous disorder in terms of its causes, clinical expression and susceptibility to comorbidities. This poses challenges for a one-size-fits-all management approach to treat this disease, hence it represents an opportunity to tailor treatment to the individual patient.

The standard treatment for patients with moderate to severe OSA is continuous positive airway pressure (CPAP), applying pressurized air throughout the respiratory cycle to keep the upper airway patent. Although CPAP is highly efficacious in reducing the severity of OSA, the clinical effectiveness is often compromised by a low patient acceptance and suboptimal adherence. As a result, there is an imminent need for non-CPAP alternatives such as oral appliance therapy using mandibular advancement device (MAD) and sleep surgery including upper airway stimulation (UAS) relying on hypoglossal nerve stimulation during sleep.
The outcome with different non-CPAP options will be variable in unselected OSA patients and therefore the aim should be to prospectively select the right non-CPAP treatment for the individual patient. In order to implement such personalized treatment a better in-depth understanding of the multi-etiology of OSA is mandatory.

The pathophysiological traits of OSA comprise three phenotypical traits, one anatomical trait and one element fitting both the phenotypical and anatomical traits being the narrow, collapsible upper airway. The different lectures within this symposium will focus on the assessment of these anatomical and phenotypical traits with various techniques, including different imaging techniques, endoscopy, multimodal techniques, remotely controlled mandibular protrusion technology, and, various types of phenotyping, based on data obtained during awake state, drug-induced sedation or natural sleep. The emerging evidence on the application of these different available methods in terms of predictive power for upfront prediction of non-CPAP treatment outcome will be reviewed, including recent results on innovative techniques including dynamic magnetic resonance imaging, feedback-controlled mandibular positioner, and non-invasive assessment of pathophysiological OSA traits derived from polysomnographic signals.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Illustrate up-to-date understanding of different emerging methods for potential ‘upfront’ prediction of treatment outcome with non-CPAP treatment options in OSA patients

•Recognize the role of imaging techniques in the prediction of treatment outcome with non-CPAP options such as upper airway stimulation and mandibular advancement device (MAD) treatment

•Idenitify the differences in the predictive value of various techniques used during awake state, drug-induced sedation versus during natural sleep

•Recall the newest developments regarding automated titration of MAD treatment using home-based remotely controlled mandibular protrusion techniques
•Recognize the innovative methodology of deriving OSA

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**What have we learned from the past about prediction of treatment outcome with non-CPAP treatment for sleep-related breathing disorders** Marc Braem (Belgium)
09:18AM - 09:34AM	**The application of imaging to extract anatomical predictors of non-CPAP treatment success** Richard Schwab (United States)
09:34AM - 09:50AM	**Multimodal prediction: Awake versus sleep-related assessments** Peter Cistulli (Australia)
09:50AM - 10:06AM	**Feedback-Controlled Mandibular Positioner (F-RCMP) to predict oral appliance therapy outcome** Shouresh Charkhandeh (Canada)
10:06AM - 10:22AM	**The role of pathophysiological phenotyping in predicting therapeutic outcome with upper airway stimulation and mandibular advancement device treatment** Olivier Vanderveken (Belgium)
10:22AM - 10:30AM	**Conclusion**

Symposium, 121-122

09:00AM - 10:30AM **S04**

S04: The subjective experience of sleep: Emerging objective correlates

Summary
Perceived (or subjective) sleep quality is an important contributor to well-being and poor sleep quality is one of the major reasons to consult a sleep specialist. Despite this obvious importance, there is currently a lack of knowledge and consensus on the objective determinants of the subjective sleep experience. In addition, sleep quantity is frequently underestimated by patients suffering from insomnia, but it is unknown what underlies this subjective-objective mismatch. Research performed in the last decade may offer new approaches to a better understanding of what accounts for subjective sleep quality and quantity. On the one hand, sleep is not considered a global phenomenon anymore, affecting the brain uniformly and simultaneously. Instead, sleep occurs and is regulated locally 1-3. In many physiological and pathological conditions, sleep- and wake-like patterns may co-exist in different brain areas 4, with major consequences on cognitive function and mental activity 5-7. Recent studies using refined signal analysis techniques have convincingly shown that it is possible to relate such patterns of regional brain activity to sleep-related subjective experiences, such as dreaming 6,8. With the present symposium, we aim to present an overview of recent work relating the subjective perception of sleep quantity and quality to objective physiological measures. The studies will cover various neuroimaging methods (positron emission tomography, high-density EEG recordings), study groups (large populational cohorts, patients with insomnia), and analysis techniques (machine learning algorithms). Prof. Zeitzer will present a large study in which polysomnographic (PSG) parameters were found to explain only 11-17% of the variance in predicting subjective quality 9,10. Among these, sleep efficiency, total sleep time and sleep stage transitions appeared as the most important objective correlates. Next, Prof. Dijk will present results 11 showing that sleep continuity and the duration of REM sleep are positively correlated with subjective sleep quality and performance accuracy during the day across the adult lifespan. Prof. Riemann will demonstrate how using a serial awakening paradigm, his group was able to show that patients with insomnia more frequently misperceive their sleep state in REM sleep compared to healthy individuals, suggesting that the subjective experience of insomnia may be specifically coupled to REM sleep 12. Dr. Siclari will then present a high-density EEG study revealing local wake-like patterns in central and posterior brain regions when healthy individuals felt awake during sleep 13. Finally, Prof. Kay will show how the perception of sleep onset latency relates to activity in the cingulate gyrus and the insula measured by PET-FDG 14. Taken together, these lines of research suggest that sleep quality depends on sleep continuity and may be specifically linked to REM sleep. In line with these findings, patients with insomnia appear to misperceive the REM sleep state. Finally, these studies advance potential anatomical substrates involved in sleep state misperception, including the insula and posterior brain regions (posterior cingulum).

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Formulate the major polysomnographic parameters associated with good sleep quality
- Identify that REM sleep plays a major role in state perception in patients with insomnia
- Distinguish how local sleep- and wake-like pattern may influence the perception of sleep quality and sleep state

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**When a gold standard isn't so golden: Predicting subjective sleep quality from sleep polysomnography** Jamie Zeitzer (United States)
09:18AM - 09:34AM	**Rapid eye movement sleep, sleep continuity and slow wave sleep as predictors of cognition, mood, and subjective sleep quality in healthy men and women** Derk-Jan Dijk (United Kingdom)
09:34AM - 09:50AM	**Results from a NREM/REM sleep awakening study in good sleepers and patients with insomnia** Dieter Riemann (Germany)
09:50AM - 10:06AM	**Feeling awake while asleep: A high-density EEG assessment of sleep perception** Francesca Siclari (Switzerland)
10:06AM - 10:22AM	**Subjective-objective sleep discrepancy is associated with alterations in Regional Glucose Metabolism in patients with insomnia and good sleeper controls** Daniel Kay (United States)
10:22AM - 10:30AM	**Conclusion**

Symposium, 212-214

09:00AM - 10:30AM **S06**

S06: Effects of sleep and sleep loss on synaptic function

Summary
Sleep promotes the acquisition and consolidation of memory traces, the integration of new information within the prior body of knowledge, and the forgetting of irrelevant information. The underlying mechanisms remain poorly characterized and a matter of intense debate. Does sleep promote learning and memory mainly by strengthening or weakening synapses, or both? Are these mechanisms conserved throughout brain development, and are they shared across brain regions? Are plastic changes mainly due to behavioral state, or do they strongly depend on the circadian clock? Do they critically depend on specific oscillations such as Up and Down states? This symposium will address each of these questions using animal models and multiple in vivo and in vitro approaches, with an emphasis on new, currently unpublished results. The five speakers have complementary expertise and different scientific background. Drs. Gisabella and Paulsen are recent “newcomers” to our field.

Chiara Cirelli will introduce the topic of sleep and synaptic plasticity and the outstanding questions that will be addressed. She will also present unpublished data obtained with serial block-face electron microscopy in the CA1 region of the hippocampus of adolescent mice, and in the immature, pre-adolescent cerebral cortex. Both results support a role for sleep in broad synaptic down-selection.

Steven Brown will take a bimodal approach, first examining the cell physiological consequences of changing sleep pressure using -omics technologies in cortex, and then exploring their function via rational perturbation of relevant pathways. The overall picture that will emerge, based significantly on unpublished data, is one in which a circadian clock attempts to anticipate sleep need, and this control is then fine-tuned or even overridden by sleep-wake-dependent cortical activity.

Ole Paulsen will discuss experiments aiming at identifying the precise mechanisms by which slow wave sleep promotes synaptic refinement during development and memory consolidation in the adult. He will discuss the circuit mechanisms of Up-Down state transitions and the implications for synaptic plasticity based on experiments in brain slices as well as in vivo. He will argue that synaptic plasticity is network state dependent, and that this may help explain the distinct effects of neural activity on synaptic weights in sleep and wake state.

Barbara Gisabella will discuss unpublished data obtained in vglut2-Cre mice injected with mCherry CRE-DIO AAV reporter, combined with confocal 3D analysis, to test how sleep loss affects dendritic spines in the hippocampus. She will show that short sleep deprivation leads to branch and segment specific increases in volume and density of CA1 spines, consistent with the hypothesis of broad synaptic decreases during sleep.
Graham Diering will describe how his lab uses sub-cellular fractionation combined with biochemistry and mass spectrometry to examine how synapses in the cortex are modified by sleep or sleep disruption in mice at different ages as the animals mature towards adulthood. He will also discuss the use of mouse models of human autism spectrum disorder to understand how chronic early life sleep disruption contributes to lasting changes in cognitive and social behaviors.

Learning Objectives
Upon completion of this CME activity, participants should be able to...

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Sleep-dependent synaptic weakening across brain regions and during development** Chiara Cirelli (United States)
09:22AM - 09:42AM	**A cortical neuron's view of sleep and wake** Steven Brown (Switzerland)
09:42AM - 10:02AM	**Cortical synaptic plasticity during slow wave sleep-related activity** Ole Paulsen (United Kingdom)
10:02AM - 10:22AM	**Regulation of hippocampal dendritic spines following sleep deprivation** Barbara Gisabella (United States)
10:22AM - 10:30AM	**Conclusion**

Oral Abstract, 216 - 215-216

09:00AM - 10:30AM O02: Pediatric issues

Chairs:
Rosemary Horne (Australia)
Rakesh Bhattacharjee (United States)

09:00AM - 09:15AM	**OBSTRUCTIVE SLEEP APNEA IS INDEPENDENTLY ASSOCIATED WITH INSULIN RESISTANCE IN ASIAN INDIAN CHILDREN** Surya Prakash (India)
09:15AM - 09:30AM	**INCIDENCE AND PREDICTOR OF OBSTRUCTIVE SLEEP APNEA IN CHILDREN WITH ADENOTONSILLAR HYPERTROPHY AND NORMAL/INCONCLUSIVE OVERNIGHT OXIMETRY: A PROSPECTIVE STUDY** Montida Veeravigrom (Thailand)
09:30AM - 09:45AM	**LONG-TERM BENEFITS IN SLEEP, BREATHING AND GROWTH AND CHANGES IN ADHERENCE IN CHILDREN ON NON-INVASIVE VENTILATION** Maria L Castro-Codesal (Canada)
09:45AM - 10:00AM	**SLEEP MACRO-ARCHITECTURE AND MICRO-ARCHITECTURE IN CHILDREN BORN PRETERM WITH SLEEP DISORDERED BREATHING** Rosemary Horne (Australia)
10:00AM - 10:15AM	**INCREASED BEHAVIORAL PROBLEMS AT 5 YEARS OF AGE ARE ASSOCIATED WITH SLEEP DISORDERED BREATHING PHENOTYPES, BASED ON PARENT-REPORTED SYMPTOMS: THE CANADIAN HEALTHY INFANT LONGITUDINAL DEVELOPMENT BIRTH COHORT STUDY** Charmaine van Eeden (Canada)

10:15AM - 10:30AM

MIDDAY NAPPING IN CHILDREN: ASSOCIATIONS BETWEEN NAP FREQUENCY AND DURATION ACROSS COGNITIVE, POSITIVE PSYCHOLOGICAL WELL-BEING, BEHAVIORAL, AND METABOLIC HEALTH OUTCOMES

Sara Mednick (United States)

10:30AM - 10:45AM

PREVALENCE OF MALOCCLUSION IN AN ORTHODONTIC POPULATION OF PRE-ADOLESCENT AND ADOLESCENT CHILDREN WITH SLEEP DISORDERED BREATHING

Oyku Dalci (Australia)

Oral Abstract, 110

09:00AM - 10:30AM

O03: Basic research: Animals

Chairs:

John Peever (Canada)
Christian Cajochen (Switzerland)

09:00AM - 09:15AM

SLEEP-WAKE STATES IN FREELY BEHAVING MARMOSETS

Olga Bukhtiyarova (Canada)

09:15AM - 09:30AM

ACTIVATION OF ADENOSINE A2A RECEPTORS IN THE OLFACTORY TUBERCLE PROMOTES SLEEP IN RODENTS

Yi-Qun Wang (China)

09:30AM - 09:45AM

SLEEP FRAGMENTATION DOES NOT MODIFY CARDIAC FUNCTION IN A MOUSE MODEL OF HEART FAILURE

Isaac Almendros (Spain)

09:45AM - 10:00AM

SELECTIVE SILENCING OF LAYER 5 PYRAMIDAL NEURONS INCREASES WAKE TIME AND AFFECTS LOCAL AND GLOBAL SLEEP HOMEOSTASIS

Lukas B. Krone (United Kingdom)

10:00AM - 10:15AM

PROLONGED WAKEFULNESS ENHANCES MOTOR SKILL CONSOLIDATION THROUGH D1R NEURONS IN THE DORSOMEDIAL STRIATUM IN MICE

Lu Wang (China)

10:15AM - 10:30AM

SLEEP IN PRADER-WILLI MOUSE MUTANTS: THE EFFECTS OF PITOLISANT

Marta Pace (Italy)

Symposium, 217-219

09:00AM - 10:30AM **S07**

S07: Innovative multi-cultural approaches to sleep health education for children and families

Summary
This symposium will bring together a diverse international group of sleep researchers and educators to present a variety of innovative strategies for addressing sleep health knowledge gaps in children across age, socio-economic and cultural backgrounds in the interest of improving child health. In particular, implementing sleep health education interventions using technological advances and social media, in novel settings and in vulnerable populations will be explored.

Sleep Education for Adolescents in Asia:
Dr. Wing's talk will summarize the effectiveness of sleep education programs among children and adolescents in Asia, including school-based and group-based sleep education. In particular, the issue of late bedtime culture among Asian adolescents will be addressed, as well as future directions to improve adolescent sleep health.

Novel Delivery Methods for Sleep Education:
Dr. Quante will describe applications of experiential learning to sleep education and how smartphone-based applications can be integrated in sleep education, as well as highlight qualitative outcomes of a first pilot trial.

Sleep Education in the School Setting: Pros and Cons:
As much of the research in youth sleep intervention has been delivered within a school setting, Dr. Rigney will provide a brief overview of the school-based sleep education programs that have been conducted worldwide to date. The advantages of this form of delivery (e.g., access to a large number of children and adolescents), as well as challenges (e.g., over-crowded curriculum and difficulties in achieving systemic changes) will be discussed. Future directions for school-based sleep education, including the advances in eHealth and mHealth programs, will also be explored.

Multi-level Sleep Health Education in Low-Income Child Care Settings:
Dr. Bonuck will present her work implementing classroom, parent, organizational, and multi-media interventions across 22 New York State (US) child care program sites, enrolling n=514 dyads, many of whom were from racial/ethnic minorities, into the stepped wedge cluster randomized controlled trial during the 2018-2019 school year. This talk will present process (implementation), fidelity (adherence to education protocols) sleep (duration, behavior/problems, parent knowledge), and classroom (emotional climate) data and report on knowledge translation (policy) outcomes.

Developing and Testing A Culturally and Contextually-Tailored Sleep Hygiene Intervention for High-Risk Youth:
Dr. Koinis-Mitchell will summarize steps involved in the development and testing of a tailored intervention to improve sleep hygiene behaviors and sleep outcomes for urban middle school Latino children in Providence, RI and San Juan, Puerto Rico (USA). The intervention is school-based and includes caregiver and child involvement in the home, as well as four group sessions in the school setting. Data that informed the development of this program will also be reviewed.

Learning Objectives
Upon Completion of this CME activity, participants should be able to

•Describe the efficacy of sleep education interventions among

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Sleep education for adolescents in Asia** Yun Kwok Wing (Hong Kong)
09:18AM - 09:34AM	**Novel delivery methods for sleep education** Mirja Quante (Germany)
09:34AM - 09:50AM	**Sleep education in the school setting: pros and cons** Gabrielle Rigney (Australia)
09:50AM - 10:06AM	**Multi-level sleep health education in low-income child care settings** Karen Bonuck (United States)
10:06AM - 10:22AM	**Developing and testing a culturally and contextually-tailored sleep hygiene intervention for high-risk youth** Daphne Koinis-Mitchell (United States)
10:22AM - 10:30AM	**Conclusion**

Symposium, 220 - 220-222

09:00AM - 10:30AM **S08**

S08: Sleep-disordered breathing and maternal and fetal outcomes of pregnancy

Summary
Adverse outcomes of pregnancy (gestational hypertension-preeclampsia, gestational diabetes, low infant birth weight, premature birth) may have devastating short- and long-term health effects for both mother and infant. Prevention and treatment strategies for these prevalent complications are limited, and new therapeutic approaches are urgently needed. Available evidence indicates that sleep-disordered breathing (SDB) may affect up to 20-25% of women by the third trimester of pregnancy. Furthermore, there is growing evidence linking maternal SDB to adverse maternal and fetal pregnancy outcomes, which suggests that SDB may represent a novel therapeutic target for improving pregnancy outcomes. This symposium will critically review current evidence regarding diagnostic criteria, testing strategies, and the prevalence of SDB over the course of pregnancy. Current data linking maternal SDB to hypertensive disorders of pregnancy, gestational diabetes and other maternal outcomes, and the mechanisms by which this is believed to occur, will be presented. Available knowledge from animal and human studies evaluating the impact of maternal SDB on fetal growth, premature birth and infant and child development and health will be discussed. Current data on CPAP, oral appliance and other treatment strategies as well as the available evidence on SDB treatment outcomes will be presented.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Describe current knowledge concerning the diagnosis and prevalence of sleep-disordered breathing during pregnancy

•Describe the evidence linking sleep-disordered breathing during pregnancy to adverse maternal pregnancy outcomes including hypertensive disorders of pregnancy and gestational diabetes

•Describe current evidence linking maternal sleep-disordered breathing to fetal growth and effects on child development and health

•Describe available evidence on treatment of maternal sleep-disordered breathing during pregnancy using positive airway pressure and oral appliances

•Identify the implications of current knowledge for patient care, summarize knowledge gaps and describe specific research priorities in this area

Target Audience
Clinicians involved in the diagnosis and management of sleep-disordered breathing; epidemiologists, clinician-scientists and basic scientists interested in sleep-disordered breathing and cardiometabolic outcomes in adults and children

Chairs:

R John Kimoff (Canada)

Scientific Programme

09:00AM - 09:02AM		**Introduction**
09:02AM - 09:25AM		**Sleep-disordered breathing in pregnancy: Definitions, diagnosis and prevalence** Judette Louis (United States)
09:25AM - 09:48AM		**Sleep-disordered breathing and maternal outcomes of pregnancy** Ghada Bourjeily (United States)
09:48AM - 10:06AM		**Impact of maternal sleep-disordered breathing on fetal/infant outcomes** Najib Ayas (Canada)
10:06AM - 10:24AM		**Treatment of sleep-disordered breathing during pregnancy: PAP, oral appliances and beyond** Sushmita Pamidi (Canada)
10:24AM - 10:30AM		**Conclusion**

Technologist Program, 223-224

09:00AM - 10:30AM — T01: Clinical guidelines on manual/APAP titrations (workshop)

Chairs:
Michael Eden (United States)
Shalanda Mitchell (United States)

09:00AM - 10:30AM	**Clinical guidelines on manual/APAP titrations** Amber Allen (United States)

Exhibition, Exhibition - Ballroom BCD

10:00AM - 4:00PM — Exhibition 1 — Exhibition

Oral Abstract, 116 - 116-117

10:45AM - 12:15PM — O04: Sleep health

Chairs:
Megan R. Crawford (United Kingdom)
Helen Driver (Canada)

10:45AM - 11:00AM	**THREE CONSECUTIVE NIGHTS OF RESTRICTED SLEEP: EFFECTS OF MORNING CAFFEINE CONSUMPTION ON MOOD, REACTION TIME AND SIMULATED DRIVING PERFORMANCE** Karly Bartrim (Australia)

Scientific Programme

11:00AM - 11:15AM	**BROKEN WINDOWS, BROKEN ZZ´S: ADVERSE HOME ENVIRONMENTS PREDICT OBJECTIVE SLEEP PROBLEMS** Wendy Troxel (United States)
11:15AM - 11:30AM	**SLEEP EXTENSION REDUCES ENERGY INTAKE IN FREE-LIVING OVERWEIGHT ADULTS: A RANDOMIZED CONTROLLED STUDY** Esra Tasali (United States)
11:30AM - 11:45AM	**SLEEP AND CIRCADIAN HEALTH IN AUSTRALIANS AGED 5 TO 85 YEARS** Yu Sun Bin (Australia)
11:45AM - 12:00PM	**SLEEP PATTERNS, GLYCOLIPID METABOLISM DISORDERS AND PROSPECTIVE COHORT STUDIES** Xue Li (China)
12:00PM - 12:15PM	**DIFFERENCE OF LONGITUDINAL SLEEP BEHAVIOR CHANGE BY GENDER IN THE MIDDLE AGE: THE KOREAN GENOME AND EPIDEMIOLOGY STUDY (KOGES)** Hyeon Jin Kim (Republic of Korea)

Panel Discussion, 118 - 118-120

10:45AM - 12:15PM **D01**

D01: Defining and identifying "restless sleep disorder" among sleep disorders of childhood

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
Pediatric sleep disorders have a significant impact in the life of children and their families. Lack of sleep can adversely affect a child’s development, health and performance. In spite of clear diagnostic criteria for sleep disorders, the diagnosis of these conditions in children can be challenging as symptoms can overlap, and other conditions can present with sleep disruption and daytime symptoms. A group of children with “restless sleep” have been identified. These children do not fit criteria of any other current diagnostic category. The parents have concerns that night time restlessness is associated with excessive sleepiness, school cognitive problems or behavioral problems (irritability or hyperactivity).

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify “restless sleep disorder” following agreed criteria

•Differentiate “restless sleep disorder” from other common sleep disorders of childhood

•Discuss the possible mechanisms of “restless sleep” and its possible association with iron deficiency

Target Audience
Sleep clinicians, Neurologists, Pediatricians

Chairs:
Lourdes DelRosso (United States)

10:45AM - 10:47AM **Introduction**

10:47AM - 11:07AM **Clinical and video polysomnographic findings in children with restless sleep**
Lourdes DelRosso (United States)

11:07AM - 11:27AM **Diagnostic criteria for pediatric RLS and PLMD**
Arthur Walters (United States)

11:27AM - 11:47AM **Hypermotor insomnia and other insomnia types in childhood**
Oliviero Bruni (Italy)

11:47AM - 12:07PM **Effects of iron deficiency on brain development**
Patricio Peirano (Chile)

12:07PM - 12:15PM **Conclusion**

Dental Symposium, 109

10:45AM - 12:15PM **S09**

S09: Treatment modalities for sleep apnea patients with complex comorbidities

Summary
This symposium is focused on the clinical aspects of evaluation and treatment of patients with sleep apnea and other concomitant complex health issues. While traditional approaches to the treatment of sleep apnea are well described in the literature, when it comes to complex patients, the personalized approach is often a case by case decision. The session will describe the literature supporting the evaluation and treatment approach and other specific personalized approaches. CPAP use in psychiatric population, patients heart failure, and in Down syndrome will be assessed and discussed. In the diabetic population, a team treatment approach will be examine, focused on treatment and ideal biomarker to assess outcomes. Oral appliance treatment role in the treatment of the above described diseases and more in depth in diabetes will discussed.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recall how to assess patients with psychiatric disorders and suspicion of OSA

•Recognize the peculiarities of treatment of OSA patients with heart failure

•Discuss with multidisciplinary teams on treatment approaches for patients with OSA and diabetes

Target Audience
Physicians, dentists, researchers

Chairs:
Hiroko Tsuda (Japan)

10:45AM - 10:47AM **Introduction**

10:47AM - 11:03AM **Incidence and treatment of OSA in the psychiatric population**
Nathaniel Marshall (Australia)

11:03AM - 11:19AM **CPAP treament for patients with heart failure**
John Fleetham (Canada)

11:19AM - 11:35AM **Does CPAP improve diabetes outcomes in OSA patients**
Sushmita Pamidi (Canada)

11:35AM - 11:51AM	**Oral appliances outcomes in diabetes and other complex cases** Tea Galic (Croatia)
11:51AM - 12:07PM	**Prevalence and treatment of OSA in adults with down syndrome** Lizzie Hill (United Kingdom)
12:07PM - 12:15PM	**Conclusion**

Symposium, 121-122

10:45AM - 12:15PM **S10**

S10: Bridging basic research to clinical aspects in REM sleep behavior disorder: From bench to bed

Summary
REM sleep behaviour disorder (RBD) is a neurological condition characterized by abnormal sleep behaviours during REM sleep, often associated with dream content. RBD is accompanied by by pathological loss of REM sleep atonia, which in healthy people prevents movement during REM sleep. More than 80% of individuals diagnosed with the isolated form of RBD (iRBD) eventually develop an overt neurodegenerative disease, particularly an alpha-synucleinopathy (Parkinson's disease, multisystem atrophy or dementia with Lewy bodies). This suggests that RBD itself could result from a neurodegenerative process. This symposium will address this idea by presenting new data unraveling potential RBD mechanisms in both animal models and humans.

The first speaker (Dr. Peever) will present new data showing that synucleinopathic degeneration of the REM sleep circuits that control muscle atonia lead to an RBD phenotype in mice. This talk will present data showing that the same pathogenic mechanisms that cause synucleinopathic disorders such as Parkinson's disease also cause neurodegeneration of the REM sleep circuits and lead to RBD in mice.
The second speaker (Jennifer Ruskey) will build on this concept by providing further insights into RBD pathogenetic mechanisms from recent genetic studies in humans. Generally, these studies demonstrate that RBD has a distinct genetic background, which only partially overlaps with that of PD or DLB. Genes such as GBA and SNCA are important in RBD, while other genes such as MAPT and APOE seem to not play an important role in risk for RBD. These and other genes will be discussed in the session.
Currently, large scale genomic studies are being performed to delineate the genetic background of RBD, and compare it to that of PD, DLB and MSA. Furthermore, the role of genetics in the rate of phenoconversion is also being studied, and recent, unpublished data will be presented.
The third speaker (Dr. Stefani) will move to a clinical focus, correlating symptoms of RBD (e.g., dream enactment, emotion-charged vivid dream content) with alteration in mechanisms regulating REM sleep. Moreover, evidence from clinical studies that iRBD is not a mere risk factor for alpha-synucleinopathies but, rather, it represents an early phase of these disorders will be reviewed. These data will be presented in light of hypothesized physiopathological mechanisms of alpha-synucleinopathy related neurodegeneration. Furthermore, the relevance of isolated loss of REM sleep atonia will be discussed.

The fourth speaker (Dr. Heidbreder) will present RBD in the context of autoimmune disorders of the central nervous system (e.g., narcolepsy, multiple sclerosis, anti-IgLON5 disease). Characteristic features of RBD in these patients will be explained and correlated with the underlying pathogenetic mechanisms. This talk will have a special focus on the novel anti-IgLON5 disease, linking known neuropathological aspects to clinical manifestations of the disease.

Overall this session aims to give a complete view of RBD based on anatomopathological, genetic and clinical studies, and to stress its relevance in neurological diseases.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize mechanisms underlying REM sleep control whose dysfunction causes REM sleep behavior disorder

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Synucleinopathic degeneration of REM sleep circuits triggers RBD in mice** John Peever (Canada)
11:07AM - 11:27AM	**Genetic studies provide further insights into pathogenetic mechanisms of RBD** Jennifer Ruskey (Canada)
11:27AM - 11:47AM	**How basic science explains dream content, motor behaviors, and neurodegeneration in RBD** Ambra Stefani (Austria)
11:47AM - 12:07PM	**RBD associated with autoimmune disorder: Pathogenetic mechanisms explain clinical manifestations** Anna Heidbreder (Germany)
12:07PM - 12:15PM	**Conclusion**

Basic Science Symposium, 211

10:45AM - 12:15PM **S11**

S11: Large-scale genomic studies advancing understanding of sleep and circadian biology and disorders in humans

Summary
Despite marked advances in sleep and circadian sciences, there remain fundamental questions regarding the molecular bases for sleep and sleep and circadian disorders. Large-scale genomic studies in humans have provided novel insights. Recent international initiatives have produced large data resources of genomic data combined with a broad variety of phenotypes, including self-reported sleep phenotypes, polysomnography, and actigraphy. These remarkable data resources have catalyzed a large number of international collaborations, leading to the discovery of multiple variants for a wide range of sleep traits, identifying novel pathways and clarifying inter-relationships and causal associations with neuro-psychiatric and cardiometabolic diseases.

In particular, the UK Biobank has performed whole genome genotyping on 500,000 individuals who have undergone a variety of phenotyping and links to electronic health data, providing scale and power. The NHLBI Trans-Omics in Precision Medicine (TOPMed) generates whole genome sequencing and multi-omic data in deeply phenotyped individuals from multiple multi-ethnic cohorts, providing base-level molecular resolution. The Cohorts for Heart and Aging Research In Genomic Epidemiology (CHARGE) is an infrastructure for promoting meta-analyses, including studies of gene by environmental interactions, across multiple international cohorts, providing context with comorbidities and generalization to diverse studies.

This proposal will highlight the unique and complementary features of the UK Biobank, TOPMed, and CHARGE, identifying newly emergent opportunities for sleep and circadian researchers to access and analyze large genomic data sets; to understand approaches for maximizing information from collected sleep and circadian phenotypes within public repositories; to identify statistical tools for optimizing statistical power and identify the influence of rare or functional variants on sleep and circadian traits; and to understand methods for dissecting mediating, causal and common genetic mechanisms that link sleep and neuropsychiatric and cardiometabolic diseases and their associated genes and molecular phenotypes. Common pitfalls and challenges of genomic research will be discussed, including population-specific variants, false discovery, and imprecision of phenotypes, along with approaches for addressing these challenges.

Seminal findings from UK Biobank, TOPMed, and CHARGE will be highlighted, including discoveries of novel variants influencing sleep duration, chronotype, sleepiness, sleep apnea, nocturnal hypoxemia, and insomnia; variation of epigenetic markers and gene expression across sleep phenotypes; and gene variants that operate to increase risk for hypertension or dyslipidemia differently in the background of short and long sleep.

An over-riding aim of the symposium also will be to foster discussion across the sleep and circadian community on strong collaborative models to enhance multi-disciplinary team science, cross-cohort and international collaboration, and attracting and supporting new investigators working in this rapidly evolving area.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recognize how to access large publicly available genomic data sets and create international collaborations.

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Emerging challenges and opportunities in human genomic studies of sleep and circadian biology** Susan Redline (United States)
11:03AM - 11:19AM	**Accelerating gene discovery using diverse international resources: UK Biobank, TOPMed, and CHARGE** Richa Saxena (United States)
11:19AM - 11:35AM	**Genetic variants influencing sleep and chronotype: Clinical and biological insights from the UK biobank** Martin Rutter (United Kingdom)
11:35AM - 11:51AM	**Genetic variants and genomic profiles for sleep disordered breathing related traits in the NHLBI TOPMed consortium** Brian Cade (United States)
11:51AM - 12:07PM	**Investigating the biology of sleep-associated cardiometabolic traits using gene-sleep interactions: CHARGE** Raymond Noordam (The Netherlands)
12:07PM - 12:15PM	**Conclusion**

Symposium, 212-214

10:45AM - 12:15PM **S12**

S12: Using sleep to maximize the mental and cognitive health of young people around the world

Summary
A growing body of research supports the benefits of sleep to optimize the mental and cognitive health of children and adolescents. Despite this evidence, few educators and policymakers worldwide have sought to use sleep optimization to improve youth academic and emotional functioning or to use sleep behavior as a basis for identifying young people at risk of poor mental health while it is still preventable. A better understanding of the ways in which sleep optimization can be used to improve cognitive and emotional health or to reduce the risk of poor mental health will provide policymakers and educators with knowledge that they can use to promote youth health and well-being.

This symposium will first provide a contemporary context for using sleep health promotion as a means to improve youth well-being along with an overview of the mechanisms that underlie the impact of optimized sleep on cognition and mental health. Such mechanisms include improvement of executive functions, memory consolidation, sustained attention, emotional regulation and impulse control – all of which are essential for youth mental and cognitive health.

The symposium will then focus on different strategies that can be used to optimize sleep for improving the mental and cognitive health of young people, and how sleep can be used to identify youth at risk of poor mental health. We will examine and integrate data from empirical studies of school-based sleep education interventions used to optimize adolescents' sleep; examine the rationale for impact of delaying school start time in the attempt to achieve such outcomes, assess practical considerations, such as the ability of use of high- and low-intensity school interventions to achieve successful outcomes; and demonstrate how sleep-related questions can be used to screen for adolescents at risk of depression. Finally, we will extract research, educational, and practical implications that can guide researchers, educators and policy makers in planning how to integrate knowledge of sleep optimization into effective action in educational settings. The outcome is expected to pave the way to enable the use of sleep improvement as a means of maximizing the mental and cognitive health of young people around the world.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the mechanisms that underlie the impact of optimized sleep on cognition and mental health

•Outline innovative strategies that use sleep to optimize youth mental health or performance or to identify and minimize risk

•Recall research, practical, and policy implications

Target Audience
Researchers, clinicians, educators and policymakers

Chairs:

Scientific Programme

10:45AM - 10:50AM	**Introduction**
10:50AM - 11:05AM	**What does a good night's sleep mean? Associations between sleep and children's cognitive functioning and mental health** Joseph Buckhalt (United States) Mona El Sheikh (United States) Ryan Kelly (United States)
11:05AM - 11:20AM	**Findings and next steps for delaying school start times for adolescents' sleep and health** Amy Wolfson (United States)
11:20AM - 11:35AM	**Low vs high-intensity school sleep interventions for teenagers** Kate Bartel (Australia)
11:35AM - 11:50AM	**Sleep behavior phenotypes in adolescents at risk for depression** Joshua J. Gooley (Singapore)
11:50AM - 12:05PM	**Discussion: Lessons learned and gaps remaining** Mary Carskadon (United States)
12:05PM - 12:15PM	**Conclusion**

Symposium, 216 - 215-216

10:45AM - 12:15PM **S13**

S13: Sleepy heads and anesthesia: Anesthetic implications of disorders of daytime hypersomnolence

Summary
As more and more people undergo surgeries and require anesthesia, health care professionals are now caring for patients with a multitude of sleep disorders. Apart from obstructive sleep apnea, there is little familiarity amongst the health care providers and patients with anesthetic considerations for other sleep disorders that have potentially significant relationship with anesthetic management. One such example are disorders of daytime hypersomnolence, such as narcolepsy and idiopathic hypersomnia (IH). These patients present with unique symptom profile and pharmacological treatment warrants special anesthetic considerations. Theoretical complications include perioperative cataplexy or sleep paralysis episodes, status cataplecticus, drug interactions with anesthetic agents, prolonged emergence after general anesthesia and postoperative hypersomnia. Currently, little information exists regarding the perioperative anesthetic management and outcomes of narcolepsy or IH patients undergoing surgery.

This symposium is presented on behalf of the Society of Anesthesia and Sleep Medicine (SASM) educational initiative to raise awareness and provide a platform to discuss the relationship between neurophysiological, neuropsychological and neuropharmacological function between sleep and anesthesia states.

The first speaker, Dr. Dennis Auckley (Case Western Reserve University, USA) will discuss the shared mechanisms determining unconsciousness, sleep and anesthesia and how derangements in these mechanisms can lead to disorders of daytime hypersomnolence. The second speaker, Dr. Lynn Marie Trotti (Emory University, USA) will discuss the differences between narcolepsy and idiopathic hypersomnia (IH) and share their institutional experience with novel therapies such as Flumazenil. Diagnostic work-up and classification of these disorders, with specific focus on pathophysiology and symptoms will be discussed. Dr. Mandeep Singh (University of Toronto, Toronto, Canada) will then discuss the treatment options with a focus on various pharmacological agents used for these conditions and the potential for interaction with anesthesia management. In the end, Dr. David Hillman (University of Western Australia, Australia) will discuss specific issues with the anesthesia management of these patients, and the importance of proper work-up, counseling, and creation of anesthesia management plan for these patients.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recognize the pathophysiology and classification of disorders of daytime hypersomnolence

•Identify the important differences between specific phenotypes such as narcolepsy and idiopathic hypersomnia

•Recognize the anesthetic considerations for such patients considering surgery

•Evaluate and apply current evidence in the optimal management

Target Audience

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Unconsciousness, sleep and anesthesia: Shared mechanisms** Dennis Auckley (United States)
11:07AM - 11:27AM	**Narcolepsy or idiopathic hypersomnia: What's the difference?** Lynn Marie Trotti (United States)
11:27AM - 11:47AM	**Pharmacological treatment options and possible drug interactions with anesthesia management** Mandeep Singh (Canada)
11:47AM - 12:07PM	**Anesthetic considerations for patients with narcolepsy and idiopathic hypersomnia** David Hillman (Australia)
12:07PM - 12:15PM	**Conclusion**

Symposium, 220 - 220-222

10:45AM - 12:15PM **S14**

S14: Multidimensional sleep health: A new paradigm for understanding sleep-health relationships

Summary
Mental health. Cardiac health. Metabolic health. We are used to thinking about different domains of health, but until recently, we have struggled to define sleep health. What, exactly, is “good sleep?” This question is important on scientific, clinical, and population health grounds. Good sleep health is not simply the absence of sleep disorders, but the presence of features that promote optimal health and wellbeing. For instance, sleep duration of 7-9 hours is associated with the best cardiac, metabolic, mental health, and mortality outcomes. But sleep health goes beyond sleep duration: satisfaction, efficiency, timing, regularity, and sleepiness are also important. Moreover, each characteristic is simultaneously present in every individual, and each exists on a continuum. Thus, sleep health is a multidimensional construct.

Important issues remain: Can we define multidimensional sleep health conceptually and psychometrically? Does sleep health relate more strongly to health outcomes than single measures of sleep? Do optimal measures of sleep health vary across age, and among different health outcomes? Can the sleep health perspective be applied to behavioral interventions? Our symposium addresses these questions.

Dr. Buysse (Chair) will present a brief introduction and overview of the multidimensional sleep health construct, setting the stage for subsequent presentations.

Dr. Wallace will discuss statistical approaches to describing multidimensional sleep health and relating it to health outcomes, ranging from the simple (composite scores of “good” or “bad” sleep dimensions) to more complex (cluster analyses) to cutting-edge techniques for sleep (variable importance indices from random forests). Dr. Wallace will illustrate these techniques using data from sleep cohort studies.

Dr. Knutson will discuss the development and validation of the National Sleep Foundation’s Sleep Health Index (SHI), developed to assess population-level sleep health. She will present the methodology and expertise behind its development, and describe how SHI scores vary by age, gender, and race/ethnicity. The SHI can inform our understanding of sleep health as a public health issue.

Dr. de Batlle will present data using a 5-item sleep health scale (SATED) in the nationally-representative Catalan Health Survey. He will present data on the utility of SATED vs. sleep duration alone in relation to physical health. He will discuss data showing that SATED is more strongly related to perceived health status than physical activity or poor diet.

Dr. Buxton will present data relating sleep health to biomarker-derived cardiometabolic risk of CVD event in 10 years. Different sleep health facets, defined by self-report and actigraphy, are associated with cardiometabolic risk among 2 cohorts of midlife/older adults. Results may optimize future biopsychosocial, behavioral, and workplace interventions.

Dr. Stone will present data on individual and multiple dimensions of self-reported sleep health in relation to functional limitations, physical performance, and risk of falls in two large cohorts of older [illegible] poor sleep health indicators had increased odds of developing limitations over 3 years.

Learning Objectives

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Multidimensional sleep health: Can we define it? Does it matter?** Daniel J. Buysse (United States)
11:03AM - 11:19AM	**The National Sleep Foundation's Sleep Health Index: An assessment of national sleep health** Kristen Knutson (United States)
11:19AM - 11:35AM	**Statistical approaches for analyzing multidimensional sleep health data** Meredith J. Wallace (United States)
11:35AM - 11:51AM	**Multidimensional sleep health is more strongly associated with self-rated health than traditional predictors: The Catalan Health Survey** Jordi de Batlle (Spain)
11:51AM - 12:07PM	**Multidimensional sleep health and age-related functional outcomes** Katie L. Stone (United States)
12:07PM - 12:15PM	**Conclusion**

Technologist Program, 223-224

10:45AM - 11:30AM

T02: Reading and analyzing PAP downloads (workshop)

Chairs:

Shalanda Mitchell (United States)
Michael Eden (United States)

10:45AM - 11:30AM

Reading and analyzing PAP downloads

Laree Fordyce (United States)
Angelica Benitez (Colombia)
Alanna Cornish (United States)

Affiliated Meeting, 106

11:00AM - 12:30PM

IRLSSG Diagnostic Methodology Research Contact: Anne-Marie Williams

Technologist Program, 223-224

11:30AM - 12:30PM

T03: PSG, PAP, & CO2 ‘Oh My’

Chairs:
Michael Eden (United States)
Shalanda Mitchell (United States)

11:30AM - 12:30PM

PSG, PAP, & CO2 ‘Oh My’
Julie Dewitte (United States)

12:30PM - 2:00PM

Satellite Symposium, BR A - Ballroom A

Waking up to narcolepsy: Strategies to improving outcomes

Summary
Narcolepsy is a life-long disorder with the core symptoms of excessive daytime sleepiness (EDS), cataplexy, hypnagogic or hypnopompic hallucinations, sleep paralysis, and sleep disruption. Narcolepsy pathophysiology is linked to loss of signaling by hypocretin-producing neurons: an autoimmune etiology possibly triggered by an environmental agent may precipitate hypocretin neuronal loss. Narcolepsy is typically associated with a delay in diagnosis of approximately 8 to 15 years. The delay is related to numerous causes, such as mildness of symptoms, gradual onset, lack of recognition of the condition by the patient or clinician, and mistaken diagnosis because of alternative disorders of sleepiness such as sleep deprivation or obstructive sleep apnea. The high comorbidity burden in patients with narcolepsy with disorders that have symptom overlap with narcolepsy also contributes to the lack of recognition. The delayed diagnosis leads to delayed treatment, which increases the burden of the disease with detrimental effects on health care resource use, employment, and quality of life.

In order to improve time to diagnosis, questions about the characteristic features of the sleepiness, sleepiness while sedentary, dreaming during naps, and the age of onset of sleepiness will help in identifying the patient with narcolepsy. Screening tools such as the Swiss Narcolepsy Scale (SNS) and Epworth Sleepiness Scale (ESS) can help identify problematic sleepiness and symptoms of narcolepsy. In order to effectively diagnose narcolepsy, a series of two in-lab diagnostic tests are performed: an overnight polysomnogram (PSG), followed by a Multiple Sleep Latency Test (MSLT). Because the diagnosis of narcolepsy relies heavily on the MSLT, it is essential that the test be performed under the correct conditions.

No cure for narcolepsy exists; therefore, treatment is targeted at symptom management. Non-pharmacologic management should be initiated in all patients. Good sleep habits with avoidance of sleep deprivation and/or irregular sleep patterns should be emphasized. Unfortunately, lifestyle changes are rarely sufficient to adequately control the symptoms of narcolepsy, and most patients require life-long medication to cope with the debilitating effects of the disorder. Pharmacologic interventions include alerting medications for EDS, sodium oxybate (which treats both EDS and cataplexy), and antidepressants for cataplexy. Emerging therapies include solriamfetol, a selective dopamine and norepinephrine reuptake inhibitor (DNRI) for EDS, and pitolisant, a selective histamine 3 receptor antagonist/inverse agonist, for EDS and cataplexy.

Narcolepsy in the pediatric population is associated with impaired academic performance and reduction in social and participatory activities. Narcolepsy is frequently not diagnosed and misdiagnosed, often due to the difficulty in diagnosing narcolepsy in children because atypical presentations of cataplexy and associated medical, sleep, and behavioral comorbidities can lead to misdiagnoses. Narcolepsy management in children involves behavioral and lifestyle changes along with pharmacologic therapy. Many of the medications used for treating narcolepsy in adults are used off-label in children; sodium oxybate has recently been approved by the FDA for the treatment of cataplexy or EDS in pediatric patients with narcolepsy.

In this symposium, sleep clinicians will be provided with best practices in the diagnosis and treatment of narcolepsy in adults and children.

Learning Objectives

12:30PM - 12:35PM	**Introduction** Michael Thorpy (United States)
12:35PM - 1:00PM	**Strategies for early and accurate diagnosis of narcolepsy** Thomas Scammell (United States)
1:00PM - 1:25PM	**Treatments for narcolepsy: Evaluating the landscape** Michael Thorpy (United States)
1:25PM - 1:50PM	**Optimizing outcomes in pediatric patients** Kiran Maski (United States)
1:50PM - 2:00PM	**Take-home tips for clinical practice**

Satellite Symposium, 121-122

12:30PM - 2:00PM Insomnia: It's a night and day issue

Summary
Insomnia can have significant implications on next day performance and long-term health. This symposium reviews the impact of poor sleep on daytime performance issues such as cognitive function, memory impairment, and reduced productivity as well as potential effects on overall health including cardiovascular disease, diabetes, depression and age-related neuro-cognitive decline.

CME credits are not offered with this program.

Supported by Eisai Inc.

12:30PM - 2:00PM **Insomnia: It's a night and day issue**

Sonia Ancoli-Israel (United States)
Eve Van Cauter (United States)

Satellite Symposium, 217-219

12:30PM - 2:00PM

Positional sleep apnea and its treatment

Summary
Positional Obstructive Sleep Apnea (POSA) is a specific diagnosis distinct from other types of OSA. It is a condition in which the vast majority of apneic events occur during supine sleep, where this is a reduction in AHI by 50% when not in the supine position. Treatment of POSA with a sleep position trainer, can lead to increased compliance compared to traditional CPAP therapy.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Define positional obstructive sleep apnea
- Discuss the prevalence of positional obstructive sleep apnea
- Review the traditional treatments for POSA compared to OSA
- Review the evidence for use of sleep position trainers.

Target Audience
Sleep Physicians, Sleep Technicians

12:30PM - 12:35PM **Introduction**
Cheryl Needham (United States)

12:35PM - 1:10PM **Positional obstructive sleep apnea: Why and how it should be treated**
Nico de Vries (The Netherlands)

1:10PM - 1:45PM **Evidence for the treatment of positional obstructive sleep apnea**
JL Pepin (France)

1:45PM - 2:00PM **Question and Answer**

Satellite Symposium, 220 - 220-222

12:30PM - 2:00PM

Restless legs syndrome: Progress and pitfalls

Arbor Pharmaceuticals Industry Symposium

12:30PM - 2:00PM **Restless legs syndrome**
John Winkelman (United States)

Scientific Programme

Social Event, 109

1:00PM - 2:00PM

World Sleep Day networking event

Join several of our World Sleep Day 2018 & 2019 delegates and past Distinguished Activity Award winners at the World Sleep Day Networking Event in Vancouver! Attendees did not need to host an event to join. worldsleepday.org

Satellite Symposium, 216 - 215-216

1:00PM - 1:45PM

Beyond the AHI: Nox Medical Industry Workshop

This is an event for everyone interested in the challenges we face in the detection and measurement of sleep disordered breathing. Those interested in new approaches in diagnostics and how we can continue to evolve sleep medicine should find this symposium of interest. Dr. Naresh Punjabi has chosen to donate his honorarium to the Helgi Kristbjarnarson Memorial Fund, to support promising students and researchers within the fields of sleep research and sleep technology.

1:00PM - 1:02PM **Introduction**

1:02PM - 1:22PM **Use of RIP to measure respiratory drive and ventilation**
Andrew Wellman (United States)

1:22PM - 1:42PM **Is the Apnea-Hypopnea Index the best way to quantify the severity of sleep-disordered breathing? No.**
Naresh Punjabi (United States)

1:42PM - 1:45PM **Question and answer**

Affiliated Meeting, 110

1:00PM - 2:00PM **SRS**

Sleep Research Society discusses "why we sleep"

1:00PM - 1:45PM

Satellite Symposium, 223-224

Patient selection: The new paradigm for collaborative treatment success in patients with OSA

Summary:
Hear leading researchers and doctors in the field of Sleep Medicine discuss patient selection to achieve the best and most effective outcomes. Patient selection will match the appropriate therapy with the patient to achieve the best adherence and achieve the maximum efficacy for that patient using that therapy. Dr. John E. Remmers, MD will highlight the benefits of patient selection for OAT using the MATRx plus™. Dr. Sharnell Muir, DMD will review the reality of OAT in the dental office with case studies and Dr. Edward T. Sall, MD, DDS, MBA will review effectiveness, and the latest research pertaining to the SARAH (Sleep Adjusted Residual AHI) Study.

Learning Objectives

•Understand adherence, efficacy and patient selection making Oral Appliance Therapy a success for patient outcomes.

•Analyze why OAT is a key therapy along with CPAP for treating OSA patients.

•Learn how OAT side effects are manageable using the latest, precision Medical Devices by ProSomnus® Sleep Technologies.

•Review the SARAH study objectives, study design and status.

•Explain how the MATRx plus™ is used to determine a patient's response and the therapeutic position in advance of treatment.

•Summarize clinical practice using the MATRx plus™ – its's a team game

•Report the NOTUS clinical trial results - the science behind the MATRx plus™.

•Hear case study presentations with mild, moderate and severe AHI.

Target Audience
Sleep Physicians and Dentists, as well as other healthcare professionals involved in the management of sleep disorders.

Supported by ProSomnus Sleep Technologies

Scientific Programme

1:00PM - 1:05PM **Introduction**

1:05PM - 1:15PM **Lecture 1**
John E. Remmers (Canada)

1:15PM - 1:25PM **Lecture 2**
Sharnell Muir (Canada)

1:25PM - 1:35PM **Lecture 3**
Edward T. Sall (United States)

1:35PM - 1:45PM **Question and answer**

Administration, SRR - 201

1:00PM - 1:30PM Press Meeting

Administration, SRR - 201

1:30PM - 5:00PM Speaker Ready Room

Keynote, BR A - Ballroom A

2:00PM - 2:13PM Christian Guilleminault Memorial

Summary
Dr Oliviero Bruni will deliver a 10 minute memorial celebrating the life of Dr. Christian Guilleminault. The memorial talk will be followed by Dr Mary Carskadon keynote address.

2:00PM - 2:02PM **Introduction**
Reut Gruber (Canada)

2:02PM - 2:13PM **Christian Guilleminault Memorial**
Oliviero Bruni (Italy)

Panel Discussion, 116 - 116-117

2:00PM - 2:45PM Meet the Professor: M Thorpy, T Scammell, K. Maski

Chairs:
Michael Thorpy (United States)

2:00PM - 2:45PM **Panel Discussion**
Thomas Scammell (United States)
Michael Thorpy (United States)
Kiran Maski (United States)

Technologist Program, 223-224

2:00PM - 3:30PM

T04: Adult PSG scoring bootcamp (workshop)

Chairs:

Shalanda Mitchell (United States)
Michael Eden (United States)

2:00PM - 3:30PM

Adult PSG scoring bootcamp

Laree Fordyce (United States)
Joel Porquez (United States)

Keynote, BR A - Ballroom A

2:13PM - 2:55PM

Carskadon

K03: Adolescent sleep: Timing is everything…or is it? Christian Guilleminault Memorial Lecture

Summary
A major focus of Dr. Carskadon’s scientific activities is research examining interrelations between the circadian timing system and sleep/wake patterns of children, adolescents, and young adults. Her findings have raised public health issues regarding the consequences of insufficient sleep for adolescents as well as concerns about early starting times of schools. Her work has affected education policy, prompting the AAP, CDC, and others to promote later school timing for adolescents and many school districts to delay school start times for high school students.

Carskadon’s current research includes an evaluation of how sleep and circadian timing influence smell, taste, food choices, and food consumption in overweight and assessing effects of serial nights of alcohol on sleep and next-day function in adults. Proposed new projects seek to (1) assess the chronic and direct effects of caffeine on circadian and homeostatic sleep systems in early adolescents; (2) evaluate sleep health disparities in inner-city children with chronic asthma; (3) measure gene methylation and genotype with observational phenotyping and experimental sleep interventions in young adults.<o:p></o:p>

2:13PM - 2:55PM

Adolescent sleep: Timing is everything…or is it?

Mary Carskadon (United States)

Symposium, BR A - Ballroom A

3:00PM - 4:30PM **S15**

S15: Management of sleep disordered breathing in specific populations: New insights from recent publications

Summary
The purpose of this symposium is to address issues related to the management of sleep disordered breathing (SDB) in specific populations. We have focused on patient groups that are commonly encountered in clinical practice, and in which there is considerable controversy in the field/recent published data with particular relevance to the population in question. The speakers/chairs are international experts with representation from Canada, Brazil, Australia, and Japan.

At the conclusion of each talk, the speaker will provide a brief one slide summary of what their practice is with respect to these patients (i.e., “This is what I do”). Each talk will be 20 mins in length, leaving 2 minutes for Introductions, and 8 mins for questions/final comments at the end.

The first talk (Dr. Drager, a keynote speaker and co-author of the SAVE study) will focus on minimally symptomatic patients with sleep apnea. This is a highly controversial area given that the SAVE study (published 2016) called into question the effectiveness of CPAP in cardiovascular (CV) disease prevention. However, this talk will not only address issues related to CPAP, but also discuss other potential non-PAP therapies (e.g. pharmaceutical and non-pharmaceutical interventions such as exercise) that might be considered to reduce future CV risk in this population.

The second talk (Dr. Naughton) will focus on patients with heart failure with reduced ejection fraction. This will not only include discussion of positive airway pressure, but also other interventions including oxygen and phrenic nerve stimulation.

The third talk (Dr. Berlowitz) will focus on patients with spinal cord injury (SCI). These patients have a markedly high prevalence of sleep apnea but management can be very challenging. Recent randomized trials (COSAQ study) will be highlighted.

The fourth talk (Dr. Hanly) will focus on the bidirectional relationship between sleep apnea and renal disease. Dr. Hanly will discuss how renal failure management can affect sleep apnea severity (e.g. frequency of dialysis, ultrafiltration, edema management), and how sleep apnea therapy may impact progression to renal disease highlighting recent RCT in the field.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify the controversies and management alternatives to reduce cardiovascular risk in patients with minimally symptomatic sleep apnea

•Recognize the treatment alternatives, as well as their indications and contraindications, to treat sleep apnea in patients with heart failure

•Describe the effectiveness and indications for therapy of sleep apnea in patients with spinal cord injury

and the implications for management

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Management of sleep apnea in minimally symptomatic patients** Luciano Drager (Brazil)
3:22PM - 3:42PM	**Management of sleep apnea in patients with heart failure** Matt Naughton (Australia)
3:42PM - 4:02PM	**Management of sleep apnea in patients with spinal cord injury** David Berlowitz (Australia)
4:02PM - 4:22PM	**Sleep apnea and kidney disease: A bidirectional relationship** Patrick Hanly (Canada)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 116 - 116-117

3:00PM - 4:30PM

O05: SBD Epidemiology

Chairs:
Allan Pack (United States)
Robert Thomas (United States)

3:00PM - 3:15PM	**SARCOPENIC OBESITY IS ASSOCIATED WITH OBSTRUCTIVE SLEEP APNEA: A POPULATION-BASED STUDY** Ronaldo Delmonte Piovezan (Brazil)
3:15PM - 3:30PM	**SEVERE OBSTRUCTIVE SLEEP APNEA ASSOCIATED WITH STAGE III-IV LUNG CANCER MORTALITY: A COHORT STUDY** Hung Yu Huang (Taiwan)
3:30PM - 3:45PM	**SCREENING FOR OBSTRUCTIVE SLEEP APNEA IN STROKE AND TIA PATIENTS USING A PORTABLE SLEEP MONITOR: A RANDOMIZED CONTROLLED TRIAL** Mark Boulos (Canada)
3:45PM - 4:00PM	**SEX DIFFERENCES IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA AND SUSPECTED HYPOVENTILATION ON HOME SLEEP APNEA TESTING** Sachin R. Pendharkar (Canada)
4:00PM - 4:15PM	**MULTIPLE SLEEP DIMENSIONS AND CHRONIC KIDNEY DISEASE: FINDINGS FROM THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS** Chandra L. Jackson (United States)
4:15PM - 4:30PM	**COMPREHENSIVE CHARACTERIZATION OF GENETIC AND PHENOTYPIC HETEROGENEITY OF OBSTRUCTIVE SLEEP APNEA ACROSS MULTIPLE UNITED STATES CLINICS** Olivia J. Veatch (United States)

Panel Discussion, 118 - 118-120

3:00PM - 4:30PM **D02**

D02: Alternative diagnostic approaches to childhood obstructive sleep apnea

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
Childhood obstructive sleep apnea (OSA) is a common condition and prevalence rate is often quoted as 3 - 5%. This condition has important clinical implications as if it is left untreated, a variety of complications can result, namely cardiovascular, neurocognitive and metabolic disturbances. Therefore it is important to recognize the condition early and offer prompt treatment. The current gold standard in diagnosing childhood OSA is overnight polysomnography (PSG). Unfortunately, PSG is rather labour and cost intensive. In addition, it is not available in all paediatric units and therefore waiting time for patients to undergo PSG is often very long. This has resulted in unnecessary delay as patients have to wait for months and even years before a diagnosis is confirmed and management instituted. Recent research has focused on alternative diagnostic methods in order to prioritise patients suspected with OSA for early intervention and in some studies, methods to replace PSG are also being investigated. In this panel discussion, the various speakers will provide pro/con information on the following topics that aim to provide an up-to-date review of alternative tools being investigated / used for the diagnosis of childhood OSA.

- Pitfalls of polysomnography for childhood OSA, why is it failing us?
- Can parent-reported sleep symptom questionnaire and or overnight oximetry replace PSG?
- Combining imaging findings and symptoms in diagnosing OSA.
- Drug-induced sedation endoscopy is the way forward, where is the evidence?

A series of discussion points will be posted at the beginning of the session to enhance subsequent discussion between the speakers and the audience.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss problems associated with the use of overnight PSG in the diagnosis of childhood OSA

•Gain a greater understanding of recent literature on the use of sleep symptom questionnaire, overnight oximetry and radiological imaging techniques in replacing / substituting PSG in managing children suspected to have OSA

•Acquire knowledge in the use of drug-induced sedation endoscopy as a diagnostic strategy for childhood OSA.

Target Audience
Pediatricians, psychologists, psychiatrists, nursing colleagues and allied health care workers interested in childhood sleep apnea

Chairs:

Albert Martin Li (Hong Kong)

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Pitfalls of polysomnography for childhood OSA, why is it failing us?** Rosemary Horne (Australia)
3:22PM - 3:42PM	**Can parent-reported sleep symptom questionnaire and or overnight oximetry replace PSG?** Gillian Nixon (Australia)
3:42PM - 4:02PM	**Combining imaging findings and symptoms in diagnosing OSA** Kate Chan (Hong Kong)
4:02PM - 4:22PM	**Drug-induced sleep endoscopy is the way forward, where is the evidence?** An Boudewyns (Belgium)
4:22PM - 4:30PM	**Conclusion**

Dental Symposium, 109

3:00PM - 4:30PM **S16**

S16: Imaging and sleep apnea: Can we predict the presence of disease and treatment outcomes?

Summary
During this symposium advanced imaging techniques used for screening and prediction of treatment outcomes will be described. Simple smart phone photography accuracy in the screening of OSA will be described and the supporting literature will be discussed. Many forms of imaging have been used over the years in the search of phenotyping children and adults with OSA. Discussions of the identification of bony restriction or excess of soft tissue around the upper airway is highly important for the better understanding of future target treatment approaches and prevention of the disease. Imaging today is also used to identify function and non-static assessment of the upper airway musculature shows important insights of the disease, treatment options and outcomes.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

- Interpret simple photography role in screening OSA
- Evaluate the role of intraoral assessments of children with OSA
- Get knowledge on new non-static imaging technique, the tag-MRI
- Discuss the role of imaging in research, screening and treatment of OSA

Target Audience
Clinicians, researchers, dentists and related health professionals

Chairs:
Fernanda Almeida (Canada)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:22PM **Photography for the evaluation of facial profiles in obstructive sleep apnea**
Kate Sutherland (Australia)

3:22PM - 3:42PM **Facial characteristics of children with OSA: Results of the PDSA cohort study**
Fernanda Almeida (Canada)

3:42PM - 4:02PM **TAG-MRI phenotyping and predicting treatment outcomes**
Lynne Bilston (Australia)

4:02PM - 4:22PM **The role of CBCT in the diagnosis and oral appliance treatment outcome**
Bingshuang Zou (Canada)

4:22PM - 4:30PM **Conclusion**

Symposium, 121-122

3:00PM - 4:30PM **S17**

S17: Frontiers of dissemination of CBT for sleep and circadian problems in mental and physical health

Summary
Despite impressive evidence documenting its efficacy and strong endorsement as first line therapy in clinical practice guidelines, CBT for sleep and circadian problems remain infrequently used in clinical practice. Several barriers contribute to this underutilization, including cost, limited access to CBT and concerns about the fit with certain populations and contexts. This symposium seeks to present five lines of research that aim to make progress on these problems.

Dr. Morin will present a pragmatic trial on the feasibility and efficacy of a two-stage CBT program for insomnia in primary care practice. Preliminary data show that Internet-based CBT-I is an acceptable and efficient initial treatment option and, for those who do not respond adequately to this initial intervention, face-to-face CBT-I can augment treatment outcomes.

Dr. Sivertsen will present an evaluation of the short- and long-term efficacy of an unguided Internetbased cognitive-behavioral treatment program for insomnia (CBTi), called SHUTi (Sleep Healthy Using the Internet). Unguided Internet-based CBTi produced significant short- term
improvements in sleep in patients with chronic insomnia.

Dr. Espie will present a summary of 8 RCTs of the digital CBT program Sleepio that addresses if targeting sleep per se maybe a sufficient treatment for at least some people with depression, and as an important adjunct in routine depression care.

Dr. Buysse will present promising findings from the Hypertension with Unsatisfactory Sleep Health (HUSH) study which is a low-cost, pragmatic, patient-centered clinical trial that examines the effectiveness of two forms of CBT-I vs. Enhanced Usual Care on patient-reported sleep outcomes and home blood pressure in primary care patients with insomnia.

Finally, Dr. Harvey will present data showing that the Transdiagnostic Intervention for Sleep and Circadian Dysfunction (TranS-C) improves functional impairment, disorder-focused symptoms and sleep and circadian functioning in severe mental illness. This study was conducted in community mental health, which are publicly funded, under resourced and provide treatment to poor and underserved community members. Taken together, these five talks make seminal contributions to the growing science of dissemination and implementation.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify challenges to the dissemination and implementation of CBT for sleep and circadian problems

•Describe the elements of treating sleep and circadian problems using CBT-I and the associated approaches

•Describe innovative approaches to ensuring CBT reaches the people who need it

Target Audience
Sleep medicine physicians, psychologists and nurses interested in public health/public policy and ensuring evidence-based treatments

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**Sequencing internet-based and face-to-face CBT-I in a stepped-care model of insomnia management in primary care** Charles Morin (Canada)
3:18PM - 3:34PM	**The short- and long-term efficacy of an unguided internet-based cognitive-behavioral therapy for insomnia: A large randomized controlled trial** Borge Sivertsen (Norway)
3:34PM - 3:50PM	**Sleep as a novel therapeutic target for depression: A meta analysis of randomized controlled trials of digital CBT for insomnia** Colin Espie (United Kingdom)
3:50PM - 4:06PM	**The Hypertension with Unsatisfactory Sleep Health (HUSH) study: A low-cost, pragmatic, patient-centered clinical trial** Daniel J. Buysse (United States)
4:06PM - 4:22PM	**A transdiagnostic sleep and circadian treatment to improve severe mental illness outcomes in a community setting: The results of a randomized controlled trial** Allison G. Harvey (United States)
4:22PM - 4:30PM	**Conclusion**

3:00PM - 4:30PM **S18**

Basic Science Symposium, 211

S18: The molecular and physiological mechanisms of sleep

Summary
Sleep, including behavior sleep, is a widely conserved and an indispensable physiological phenomenon in almost all living organisms. The success of electroencephalogram (EEG) and electromyogram (EMG) recording in 1929 by Hans Berger enables us to define physiological sleep stages quantitatively: slow-wave sleep (SWS), rapid eye movement (REM) sleep, and wakefulness. The knowledge about functions and underlying mechanisms of each state has been accumulated for several decades; however, we are still not able to answer many fundamental questions: What drives sleep oscillation? How are they shaped? Which genes are essential for maintaining/switching the states?

To address these questions, in this symposium, we will focus on the molecular and cellular mechanisms of sleep with unpublished simulation studies, tens of transgenic mice lines, and unique animal models. All the speakers have expertise in the area of the molecular or circuit mechanism of sleep.

Shoi Shi will present a new hypothesis raised by his group. They recently identified several sleep genes, and raise a hypothesis that the Ca2+-dependent or -independent hyperpolarization owed by the potassium channels could shape the SWS and play a role in SWS duration regulation in mammals.

Yasutaka Niwa will talk about REM sleep. To identify the essential genes of REM sleep, he knocked out each gene of the acetylcholine receptor family. He identified Chrm1 and Chrm3 as the essential genes in REM sleep and succeeded to create “NO REM” mice.

Hirofumi Toda will present his genetical screening of somnogen in fruit flies. He carried out an unbiased and genome-wide genetic screen over 12,000 lines and discovered a novel gene, “nemuri” regulating sleep in Drosophila.

Hiroaki Norimoto will present unpublished data obtained in Australia dragon pogona vitticeps. Using ex vivo whole brain preparation, he succeeded to replicate the SWS state which can be observed in vivo dragon and clarified a novel circuit mechanism that regulates the state. Combined with his recent work (Norimoto et al., Science, 2018), he will also discuss the function of SWS for synaptic plasticity.

Daisuke Miyamoto will present his recent data about cortical circuitry and molecular mechanisms of memory consolidation during sleep. With in vivo repeated imaging in dendritic spines and shafts, he visualized AMPA receptors' sequential dynamics by motor learning and sleep.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recall the up-to-date studies on sleep homeostasis

•Idenitfy the molecular mechanisms of NREM and REM sleep regulation

•Idenitfy new molecular targets of sleep medicine

•Recongize a diversity of model systems is essential to identify the brain's fundamental principles

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**Genetic identification of cholinergic mechanisms controlling sleep and wakefulness** Yasutaka Niwa (Japan)
3:18PM - 3:34PM	**Spatio-temporal structure of sleep oscillations in reptilian brain** Hiroaki Norimoto (Germany)
3:34PM - 3:50PM	**Synaptic AMPA receptor plasticity by learning and sleep** Daisuke Miyamoto (United States)
3:50PM - 4:06PM	**Newly-identified sleep genes: The role of calcium dependent hyperpolarization pathway in sleep regulation** Shoi Shi (Japan)
4:06PM - 4:22PM	**Genetic dissection of sleep in fruit flies** Hirofumi Toda (United States)
4:22PM - 4:30PM	**Conclusion**

Symposium, 212-214

3:00PM - 4:30PM **S19**

S19: Novel strategies to personalize OSA treatment and care from adolescents to adults

Summary
Obstructive sleep apnea (OSA) is highly prevalent in obese adolescents and in the adult population. The pathogenesis of OSA in multi-factorial and not just related to anatomical factors. However, the mainstay of treatment, continuous positive airway pressure (CPAP), although highly efficacious is poorly tolerated. Indeed, recent data suggests that CPAP adherence rates are approximately 50% in adults and may be even lower in adolescence and that there has been no increase in CPAP adherence rates over the last 10 years. Since OSA is associated with adverse metabolic, cerebrovascular and cardiovascular consequences, effective, tolerated therapies for OSA are a clinical priority. In particular, since 75% of obese adolescents will become obese adults, many with co-existing OSA, effective therapies are urgently needed prior to adulthood. Current and emerging data has identified at least 4 distinct phenotypes of OSA.

This session will commence with a presentation by Dr Jayne Carberry (Flinders University, Adelaide Australia) on the knowledge related to the distinct OSA phenotypes. This will be followed by a presentation by Professor Danny Eckert (Neuroscience Research Australia, Sydney) on the exciting advances in novel targeted therapeutic strategies that address the distinct OSA phenotypes. Dr Indra Narang (Hospital for Sick Children, Toronto) will discuss how a personalized approach in adolescents with OSA is paramount to limiting OSA related morbidity downstream in adulthood. Finally, Dr Clodagh Ryan (Toronto General Hospital, Toronto) will discuss how a personalized approach to OSA aligns with patient centered initiatives and outcomes.

Given the emerging evidence for novel strategies for OSA, this session will be of major interest to many attendees at 2019 World Sleep Meeting.
Each speaker will have approximately 15 minutes per presentation, leaving 5-7 minutes for questions. The session will total 90 mins.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recall the pathogenesis of OSA lending to different phenotypic variability of OSA

•Describe the novel targeted therapies for the management of OSA in adults

•Identify the differences in approach to the management of OSA in adolescence versus adults

•Discuss how a personalized approach to OSA aligns with patient centered outcomes

Target audience
Sleep specialists, fellows, technologists, researchers and trainees

Chairs:
Susan Redline (United States)

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Pathophysiological phenotypes of OSA** Jayne Carberry (Australia)
3:22PM - 3:42PM	**Novel targeted therapies for OSA in adults** Danny Eckert (Australia)
3:42PM - 4:02PM	**Personalized approach for OSA in adolescence- is it time to through away the CPAP?** Indra Narang (Canada)
4:02PM - 4:22PM	**Aligning a personalized approach to OSA with patient centered outcomes** Clodagh Ryan (Canada)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 216 - 215-216

3:00PM - 4:30PM

O06: Better memory with better sleep

Chairs:
Stuart Fogel (Canada)
Philippe Peigneux (Belgium)

3:00PM - 3:15PM	**SHORT-DURATION REPETITIVE TRANSCRANIAL ELECTRICAL STIMULATION DURING A DAYTIME NAP IMPROVES MEMORY CONSOLIDATION** Nicola Cellini (Italy)
3:15PM - 3:30PM	**SLEEP DEPRIVATION LEADS TO FRAGMENTED MEMORY LOSS** Scott Cairney (United Kingdom)
3:30PM - 3:45PM	**CHRONIC SLEEP RESTRICTION INCREASES CONFIDENCE IN INCORRECT RESPONSES DURING A WORKING MEMORY TASK** Gina Marie Mathew (United States)
3:45PM - 4:00PM	**MOOD AND SLEEP IMPROVEMENT WITH CRITICALLY-TIMED WAKE AND LIGHT INTERVENTIONS IN PREMENSTRUAL, PERIPARTUM VS. PERIMENOPAUSAL DEPRESSION DEPEND ON SPECIFIC UNDERLYING MELATONIN AND SLEEP CIRCADIAN PHASE DISTURBANCES** Barbara Parry (United States)
4:00PM - 4:15PM	**A NIGHT OF SLEEP, BUT NOT A DAYTIME NAP IS NECESSARY FOR SLEEP-DEPENDENT CONSOLIDATION OF HIPPOCAMPAL MEMORY TRACES FOR A NEWLY ACQUIRED COGNITIVE STRATEGY** Nicholas H. van den Berg (Canada)
4:15PM - 4:30PM	**DEACTIVATING COMPLETED INTENTIONS: A DARK-SIDE OF SLEEP IN PROSPECTIVE MEMORY** Qinhua Sun (United States)

Oral Abstract, 110

3:00PM - 4:30PM

O08: REM sleep behavior

Chairs:
Yuichi Inoue (Japan)
Jaques Montplaisir (Canada)

3:00PM - 3:15PM

HEALTH, SOCIAL AND ECONOMIC CONSEQUENCES OF REM SLEEP BEHAVIOR DISORDER: A CONTROLLED NATIONAL STUDY EVALUATING SOCIETAL EFFECTS
Rune Frandsen (Denmark)

3:15PM - 3:30PM

COMORBIDITIES IN CHILDREN WITH ELEVATED PERIODIC LEG MOVEMENT INDEX
Lourdes DelRosso (United States)

3:30PM - 3:45PM

THE ASSOCIATION BETWEEN REM SLEEP AND MORTALITY IN THE MROS AND WISCONSIN SLEEP COHORTS
Eileen B Leary (United States)

3:45PM - 4:00PM

HIPPOCAMPAL ACTIVATION DURING REM SLEEP REDUCES FEAR MEMORY
Jie Chen (China)

4:00PM - 4:15PM

NEW INSIGHTS INTO THE “GLYCOGENETIC” HYPOTHESIS OF SLEEP: BRAIN GLYCOGEN AVAILABILITY AFFECTS REM-RELATED THETA RHYTHM PROVIDING A POSSIBLE LINK WITH EMOTIONAL MEMORY MECHANISMS
Jean-Marie Petit (Switzerland)

4:15PM - 4:30PM

THE ROLE OF REM SLEEP IN THE FORMATION OF EMOTIONAL FALSE MEMORY - AN EXPERIMENTAL STUDY USING DEESE-ROEDIGER-MCDERMOTT (DRM) PARADIGM
Jiefan Ling (Hong Kong)

Symposium, 217-219

3:00PM - 4:30PM **S20**

S20: Pathophysiological insights from animal models of restless legs syndrome

Summary
Restless legs syndrome (RLS), is a common neurological disorder that has motor, sensory, and circadian components. RLS affects up to 10% of the general population. The symptoms of RLS often lead to sleep disturbances and can severely affect the patient's daytime function and quality of life. This therefore suggests importance of studying the pathophysiology of RLS.

Iron deficiency, which produces changes in dopaminergic neurons and receptors in the substantia nigra and putamen, has been reported to correlate with RLS. Iron Deficient rats have insomnia and severe PLM in wake and in Slow Wave Sleep. The sleep pattern and symptoms of putamen-lesioned rats and ID rats resemble human RLS patients. Using neurotoxic lesion, in vivo microdialysis HPLC analysis, microinfusion of GABAA receptor agonists and antagonists, systemic injection of histamine receptor agonist and antagonist, Western blotting, and EEG spectral analysis techniques, a comprehensive understanding of RLS pathophysiology has emerged (speaker 1).

Recently, genome-wide association studies were performedperformed, and 19 genetic loci were found to impart varying increased risk of developing RLS. Among these loci, genetic regions containing the genes MEIS1 and BTBD9 represent the top two hits and have been replicated in multiple independent genetic studies. The identification of these RLS candidate genes paved the way for making genetic animal model of RLS that could potentially be more relevant in elucidating the pathophysiology of RLS and developing therapeutic treatments.
The BTBD9 gene encodes a protein, which modulates cytoskeleton arrangement, transcription repression, and protein ubiquitination. An alteration in hippocampal synaptic plasticity and neurotransmission has been found in Btbd9 knockout mice. Furthermore, loss of the BTBD9 homolog in fly and mice, results in increased motor activity, altered dopaminergic systems, and fragmented sleep patterns. The latest studies using BTBD9 homolog knockout in worms and conditional knockout and brain imaging in mice will be discussed (speaker 2).

MEIS1 is a homeobox protein that has been linked with maintenance of hematopoietic stem cells and in forebrain development. Mutant Meis1 knock-out mice show behavioral alterations, including a circadian hyperactivity pattern, that are analogous to the symptoms of RLS in humans. Functional studies using zebrafish and mouse models suggest RLS is a neurodevelopmental disorder linked to the development of the basal ganglia (speaker 3).

Finally, speaker 4 will discuss ways to use animal models of RLS to gain pathophysiological insight of RLS. What defines a valid RLS animal model for pathophysiological studies? The advantages and limitations of genotypic and phenotypic animal models of RLS will be summarized.
The 4 speakers as a group are uniquely positioned to achieve the goal of the proposed symposium. All of them are established scientists in the RLS pathophysiology and published extensively in this and related topics. They come from 3 countries and one speaker is a successful women scientist.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recall the latest update on the pathophysiology of the RLS from

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Pathophysiological insights from the iron deficient rats** Yuan-Yang Lai (United States)
3:22PM - 3:42PM	**Pathophysiological studies of RLS using BTBD9 mutant animal models** Yuqing Li (United States)
3:42PM - 4:02PM	**MEIS1-based animal models and the pathophysiology of RLS** Aaro Salminen (Germany)
4:02PM - 4:22PM	**Use of animal models for the pathophysiological study of RLS** Mauro Manconi (Switzerland)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 220 - 220-222

3:00PM - 4:30PM O07: Young or new investigator awards

Chairs:
Liborio Parrino (Italy)
Dalva Poyares (Brazil)

3:00PM - 3:15PM	**THE HUMAN K-COMPLEX: INSIGHTS FROM COMBINED SCALP-INTRACRANIAL EEG RECORDINGS** Veronique Latreille (Canada)
3:15PM - 3:30PM	**NEURAL CIRCUITS OF CATAPLEXY** Emi Hasegawa (Japan)
3:30PM - 3:45PM	**THE CORPUS CALLOSUM IS ESSENTIAL FOR THE CROSS-HEMISPHERIC PROPAGATION OF SLEEP SLOW WAVES: A HIGH-DENSITY EEG STUDY IN TOTAL CALLOSOTOMIZED PATIENTS** Giulia Avvenuti (Italy)
3:45PM - 4:00PM	**APNEA-HYPOPNEA INDEX IS ASSOCIATED WITH INCREASED LOOP GAIN DURING SLEEP AT ASCENDING ALTITUDES** Brooke M. Shafer (Canada)
4:00PM - 4:15PM	**DEVELOPMENTAL TRAJECTORY OF SLEEP DISTURBANCES IN A SHANK3 MOUSE MODEL OF AUTISM** Hannah Schoch (United States)
4:15PM - 4:30PM	**MANIPULATING MEMORY DURING SLEEP** Eva A.M. van Poppel (The Netherlands)

Technologist Program, 223-224

4:00PM - 5:00PM

T05: Pediatric PSG complex case studies (workshop)

Chairs:

Michael Eden (United States)
Shalanda Mitchell (United States)

4:00PM - 5:00PM

Pediatric PSG complex case studies

Julie Dewitte (United States)

Symposium, BR A - Ballroom A

4:30PM - 6:00PM **S21**

S21: The nature of arousals: An update for the 21st century

Summary
Arousals in sleep have been defined in 1992 and this definition has remained basically unchanged since then, as has our incorporation into clinical practice, which simply quantifies the number of arousals during sleep but little else. Since then, however, a wealth of evidence has accumulated arguing for a more differentiated approach to arousals in sleep, and the aim of this symposium is to provide a timely update of recent developments in the field.

The first presentation will be focused on respiratory-induced cortical arousals, including the factors that influence these arousals, and the role that cortical arousal plays in obstructive sleep apnea pathogenesis.
The second presentation will discuss the relationship between movements during sleep and cortical and autonomic arousals, including the contribution of state-of-the-art machine learning approaches in defining movement characteristics that identify different central nervous system processes producing arousals.

The third presentation will spotlight the different forms of arousals during slow wave sleep including those that so far have not been considered as arousals according to the scoring rules but critically contribute to the characterization of physiological and pathological NREM arousal patterns.
Finally, the fourth presentation will focus on the nonrandom time structure of cortical and autonomic arousals, highlighting the periodic components of both spontaneous arousals as well as arousal associated respiratory or movement events that are intimately involved in the dynamic regulation of sleep.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recognize different types of arousals and understand their involvement in healthy and disordered sleep

•Recall that easy arousability is a major determinant of severity of obstructive sleep apnea

•Use the sleep-related movement, particularly leg movement, characteristics to identify occurrence of different types of arousals

•Identify the different patterns of arousal during SWS, the limits of the actual criteria for their scoring and their relations with pathological phenomena in SWS

•Recognize the periodic nature of cortical arousals

Target Audience
sleep clinicians, human sleep researchers, sleep technicians

Chairs:

Régis Lopez (France)

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**Cortical arousals: Determinants and role in obstructive sleep apnea** Magdy Younes (Canada)
4:52PM - 5:12PM	**The relation of movements to cortical and autonomic arousals in sleep: Artificial intelligence – machine learning analyses** Richard Allen (United States)
5:12PM - 5:32PM	**The problematic definition of arousals during SWS. Implications for the characterization of the NREM parasomnias** Régis Lopez (France)
5:32PM - 5:52PM	**On the periodicity of arousals** Stephany Fulda (Switzerland)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 116 - 116-117

4:30PM - 6:00PM O09: Sleep and aging

Chairs:
Katie L. Stone (United States)
Bjørn Bjorvatn (Norway)

4:30PM - 4:45PM	**SLEEP TIMING IS ASSOCIATED WITH GUT MICROBIOTA COMPOSITION IN OLDER ADULTS WITH INSOMNIA** Tamar Shochat (Israel)
4:45PM - 5:00PM	**A PRELIMINARY EXAMINATION OF GUT MICROBIOTA COMPOSITION AND SLEEP QUALITY IN OLDER ADULTS WITH INSOMNIA** Iris Haimov (Israel)
5:00PM - 5:15PM	**DOES WORKING MEMORY IMPROVE WITH SLEEP OR WAKE IN OLDER ADULTS?** Negin Sattari (United States)
5:15PM - 5:30PM	**REPURPOSING LEVODOPA IN HEALTHY OLDER ADULTS TO ENHANCE SLOW WAVE SLEEP WITH POTENTIAL TO MODIFY DISEASE PROGRESSION IN ALZHEIMER'S DISEASE** Elizabeth Coulthard (United Kingdom)
5:30PM - 5:45PM	**THE RELATIONSHIP BETWEEN SLEEP PATTERNS AND MULTIMORBIDITY AMONG COMMUNITY-DWELLING ADULTS IN THE CANADIAN LONGITUDINAL STUDY ON AGING** Kathryn Nicholson (Canada)

5:45PM - 6:00PM

ASSOCIATION BETWEEN SLEEP AND MENTAL HEALTH AND WELL-BEING AMONG OLDER ADULTS IN THE CANADIAN LONGITUDINAL STUDY ON AGING

Rebecca Rodrigues (Canada)

Panel Discussion, 118 - 118-120

4:30PM - 6:00PM **D03**

D03: Sleep medicine and research training opportunities throughout the world

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
The pipeline for trainees entering into sleep medicine and research has been a concern for many established clinicians and investigators. An underlying issue is that young clinicians and investigators might not be aware of the educational and training opportunities for sleep medicine and research within their own countries as well as on an international level.

For example, the World Sleep Society has recently initiated an International Sleep Research Training Program (ISRTP), the goal of which is to select trainees who are interested in sleep research and have them be matched to mentors and training programs at academic sleep centers throughout the world. This program is being initiated at five international sites: Harvard University, Stanford University, University of Oxford, University of Pennsylvania, and University of Sydney.

The goal of this program is to provide mentorship for these trainees in sleep research and exposure to clinical sleep medicine within a one-year training period.

This Discussion Panel will highlight the current state of international sleep medicine education and training in five continents: Asia, Australia, Europe, North America, and South America. We will also discuss the opportunities for the future, in terms of expansion of their educational and training programs, both in scope, size, and spread to other geographic regions. Challenges (e.g., institutional barriers, selection of candidates, attracting potential candidates, etc.) to growth of these programs will be covered, as well as strategies for overcoming these challenges.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe the current state of existing sleep medicine/research educational and training opportunities in five continents.

•Discuss what is being done on an international level for mentoring trainees in sleep research.

•Recognize opportunities for the future, in terms of expansion of existing sleep medicine/research educational and training programs.

Target Audience
Sleep researchers and clinicians

Chairs:

Clete Kushida (United States)

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:48PM	**Sleep medicine and research training opportunities in North America** Clete Kushida (United States) Brian Rowe (Canada)
4:48PM - 5:04PM	**Sleep medicine and research training opportunities in Asia** Hrudananda Mallick (India)
5:04PM - 5:20PM	**Sleep medicine and research training opportunities in Europe** Zoran Dogas (Croatia)
5:20PM - 5:36PM	**Sleep medicine and research training opportunities in Australia** Brendon Yee (Australia)
5:36PM - 5:52PM	**Sleep medicine and research training opportunities in South America** Dalva Poyares (Brazil)
5:52PM - 6:00PM	**Conclusion**

Dental Symposium, 109

4:30PM - 6:00PM **S22**

S22: Advances in precision application of dental appliances: Indications, design, and prognostic risk

Summary
The clinical application of oral appliances has entered a more precise and refined stage. It plays an effective role in the treatment of various sleep-related breathing disorders, not only the obstructive sleep apnea syndrome. When considering indications, we should fully weigh the side effects and risks. Together, these constitute suitable objects for oral appliances. For adapting to the witness group, we should find ways to enhance the effectiveness and comfort of the two aspects. As a therapeutic method based on morphological changes, a large number of morphological analysis will appear in this section.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Balance and compare the indications and side effects of OA

•Choose OA for more possibilities

•Idenitfy the development of dental appliances in terms of effectiveness and patient compliance

Target Audience
Dentists

Chairs:
Fernanda Almeida (Canada)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM **Oral appliance for Downs Syndrome**
Fernanda Almeida (Canada)

4:48PM - 5:04PM **Application of oral appliance in Catathrenia (groaning)**
Xuemei Gao (China)

5:04PM - 5:20PM **Mechanism and efficacy of magnetic levitation mandibular elevator in treatment of obstructive sleep apnea syndrome**
Xilong Zhang (China)

5:20PM - 5:36PM **Phenotyping Obstructive Sleep Apnea: Bringing precision to oral appliance therapy**
Kate Sutherland (Australia)

5:36PM - 5:52PM **3D imaging application in OSA**
Bingshuang Zou (Canada)

5:52PM - 6:00PM **Conclusion**

Symposium, 121-122

4:30PM - 6:00PM **S23**

S23: Using eHealth to bridge the gap between research and practice for insomnia: Examples from across the lifespan

Summary
Insomnia is highly prevalent, with approximately one-third of individuals across the lifespan displaying at least symptoms of this disorder. Insomnia, and symptoms of insomnia, are associated with poorer quality of life, including more physical and mental health problems, and lower academic/occupational functioning. Importantly, behavioral treatments are highly effective at resolving insomnia symptoms, but without treatment, insomnia can become a chronic and impairing disorder.

While there exists effective behavioral interventions, these are not often used; rather, medication is the most common treatment, despite its lack of known effectiveness with some ages (e.g., children) and its poor long-term resolution of symptoms. This knowledge-to-practice gap is significant; it is estimated that < 20% of individuals with insomnia receive appropriate evidence-based interventions.

eHealth (i.e., delivering interventions over the internet) shows promise in reducing this knowledge-to-practice gap by addressing key barriers related to inadequate human resources and limited access to evidence-based interventions. During this symposium we will share information about five eHealth programs that were designed to deliver evidence-based interventions to treat insomnia in infants (Mindell), children (Corkum), adolescents (Stremler), young adults (Rigney), and adults (Thorndike).

Each of these eHealth programs are at a different stage of the research-to-practice continuum, with two being used in everyday practice (infants, adults), two in the testing stage (adolescents, young adults), and one just entering the sustainability stage (children). Mindell will present on an infant program that has been found to be efficacious in randomized control trials (RCT) and is now incorporated into a publicly-available app and educationally-based websites. She will present on real world data collected regarding parental concerns and effectiveness. Corkum will present on the development and evaluation of an eHealth intervention that was recently evaluated via a large pan-Canadian RCT. Satisfaction, adherence, and efficacy data will be presented, along with plans for sustainability. Stremler developed and tested a mobile app intervention using high-fidelity user testing with sleep-restricted adolescents to gain feedback on the experience, content, and feedback features including goal-setting and gamification strategies. She will also share the results of a pilot RCT (n=60), aimed at determining compliance, feasibility, and preliminary data on health outcomes. Rigney will present on the user-centered approach taken to develop an eHealth program for young adults, which supported the importance of using a micro-content delivery framework. The results of the focus groups with end-users and stakeholders, development process, and initial usability data will be presented.

While eHealth programs for insomnia have been found to be efficacious with adults, the true potential of digital health interventions in the real world is unknown. Toward that aim, Thorndike will share data from over 7,000 adults who consecutively registered (paid for) a digital CBT-I program. That cohort's usage, completion, and insomnia severity index scores will be reported, comparing those metrics to published RCT data using the same web

providing a reflection on the key themes that arose during the symposium and then facilitating a question and answer period.

Learning Objectives

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:48PM	**eHealth applications for infants and toddler sleep disturbances: Real world data and moving from efficacy to effectiveness** Jodi Mindell (United States)
4:48PM - 5:04PM	**Development, evaluation and dissemination of Better Nights, Better Days for preschool and elementary school-aged children** Penny Corkum (Canada)
5:04PM - 5:20PM	**Design and pilot RCT of a mHealth intervention for sleep promotion in adolescents** Robyn Stremler (Canada)
5:20PM - 5:36PM	**Development of Better Nights, Better Days-Youth: The importance of a user-centered design when working with young adults** Gabrielle Rigney (Australia)
5:36PM - 5:52PM	**Real world evidence: Impact of digital therapeutic for insomnia in adults** Frances Thorndike (United States)
5:52PM - 6:00PM	**Conclusion**

Basic Science Symposium, 211

4:30PM - 6:00PM **S05**

S05: Sleep and bidirectional changes in synaptic plasticity: The untold story

Summary
Converging lines of evidence support an important role for sleep in synaptic plasticity. From flies to worms to humans, sleep and sleep loss have been shown to profoundly alter behavior dependent upon synaptic plasticity, synaptic processes necessary for plasticity and in some cases, plasticity itself. Nevertheless, there is no single, unifying theory that adequately explains the diverse effects of sleep on synapse number, strength or morphology. In this symposium, scientists that measure plasticity on multiple levels spanning behavior, synaptic proteins, morphology and neuronal activity discuss the complex effects of sleep on brain plasticity. Our speakers will show that the effects of sleep are not easily explained by uniform changes in synaptic strength or processes that spare some synapses while globally downscaling others. Sleep can instead lead to synaptic strengthening or weakening based on the circuit under examination, prior waking experience, and ontogenetic status. These findings show that sleep more generally leads to bidirectional changes in synapses that are determined by different types of waking experience. They suggest that current theories of sleep function as they relate to plasticity must be revised or discarded.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize that sleep has diverse effects on synapse number and efficacy

•Recall some of the factors that determine these diverse effects

•Identify that there are different theories that explain how sleep influences synaptic plasticity, but no one theory is universally accepted

Target Audience
Students, post-doctoral fellow, clinicians and basic scientists

Chairs:
Marcos G. Frank (United States)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM **Sleep-dependent thalamocortical activity is crucial for visual system plasticity**
Sara Aton (United States)

4:48PM - 5:04PM **Slow-wave sleep potentiates thalamocortical responsiveness and facilitates memory formation in mice**
Igor Timofeev (Canada)

5:04PM - 5:20PM	**Learning and sleep-dependent synaptic plasticity in the cortex** Wen Biao Gan (United States)
5:20PM - 5:36PM	**Homeostatic regulation by GABA and glutamate receptors of cortical neurons in response to sleep deprivation** Barbara Jones (Canada)
5:36PM - 5:52PM	**The tired hippocampus; elucidating the molecular underpinnings of sleep loss-induced memory impairments** Robbert Havekes (The Netherlands)
5:52PM - 6:00PM	**Conclusion**

Symposium, 212-214

4:30PM - 6:00PM **S24**

S24: Sleep-wake disturbance and the aging brain: Insights into the impact of poor sleep and sleep-disordered breathing on neurodegeneration

Summary
Prof. Benca will provide an overview of the associations between sleep-wake disturbance in aging and the risk of AD. She will summarize the epidemiological work showing increased risk of MCI and AD in the presence of sleep and circadian rhythm disorders. There will be a discussion of the potential mechanisms that are thought to underpin these associations, including the glymphatic system and the functional role of slow wave sleep, and OSA in the pathogenesis of Alzheimer's disease. Dr. Spira will discuss the use of wrist actigraphy to quantify circadian rest activity rhythms (RARs) in large-scale epidemiological studies, and summarize the literature documenting links between RARs and brain health. He will then present his group's recent results linking data-driven actigraphic RAR indices with brain volumes from MRI in cognitively normal older people, and discuss the implications of these findings.

Dr. D'Rozario will summarize the objectively measured changes to sleep macro- and microarchitecture that occur in older adults at-risk of dementia and sleep-disordered breathing populations, highlighting how some sleep and wake EEG abnormalities are common to both groups. She will provide insights about how alterations to sleep neurophysiology relate to cognitive functioning. She will also present the latest data from high-density EEG sleep studies and routine polysomnography investigating the recovery of sleep EEG deficits and cognitive dysfunction following CPAP treatment.

Dr. Mander will present findings linking local deficits in NREM and REM sleep EEG with amyloid and tau pathological burden. He will also discuss the clinical biomarker potential of these signature changes in sleep EEG, and how they relate to local sleep deficits observed in MCI and AD. He will finally touch on the cognitive functional significance of these sleep deficits as they relate to hippocampus-dependent memory impairment.
Prof. Naismith will conclude the session by discussing the neuroimaging evidence of sleep-wake disturbance and sleep disordered breathing on worsened cognitive trajectories in aging. She will present data on the role of hypoxemia and oxidative stress as mechanisms for neurodegeneration, and will also describe interventional approaches to optimize sleep in patients with mild cognitive impairment, with and without OSA.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify the associations between sleep-wake disturbance in aging and the risk of Alzheimer's disease from epidemiological studies.

•Recognize the links between actigraphic sleep and brain atrophy in aging populations.

•Describe the evidence base linking objective measures of sleep architecture with cognitive impairment and brain changes in aging, mild cognitive impairment and sleep disordered breathing clinical populations.

underlie worse cognitive trajectories in older adults at risk of dementia.

•Interpret the bidirectional relationship between altered sleep

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:48PM	**Introduction and overview** Ruth M. Benca (United States)
4:48PM - 5:04PM	**Altered circadian rest/activity rhythms and brain atrophy in cognitively normal older adults** Adam Spira (United States)
5:04PM - 5:20PM	**Abnormal sleep neurophysiology in mild cognitive impairment and sleep-disordered breathing populations** Angela D'Rozario (Australia)
5:20PM - 5:36PM	**Sleep disruption and Alzheimer's disease pathology: A mechanism for increased AD risk?** Bryce Mander (United States)
5:36PM - 5:52PM	**What is the link between sleep-disordered breathing and neurodegeneration?** Sharon Naismith (Australia)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 216 - 215-216

4:30PM - 6:00PM O10: Pediatrics

Chairs:
Roger Godbout (Canada)
Fiona Baker (South Africa)

4:30PM - 4:45PM	**SLEEP PROBLEMS AMONG PRESCHOOL-AGED CHILDREN INVESTIGATED FOR MALTREATMENT** Samantha Brown (United States)
4:45PM - 5:00PM	**AUTISTIC TEENS PERSONAL ACCOUNTS ABOUT THEIR SLEEP PROBLEMS AND DAYTIME ANXIETY** Dagmara Dimitriou (United Kingdom)
5:00PM - 5:15PM	**SLEEP, BULLYING, AND PHYSICAL AND MENTAL HEALTH IN ADOLESCENCE** Alex Agostini (Australia)
5:15PM - 5:30PM	**BEHAVIORAL AND EMOTIONAL CHARACTERISTICS OF CANADIAN CHILDREN WITH OBESITY AND MODERATE-SEVERE SLEEP-DISORDERED BREATHING TREATED WITH POSITIVE AIRWAY PRESSURE: LONGITUDINAL CHANGES AND ASSOCIATIONS WITH ADHERENCE** Evelyn Constantin (Canada)
5:30PM - 5:45PM	**ASSOCIATIONS BETWEEN SLEEP, BRAIN CONNECTIVITY AND DEPRESSION SYMPTOMS IN CHILDHOOD** Aimee Goldstone (United States)

5:45PM - 6:00PM

CHILDHOOD SLEEP PATTERNS LONGITUDINALLY PREDICT LATER POST-TRAUMATIC STRESS AFTER HURRICANE HARVEY
Cara Palmer (United States)

Oral Abstract, 110

4:30PM - 6:00PM

O11: Psychiatric disorders

Chairs:
Joseph De Koninck (Canada)
Yun Kwok Wing (Hong Kong)

4:30PM - 4:45PM

IRON DEFICIENCY AND NEURODEVELOPMENTAL DISORDERS (ADHD, AUTISM, FETAL ALCOHOL SPECTRUM DISORDER/FASD) - A SCOPING REVIEW
Ishmeet Singh (Canada)

4:45PM - 5:00PM

SLEEP HEALTH PROBLEMS AMONG YOUNG ADULTS WITH CURRENT AND PAST HOMELESSNESS EXPERIENCES
Brian Redline (United States)

5:00PM - 5:15PM

THE THERAPEUTIC BENEFIT OF SLEEP SPINDLESIN ADOLESCENTS WITH MAJOR DEPRESSIVE DISORDER
Balmeet Toor (Canada)

5:15PM - 5:30PM

SLEEP DISTURBANCE AND SUICIDALITY IN PATIENTS WITH BIPOLAR DISORDERS - THE MEDIATING ROLE OF RUMINATION AND IMPULSIVITY
Tin Wai Forrest Cheung (Hong Kong)

5:30PM - 5:45PM

TEMPORAL DYNAMICS OF HEART RATE DURING SLEEP IN PEOPLE WITH DEPRESSION
Karianne Dion (Canada)

5:45PM - 6:00PM

PRELIMINARY OBSERVATIONS ON THE RELATIONSHIP BETWEEN AUTONOMIC AROUSAL AND SLEEP IN PEOPLE WITH PTSD
Rebecca Robillard (Canada)

Symposium, 217-219

4:30PM - 6:00PM **S25** **S25: New insights on sleep at high altitude**

Summary
The health effects of sleep at high altitude affect more and more people because high altitude trekking in the Himalayans and larger hiking and climbing tours in all continents is practiced meanwhile by millions. Recent research shows that although sleep at high altitude despite hypoxia induced periodic breathing appears to be sufficient in regard to amount of total sleep time and sleep stage distribution, nightly hypoxemia might still have significant effects on different organic functions. Especially the brain could suffer from the nightly hypoxemia. There are hints from latest research that there is an increased cranial pressure at night at altitude with effect on neuronal function, and cognitive function declines on the following day to a certain degree. This might affect not only difficult tasks during climbing but also difficult tasks of professionals doing commercial and non commercial labour at altitude. Furthermore, depending on individual circumstances more people than previously thought might develop hypoxia induced breathing already at lower altitudes than 2000m above sea level and could be affected by nightly hypoxemia occuring with central apneas.

These new insights will not only be discussed at this symposium but the attendees will learn how to prevent health problems by diagnostic procedures before high altitude exposure and giving the correct advice to high altitude sojourners.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify new possible health problems occuring after sleep at high altitude

•Illustrate individual problems of persons at high altitude after a previously more generalized pathophysiology

•Recall new diagnostic approaches for clients who want to travel to high altitude

•Discuss individualized medical advice to high altitude travellers and workers

Target Audience
Family practitioners, nurse practitioners and nurses, pulmonologists, sleep specialists, medical, physiology and sport science students

Chairs:
Nikolaus C. Netzer (Germany)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM **The brain at altitude**
Nikolaus C. Netzer (Germany)

4:48PM - 5:04PM	**Cognitive decline after sleep at high altitude** Stephan Pramsohler (Germany)
5:04PM - 5:20PM	**MRI studies on the brain after exposure to hypobaric hypoxia** Michael Decker (United States)
5:20PM - 5:36PM	**Individual influences on hypoxia and hypobaria induced periodic breathing** Linda Rausch (Austria)
5:36PM - 5:52PM	**Does central sleep apnea help or hurt oxygenation during ascent to high altitude?** Trevor Day (Canada)
5:52PM - 6:00PM	**Conclusion**

Poster Abstract, Exhibition - Ballroom BCD

Poster session 2

DIFFERENCE OF LONGITUDINAL SLEEP BEHAVIOR CHANGE BY GENDER IN THE MIDDLE AGE: THE KOREAN GENOME AND EPIDEMIOLOGY STUDY (KOGES)
Hyeon Jin Kim (Republic of Korea)

PROTECTIVE EFFECT OF ADIPONECTIN ON GENIOGLOSSUS IN MITOPHAGY IMPAIRED BY CHRONIC INTERMITTENT HYPOXIA
Wenjing Wang (China)

EDUCATIONAL VIDEO TO IMPROVE CPAP USE IN PATIENTS WITH OBSTRUCTIVE SLEEP APNOEA AT RISK FOR POOR ADHERENCE: A RANDOMISED CONTROLLED TRIAL
Leila Emami (United States)

OBJECTIVE ADHERENCE TO DENTAL DEVICE VERSUS POSITIVE AIRWAY PRESSURE TREATMENT IN ADULTS WITH OBSTRUCTIVE SLEEP APNEA
Liyue Xu (China)

THE CORPUS CALLOSUM IS ESSENTIAL FOR THE CROSS-HEMISPHERIC PROPAGATION OF SLEEP SLOW WAVES: A HIGH-DENSITY EEG STUDY IN TOTAL CALLOSOTOMIZED PATIENTS
Giulia Avvenuti (Italy)

THE HUMAN K-COMPLEX: INSIGHTS FROM COMBINED SCALP-INTRACRANIAL EEG RECORDINGS
Veronique Latreille (Canada)

MANIPULATING MEMORY DURING SLEEP
Eva A.M. van Poppel (The Netherlands)

PERIODIC LIMB MOVEMENT DURING SLEEP AND THE INCIDENCE OF CARDIOMETABOLIC OUTCOMES: THE HYPNOLAUS STUDY
Camila Hirotsu (Switzerland)

SLEEP DURATION AND BREAST CANCER INCIDENCE: RESULTS FROM THE MILLION WOMEN STUDY AND A META-ANALYSIS OF PUBLISHED STUDIES
Angel Tsz Yan Wong (United Kingdom)

CIRCADIAN BIOMARKERS IN ASYMPTOMATIC OFFSPRING OF PATIENTS WITH LATE-ONSET ALZHEIMER'S DISEASE AND THEIR RELATIONSHIP WITH COGNITIVE PERFORMANCE
Carolina Abulafia (Argentina)

THE COMPOSITE SCALE OF MORNINGNESS FOR CHRONOTYPE ESTIMATION IN PORTUGUESE OLDER ADULTS – PSYCHOMETRIC PROPERTIES AND CUTOFF SCORES
Ana Allen Gomes (Portugal)

SUBJECTIVE VS. OBJECTIVE SLEEP MEASURES FOR ASSESSING HABITUAL SLEEP PATTERNS IN THE FIRST YEAR OF LIFE: IMPLICATIONS FOR SLEEP QUALITY ASSESSMENTS
Louisa Katharina Gossé (United Kingdom)

CHECKING-IN: WHAT FACTORS PREDICT PARENTS VISITING THEIR INFANTS DURING THE NIGHT?
Michael Gradisar (Australia)

ASSOCIATIONS BETWEEN MIDLIFE POLYSOMNOGRAPHY-MEASURED SLEEP QUALITY AND 12-YEAR CHANGE IN COGNITIVE FUNCTION IN THE WISCONSIN SLEEP COHORT STUDY
Erika W. Hagen (United States)

SLEEP AND CIRCADIAN RHYTHM ALTERATIONS IN OLDER PEOPLE WITH DEPRESSION
Camilla Hoyos (Australia)

SLEEP STATUS DURING PREGNANCY AND THE APPROPRIATE MOMENT OF SCREENING
Keun Tae Kim (Republic of Korea)

THE ASSOCIATION BETWEEN REM SLEEP AND MORTALITY IN THE MROS AND WISCONSIN SLEEP COHORTS
Eileen B Leary (United States)

SLEEP STATUS DURING PREGNANCY: A MULTICENTER STUDY IN KOREA
Jun-Seok Lee (Republic of Korea)

ASSOCIATION BETWEEN RISK OF OBSTRUCTIVE SLEEP APNEA AND COGNITIVE DECLINE IN OLDER ADULTS
Julie Legault (Canada)

LONGITUDINAL ASSOCIATION BETWEEN CIRCADIAN ACTIVITY RHYTHMS AND RISK OF INCIDENT PARKINSON'S DISEASE IN OLDER MEN
Yue Leng (United States)

THE STABILITY OF SLEEP EEG MICROSTRUCTURE AND VIGILANCE MEASURES ACROSS TWO CONSECUTIVE NIGHTS OF LABORATORY POLYSOMNOGRAPHY IN COGNITIVELY NORMAL OLDER ADULTS
Anna Elizabeth Mullins (United States)

CHILDHOOD SLEEP PATTERNS LONGITUDINALLY PREDICT LATER POST-TRAUMATIC STRESS AFTER HURRICANE HARVEY
Cara Palmer (United States)

DEVELOPMENT OF INTELLIGENT STROKE MONITORING SYSTEM FOR THE ELDERLY DURING SLEEPING
Se Jin Park (Republic of Korea)

WHAT APPS?: TECHNOLOGY AND (RESTRICTED) SLEEP IN ADOLESCENTS
Meg Pillion (Australia)

ASSOCIATIONS BETWEEN HABITUAL SLEEP DURATION AND CIRCADIAN PREFERENCE WITH SCHOOL ATTENDANCE AMONG MIDDLE SCHOOL STUDENTS
David T. Plante (United States)

THE PRESENCE OF EITHER INSOMNIA OR SLEEP APNEA ATTENUATE THE BENEFITS ACHIEVED FROM STRESS MANAGEMENT TRAINING FOR REDUCING DAYTIME SYMPTOMS OF HYPERAROUSAL BY CARDIOVASCULAR PATIENTS
Jaan Reitav (Canada)

LIPID METABOLISM PARAMETERS IN CAUCASIAN AND ASIAN MENOPAUSAL WOMEN WITH INSOMNIA
Natalya Semenova (Russian Federation)

IMPACT OF DIAPERS ON A SLEEP-WAKE RHYTHM OF 2-MONTH OLD INFANTS; EVALUATION BASED ON CORTISOL AWAKENING RESPONSE
Akiko Tange (Japan)

INFLUENCE OF DEMOGRAPHIC, SOCIOECONOMIC, CLINIC AND BEHAVIORAL FACTORS IN SLEEP QUALITY IN CLIMATERIC WOMEN
Heloísa Theodoro (Brazil)

POLYPHARMACY AND SLEEP QUALITY IN AN OLDEST-OLD LONG-LIVING POPULATION. PRELIMINARY DATA
Silvana Urru (Italy)

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SOMATIC SYMPTOMS AND SUBJECTIVE SLEEP QUALITY OF PATIENTS WITH STRESS-RELATED DISEASES IN AN OUTPATIENT DEPARTMENT OF PSYCHOSOMATIC MEDICINE – A RETROSPECTIVE OBSERVATIONAL STUDY
Tokusei Tanahashi (Japan)

POOR SLEEP AND CHRONIC PAIN'S EFFECT ON PHYSICAL AND PSYCHOLOGICAL WELL-BEING FROM THE UK BIOBANK DATASET
Jeremy Zwaig (Canada)

IMPACT OF AIRWAY TISSUE PROPERTIES & GRAVITATIONAL FORCE UPON SLEEP APNOEA
Omid Bafkar (Australia)

DRUG-INDUCED SLEEP ENDOSCOPY IN ASSESSING AIRWAY PATENCY – OWN EXPERIENCES
Agnieszka Dmowska-Koroblewska (Poland)

DEVELOPMENT OF SPINDLE DETECTION ALGORITHM BY WAVELET SYNCHROSQUEEZED TRANSFORM AND RANDOM UNDER SAMPLING
Koichi Fujiwara (Japan)

EVALUATION OF A SLEEP QUALITY SCORE METRIC
Conor Heneghan (United States)

CHARACTERIZATION AND RELATIONSHIP BETWEEN CENTRAL AND AUTONOMIC AROUSALS IN HEALTHY CONTROLS AND APNEA PATIENTS
Manuel Kemethofer (Austria)

WHOLE-BRAIN IMAGING TO PROFILE NEURONAL AND MICROGLIAL ACTIVITIES ASSOCIATED WITH INFLAMMATION-MEDIATED SLEEP
Kazuhiro Kon (Japan)

AUTOMATIC SLEEP SCORING SYSTEM USING A PATCH-TYPE EEG SENSOR BASED ON DEEP LEARNING
Haruo Mizutani (Japan)

A NEW SOLUTION TO MAJOR LIMITATION OF HSAT: WEARABLE PRINTED SENSOR FOR SLEEP QUANTIFICATION AND COMORBID DETECTION
Sami Myllymaa (Finland)

WITHOUT LIFTING A FINGER: A NOVEL APPROACH TO DETECTING SLEEP STAGES
Andrew Reiter (Australia)

THE ACCURACY OF THE THIM DEVICE FOR PASSIVELY MEASURING SLEEP AND WAKEFULNESS OVERNIGHT WITH GOOD AND POOR SLEEPERS
Hannah Scott (Australia)

SLEEP ANALYSIS WITH SOMNO-ART SOFTWARE AS COMPARED TO SOMNOLYZER, A VALIDATED COMPUTER-ASSISTED SLEEP CLASSIFICATION, IN APNEIC PATIENTS AND HEALTHY CONTROLS – A VALID ALTERNATIVE?
Laurie Thiesse (France)

EFFECT OF THE INTENSITY OF ROCKING MOVEMENTS ON NAP SLEEP
Rachel van Sluijs (Switzerland)

DEVELOPMENT OF TABLET-SHAPED INGESTIBLE THERMOMETER WITH GASTRIC ACID BATTERY FOR DAILY MONITORING OF CORE-BODY TEMPERATURE AND ITS RHYTHM
Shinya Yoshida (Japan)

PROGESTAGEN-BASED CONTRACEPTIVES AND SUBJECTIVE SLEEP REPORTS IN PREMENOPAUSAL WOMEN
Andréia Bezerra (Brazil)

SNORING DURING PREGNANCY AS A PREDICTOR OF FUTURE OBSTRUCTIVE SLEEP APNOEA: A CASE-CONTROL STUDY
Yu Sun Bin (Australia)

LATE PREGNANCY SLEEP DISRUPTION – PATHOLOGICAL OR PHYSIOLOGICAL?
Robin Cronin (New Zealand)

SLEEP QUALITY AND ANXIETY AMONG WOMEN WITH TEMPOROMANDIBULAR DYSFUNCTION: A COMPARATIVE STUDY
António Sérgio Guimarães (Brazil)

SLEEP AND FATIGUE IN WOMEN WITH AND WITHOUT SYSTEMIC LUPUS ERYTHEMATOSUS
Shao-Yu Tsai (Taiwan)

A NEW DIAGNOSTIC APPROACH TO IDENTIFY ISOLATED REM SLEEP BEHAVIOR DISORDER (IRBD): 3D VIDEO ANALYSIS
Markus Waser (Austria)

Social Event, 301-305

6:00PM - 9:00PM **Gala Dinner**

Social Event, Banquet 305 - 306

8:30PM - 11:30PM **Social** **Blues Night**

Included in registration; no ticket needed

Celebrate sleep! Immediately following the Gala Dinner, join colleagues for live musical entertainment, cold hors d'oeuvres, a free drink, cash bar and dancing.

Scientific Programme

Tuesday, 24 September 2019

Administration, 118 - 118-120

07:00AM - 07:50AM

WSS Membership Meeting

We would like to share our vision of the exciting opportunities in front of our society. All current World Sleep Society members in good standing, we invite you to attend to cast your vote deciding the future leadership of our society.

The member vote will occur in Vancouver, BC on Tuesday, September 24, 2019 at 7:00am (Pacific Daylight Time).

Administration, SRR - 201

07:00AM - 5:00PM

Speaker Ready Room

Keynote, BR A - Ballroom A

08:00AM - 08:45AM **Riemann**

K04: Sleep, insomnia and mental health: A chance for prevention?

Summary
Almost all mental disorders are accompanied by sleep disturbances, especially depressive disorders. In this patient group, not only rather specific changes of REM sleep (shortening of REM sleep latency) and a decrease of Slow Wave Sleep) occur, but from a clinical point of view insomnia complaints (prolonged sleep latency, sleep maintenance problems, early morning awakening) may dominate the picture. Insomnia disorder, on the other hand, without co-morbidity has been shown to be a risk factor for depression and other mental disorders. It is postulated that the relationships between insomnia and mental disorders are bi-directional and that the treatment of insomnia may serve a a preventive strategy for mental illness.

08:00AM - 08:02AM **Introduction**

Colin Espie (United Kingdom)

08:02AM - 08:45AM **Sleep, insomnia and mental health: A chance for prevention?**

Dieter Riemann (Germany)

Scientific Programme

Keynote, 211

08:00AM - 08:45AM **Van Cauter**

K05: Interactions between sleep, circadian rhythms and body weight regulation

This lecture will review and discuss the epidemiologic evidence that has linked insufficient sleep duration, poor sleep quality and/or circadian misalignment to the risk of obesity, noting that sleep deficiency and circadian disruption strongly interact. Putative causal mechanisms identified in laboratory interventions involving several nights of experimental sleep restriction, fragmentation or extension with and without circadian disruption will be presented, with an emphasis on the role of endocrine mediators in the dysregulation of energy balance. The potential benefits of optimizing sleep and circadian alignment to reduce the risk of obesity, and promote weight maintenance or weight loss will be discussed.

08:00AM - 08:02AM **Introduction**

Maree Barnes (Australia)

08:02AM - 08:45AM **Interactions between sleep, circadian rhythms and body weight regulation**

Eve Van Cauter (United States)

Symposium, BR A - Ballroom A

09:00AM - 10:30AM **S26**

S26: Placing patient needs first: Designing personalized care in sleep medicine

Summary
As personalized sleep medicine has emerged as an area of research and practice, much of the focus has remained on the impact of genetic influences and circadian systems on sleep. In addition to patients being phenotypically diverse, they also have individual needs, preferences, and values that impact treatment decisions in the care of sleep disorders. Designing care models and treatment pathways that are personalized for an individual patient's values, preferences, and biology has the potential to improve patient outcomes, satisfaction scores, influence access, and transform the patient care experience.

This symposium will explore personalized care approaches in sleep medicine which could include: identification of patient values, preferences, and other factors impacting treatment decisions; determining patient-specific needs to guide treatment decisions; possible methods to promote patient engagement and reduce patient burden, tools for assessing patient-centered outcomes, and genetically directed care. While exploring these approaches, attendees will be exposed to several different research approaches, including patient-centered design, traditional case-control trials, usability testing and various genetic analytic methods that will continue to inform sleep medicine as a field.

Dr. Timothy I. Morgenthaler, MD. (Mayo Clinic, Rochester, MN) A framework with which to deliver patient-centered care in sleep medicine. This will serve as a general introduction to concepts of personalized healthcare models for sleep medicine, methods to understand gaps in patient needs and experiences, and exploration of tools for personalized patient care within sleep medicine.

Lauren Seymour (Designer, Mayo Clinic Center of Innovation) Using a combination of human-centered design, market research, and literature research, this speaker will share insights about perceived patient needs and modalities to serve those needs as it applies to insomnia and sleep health. This session will highlight a design approach to learning how to learn and respond to “what matters to the patient?” rather than the Baconian hypothesis driven-approach dealing with “what’s the matter with the patient?”.

Nick Bansback (Canada) Improving the shared decision-making process is essential to placing patients’ choices first. This speaker will discuss the development and testing of technological tools to present information about competing treatment options for OSA, while also helping the patient deliberate and clarify their values and communicate these to their healthcare professional.

Simon Archer, BSc, PhD, FRSB (University of Surrey, UK) New tools are clarifying the genetic basis for diverging phenotypes in circadian rhythm preference and disorders, sleep disruption, and even acute and chronic sleep loss. This speaker will explore how these new findings will begin to influence sleep medicine diagnostic and therapeutic planning in a much more personalized way, delivering better value to the patient.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify and understand gaps in the perceptions, needs, behaviors, and expectations of patients with sleep disorders and their relationship to offerings in health care.

•Gain awareness of methods you can apply in your sleep practice

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Sleep medicine and the healthcare and patient revolution** Timothy I. Morgenthaler (United States)
09:22AM - 09:42AM	**Learning “what matters to patients”: A human-centered design approach to insomnia and sleep health** Lauren Seymour (United States)
09:42AM - 10:02AM	**Improving shared decision making in sleep apnea management: technological tools and user preferences** Nick Bansback (Canada)
10:02AM - 10:22AM	**My genes, my sleep medicine; genomics and the personalization of sleep medicine** Simon Archer (United Kingdom)
10:22AM - 10:30AM	**Conclusion**

Administration, Admin 105 - 105

09:00AM - 11:00AM Admin Meeting

Oral Abstract, 116 - 116-117

09:00AM - 10:30AM O12: Insomnia mechanisms and pathophysiology

Chairs:
Sean Drummond (Australia)
Michelle Olaithe (Australia)

09:00AM - 09:15AM	**PSYCHOPHYSIOLOGICAL AND PARADOXICAL INSOMNIA: HOW DIFFERENT IS THEIR BRAIN ASYMMETRY? AN EEG STUDY** Thierry Provencher (Canada)
09:15AM - 09:30AM	**INSOMNIA AND COVERT VASCULAR BRAIN DISEASE** Olga Tikhomirova (Russian Federation)
09:30AM - 09:45AM	**NEUROPHYSIOLOGICAL HYPERAROUSAL IN INSOMNIA BASED ON SLOW WAVE ACTIVITY: EVIDENCE OF SUBTYPES** Christopher Gordon (Australia)
09:45AM - 10:00AM	**MODELLING SLEEP ONSET MISPERCEPTION IN INSOMNIA** Lieke Hermans (The Netherlands)
10:00AM - 10:15AM	**FEELING AWAKE DURING SLEEP: A HIGH-DENSITY EEG ASSESSMENT OF SLEEP PERCEPTION IN GOOD SLEEPERS AND PATIENTS WITH PARADOXICAL INSOMNIA** Sandro Lecci (Switzerland)

10:15AM - 10:30AM

INSOMNIA AND CARDIORESPIRATORY FITNESS IN A MIDDLE-AGED POPULATION: THE SWEDISH CARDIOPULMONARY BIOIMAGING PILOT STUDY

Ding Zou (Sweden)

Symposium, 118 - 118-120

09:00AM - 10:30AM **S27**

S27: New insights into light's non-visual impact on sleep and circadian physiology

Summary
Light exerts profound effects on circadian physiology and sleep-wake behavior. This symposium will shed new insights into: 1.) how classical and non-classical retinal photoreceptors mediate non-visual responses to light, 2.) how light is implicated in direct non-circadian effects and sleep homeostasis, 3.) how daylight affects the human circadian timing system, 4.) how new LED solutions replicating daylight affect mood, circadian rhythms and sleep and 5.) how the daytime lighting situation affects nighttime sleep quality in a clinical setting.

Dr. Stuart Peirson, Oxford, UK: will discuss the interaction of the classical rod/cone- and the melanopsin photoreceptor system and their role in mediating the effects of light on circadian rhythms, sleep and performance in mice.

Dr. Patrice Bourgin, Strasbourg, F: will present novel data on light's influence on the kinetics of the sleep homeostatic process in mice and humans.

Dr. John Axelsson, Sweden: will discuss insights into the influence of daylight on the human circadian clock including effects of latitude and season.

Dr. Oliver Stefani, Basel, Switzerland: will present various approaches on how to simulate daylight and their impact on human visual and non-visual responses including mood, circadian physiology and sleep.
Dr. Tomoko Wakamura, Kyoto, Japan: will discuss insights into the association between various light exposures during the day and sleep quality in humans.

Since this symposium gives an integrative view on light's non-visual repercussions on sleep and circadian physiology ranging from mechanisms and concepts in animal research to human basic and clinical studies, it is attractive for a broad audience working in the sleep field. Furthermore, the current development in LED technology along with the increasing amount of daily "screen time" makes light an important environmental factor to consider in sleep medicine and in our society in general. Thus, we think that our symposium would provide an exciting and up-to-date contribution to the World sleep meeting 2019 in Vancouver.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Express the impact of light on human and animal sleep

•Recognize how respective photoreceptive systems interact to elicit non-visual responses of light

•Identify the impact of natural light exposures on the human circadian timing system

•Demonstrate how to design human-centric light solutions at the workplace and in residential areas

Target Audience
Basic animal and human sleep researchers, clinicians interested in non-pharmacological treatments of sleep-wake disorders, clinicians interested in the effects of light on clocks and sleep,

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Effects of altered light schedules on sleep regulation in mice** Vladyslav Vyazovskiy (United Kingdom)
09:18AM - 09:34AM	**A model to predict the 24-hour sleep-wake distribution under aberrant light dark cycles** Patrice Bourgin (France)
09:34AM - 09:50AM	**Daylight replications with LEDs: Effects on sleep, circadian physiology and mood** Oliver Stefani (Switzerland)
09:50AM - 10:06AM	**Natural light, sleep and the circadian clocks in humans** John Axelsson (Sweden)
10:06AM - 10:22AM	**The effect of daytime lighting on the quality of sleep in human - from healthy people to caregivers** Tomoko Wakamura (Japan)
10:22AM - 10:30AM	**Conclusion**

Symposium, 109

09:00AM - 10:30AM **S28**

S28: Memory processing as a biological drive for sleep? The impact of waking cognition on subsequent sleep: Evidence from basic and clinical research

Summary
While the influence of sleep on wake has been extensively investigated in the last century, the opposite issue (i.e., how wake affects sleep) has received much less attention, but can reveal valuable insight into the processes which unfold specifically during sleep that support cognitive and mnemonic function. For many years, wake duration has been mostly considered as the main factor (i.e., “Process S”) affecting sleep’s timing and features (e.g., slow wave sleep intensity). However, recent research provides compelling evidence that waking experiences have a remarkable impact on sleep architecture. Learning during wake may also lead to electrophysiological and biochemical brain modifications during subsequent sleep, thus constituting a competing biological drive reflected in the reorganization of sleep macro- and micro-architecture.

Here, we propose a symposium to elucidate the influence of waking cognitive processes on sleep. We feel this will contribute both to the refinement of existing sleep regulation models and to improved clinical interventions for sleep quality. We aim to provide the latest evidence of the dramatic impact of learning on subsequent sleep, highlighting the dynamic and active role of sleep in memory reorganization processes and the changes at the systems and synaptic level sustaining them. We will also provide integration between animal and human literature and between basic and clinical aspects.

The symposium will be opened by Sara Aton, from the University of Michigan, presenting animal data on how novel sensory (visual) experiences during wake lead to changes in the electrophysiological behavior of thalamocortical circuits during subsequent sleep. She will also discuss the role of electrophysiological features of sleep in renormalizing firing rates and tuning visual response properties in the cortex. This contribution will set the basis for the understanding of a core part of the symposium, dedicated to research on brain mechanisms reflecting the reactivation and reorganization of memories during sleep. Stuart Fogel, from the University of Ottawa, will present results from simultaneous and combined electrophysiological (EEG) and functional neuroimaging (fMRI) studies on post-learning sleep spindle-related memory trace reactivation, with a focus on procedural memory. These data will be nicely integrated by those on processes of abstraction and creative problem solving enhanced by sleep presented by Penelope Lewis, from the University of Cardiff, obtained through the targeted memory reactivation (TMR) technique.

These topics will provide the background to explain the underlying mechanisms leading to the relevant sleep macrostructural changes observed after pre-sleep tasks both in healthy and clinical populations. Francesca Conte, from the University of Campania (Italy), will discuss how administering specific cognitive tasks before sleep consistently increases sleep quality indexes (e.g., stability and continuity), while Iris Haimov, from the Yezreel Valley College (Israel), will extend these observations to the clinical setting, showing how long-term cognitive training improves sleep quality in elderly insomniacs.

Learning Objectives

•Restate the reciprocal influence of waking cognition and sleep

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Effects of experience and subsequent sleep on visual system function** Sara Aton (United States)
09:18AM - 09:34AM	**The need for sleep: Memory optimization and enhancement - Insights from recent EEG-fMRI studies** Stuart Fogel (Canada)
09:34AM - 09:50AM	**Sleep's impact on semantic memory and creative problem solving** Penelope Lewis (United Kingdom)
09:50AM - 10:06AM	**Sleep quality improvements after pre-sleep training** Francesca Conte (Italy)
10:06AM - 10:22AM	**Effects of cognitive training on sleep quality among older adults with insomnia** Iris Haimov (Israel)
10:22AM - 10:30AM	**Conclusion**

Symposium, 121-122

09:00AM - 10:30AM **S29**

S29: REM Sleep and insomnia: So emotional!

Summary
Recent epidemiological data indicate between 30-48% of adults complain of insomnia symptoms while close to 10% suffer of an insomnia syndrome (severe and chronic insomnia complaints) or insomnia disorder. Reports of negative daily consequences, associated with insomnia, are part of the clinical picture. Insomnia is a 24-hour problem. Surprisingly though, little research or clinical efforts have been devoted so far to understanding emotional distress and the impact of cognitive activity during REM sleep in this population. REM sleep fragmentation is a neurophysiological marker of insomnia and the negative impact it has on emotion regulation should be advanced if we want to develop adequate treatments, especially in an era of neurobiological discoveries, and specifically about the dysregulation of certain brain structures (limbic system and Default Mode Network) in insomnia. Challenging the link between maladaptive cognitions and emotions and the arousal produced by sleep-onset difficulties or nightly awakenings is an essential first step in adequately developing a novel target for treatment of insomnia. Also understanding how emotional regulation is impaired in comorbid disorder such as PTSD can enhance our understanding of fear circuitry n insomnia. This symposium is aimed at assessing the neurophysiological components of nocturnal insomnia through the study of cognitive and neurophysiological activity during REM sleep. It is our aim to present both basic and clinical data as a translational way to better understand the challenges faced by individuals suffering from insomnia on a 24hr basis. From dream questionnaires to treatments targeting REM sleep, this symposium will illustrate: 1) diurnal impact of negative valence of cognitive nocturnal activity (Crawford); 2) the role of REM sleep and arousals on cognition during the night (links to neurophysiological measures of the EEG) (Riemann), 3) REM sleep features related to fear circuitry (Poe); and 4) the use of lucid dreaming as an adjunct treatment (Ellis and Bastien). It is our aim to present the most recent data from neurophysiological measurement techniques and clinical settings as a means to advance our understanding of the 24hr cycle of insomnia.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize different aspects of emotions in insomnia

•Recall different aspects of REM sleep in relation with emotions

•Introduce new markers of insomnia

•Discuss the hyperarousal concept of insomnia on an integrative level.

•Distinguish the importance of novel research and treatment approaches and theories for further progress in the field

Target Audience
Students, clinicians, psychologists, psychiatrists, physicians

Chairs:

Célyne H. Bastien (Canada)

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Dream valence and next day mood in individuals with insomnia symptoms** Megan R. Crawford (United Kingdom)
09:22AM - 09:42AM	**REM sleep and arousal** Dieter Riemann (Germany)
09:42AM - 10:02AM	**Maladaptive REM sleep features as mechanisms for establishing PTSD** Gina Poe (United States)
10:02AM - 10:22AM	**Lucid dreaming as an adjunct treatment for insomnia** Jason Ellis (United Kingdom) Célyne H. Bastien (Canada)
10:22AM - 10:30AM	**Conclusion**

09:00AM - 10:30AM **S30**

Basic Science Symposium, 211

S30: New sleep circuits and their role in disorders

Summary
The recent development of tools for remote control and recording of phenotypically defined population of neurons and circuits like optogenetics, chemogenetics, virally-mediated ablation, fiber photometry and calcium imaging has revolutionized our understanding of the circuits that regulate sleep-wake behaviors. Careful characterization of these circuits will undoubtedly provide a mechanistic explanation of disorders where these circuits have been altered, and may offer novel therapeutic avenues. For this symposium, we propose to cover recent discoveries in neural circuits and behavior research, and what role these circuits play in sleep disorders and related co-morbid diseases. The speakers that composed this symposium are investigators from four different countries (Canada, Switzerland, USA and Japan) representing a wide range of international expertise and backgrounds. This symposium will cover several major disorders (i.e., Insomnia, Narcolepsy, RBD, Parkinson's disease and schizophrenia), and will be of the highest interest to both basic research and clinical audiences.

In this symposium, we will present four recently described sleep-wake circuits relevant to sleep medicine. 1) Melanin-concentrating hormone (MCH) neurons of the lateral hypothalamus (LH) have been implicated in the modulation of REM sleep by ambient temperature. New pieces of evidences have implicated their role in Narcolepsy. 2) The ventral midbrain/pons (VMP) circuit control the daily amount of sleep and wakefulness. Understanding how this circuit functions is of critical importance for patients suffering from insomnia and may provide potential therapeutic targets for this sleep disorder that affect 30% of the population. 3) The sublaterodorsal nucleus (SLD) and the ventral medulla (vM) form the brainstem circuit controlling rapid eye movement (REM) sleep. Neurodegeneration of this circuit has been hypothesized to underlie REM sleep behavior disorder (RBD), offering new avenues for treating RBD as well as neurodegenerative synucleinopathies like Parkinson's disease. 4) The thalamic reticular nucleus (TRN) has been shown to be a strong modulator of arousal and sleep. Disruption of this circuit triggers symptoms mimicking schizophrenia; hence, understanding its regulation will provide therapeutic insights for this severe mental disorder. There are no doubts that novel molecular and genetic tools (e.g., optogenetics and chemogenetics) have helped dissect the critical neural circuits involved in sleep-wake regulation, and will not only provide insight on the pathobiology of sleep disorders but also offer potential therapeutic strategies that are more focused and with fewer side effects for a variety of diseases.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Recognize the methodologies used to dissect sleep-wake neural circuit (e.g., optogenetics, chemogenetics and calcium imaging) and how they can be useful in sleep medicine
- Identify the LH MCH circuit affecting REM sleep and Narcolepsy
- Identify the VMP GABA circuit underlying arousal and potentially insomnia
- Identify the neurodegenerative process that affect the brainstem circuit underlying RBD
- Identify the thalamic circuit controlling sleep/wake behavior and schizophrenia

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Dynamic REM sleep modulation by ambient temperature: Critical role of the lateral hypothalamus and the pathological phenotype in narcolepsy** Markus Schmidt (Switzerland)
09:22AM - 09:42AM	**Sleep-regulating midbrain GABAergic circuitry** Yo Oishi (Japan)
09:42AM - 10:02AM	**REM sleep circuit underlying REM sleep behavior disorder** Jimmy Fraigne (Canada)
10:02AM - 10:22AM	**Thalamic contribution to sleep wake and schizophrenia** Carolina Gutierrez-Herrera (Switzerland)
10:22AM - 10:30AM	**Conclusion**

Dental Symposium, 212-214

09:00AM - 10:30AM **S31**

S31: Combination therapy approaches for OSA: Can we improve effectiveness?

Summary
Obstructive Sleep Apnea (OSA) is a highly prevalent condition associated with daytime symptoms and cardiovascular and metabolic risk. As a chronic disorder, effective treatment needs to be applied long-term in order to circumvent poor health outcomes. However, available therapy options for OSA come with various therapeutic limitations. Standard care remains CPAP, a highly efficacious therapy but with the well-recognized limitation that a large proportion of OSA patient use it at suboptimal levels to achieve health effects, or abandon it altogether soon after implementation. Alternative therapies often fair better on patient adherence and preference. However, most alternative therapies do not eliminate all apneic events, leaving some level of residual OSA in most patients. Given that no single treatment is ‘perfect’, there is scope for combination therapy approaches to OSA treatment to improve treatment effectiveness. Combination therapy approaches can involve adjuncts to standard CPAP to improve effectiveness and meet patient needs. Additionally, alternative therapies, which are not completely efficacious on their own, can be combined to better eliminate the disease. Novel opportunities for combination therapies targeting non-anatomical pathophysiology are also emerging. This symposium will highlight advances in combination therapy approaches to OSA therapy.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the limitations of traditional single therapy approaches to OSA

•Discuss the scope of existing and emerging combination therapy approaches to OSA treatment

•Recall the potential for enhancing oral appliance therapy outcomes with other therapies

•Interpret up-to-date understanding of therapies which target various non-anatomical pathophysiology in OSA

Target Audience
Dentists and physicians, researchers, sleep & respiratory technologists

Chairs:

Kate Sutherland (Australia)

09:00AM - 09:02AM **Introduction**

09:02AM - 09:18AM	**Combining the two main device therapies: CPAP and oral appliances** Fernanda Almeida (Canada)
09:18AM - 09:34AM	**Targeting both jaw and body position in supine OSA: Oral appliances and positional therapy** Marijke Dieltjens (Belgium)
09:34AM - 09:50AM	**Combining weight loss with CPAP for OSA treatment: Are there any benefits?** Craig Phillips (Australia)
09:50AM - 10:06AM	**Targeting pathophysiological mechanisms for combination therapy options** Scott Sands (United States)
10:06AM - 10:22AM	**Combination drug therapy for the upper airway muscles** Luigi Taranto Montemurro (United States)
10:22AM - 10:30AM	**Conclusion**

Oral Abstract, 216 - 215-216

09:00AM - 10:30AM O13: Restless legs syndrome

Chairs:
John Winkelman (United States)
Yuichi Inoue (Japan)

09:00AM - 09:01AM	**Introduction**
09:01AM - 09:13AM	**VALIDATION OF THE SELF-ADMINISTERED VERSION OF THE INTERNATIONAL RESTLESS LEGS SYNDROME STUDY GROUP SEVERITY RATING SCALE - THE SIRLS** Denise Sharon (United States)
09:13AM - 09:25AM	**GENDER DIFFERENCES IN CLINICAL, LABORATORY, AND POLYSOMNOGRAPHIC FEATURES OF RESTLESS LEGS SYNDROME** Evi Holzknecht (Austria)
09:25AM - 09:37AM	**SEASONALITY OF RESTLESS LEGS SYNDROME: SYMPTOMS VARIABILITY IN WINTER AND SUMMER TIMES** Evi Holzknecht (Austria)
09:37AM - 09:49AM	**RESTLESS LEGS SYNDROME (RLS) SHOWS INCREASED POST-MORTEM MICROVASCULAR DISEASE IN CORTEX COMPARED TO CONTROLS** Arthur Walters (United States)
09:49AM - 10:01AM	**ONE-YEAR LONGITUDINAL FOLLOW-UP DATA FROM THE NATIONAL RLS OPIOID REGISTRY** John Winkelman (United States)

10:01AM - 10:13AM

RESTLESS LEG SYNDROME AND CARDIOVASCULAR AND CEREBROVASCULAR DISEASES IN THE CANADIAN LONGITUDINAL STUDY ON AGING

Sheida Zolfaghari (Canada)

10:13AM - 10:25AM

EVALUATION OF BRAIN IRON DEPOSITS IN RESTLESS LEGS SYNDROME: THE PROMISING ROLE OF TRANSCRANIAL SONOGRAPHY

Celia Garcia-Malo (Spain)

10:25AM - 10:30AM

Question and answer

Oral Abstract, 110

09:00AM - 10:30AM

O14: Circadian

Chairs:

Melinda Jackson (Australia)
Sonia Ancoli-Israel (United States)

09:00AM - 09:15AM

CROSS-SECTIONAL AND LONGITUDINAL RELATIONSHIPS BETWEEN REST-ACTIVITY RHYTHMS AND CIRCULATING INFLAMMATORY MARKERS IN OLDER MEN: THE OSTEOPOROTIC FRACTURES IN MEN SLEEP STUDY

Qian Xiao (United States)

09:15AM - 09:30AM

SLEEP AND FATIGUE IN SHIFT WORK WITH AND WITHOUT NIGHT WORK: LINKAGE TO OBJECTIVE WORKING TIME DATA

Kati Karhula (Finland)

09:30AM - 09:45AM

SOCIAL JETLAG AND SUICIDAL IDEATION: A POPULATION-BASED CROSS-SECTIONAL STUDY AMONG JAPANESE DAYTIME EMPLOYEES

Akinori Nakata (Japan)

09:45AM - 10:00AM

CAN WE OPTIMISE THE TIMING OF DAYTIME SLEEP TO INCREASE SLEEP DURATION IN HEALTHY ADULTS DURING A WEEK OF SIMULATED NIGHT WORK?

Charli Sargent (Australia)

10:00AM - 10:15AM

LONGER SEQUENCES OF CONSECUTIVE NIGHT SHIFTS MAY REDUCE THE LIKELIHOOD OF CRASHING WHILE DRIVING HOME FROM WORK

Greg Roach (Australia)

10:15AM - 10:30AM

PREDICTORS AND CORRELATES OF CHANGES IN SLEEP DURATION OVER 3 YEARS: DATA FROM A COMMUNITY-BASED COHORT

Yu Sun Bin (Australia)

Symposium, 217-219

09:00AM - 10:30AM **S32**

S32: Cross-cultural sleep: Sleep around the world and across the lifespan

Summary
Sleep issues are universal, with research indicating significant differences across cultures. Surprisingly, though, few studies have examined sleep cross-culturally. Almost all studies conducted on sleep patterns and sleep health have focused on one country or region. Almost no research has compared sleep patterns and sleep health across countries/regions, by either utilizing similar methodologies and measures or by comparing data across studies in an integrated fashion. These expected cross-cultural differences in sleep are also not specific to one age group but rather span the ages.

Thus, the aim of this symposium is to present and consider the cross-cultural contexts and differences, as well as similarities, in sleep patterns, sleep problems, and sleep health across the developmental span, from infants through adolescence to adulthood. Speakers will highlight not only cultural sleep differences, but also the common features. This study of sleep cross-culturally and across the lifespan is expected to contribute to our understanding of the nature of sleep, as well as provide a better understanding of sleep health around the world, which has implications for global interventions that can be universally efficacious.

Dr. Jodi Mindell (Saint Joseph's University and Children's Hospital of Philadephia, United States) will present data collected from over 50,000 young children (ages 0-5) from over 25 countries, including North America (US, Canada), South America (Brazil), Europe (UK), Middle East (e.g., Saudi Arabia, Egypt, Algeria), Asia (e.g., China, Japan, India, Malaysia, South Korea), and Australasia (Australia, New Zealand). Data will be presented regarding sleep patterns, sleep ecology, and sleep problems.

Dr. Michael Gradisar (Flinders University, Australia) will present an update of his 2011 publication in Sleep Medicine, which was a meta-analysis of adolescent sleep published in the scientific literature during the 2000s. This new update adds several years of new data to the original study, including new evidence from an additional 3 continents (Africa, South America, Australia). School-night vs weekend bedtimes, wake-up times, and total sleep time, as well as daytime sleepiness and sleep-onset insomnia meta-data will be presented and compared across continents. Potential contributing cultural factors influencing the sleep patterns and problems of teens across the world will be discussed.

Dr. Bizu Gelaye (Harvard Medical School, United States) will present data on prevalence and correlates of chronotype, sleep quality, and sleep apnea from a large multi-country study of college students across four countries (Peru, Thailand, Ethiopia and Chile). Additional data on sleep problems and associated outcomes will be presented from a recent study of working adults in Chile and older adults in Thailand.

Dr. Saverio Stranges (Western University, Canada) will present epidemiological evidence on sleep problems and health in adult populations, across low-, middle- and high-income countries. Among other sleep projects, Dr Stranges led one of the first comprehensive examinations of the burden of sleep problems and associated correlates in low-income settings, among over 40,000 older adults (aged 50 years and over) from eight countries across Africa and Asia, as well as cross-cultural comparisons on the cardio-metabolic implications of sleep problems in high-income countries, such as the US and UK.

Learning Objectives

09:00AM - 09:02AM		**Introduction**
09:02AM - 09:22AM		**Sleep patterns and sleep ecology in young children around the world** Jodi Mindell (United States)
09:22AM - 09:42AM		**Recent worldwide sleep patterns and problems during adolescence: An updated 2019 review and meta-analysis of age, region, and cultural influences** Michael Gradisar (Australia)
09:42AM - 10:02AM		**Epidemiology of sleep disturbances among African, South East Asian and South American adults** Bizu Gelaye (United States)
10:02AM - 10:22AM		**Sleep problems and health in adult populations: A global perspective** Saverio Stranges (Canada)
10:22AM - 10:30AM		**Conclusion**

Affiliated Meeting, 220 - 220-222

09:00AM - 10:00AM A08 A08: SRS-CSS Frontiers: Sleeping well and staying in rhythm

Summary
Sleep is important for the brain as well as the body. This symposium includes an exciting range of speakers that will present data linking sleep to brain function and physiology in both experimental and population-based studies. Our key speakers are renowned experts in the field of sleep and health (Dr. Phyllis Zee) and in the associations between sleep and cognitive function (Dr. Nadia Gosselin). Each featured presentation is followed by an oral symposium on a related theme with a broad range of speakers and topics.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the associations between sleep, circadian rhythms and metabolic health

•Restate which sleep characteristics are most strongly associated with cognitive function and decline

•Identify the public health implications of poor sleep on health and disease

Target Audience
Basic and clinical researchers and clinicians

09:00AM - 10:00AM

Sleeping Well and Staying in Rhythm: Implications for Brain and Metabolic Health
Phyllis Zee (United States)

Technologist Program, 223-224

09:00AM - 10:30AM

T06: Board of Registered Polysomnographic Technologists: Future of sleep

Summary
The BRPT will share their perspectives on the future os sleep medicine. BRPT representatives willl outline the wasys in which the field is changing, and how sleep technicians can best capitalize on the changes

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe the evolving role of Sleep professionals including in inpatient screening and as physician extenders

•Discuss the changing healthcare landscape including novel payment models and disruptive technologies

•Situated Sleep Medicine in the broader healthcare industry in terms of outcomes, population health, and wellness

Target Audience
Sleep Technologists,Sleep Health Educators, and other Allied Health professionals.

Chairs:
Jessica Schmidt (United States)

09:00AM - 09:02AM **Introduction**

09:02AM - 09:18AM **Future of sleep: Disruptive trends**
Vikas Jain (United States)

09:18AM - 09:34AM **Evolving role of sleep health professionals**
Andrea Ramberg (United States)

09:34AM - 09:50AM **Growing your sleep health career / profession**
Jomo Nkunika (United States)

09:50AM - 10:06AM **Technology's impact on the future of sleep**
Amber Allen (United States)

10:06AM - 10:22AM **Are microcredentials relevant to the sleep world**
Becky Appenzeller (United States)

10:22AM - 10:30AM **Question and answer**

10:00AM - 4:00PM **Exhibition 2**

Exhibition, Exhibition - Ballroom BCD

Exhibition

10:15AM - 12:00PM **A09**

Affiliated Meeting, 220 - 220-222

A09: SRS-CSS Frontiers: Sleep: Impact on physiology and public health

Summary
Sleep is important for the brain as well as the body. This symposium includes an exciting range of speakers that will present data linking sleep to brain function and physiology in both experimental and population-based studies. Our key speakers are renowned experts in the field of sleep and health (Dr. Phyllis Zee) and in the associations between sleep and cognitive function (Dr. Nadia Gosselin). Each featured presentation is followed by an oral symposium on a related theme with a broad range of speakers and topics.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the associations between sleep, circadian rhythms and metabolic health

•Restate which sleep characteristics are most strongly associated with cognitive function and decline

•Identify the public health implications of poor sleep on health and disease

Target Audience
Basic and clinical researchers and clinicians

Chairs:

John Peever (Canada)
Kristen Knutson (United States)

10:15AM - 10:40AM **Inflammatory and counter-inflammatory responses to chronic sleep disruption in humans**
Monika Haack (United States)

10:40AM - 11:05AM **Sleep, Recovery and Human Performance in Elite Athletes**
Charles Samuels (Canada)

11:05AM - 11:30AM **The Epidemiology of Sleep and Population Health Implications**
Chandra L. Jackson (United States)

11:30AM - 11:55AM

Human sleep in comparative context: exploring the link between our evolutionary history, health, and well-being
David Samson (Canada)

Symposium, BR A - Ballroom A

10:45AM - 12:15PM **S33**

S33: Orexin receptor antagonists in the treatment of insomnia

Summary
Although cognitive behavioral therapy for insomnia (CBT-I) is widely accepted as a first line treatment for chronic insomnia, pharmaceutical treatment still remains as a convenient and practical approach. In this symposium we will review the merit and weakness of the older drugs (benzodiazepines and Z-drugs) and the newer drugs (melatonergic drugs and orexin antagonists) as well as the strategy for combined treatment with medication and CBT-I.

Firstly, we will discuss about the indication and limitation of benzodiazepines and Z-drugs for the treatment of insomnia. In addition, we will discuss about the associated factors for the occurence of withdrawal symptom at the abrupt cessation of these kinds of hypnotics among patients with chronic insomnia by using newly developed Benzodiazepine hypnotics Withdrawal Symptom Scale.
Secondly, we will review the data supporting a role of melatonergic agents (melatonin, ramelteon, tasimelteon, agomelatine) as well as specific formulations in the treatment of insomnia disorder and in circadian rhythm sleep-wake disorders.We will also discuss the role of melatonergic drugs in the context of adjunctive therapy for insomnia and co-morbid circadian disorders.

Thirdly, we will review the basic properties of the orexin system and the expected impact of blocking orexin receptors as a basis for understanding the unique clinical properties of orexin receptor antagonists and review the available data on the use of these medictaions for treating insomnia.

Finally, we will address the rationale, benefits, and limitations of combined therapeutics with CBT-I and medication in the management of insomnia. It will summarize current evidence on combined and sequential approaches, outline different models for combining CBT and medication, and discuss whether it is preferable to first introduce medication, CBT, or both therapies concurrently.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•To understand the merit and weakness of the currently available hypnotics

•To understand the future trend of pharmaceutical treatment for insomnia

•To address the rationale, benefits, and limitations of combined medication and CBT-I in the management of insomnia

•To guide clinical decision-making and stimulate new research ideas for optimizing management of insomnia

Target Audience
Clinical sleep scientists and sleep medicine specialists interested in the treatment of insomnia

Chairs:

Yuichi Inoue (Japan)

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**The indication and limitation of BZDs and Z-drugs** Yuichi Inoue (Japan)
11:07AM - 11:27AM	**Melatonergic drugs: Chronobiotic vs soporific effects in the management of insomnia** Phyllis Zee (United States)
11:27AM - 11:47AM	**Orexin receptor antagonists in the treatment of insomnia** Andrew Krystal (United States)
11:47AM - 12:07PM	**Combined CBT and medication therapies for optimal management of insomnia** Charles Morin (Canada)
12:07PM - 12:15PM	**Question and answer**

Oral Abstract, 116 - 116-117

10:45AM - 12:15PM O15: Dental

Chairs:
Gilles Lavigne (Canada)
Peter Cistulli (Australia)

10:45AM - 11:00AM	**SLEEP DISTURBANCE AS A CAUSATIVE FACTOR OF INFLAMMATION AND COMORBIDITIES IN HIGH DISABILITY TEMPOROMANDIBULAR DISORDERS** Ji Woon Park (Republic of Korea)
11:00AM - 11:15AM	**PREDICTION OF SLEEP BRUXISM DIAGNOSIS WITH CONCOMITANT INSOMNIA COMPLAINTS IN A MID-AGE SUB-GROUP: GENERAL POPULATION OBSERVED AT 8 YEARS INTERVAL** Milton Maluly-Filho (Brazil)
11:15AM - 11:30AM	**MAXILLOMANDIBULAR ADVANCEMENT FOR OBSTRUCTIVE SLEEP APNEA: DOES PREVIOUS PALATAL SURGERY AFFECT THE OUTCOME?** Hung Tuan Lau (Singapore)
11:30AM - 11:45AM	**LONG TERM OUTCOME AND CEPHALOMETRIC ANALYSIS OF MAXILLOMANDIBULAR ROTATIONAL ADVANCEMENT SURGERY FOR TREATMENT OF OBSTRUCTIVE SLEEP APNOEA IN ASIAN PATIENTS** Shaun RH Loh (Singapore)
11:45AM - 12:00PM	**CONTINUOUS POSITIVE AIRWAY PRESSURE VERSUS MANDIBULAR ADVANCEMENT SPLINTS IN OBSTRUCTIVE SLEEP APNEA PATIENTS:A RANDOMIZED TRIAL** Mona M Hamoda (Canada)

12:00PM - 12:15PM

THE IMPACT OF UPPER AIRWAY SURGERY ON THE PATHOPHYSIOLOGICAL TRAITS CAUSING OBSTRUCTIVE SLEEP APNEA (OSA)

Ai-Ming Wong (Australia)

Panel Discussion, 118 - 118-120

10:45AM - 12:15PM **D04**

D04: Melatonin use in children: The promise and the peril

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
While there is a robust literature supporting the efficacy of melatonin in short-term pediatric clinical trials in special needs populations, many questions remain. For example, recent evidence suggests that over-the-counter preparations of melatonin may vary significantly in terms of actual concentration, and may contain contaminants such as serotonin. There are concerns regarding long-term safety considerations in children, including the impact on the hypothalamic-gonadal axis and the immune system. The appropriate timing and dosage of melatonin for circadian rhythm disorders in adolescents have yet to be determined.

This discussion panel will address a number of fundamental concerns regarding melatonin use in children, including what is currently known regarding melatonin neurophysiology in the developing brain, the challenges of establishing clinical guidelines for melatonin use in the face of somewhat limited empirical evidence, indications for use of melatonin in a variety of pediatric populations, and future directions for research. Discussion topics could include:

•Update on the neurophysiology of melatonin in children and adolescents.

•The neuroanatomy of the retinohypothalmic track, the concepts of entrainment, the ontogeny of sleep and circadian rhythms, and the influence of melatonin in childhood sleep.

•Safety of Short Term and Long Term Pharmacologic Treatment with Melatonin in Children

•The melatonin safety literature regarding adverse events in general, in special patient populations, and some theoretical safety issues based on melatonin characteristics in seasonal breeding animals.

•Melatonin in Children with Autism and Neurodevelopmental Disorders- The Latest Evidence

•The results of 3 large randomised-controlled trials of pharmacological and non-pharmacological interventions for children with ASD and sleep problems. Findings from the MENDS immediate release melatonin study and recent studies on a novel, pediatric prolonged-release melatonin will be presented.

•Establishing Clinical Guidelines for Melatonin Use in Children

Despite a relative dearth of studies examining the safety and efficacy of melatonin in typically-developing healthy infants, school-age children and adolescents, and conflicting data regarding dosage and timing of administration in relation to the specific type of sleep disturbance, melatonin is one of the most commonly used drug by pediatricians

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Update on the neurophysiology of melatonin in children and adolescents** Jonathan Lipton (United States)
11:03AM - 11:19AM	**Safety of short term and long term pharmacologic treatment with melatonin in children** Ingeborg van Geijlswijk (The Netherlands)
11:19AM - 11:35AM	**Melatonin in children with autism and neurodevelopmental disorders: The latest evidence** Paul Gringras (United Kingdom)
11:35AM - 11:51AM	**Establishing clinical guidelines for melatonin use in children** Oliviero Bruni (Italy)
11:51AM - 12:07PM	**“Vitamin M”: Melatonin and insomnia in children** Judith Owens (United States)
12:07PM - 12:15PM	**Conclusion**

Symposium, 109

10:45AM - 12:15PM **S34**

S34: Sensory–motor network of the restless legs syndrome (RLS): Electrophysiology and imaging

Summary
In recent years, there are most progress on pathophysiology of restless legs syndrome (RLS), especially electrophysiological and neuroimaging researches in sensory-motor disorder of RLS.

Novel imaging techniques such as functional MRI and diffusion tractography imaging have demonstrated activation or connectivity changes in the sensory–motor network. The cortex, basal ganglia, cerebellum, thalamus, and their connections seem to play a key part in abnormalities of sensory–motor processing in RLS. Also, RLS patients exhibit increased excitability of the sensorimotor cortex, a remarkable abnormality existing in early somatosensory gating control and an attenuated inhibitory interneuron network by electrophysiological magnetoencephalography. But in vivo excitability studies on motor and sensory axons of the median nerve provide evidence that the increased excitability of peripheral motoneurons but not sensory axons contributes to the pathophysiology of RLS. And RLS like tics in Tourette's syndrome, the movement disorders are modulated by internal and external sensory signals and that abnormal sensorimotor integration might alter normal motor control. Reduced short-latency afferent inhibition, a marker for sensorimotor integration, has been shown with transcranial magnetic stimulation (TMS) in RLS patients. Further, low-frequency rTMS on S1-M1 connectivity alleviated the sensory–motor complaints of RLS patients by modulating cortical excitability and inducing short-term synaptic plasticity.

We want to hold a symposium to have topic on sensory–motor network of RLS, to provide the electrophysiological and imaging evidence for the abnormality of sensory–motor network and gain novel insight into physiopathologic mechanism of RLS in order to better guide the treatment.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify the abnormal central sensory process of RLS

•Recognize the abnormal excitability of sensory and motor cortex of RLS

•Recall the abnormal sensorimotor integration of RLS

•Recognize the changes on neural activity and connectivity in region related to sensory and motor process of RLS

•Identify the neuromodulation of sensory–motor network in RLS

Target Audience
Professionals with interest in sleep medicine and research, restless legs syndrome, movement disorder, electrophysiology, neuroimaging and neuromodulation

Chairs:

Richard Allen (United States)

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Restless Legs Syndrome as a network disorder** Yong Won Cho (Republic of Korea)
11:07AM - 11:27AM	**The mechanism of sensory disorder in RLS based on MEG** Yuping Wang (China)
11:27AM - 11:47AM	**Non-invasive brain stimulation and RLS: Clinical, electrophysiological and neuroplastic effects** Giuseppe Lanza (Italy)
11:47AM - 12:07PM	**The sensory experience of RLS and its relationship to pain, itch and Tourette's** John Winkelman (United States)
12:07PM - 12:15PM	**Conclusion**

Pediatric Symposium, 121-122

10:45AM - 12:15PM **S35**

S35: Progression of childhood sleep-disordered breathing: Natural and after intervention

Summary
Childhood sleep-disordered breathing (SDB) is a spectrum spanning from individuals with regular snoring yet normal sleep study to obstructive sleep apnoea (OSA). Latter belongs to the severe end of this spectrum and can lead to a variety of complications if it is unrecognized and left untreated. Childhood and adult OSA share some similarities in terms of pathophysiology, namely anatomically narrow upper airway, and/or increase in airway collapsibility, and/or alterations of neuromuscular tone. However, they are pretty distinct disease entities because of different underlying aetiologies. During childhood, the most common cause is adenotonsillar hypertrophy, while approaching adulthood, obesity becomes the more common predisposing factor. Understanding the natural history of SDB can help us predict disease course, perform risk stratification with individual characteristics and guide us in management. More importantly, longitudinal data will help answer the question of whether childhood OSA predisposes an individual to the development of adult OSA. Furthermore, information and progress related to post OSA intervention are essential when we counsel parents and patients regarding the most suitable treatment options and prognosis.

In this symposium, the various speakers will discuss on the following topics that aim to provide an up-to-date review on natural progression of SDB and longer term outcomes following OSA intervention.
- What happens to a child with primary snoring with time, is he morbidity free?
- Longitudinal follow-up data from a Chinese cohort to examine predictors of SDB resolution
- Findings from Penn State longitudinal cohort to evaluate predictors for incident SDB
- The cohort study of Pediatric OSA following surgery treatment
- Are OSA related complications reversible following intervention

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss the natural history of primary snoring and OSA in children, and the information gathered will help them in disease management

•Practice an understanding of predictors for OSA occurrence and resolution in adulthood

•Apply knowledge for patient counseling in relation to longer term outcomes following intervention for childhood OSA

Target Audience
Pediatricians, ENT surgeons, nursing colleagues and allied healthcare workers interested in childhood sleep-disordered breathing

Chairs:

Albert Martin Li (Hong Kong)

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**What happens to a child with primary snoring with time, is he morbidity free?** Chun Ting Au (Hong Kong)
11:03AM - 11:19AM	**Longitudinal follow-up data from a Chinese cohort to examine predictors of SDB resolution** Kate Chan (Hong Kong)
11:19AM - 11:35AM	**Findings from Penn State longitudinal cohort to evaluate predictors for incident SDB** Edward Bixler (United States)
11:35AM - 11:51AM	**The cohort study of Pediatric OSA following surgical treatment** Yu-Shu Huang (Taiwan)
11:51AM - 12:07PM	**Are OSA related complications reversible following intervention?** Rosemary Horne (Australia)
12:07PM - 12:15PM	**Conclusion**

Basic Science Symposium, 211

10:45AM - 12:15PM **S36**

S36: What else can we learn from sleep oscillations?

Summary
Brain activity during sleep is characterized by a wide spectrum of oscillatory activities. The use of high-density scalp EEG and intracranial recordings in human and rodents during sleep have revealed a complex landscape of region-specific oscillations in what was previously assumed to be a ‘uniform’ pattern of brain activity. These oscillations include slow waves, spindles and theta rhythms and reflect patterned activities of anatomically distinct neuronal circuits located in, or encompassing, the cortex, thalamus or hippocampus structures. A major challenge in sleep research and sleep medicine is to better understand the neurobiological mechanisms orchestrating sleep oscillation in time and space to shine light on the structure and the functions of sleep in animal models and humans, as well as make important advances in prevention and treatment of brain disorders.

This symposium will focus on the oscillatory nature of neural circuits in the sleeping brain at different levels of organization studied using a variety of experimental models and approaches. The main goal of the symposium will be to provide the audience with recent results and novel concepts on the basic mechanisms and function of sleep oscillations. In agreement with the title of the symposium ‘What else can we learn from sleep oscillations about..." each speaker will offer their perspective on the origin and the role of brain activity during sleep.

The first speaker, Prof. A Adamantidis (Bern, Switzerland) will describe the dynamics of single cell activity underlying sleep states studied using electrophysiological recordings, calcium imaging and optogenetics. Then, Prof. V. Vyazovskiy (Oxford, UK) will discuss local and global aspects of sleep homeostasis, and Dr K. Benchenane (Paris, France) will provide novel insights into the sleep-wake state related activities in non-canonical brain structures, such as the olfactory bulb. Next, Dr M. Boly (Madison, USA) will address how oscillatory brain dynamics can inform us about the presence of conscious experience in specific sleep stages and also under anesthesia and in disorders of consciousness. Finally, Prof. R. Benca (Irvine, USA) will discuss recent advances provided by the use of high-density EEG in patients with neuropsychiatric conditions, and describe how sleep changes mediate these disorders or some of their associated symptoms.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the state-of-the-art techniques used in sleep research (both animal and human)

•Idenitfy a knowledge of the global and local regulation of sleep and consciousness

•Recall the importance of global and local regulation of brain circuits during sleep

•Examine novel (unpublished) results on brain mechanisms of sleep oscillations

•Apply knowledge on the relationship between sleep and psychiatric disorders

Target Audience

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**The NREM-REM Sleep Cycle: Insights into Mechanism and Function** Markus Schmidt (Switzerland)
11:07AM - 11:27AM	**Local and global aspects of sleep homeostasis** Vladyslav Vyazovskiy (United Kingdom)
11:27AM - 11:47AM	**Brain oscillations, sleep states and consciousness** Melanie Boly (United States)
11:47AM - 12:07PM	**High-density EEG in sleep and mental disorders** Ruth M. Benca (United States)
12:07PM - 12:15PM	**Conclusion**

Symposium, 212-214

10:45AM - 12:15PM **S37**

S37: Novel biomarkers in sleep and circadian research: Requirements and real-world applications

Summary
The search for novel biomarkers for sleep and circadian disruption has been propelled by new technologies such as the omics revolution and novel data analysis methods such as machine learning. Amidst these new opportunities, there is a need for evaluation of the biomarkers developed against requirements that arise from sleep and circadian biology and real-world scenarios. This symposium will explore the theoretical concepts and approaches to sleep and circadian rhythm biomarker discovery and will provide an overview of novel approaches to biomarker discovery and their value for sleep and circadian rhythm research and real-world applications.

The symposium will be chaired by Simon Archer (UK) who has worked on the development and validation of human blood-based transcriptome biomarkers for sleep and circadian rhythms and is a member of the ESRS-EBRS biomarker task force.

Julie Carrier (Canada) and Jeanne Duffy (USA) will each give a short overview of the requirements and criteria to be used in the development and evaluation of novel biomarkers for sleep and circadian rhythms, respectively. They will discuss the case for developing biomarkers for the sleep field and beyond. A review of critical features that a useful biomarker should capture, protocol features important in collecting data for sleep and circadian rhythm biomarkers, and test populations for validating biomarker robustness will be discussed.

Alterations in the microbiome-gut-brain-axis are associated with poor health and poor cognitive outcomes. Ken Wright (USA) will present findings from research studies designed to determine the influence of combined sleep restriction and circadian misalignment on the microbiota-gut-brain axis (MGB), characterize stability of individual differences in MGB, and determine associations with an objective measure of alertness in humans.
Joshua Gooley (Singapore) will present data fro
m a study to investigate whether baseline measures of psychomotor vigilance test (PVT) performance and heart rate variability can be used to estimate individual differences in drowsy driving. He will present data showing that subjects with more than one PVT lapse or with higher heart rate variability had significantly shorter survival times to their first drowsy driving event. The findings indicate that baseline measures of PVT performance and heart rate variability carry information about a person’s risk of drowsiness-related driving events following exposure to total sleep deprivation.

Emma Laing (UK) will present computational approaches to identify candidate blood-based mRNA biomarkers for predicting the status of an individual at multiple ‘levels’; molecular (e.g. circadian disruption), physiological (e.g. lack of sleep), and cognitive (e.g. task performance).

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate understanding of the potential of biomarker discovery for sleep research and sleep medicine

•Recognize the theoretical considerations and limitations for sleep and circadian rhythm biomarker development

•Recall multi-level approaches that can be used in biomarker

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Biomarkers for circadian rhythmicity: Considerations for development and validation** Jeanne Duffy (United States)
11:03AM - 11:19AM	**Biomarkers for sleep: Considerations for development and validation** Janet Mullington (United States)
11:19AM - 11:35AM	**Microbiome related biomarkers of alertness during sleep and circadian disruption** Kenneth Wright (United States)
11:35AM - 11:51AM	**Baseline predictors of drowsy driving performance** Joshua J. Gooley (Singapore)
11:51AM - 12:07PM	**Blood transcriptome-based biomarkers for the multi-level assessment of sleep and circadian perturbations in humans** Emma Laing (United Kingdom)
12:07PM - 12:15PM	**Conclusion**

Scientific Programme

10:45AM - 12:15PM **S38**

Symposium, 216 - 215-216

S38: Sleep in elite athletes: Implications for performance and recommendations for optimal recovery

Summary
The scientific literature on the role of sleep in athletes has exponentially increased in the last decade and therefore, sports medicine/science staff now understand the potential for sleep to enhance athletic performance and recovery. Sleep is considered a vital component for both physical and mental recovery from exercise and hence, coaches and athletes rate it as the best recovery strategy available.

Unfortunately, acute sleep disruption in athletes is not unusual; sleep impairments have been commonly observed in individual sport athletes due to habitual early morning training and may also occur in team sport athletes due to night matches. Several other factors may also negatively influence sleep in athletes, including chronotype, high-volume and/or intensity training, pre-competition anxiety and long-haul travel.
Therefore, the aims of the present symposium will be to: 1) Describe how an athletes' chronotype and training/competition schedule may influence their sleep behavior, including the reciprocal relationship between sleep and exercise; 2) Describe the impact of long-haul travel on sleep and physical performance, and provide evidence-based strategies to counteract these effects; 3) Highlight the role of napping for athletes, specifically indicating the importance of nap duration and timing to achieve optimal benefits in a training and competition setting; 4) Present the methods commonly used to monitor athlete's sleep and highlight the reliability and validity of these various methods; and 5) Provide evidence-based solutions to mitigate sleep disruption in athletes and present some novel, state of the art and sleep hygiene strategies to improve athletes' sleep and recovery.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Explain the role of sleep for elite athletes' health, performance and recovery

•Describe how to manage common factors that can disrupt athletes sleep: long-haul travel, training/competition schedules and training volume and/or intensity

•Recall the reciprocal relationship between sleep and exercise. Not only is this related to athletes, but also the health and wellness of the general population

•Recognize the advantages and disadvantages of the various methods that commonly used to assess athletes sleep

•Recall the advantages and disadvantages of the various methods that commonly used to assess athletes sleep

Target Audience
Experts in sport science, chronobiology applied to sport science, and researchers with an interest in the interaction between exercise and sleep, particularly in athletic populations; experts in sleep research

Chairs:

Shona Halson (Australia)
Jacopo A. Vitale (Italy)

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**The influence of chronotype and training schedules on athletes' sleep** Jacopo A. Vitale (Italy)
11:03AM - 11:19AM	**How to assess athletes' sleep? The pros and cons of common methods** Mathieu Nedelec (France)
11:19AM - 11:35AM	**The impact of long-haul travel on sleep and evidence-based solutions** Meeta Singh (United States)
11:35AM - 11:51AM	**To nap or not to nap? Possible benefits and risks for athletes** Michele Lastella (Australia)
11:51AM - 12:07PM	**State of the art on non-invasive sleep hygiene strategies to improve athletes' sleep** Shona Halson (Australia)
12:07PM - 12:15PM	**Conclusion**

Symposium, 110

10:45AM - 12:15PM **S39**

S39: Update on non OSA sleep breathing abnormalities: Upper airway resistance syndrome and inspiratory flow limitation

Summary
UARS (Upper Airway Resistance Syndrome) and IFL (Inspiratory Flow Limitation) are considered as non OSA breathing abnormalities during sleep. However, the importance of those mild sleep breathing disorders are still under debate. Despite the frequency and clinical relevance of these breathing abnormalities; few international efforts have been made towards consensus definition. The purpose of this symposium is to put together experienced sleep researchers and clinicians to raise the current evidence and to encourage discussion for future directions.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Update knowledge regarding currently data on UARS and IFL

•Understand the importance of IFL on sleep breathing disorders

•Contribute to future planning on studies on IFL and UARS

Target Audience
Sleep medicine professionals

Chairs:

Luciana Palombini (Brazil)
Dalva Poyares (Brazil)

10:45AM - 10:47AM **Introduction**

10:47AM - 11:03AM **Defining UARS: Which parameters should be scored? RERAs, IFL or both?**
JL Pepin (France)

11:03AM - 11:19AM **UARS data from Follow Up of Sao Paulo epidemiological study**
Luciana Palombini (Brazil)

11:19AM - 11:35AM **What are the evidences currently available that UARS is a distinct syndrome?**
JL Pepin (France)

11:35AM - 11:51AM **Discussion IFL: update on evidences and perspectives for consensus on the analysis and scoring of IFL in PSG among sleep specialists**
David Rapoport (United States)

11:51AM - 12:07PM **Is there a specific UARS phenotype?**
Avram Gold (United States)

12:07PM - 12:15PM **Conclusion**

Technologist Program, 223-224

10:45AM - 11:30AM T07: Medications and pharmacological effects on PSG

Chairs:
Shalanda Mitchell (United States)
Michael Eden (United States)

10:45AM - 11:30AM **Medications and pharmacological effects on PSG**
Christoph Schoebel (Germany)

Technologist Program, 223-224

11:30AM - 12:30PM T08: Quality assurance in the sleep lab

Chairs:
Michael Eden (United States)
Shalanda Mitchell (United States)

11:30AM - 12:30PM **Quality assurance in the sleep lab**
Marietta Bibbs (United States)

Administration, Admin 105 - 105

12:00PM - 1:00PM CSS / RCP Meeting

Scientific Programme

12:30PM - 2:00PM

Satellite Symposium, BR A - Ballroom A

Excessive daytime sleepiness in patients with OSA: Impact, causes and treatment strategies

Summary
Patients with obstructive sleep apnea (OSA) who remain excessively sleepy despite use of continuous positive airway pressure (CPAP) present a long-standing clinical dilemma. Quantifying the degree of excessive daytime sleepiness (EDS) and the impact on quality of life and function is clinically important. Identifying the cause of EDS in OSA patients is critical. Adequacy of therapy with CPAP is pivotal. Concomitant sleep disorders can coexist with OSA and should be ruled out, as should mood disorders (which can be associated with hypersomnolence), neurologic conditions, and other comorbidities. In addition, many medications have sedating side effects. Therefore, careful history-taking is essential, and clinical tools such as patient questionnaires can be useful to proactively monitor EDS in OSA.

Recent research indicates that OSA can lead to brain alterations that increase sleepiness, and one of the major consequences of OSA syndrome (the combination of OSA and EDS) is an impact on neurocognitive functioning. Because many patients have OSA for many years before seeking treatment, it may be that years of intermittent hypoxia or sleep fragmentation have caused damage to brain regions, and this cannot be completely reversed on initiation of CPAP therapy. Therefore, identifying early, targeted treatment of patients at highest risk of developing EDS is prudent.

Effective management of OSA patients with EDS includes recognition of clinical occurrence and impact, definition of etiology, and treatment intervention. Non-pharmacologic treatment of EDS in OSA patients includes emphasizing cognitive therapy with appropriate quantity and quality of sleep as well as lifestyle changes. Optimizing CPAP treatment is imperative. Modafinil and armodafinil are non-amphetamine wakefulness promoters that are used in patients with OSA and residual sleepiness despite CPAP treatment. An emerging potential therapy recently reported for EDS in patients with OSA is solriamfetol, a selective dopamine and norepinephrine reuptake inhibitor with wake-promoting effects.

This symposium will provide sleep clinicians with 1) up-to-date research exploring the prevalence and impact of EDS in OSA patients; 2) causes of EDS in OSA including a relationship between neuronal injury and excessive sleepiness; 3) clinical tools to proactively monitor EDS in OSA; 4) clinical pearls to improve accuracy in determining the cause of the EDS; and 5) best practices for nonpharmacologic (behavioral) and pharmacologic management of EDS in patients with OSA.

Learning Objectives:

•Describe best practices in identifying OSA patients with residual daytime sleepiness and determining the causes of residual daytime sleepiness

•Discuss nonpharmacologic treatments for excessive daytime sleepiness in OSA patients

•Interpret data with pharmacologic therapies and identify appropriate settings for use

Target Audience
Physicians and other healthcare professionals involved in the management of sleep disorders

Chairs:

Scientific Programme

12:30PM - 12:35PM	**Introduction** Richard Bogan (United States)
12:35PM - 1:00PM	**OSA patients with residual daytime sleepiness: Who are the patients? What are the causes?** Patrick Strollo (United States)
1:00PM - 1:25PM	**Treatment of residual daytime sleepiness in OSA patients** Atul Malhotra (United States)
1:25PM - 1:50PM	**Case presentations** Richard Bogan (United States)
1:50PM - 2:00PM	**Take-home tips for clinical practice**

Satellite Symposium, 118 - 118-120

12:30PM - 2:00PM

Rethinking narcolepsy treatment options

Join Your Colleagues for a Discussion on WAKIX® (pitolisant)
Join Michael J. Thorpy, MD (Albert Einstein College of Medicine); W. Chris Winter, MD (Charlottesville Neurology and Sleep Medicine); and Ulf Kallweit, MD (Witten/Herdecke University) for a discussion on WAKIX, including:

- The role of histamine in sleep and wakefulness
- WAKIX as a new treatment option

Visit Harmony Biosciences at Booth #317 to learn more.

12:30PM - 2:00PM **Discussion on WAKIX® (pitolisant)**

Michael Thorpy (United States)
W. Chris Winter (United States)
Ulf Kallweit (Germany)

Satellite Symposium, 217-219

12:30PM - 2:00PM

Clinical update in servo-ventilation

Summary
Sleep apnea affects millions of people around the world and many of those may have heart failure. The use of servo-ventilation for the treatment of Cheyne-Stokes Respirations or complex sleep apnea have decreased, but more recent studies have provided evidence that the ASV treatment option should be reviewed.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Review past evidence for the use of ASV.

•Discuss the prevalence of sleep apnea and heart failure with reduced ejection fraction

•Identify the treatments for Cheyne-stokes respirations

•Review the impact of different treatment algorithms on the treatment

Target Audience
Sleep Physicians, Sleep Technicians

12:30PM - 12:35PM **Introduction**
Cheryl Needham (United States)

12:35PM - 1:10PM **Comparison of various forms of PAP therapies in sleep-disordered breathing**
Colleen Lance (United States)

1:10PM - 1:45PM **Update on the ADVENT-HF trial**
Douglas Bradley (Canada)

1:45PM - 2:00PM **Question and Answer**

Satellite Symposium, 220 - 220-222

12:30PM - 2:00PM

Insomnia in Alzheimer’s disease: Sleep matters

Chairs:
Charles Morin (Canada)

12:30PM - 12:32PM **Introduction**

12:32PM - 12:52PM **Insomnia in the elderly – Night and day impact on patients and caregivers**
Charles Morin (Canada)

12:52PM - 1:12PM

Assessing sleep issues in patients with dementia
Phyllis Zee (United States)

1:12PM - 1:32PM

Managing insomnia in Alzheimer's Disease
Alon Avidan (United States)

1:32PM - 1:57PM

Question & answer

Administration, Admin 105 - 105

1:00PM - 5:00PM

RSD Restless Sleep Disorder

Chairs:
Lourdes DelRosso (United States)

1:00PM - 5:00PM

RSD Restless Sleep Disorder
Suresh Kotagal (United States)
Judith Owens (United States)
Raffaele Ferri (Italy)
Oliviero Bruni (Italy)
Daniel Picchietti (United States)
Diego García-Borreguero (Spain)
Anne-Marie Williams (France)
Narong Simakajornboon (United States)

Satellite Symposium, 110

1:00PM - 1:45PM

The future of Insomnia Therapy: A proposition of implementation at scale

Cognitive behavioral therapy for insomnia (CBT-I) is the current first-line treatment for insomnia disorder, recommended by all international therapeutic guidelines. CBT-I is traditionally a head-to-head therapy, which can be a major hurdle for some patients because of the paucity of qualified therapists, but also the difficulties or reluctances for some patients to follow a therapy in person. Here we discuss a proposition of implementation at scale which involves an app and phone call with experts.

Target audience
Sleep experts in insomnia, general practitioners, psychologists

1:00PM - 1:10PM

The future of insomnia therapy
Eden Debellemaniere (France)
Pierrick J. Arnal (United States)

Scientific Programme

Keynote, BR A - Ballroom A

2:00PM - 2:45PM **Drager**

K06: Discussing the impact of obstructive sleep apnea and sleep duration: Time to put the pieces together

Obstructive sleep apnea (OSA) and sleep duration abnormalities are traditionally associated with daytime symptoms and cardiometabolic risk. However, the vast majority of studies addressing OSA has not evaluated sleep duration, and vice versa. This talk will intend to provide a practical discussion addressing the complex interaction between these major sleep issues in our Society highlighting recent evidence approaching OSA and sleep duration with objective tools.

2:00PM - 2:02PM **Introduction**

Matt Naughton (Australia)

2:02PM - 2:45PM **The impact of obstructive sleep apnea and sleep duration**

Luciano Drager (Brazil)

Affiliated Meeting, 106

2:00PM - 4:00PM

A15: Ageing and Sleep Special Interest Meeting. Chair Julia Chapman

Panel Discussion, 121-122

2:00PM - 2:45PM

Meet the Professor: R. Bogan, P. Strollo, A Malhotra

Chairs:

Richard Bogan (United States)

2:00PM - 2:45PM **Panel Discussion**

Patrick Strollo (United States)
Atul Malhotra (United States)
Richard Bogan (United States)

Keynote, 211

2:00PM - 2:45PM **Yanagisawa** **K07: Toward the mysteries of sleep**

Summary
Although the executive neurocircuitry and neurochemistry for sleep/wake switching has been increasingly revealed in recent years, the fundamental mechanism for homeostatic regulation of sleep, as well as the neural substrate for “sleepiness” or sleep need, remains unknown. We have initiated a large-scale (>9,000 mice thus far) forward genetic screen of sleep/wake phenotype in ENU-mutagenized mice based on EEG/EMG measurements. By combining linkage analysis, whole-exome sequencing and genome editing, we have identified the causal mutations in several pedigrees with marked sleep abnormalities (Nature 539:378-383, 2016). We expect that the mutated genes will provide new insights into the elusive cellular/molecular pathway regulating sleep. Indeed, through a systematic cross-comparison of the hypersomnia Sleepy mutants and sleep-deprived wildtype mice, we have recently found that the cumulative phosphorylation state of a specific set of mostly synaptic proteins may be the molecular substrate of sleep need (Nature 558:435-439, 2018).

2:00PM - 2:02PM **Introduction**
Pierre-Hervé Luppi (France)

2:02PM - 2:45PM **Mysterious molecular basis of sleep need**
Masashi Yanagisawa (Japan)

Keynote, 212-214

2:00PM - 2:45PM **García-Borreguero** **K08: Restless legs syndrome/periodic limb movements of sleep: New insights into neurobiology and treatment**

Summary
Restless legs syndrome (RLS) is a common chronic neurological disorder that manifests through sensorimotor symptoms that interfere with rest and sleep. It has a wide spectrum of symptom severity affecting not only quality of life but also possibly increasing cardiovascular risk.
Our knowledge on the causes and mechanisms of RLS is still limited: several susceptible single nucleotide polymorphisms such as BTBD9 and MEIS1, which are thought to be involved in embryonic neuronal development, have been reported to be associated with RLS. An increasing number of studies have suggested an important role of brain iron deficiency in the pathophysiology of RLS. Moreover, a number of recent preclinical and clinical studies suggest a hypoadenosinergic state leading to hypersensitive cortico-striatal input and leading to a striatal presynaptic hyperglutamatergic and hyperdopaminergic neurotransmission. Understanding the interplay between these dysfunctional striatal circuitries might be crucial to develop new therapeutic targets.

2:00PM - 2:02PM **Introduction**
Birgit Hogl (Austria)

2:02PM - 2:45PM

Restless legs syndrome/periodic limb movements of sleep: New insights into neurobiology and treatment
Diego García-Borreguero (Spain)

Technologist Program, 223-224

2:00PM - 3:30PM

T09: Complex sleep apnea

Chairs:
Shalanda Mitchell (United States)
Michael Eden (United States)

2:00PM - 3:30PM

Complex sleep apnea
Richard Castriotta (United States)

Symposium, BR A - Ballroom A

3:00PM - 4:30PM **S40**

S40: New insights into the pathophysiology, clinical manifestations and treatment of sleep related eating disorder

Summary
Sleep-related eating disorder (SRED) is a female predominant condition characterized by recurrent episodes of eating at the transition from night-time NREM sleep to arousal. Level of consciousness during SRED episodes ranges from partial consciousness to dense unawareness typical of somnambulistic episodes. Patients who seek medical assistance are likely to show a chronic course with near-nightly eating episodes and suffer from a variety of consequences such as weight gain and psychological distress.

The current data indicate that the appearance of SRED is sometimes associated with several factors including genetic background, use of psychotropic medication and the existence of psychiatric disorders as well as other sleep disorders. Night eating syndrome (NES) is another important condition in the disordered night-time eating spectrum showing hyperphagia episodes in the evening prior to sleep. While SRED and NES have been described as independent categories, some features overlap and the coexistence of these two disorders is recognized in a certain number of patients. Considering this, there has been some argument about similarities and differences between them. NES has been speculated to appear based on an abnormality in the circadian rhythm of meal timing but with a normal circadian timing of sleep onset. Given that SRED and NES share some similarities in phenotype, it is possible that circadian misalignment is partially involved in the mechanism of SRED. Taking these together, the mechanism of SRED is thought to be heterogenous, and patients require careful treatment selection corresponding to respective backgrounds/mechanism of the disorder.

In this symposium, we firstly would like to introduce recent study results regarding the background factors of SRED focusing on other sleep disorders including parasomnias, narcolepsy, restless legs syndrome and periodic limb movements during sleep. Secondly, the relationship of mood disorders and psychotic disorders to the occurrence of SRED with consideration of the influence of psychotropic drugs will be presented. Thirdly, we would like to make a comparison of the mechanism and clinical manifestation between SRED and NES with both clinical and basic research perspective. We also would like to discuss the possible contribution of circadian misalignment to the occurrence of SRED and the adverse effect of night eating on the metabolic control system. Finally, recent advances in the pharmaceutical treatment of SRED including topiramate, SSRIs and melatonergic drugs will be presented.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the background factors that cause or trigger SRED

•Recognize the similarity and difference in the mechanism and clinical manifestation between SRED and NES

•Recall the relationship between the circadian system and metabolic control

pathophysiology and clinical characteristics

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**The borderlands of sleep related eating disorder** Carlos Schenck (United States)
3:18PM - 3:34PM	**The associated factors of SRED in the general population** Yuichi Inoue (Japan)
3:34PM - 3:50PM	**Sleep related eating disorder in psychiatric populations** Yun Kwok Wing (Hong Kong)
3:50PM - 4:06PM	**Meal timing: Circadian control and metabolic consequences** Frank Scheer (United States)
4:06PM - 4:22PM	**What works for the treatment of sleep-related eating disorder** John Winkelman (United States)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 116 - 116-117

3:00PM - 4:30PM O16: Treatments CPAP and nonCPAP

Chairs:
Robert Skomro (Canada)
Atul Malhotra (United States)

3:00PM - 3:15PM	**RESPONSIVENESS OF PATIENT REPORTED OUTCOMES TO OBSTRUCTIVE SLEEP APNEA TREATMENT WITH CONTINUOUS POSITIVE AIRWAY PRESSURE THERAPY** Lucas Donovan (United States)
3:15PM - 3:30PM	**BILATERAL HYPOGLOSSAL NERVE STIMULATION FOR TREATMENT OF OBSTRUCTIVE SLEEP APNEA** Peter Eastwood (Australia)
3:30PM - 3:45PM	**THE EFFECT OF OBSTRUCTIVE SLEEP APNEA AND CPAP THERAPY ON THE PULMONARY EMBOLISM RECURRENCE** Emir Festic (United States)
3:45PM - 4:00PM	**THE EFFECT OF COGNITIVE AND BEHAVIOURAL THERAPY FOR INSOMNIA ON CHANGES IN SLEEP ARCHITECTURE AND AHI IN PATIENTS WITH CO-OCCURRING INSOMNIA AND SLEEP APNEA** Alexander Sweetman (Australia)
4:00PM - 4:15PM	**THE COMPARATIVE EFFECTIVENESS OF A SIMPLE ALARM-BASED SUPINE-AVOIDANCE DEVICE VERSUS USUAL CARE WITH CONTINUOUS POSITIVE AIRWAY PRESSURE FOR TREATING PATIENTS WITH SUPINE PREDOMINANT OBSTRUCTIVE SLEEP APNEA** Matthew Rahimi (Australia)

4:15PM - 4:30PM

A NOVEL RISK INDEX FOR PREDICTING CENTRAL SLEEP APNEA IN CHRONIC PAIN PATIENTS ON OPIOIDS

Jean Wong (Canada)

Panel Discussion, 118 - 118-120

3:00PM - 4:30PM **D05**

D05: The International Sleep Research Training Program (ISRTP) of World Sleep Society

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
World Sleep Society (WSS) has initiated an International Sleep Research Training Program (ISRTP) to provide training to international trainees (i.e., post-doctoral students with Ph.D., M.D., or equivalent degrees) in sleep research. The overarching goal of the program is to prepare sleep trainees from various countries throughout the world for future leadership in basic and/or clinical sleep research. Currently, there is not a formalized process to select the best international trainees; most academic sleep centers do not have a formal curriculum or rigorous selection process to choose trainees whom have the best education/backgrounds and/or whom might best benefit from a 1-year comprehensive training program.

The ISRTP will provide an opportunity for such trainees, especially those in underserved countries, to train at major academic institutions (Harvard University, Stanford University, University of Oxford, University of Pennsylvania, University of Sydney) so they can acquire sleep research skills from experienced investigators.

In turn, the program will foster a cohort of future sleep research leaders who will keep the field of sleep medicine and research vibrant with their ideas, plans, and goals.

The purpose of this Discussion Panel is for the Steering Committee of this program (directors of the 5 sites, and representatives from the WSS Education and Examination Committees) to discuss the goals, curricula, short-term and long-term learning objectives, outcomes, timeline, applicant selection process, ensuring the future success of the trainees, and challenges for the program.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the goals and learning objectives of the program

•Discuss the current state of sleep trainees in different regions of the world

•Examine the opportunities and challenges of international sleep trainees

Target Audience
Potential mentors and trainees for this program

This educational initiative is supported by Philips.

Chairs:

Clete Kushida (United States)

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:12PM	**Sleep research opportunities at Stanford University** Clete Kushida (United States)
3:12PM - 3:22PM	**Sleep research opportunities at Harvard University** Susan Redline (United States)
3:22PM - 3:32PM	**Sleep research opportunities at the University of Oxford** Simon Kyle (United Kingdom)
3:32PM - 3:42PM	**Sleep research opportunities at the University of Pennsylvania** Allan Pack (United States)
3:42PM - 3:52PM	**Sleep research opportunities at the University of Sydney** Brendon Yee (Australia)
3:52PM - 4:02PM	**Sleep research opportunities in Brazil** Dalva Poyares (Brazil)
4:02PM - 4:12PM	**Sleep research opportunities in Germany** Thomas Penzel (Germany)
4:12PM - 4:22PM	**Current trainee experience** Liyue Xu (China)
4:22PM - 4:30PM	**Conclusion**

Surgery Symposium, 109

3:00PM - 4:30PM **S41**

S41: Patient selection for adenotonsillectomy: What can the RCTs teach us and what's the way forward?

Summary
Hypertrophy of the adenoids and tonsils is a treatable cause of obstructive sleep apnoea (OSA) in the majority of children with this condition. Surgical removal of the tonsils and adenoids (adenotonsillectomy, AT) is recommended as first line therapy for pediatric OSA in international guidelines. OSA is currently the main indication for tonsillectomy, a procedure performed in millions of children worldwide each year.

The decision to proceed with surgery is complex as AT carries a risk of major complications, particularly children with severe OSA (Nixon GM Pediatrics 2004; Theilhaber M Int J Pediatr ORL 2014). Polysomonography (PSG) is the established diagnostic procedure for classifying OSA and thus for identifying severe OSA. AT normalises the polysomnogram (PSG) for many children with OSA and is beneficial for those with primary snoring or mild OSA on PSG (Borovich A Sleep Medicine 2016). But around 90% of children do not have PSG prior to AT. Recent literature suggests that symptoms are a better predictor of response to AT than PSG findings (Rosen CL Pediatrics 2015), many cases of mild OSA on PSG resolve with time alone (Marcus CL NEJM 2013) and medical therapies benefits many children with milder forms of OSA (Chan CC Sleep Medicine 2015). Pragmatic approaches to peri-operative decision making have been proposed from many corners of the world (Horwood L JAMA Otolaryngol Head Neck Surg. 2014; Arachchi S Int J Pediatr ORL 2016).

This symposium brings together world leaders in this area with recent publications on these topics. They will synergise the current literature from a medical and surgical perspective, and provide stimulating discussion on the way forward.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss the literature about patient selection for adenotonsillectomy, both when PSG is available and when it is not

•Formulate an evidence –based management plan for a child presenting with snoring and symptoms of OSA, individualised for that child

•Identify the challenges of translating research about patient selection into practice

Target Audience
Clinicians assessing children for treatment of obstructive sleep apnea; medical and scientific participants with an interest in pediatrics and those with an interest in behavioural or neurocognitive impacts of obstructive sleep apnea

Chairs:

Gillian Nixon (Australia)
Evelyn Constantin (Canada)

Scientific Programme

3:00PM - 3:05PM	**Introduction**
3:05PM - 3:20PM	**The impact of AT in pre-schoolers- results of the POSTA study** Karen Waters (Australia)
3:20PM - 3:35PM	**The key lessons from CHAT for predicting surgical outcome** Carol Rosen (United States)
3:35PM - 3:50PM	**Choosing candidates for AT- a surgeon's perspective** Robert Black (Australia)
3:50PM - 4:05PM	**What's the way forward? Controversies, dilemmas and future research agendas** Catherine Hill (United Kingdom)
4:05PM - 4:30PM	**Panel discussion/Q&A**

Scientific Programme

Symposium, 121-122

3:00PM - 4:30PM **S42**

S42: Treatment of insomnia in co-morbid obstructive sleep apnea and insomnia

Summary
Reviews have shown a high prevalence (40-60%) of insomnia in those diagnosed with obstructive sleep apnea (OSA). Those with co-morbid insomnia/OSA (COMISA) have higher morbidity than those suffering either disorder alone. Positive airway pressure (PAP) is the indicated treatment for OSA yet suffers poor acceptance and adherence. Evidence shows that co-morbid insomnia reduces acceptance and adherence to PAP therapy. Most sleep clinics around the world specialize in the diagnosis and treatment of OSA and may often overlook the presence of insomnia in their patients thereby under-treating this COMISA group.

Cognitive behavior therapy for insomnia (CBTi) has been shown to be an effective and durable treatment for insomnia without significant side effects and is recommended over drug treatment for insomnia. The series of speakers in this symposium will present the results of large (all N>121) randomized controlled trials investigating the adjunct use of CBTi in the treatment of insomnia in patients with COMISA. All trials measured outcomes of PAP adherence and sleep quality. One trial assessed the effectiveness of pre-treating the insomnia with therapist led CBTi before introduction of PAP therapy. The second trial compared treatment of the insomnia before with insomnia treatment concurrent with the beginning of PAP therapy to assess when it is best to use CBTi to treat the insomnia component of this co-morbid condition. The third trial treated the insomnia concurrent with CPAP therapy using an on-line CBTi program and additional CBTi if needed. The fourth trial used an integrated CBTi treatment with a PAP adherence program with ongoing PAP treatment in these co-morbid patients.

In these pivotal trials, several important outcome measures are compared between the insomnia treated and untreated groups including sleep quality from polysomnography, actigraphy, sleep diaries, and quality of life questionnaires. The symposium will present the latest findings in this important area of clinical research.

This symposium in World Sleep 2019 will raise the awareness of the sleep community to the high prevalence and negative impact of co-morbid OSA/insomnia and its past treatment inadequacies and challenges. The most obvious approach would be to treat the co-morbid insomnia with CBTi. This symposium will explore the success of CBTi both before the introduction of PAP, concurrent with PAP and combined with therapies directly addressing PAP adherence. The findings could lead to a change in the operation of sleep clinics around the world by introducing diagnostic processes for the detection of co-morbid insomnia and putting in place the best modes of treating it either before or concurrently with the introduction of PAP therapy.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the high prevalence and high morbidity of co-morbid insomnia/OSA

•Identify the effectiveness of cognitive/behavior therapy for the treatment of insomnia (CBTi) that is co-morbid with OSA

•Interpret the different sequencing and modes with which CBTi can be effectively used to improve PAP adherence and overall sleep quality

•Identify how this area of clinical research can raise the importance

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**The combination of CBTi and CPAP therapy in the treatment of co-morbid insomnia and sleep apnea** Alexander Sweetman (Australia)
3:22PM - 3:42PM	**Treating COMISA in a multidisciplinary sleep clinic: Does sequence of treatment matter?** Jason C. Ong (United States)
3:42PM - 4:02PM	**Online and in-person Cognitive Behavioral Therapy for insomnia co-occurring with sleep apnea** Jack Edinger (United States)
4:02PM - 4:22PM	**Using sleep coaches to provide integrated behavioral treatment for insomnia and PAP adherence in US veterans** Cathy Alessi (United States)
4:22PM - 4:30PM	**Conclusion**

Basic Science Symposium, 211

3:00PM - 4:30PM **S43**

S43: Genetic and epidemiological triggers of sleepiness: from natural variation to severe sleep disorders

Summary
This symposium will summarize the latest findings in sleepiness, the effect of sleepiness on diseases and the severe sleep disorders with core disease component of sleepiness (narcolepsy, excessive daytime sleepiness and Kleine-Levin Syndrome). In addition, we will present the triggering factors for natural and pathological sleepiness disorders and their recentle discovered underlying biological mechanisms as well as unpublished work. This symposium comprises five talks that specifically address the following topics. 1) What affects normal variation in sleepiness in population level 2) What are the genetic and environmental triggers behind hypersomnia disorders 3) How is sleepiness connected with disease predisposition. Finally, this symposium shows the known triggers and mechanisms in severe sleepiness, most notably in narcolepsy and Kleine-Levin Syndrome. Data presented comprises clinical cohorts, large scale population cohorts, electronic health records and functional biological assays where the exact disease mechanisms have been measured both in humans and in model organisms.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the spectrum of sleepiness from natural variation to severe sleep disorders

•Recall an overview of the environmental and genetic triggers

•Discuss the novel predisposing factors that lead to the development of these disorders

Target Audience
Clinical fellows interested in sleepiness, treating type1 or type 2-narcolepsy, hypersomnia or extreme daytime sleepiness. Basic scientists interested in the molecular mechanisms of sleep disorders and pathways controlling normal sleep regulation

Chairs:
Hanna M. Ollila (United States)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:18PM **Genetic association analyses for excessive daytime sleepiness**
Brian Cade (United States)

3:18PM - 3:34PM **USF1 ties metabolism to chronotype and sleepiness**
Nasa Sinnott-Armstrong (United States)

Scientific Programme

3:34PM - 3:50PM	**Kleine Levin Syndrome is strongly associated with variants at TRANK1 locus and genes involved in the regulation of rhythmic behaviours** Emmanuel Mignot (United States)
3:50PM - 4:06PM	**Electronic health records define novel genetic and environmental triggers for sleepiness and narcolepsy** Hanna M. Ollila (United States)
4:06PM - 4:22PM	**CD8 T-cell autoreactivity in type 1 narcolepsy** Birgitte Kornum (Denmark)
4:22PM - 4:30PM	**Conclusion**

Symposium, 212-214

3:00PM - 4:30PM **S44**

S44: Upper airway physiology and new treatment in patients with OSA

Summary
Obstructive sleep apnea (OSA) is a common condition, with numerous co-morbidities. The major pathophysiological changes in OSA are frequent arousals and intermittent hypoxia due to partial or completed upper airway including the pharyngeal collapse. The current main treatment of OSA is continuous positive airway pressure (CPAP) which could not be tolerated by many patients, although substantial efforts have been made to improve CPAP compliance. It is critical to understand pharyngeal function and mechanism of arousal and to develop alternative new treatments for OSA.

This symposium covers from bench science to clinical medicine and will focus on upper airway physiology including assessment of laryngeal function using endoscopic techniques, inspiratory muscle activity and its coordination with the upper airway muscles, in particular, genioglossus, will be discussed. The new insight into the mechanism of arousal and its contribution to phenotype of OSA would be introduced. After introduction of physiological change of upper airway a novel treatment with transvenous electrical stimulation of hypoglossal nerve will be introduced for OSA treatment.

Finally, the development of potential new drug targeting on upper airway dilator muscle for treatment of OSA would be introduced

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify upper airway physiology including assessment of laryngeal function, respiratory muscle function and coordination between pump muscle and geniogloussus muscle

•Recognize the arousal mechanism related to sleep apnea events and its roles on OSA phenotype

•Illustrate the new incoming treatments including transvenous electrical stimulation and drug treatment targeting on upper airway muscles

Target Audience
Physicians, scientists, physiologists and technicians

Chairs:

Yuanming Luo (China)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:18PM	**Endoscopic laryngeal assessment: What is it and can it help those prescribing PAP therapy** Michael Polkey (United Kingdom)
3:18PM - 3:34PM	**Coordination between respiratory pump and upper airway muscles in OSA** Yuanming Luo (China)
3:34PM - 3:50PM	**New insights into mechanisms of arousal and airway opening and implications for OSA phenotypes** Peter Catcheside (Australia)
3:50PM - 4:06PM	**Treatment of sleep apnea with transvenous electrical stimulation** Xilong Zhang (China)
4:06PM - 4:22PM	**New development of drug targeting on upper airway dilator muscles in OSA** Andrew Wellman (United States)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 216 - 215-216

3:00PM - 4:30PM O17: Behavior Cognition

Chairs:
Romola Bucks (Australia)
Kimberly Cote (Canada)

3:00PM - 3:15PM	**ABNORMAL VESTIBULAR EVOKED MYOGENIC POTENTIALS ARE CORRELATED WITH REM SLEEP WITHOUT ATONIA IN PATIENTS WITH ISOLATED REM SLEEP BEHAVIOR DISORDER** Raffaele Ferri (Italy)
3:15PM - 3:30PM	**TECHNOLOGY ASSISTED BEHAVIOR INTERVENTION TO EXTEND SLEEP AMONG ADULTS WITH SHORT SLEEP DURATION AND PREHYPERTENSION/STAGE 1 HYPERTENSION: A RANDOMIZED PILOT FEASIBILITY STUDY** Kelly Baron (United States)
3:30PM - 3:45PM	**CUTANEOUS ALPHA-SYNUCLEIN DEPOSITION IN IDIOPATHIC REM SLEEP BEHAVIORAL DISORDER** Mitchell Miglis (United States)
3:45PM - 4:00PM	**SUBJECTIVE AWARENESS OF DROWSINESS: TEMPORAL DYNAMICS OF SUBJECTIVE AND OBJECTIVENESS SLEEPINESS ACROSS SLEEP DEPRIVATION** Jessica Manousakis (Australia)
4:00PM - 4:15PM	**REM SLEEP BEHAVIOR DISORDER IN PARKINSON'S DISEASE: A MODEL FOR IDENTIFICATION AND PREDICTION OF ITS PROGRESSION FROM THE PRODROMAL STAGE** Matteo Cesari (Denmark)

4:15PM - 4:30PM

QUANTITATIVE ANALYSES OF REM SLEEP WITHOUT ATONIA IN PATIENTS WITH LGI1 AND CASPR2 AUTOIMMUNITY
Michelle F. Devine (United States)

Oral Abstract, 110

3:00PM - 4:30PM

O18: ESRS/WSS co-hosted young or new investigator award

Chairs:
Walter McNicolas (Ireland)
Charles Morin (Canada)

3:00PM - 3:15PM

EFFECT OF THE SELECTIVE MELATONIN MT1 RECEPTOR PARTIAL AGONIST UCM871 IN THE ACTIVITY OF NORAPHINEPRINE NEURONS OF THE LOCUS COERULEUS DURING THE SLEEP/WAKE CYCLE
Martha Lopez-Canul (Canada)

3:15PM - 3:30PM

PERIODIC LIMB MOVEMENT DURING SLEEP AND THE INCIDENCE OF CARDIOMETABOLIC OUTCOMES: THE HYPNOLAUS STUDY
Camila Hirotsu (Switzerland)

3:30PM - 3:45PM

MULTIMODAL MRI REVEALS ALTERATIONS OF SENSORIMOTOR CIRCUITS IN RESTLESS LEGS SYNDROME
Ambra Stefani (Austria)

3:45PM - 4:00PM

A ROLE FOR ASTROGLIAL CALCIUM ACTIVITY IN SLEEP AND SLEEP HOMEOSTASIS
Ashley Ingiosi (United States)

4:00PM - 4:15PM

MICROGLIA ELIMINATION CAUSED PROLONGED INCREASES IN SLEEP FOLLOWING BOTH PERIPHERAL AND CENTRAL INFLAMMATORY CHALLENGES IN THE MOUSE
Rachel Rowe (United States)

4:15PM - 4:30PM

EFFECTS OF SLEEP EXTENSION ON DAYTIME BLOOD PRESSURE IN SLEEP-DEPRIVED ADOLESCENTS
Chun Ting Au (Hong Kong)

Pediatric Symposium, 217-219

3:00PM - 4:30PM **S45**

S45: New perspectives in the management of pediatric narcolepsy

Summary
Narcolepsy is a chronic and disabling disorder affecting sleep and wakefulness, characterized by excessive daytime sleepiness (EDS), sudden sleep episodes and attacks of muscle atonia mostly triggered by emotions (cataplexy). Narcolepsy is a lifelong disorder, however not progressive, due to the loss of hypocretin neurons, and which occurrence during childhood is frequent. Among others, the occurrence of the disorder during childhood and adolescence should be taken into consideration. Narcolepsy in children and adolescents is still under-diagnosed and is often mistaken in its onset for other diseases or even neglected.

Young patients affected by the disorder often show dramatic and abrupt impairment in their social skills and academic performances due to excessive daytime sleepiness, fatigue and lack of energy. The goal of the symposium is to underlie the clinical characteristics of pediatric narcolepsy and to highlight the therapeutic outcome for the disorder.
All speakers are well known experts in the field of narcolepsy and pediatrics who will provide useful information from their clinical practice and/or specific research. For each topic, speakers will focus on clinical and therapeutic specificities in childhood and adolescent narcolepsy.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Demonstrate improved understanding of the diagnosis of narcolepsy and cataplexy in children
- Identify the role of clinical investigation in the management of narcoleptic children
- Describe the underlying mechanisms involved in pediatric narcolepsy
- Recall psychiatric comorbidities related to pediatric narcolepsy
- Describe current treatment and new perspectives in the management of narcoleptic children and adolescents

Target Audience
Physicians, pediatricians, sleep specialists involved with children and adolescents, child psychiatrists, psychologists, neuro-pediatricians, specialists in narcolepsy and hypersomnias

Chairs:

Michel Lecendreux (France)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:18PM		**Clinical features in the narcoleptic child: How clinical evaluation may orientate towards therapeutic decisions** Giuseppe Plazzi (Italy)
3:18PM - 3:34PM		**Pediatric narcolepsy, auto-immunity and potential therapeutic outcomes** Lucie Barateau (France)
3:34PM - 3:50PM		**Pediatric narcolepsy and psychiatric features and treatment issues** Paul Gringras (United Kingdom)
3:50PM - 4:06PM		**Management of the pediatric narcoleptic patient** Michel Lecendreux (France)
4:06PM - 4:22PM		**Directions for the future, what can we expect regarding narcolepsy and other disorders of EDS based on current research?** Yves Dauvilliers (France)
4:22PM - 4:30PM		**Conclusion**

Affiliated Meeting, 220 - 220-222

3:00PM - 4:00PM A10 A10: SRS-CSS Frontiers: Obstructive sleep apnea and the risk of cognitive decline in older adults

Summary
Sleep is important for the brain as well as the body. This symposium includes an exciting range of speakers that will present data linking sleep to brain function and physiology in both experimental and population-based studies. Our key speakers are renowned experts in the field of sleep and health (Dr. Phyllis Zee) and in the associations between sleep and cognitive function (Dr. Nadia Gosselin). Each featured presentation is followed by an oral symposium on a related theme with a broad range of speakers and topics.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the associations between sleep, circadian rhythms and metabolic health

•Restate which sleep characteristics are most strongly associated with cognitive function and decline

•Identify the public health implications of poor sleep on health and disease

Target Audience
Basic and clinical researchers and clinicians

3:00PM - 4:00PM

Obstructive sleep apnea and the risk of cognitive decline in older adults

Nadia Gosselin (Canada)

Technologist Program, 223-224

3:45PM - 5:00PM

T10: Residual EDS with CPAP; MSLT and/or MWT (workshop)

Chairs:

Michael Eden (United States)
Shalanda Mitchell (United States)

3:45PM - 5:00PM

Residual EDS with CPAP; MSLT and/or MWT

Michael Eden (United States)

Affiliated Meeting, 220 - 220-222

4:15PM - 6:00PM **A11**

A11: SRS-CSS Frontiers: Sleep: Impact on neurological function

Summary
Sleep is important for the brain as well as the body. This symposium includes an exciting range of speakers that will present data linking sleep to brain function and physiology in both experimental and population-based studies. Our key speakers are renowned experts in the field of sleep and health (Dr. Phyllis Zee) and in the associations between sleep and cognitive function (Dr. Nadia Gosselin). Each featured presentation is followed by an oral symposium on a related theme with a broad range of speakers and topics.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the associations between sleep, circadian rhythms and metabolic health

•Restate which sleep characteristics are most strongly associated with cognitive function and decline

•Identify the public health implications of poor sleep on health and disease

Target Audience
Basic and clinical researchers and clinicians

Chairs:

Kristen Knutson (United States)
John Peever (Canada)

Scientific Programme

4:15PM - 4:40PM	**Chronic sleep loss neural injury: play early, pay later** Sigrid Veasey (United States)
4:40PM - 5:05PM	**Links between global and local sleep disruption and Alzheimer's disease pathophysiology** Bryce Mander (United States)
5:05PM - 5:30PM	**REM sleep behavior disorder: animal models and the neuronal network involved** Pierre-Hervé Luppi (France)
5:30PM - 5:55PM	**Obstructive sleep apnea and Alzheimer Disease: Is amyloid the link between breathing and dementia?** Yo-El Ju (United States)

Symposium, BR A - Ballroom A

4:30PM - 6:00PM **S46**

S46: Central sleep apnea: PAP, ASV or Phrenic Nerve Stimulation?

Summary
In this session, we will be reviewing the epidemiology of obstructive and central sleep apnea (OSA, CSA) in heart failure patients. Since the results of the SERVE-HF trial have been published, the treatment of central sleep apnea has been confusing for many providers. The speakers will present evidence to support the choice of treatment for central sleep apnea, which includes PAP, ASV and phrenic nerve stimulation.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Distinguish with accuracy between central vs obstructive hypopneas on polysomnograms in patients with heart failure

•Recall evidence on the efficacy of CPAP on central sleep apnea

•List evidence on the efficacy and safety of ASV on central sleep apnea

•Determine how to treat patients with central sleep apnea

•Apply the best evidence when deciding on the treatment plan for your patient with central sleep apnea.

Target Audience
Cardiologists, physicians-in-training, general medicine physicians;, pulmonary physicians, registered nurses, respiratory therapists, sleep physicians, nurse practitioners

Chairs:
Neomi Shah (United States)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM **Epidemiology of sleep apnea in heart failure**
Neomi Shah (United States)

4:48PM - 5:04PM **CPAP for central sleep apnea**
Douglas Bradley (Canada)

5:04PM - 5:20PM **ASV for central sleep apnea**
Virend Somers (United States)

5:20PM - 5:36PM **Phrenic nerve stimuation for central sleep apnea**
David Rapoport (United States)

5:36PM - 5:52PM	**Summary & discussion** Virend Somers (United States) Neomi Shah (United States)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 116 - 116-117

4:30PM - 6:00PM

O19: Excessive daytime sleepiness and hypersomnia

Chairs:
Michael Thorpy (United States)
Yves Dauvilliers (France)

4:30PM - 4:45PM	**TAU-PET SIGNAL ELEVATION IN SELECTIVE BASAL FOREBRAIN NUCLEI IS ASSOCIATED WITH EXCESSIVE DAYTIME SLEEPINESS IN COGNITIVELY UNIMPAIRED MIDDLE AGED AND OLDER ADULTS** Diego Carvalho (United States)
4:45PM - 5:00PM	**MEASUREMENT OF SYMPTOMS IN IDIOPATHIC HYPERSOMNIA: THE IDIOPATHIC HYPERSOMNIA SEVERITY SCALE** Isabelle Jaussent (France)
5:00PM - 5:15PM	**SLEEP STABILIZATION PATTERNS DEFINE PEDIATRIC CNS HYPERSOMNIA CONDITIONS** Kiran Maski (United States)
5:15PM - 5:30PM	**ADDITIVE EFFECT OF VISUAL FIELD DEFECT AND DAYTIME SLEEPINESS ON MOTOR VEHICLE CRASHES AMONG JAPANESE TAXI DRIVERS** Kiyohide Tomooka (Japan)
5:30PM - 5:45PM	**DIFFERENTIATING SLEEPY AND NON-SLEEPY OBSTRUCTIVE SLEEP APNEA PATIENTS USING NOCTURNAL PULSE OXIMETRY AND DEEP LEARNING** Samu Kainulainen (Finland)
5:45PM - 6:00PM	**NOCTURNAL SLEEP FRAGMENTATION AND CSF OREXIN LEVELS IN HUMANS: SLEEP AND WAKE BOUTS** Lucie Barateau (France)

Panel Discussion, 118 - 118-120

4:30PM - 6:00PM **D06**

D06: And you thought CPAP adherence was hard: Weight management for patients with obstructive sleep apnea

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
Obesity is the greatest risk factor for obstructive sleep apnea (OSA). Although weight loss is an important patient-centered outcome, treatment of OSA with continuous positive airway pressure (CPAP) typically results in weight GAIN rather than weight loss. In addition to CPAP, optimal management of overweight and obese patients with OSA should include attention to weight management, yet few Sleep Medicine providers have training in or experience in weight management.

The American Thoracic Society recently published a Clinical Practice Guideline on the impact of weight loss interventions in patients with OSA*. Various methods of weight loss including diet, exercise, pharmacological and surgical were considered. A number of patient-centered outcomes were reviewed. Using a panel of international experts, the purpose of this Discussion Panel will be to disseminate the findings of the clinical practice guideline and:

1) review the evidence of the impact of weight-loss interventions on OSA severity, quality of life, and associated comorbidities.
2) provide specific recommendations for weight management in adult patients with OSA who are overweight or obese.

*The Role of Weight Management in the Treatment of Adult Obstructive Sleep Apnea. An Official American Thoracic Society Clinical Practice Guideline. Hudgel DW, Patel SR, Ahasic AM, Bartlett SJ, Bessesen DH, Coaker MA, Fiander PM, Grunstein RR, Gurubhagavatula I, Kapur VK, Lettieri CJ, Naughton MT, Owens RL, Pepin JD, Tuomilehto H, Wilson KC; American Thoracic Society Assembly on Sleep and Respiratory Neurobiology. Am J Respir Crit Care Med. 2018 Sep 15;198(6):e70-e87. PMID: 30215551

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recognize the impact of weight loss on OSA severity and other patient-centered outcomes in people with OSA.

•Compare and contrast different methods (diet, exercise, surgery, medications) for promoting weight loss in overweight and obese patients with OSA.

•Construct a weight management program for their overweight and obese patients with OSA.

Target Audience
Sleep Clinicians, researchers interested in weight loss in OSA

Chairs:
Robert L. Owens (United States)

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:48PM	**Beyond the AHI: What else gets better with weight loss?** Indira Gurubhagavatula (United States)
4:48PM - 5:04PM	**Impact of diet/exercise/behavior modification on weight in OSA** Susan Bartlett (Canada)
5:04PM - 5:20PM	**A chance to cut is a chance to heal: Impact of surgery on weight in OSA** Sanjay R. Patel (United States)
5:20PM - 5:36PM	**Red pill vs blue pill?: Impact of pharmacotherapy on weight in OSA** Daniel Bessesen (United States)
5:36PM - 5:52PM	**Delivering weight loss in a sleep clinic** Ron Grunstein (Australia)
5:52PM - 6:00PM	**Conclusion**

Surgery Symposium, 109

4:30PM - 6:00PM **S47**

S47: From past, present, to precision: Contemporary sleep surgery

Summary
Sleep surgery has evolved significantly since its inception about 3 decades ago. New diagnostic modalities have equipped surgeons with more tools to better phenotype patients. Generally, there has been a trend towards less ablative or reconstructive operations. Procedures that restore proper airway function during sleep have gained ground. This symposium focuses on precision sleep surgery in three main areas: 1) patient selection, 2) procedure selection, and 3) outcome evaluation. While all speakers are full scope sleep surgeons, each will focus on an area where they are indisputably expert based on a track record of pioneering research and recognized teaching. Dr. Nico de Vries described the most widely used VOTE classification for drug induced sedation endoscopy. Dr. Clemens Heiser has performed the most number of upper airway stimulation cases in the world. Dr. Peter Baptista has conducted multiple large-scale outcome studies including soft palate and robotic tongue base surgery. The updated sleep surgery protocol will be discussed by Dr. Stanley Liu with a particular focus on skeletal surgery. Combined, this group of faculty speakers have over 800 publications and textbooks on sleep surgery.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Understand the indications and utility of drug induced sedation endoscopy

•Recognize advances in soft palate surgery and its place in a contemporary sleep surgery algorithm

•Be aware of the diversity of procedures indicated for different elements of tongue base collapse in obstructive sleep apnea

•Be able to counsel patients on the indications, techniques, and outcome of upper airway stimulation (Inspire)

•Recognize the role of skeletal surgery (MMA, GGA, DOME), and their latest indications, patient selection, and outcome

Target Audience
Sleep physicians, otolaryngologists, oral surgeons, dentists, sleep technologists, nurse practitioners

Chairs:

Stanley Yung-Chuan Liu (United States)
Clemens Heiser (Germany)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM	**Drug induced sleep endoscopy: Does it direct treatment? How else can we use it?** Nico de Vries (The Netherlands)
4:48PM - 5:04PM	**Palate surgery** Olivier Vanderveken (Belgium)
5:04PM - 5:20PM	**Tongue surgery** Peter Baptista (Spain)
5:20PM - 5:36PM	**Upper airway stimulation** Clemens Heiser (Germany)
5:36PM - 5:52PM	**Skeletal surgery** Stanley Yung-Chuan Liu (United States)
5:52PM - 6:00PM	**Conclusion**

Symposium, 121-122

4:30PM - 6:00PM **S48**

S48: Insomnia and performance: From school age to workplace

Summary
While about 25% of school-age children will experience behavioral insomnia at one point or another, according to different studies between 4 and 13% of adolescents will also experience sleep difficulties (especially falling asleep). In college and university students, the prevalence of poor sleep quality can reach up to 60% and about 8% of students report insomnia. Once education is completed and individuals find themselves in the workplace, adults complaining of severe and chronic insomnia or diagnosed with an insomnia disorder compose about 12% of the population.

While insomnia has been linked to many negative consequences in adults, it is only in the last decade or so that grades at school or productivity on the job have become an important aspect of performance linked to insomnia. Although we know that insomnia per se cost billions of dollars each year in direct and indirect costs in adults, we do not know much about school performance and insomnia. Little research or clinical efforts have been devoted so far to understanding the emotional or psychological impact of insomnia on grades at school and in productivity in adults. Moreover, we do not know much about how behavioral interventions or CBT-I can help students and adults at increasing their performance or productivity.

This symposium is aimed at assessing school performance in students from different age groups to productivity in adults as one receives hygiene tips or full CBT-I to counteract negative effects of insomnia. It is our aim to present data to better understand the impact of daily factors linked to insomnia on performance and productivity across the lifespan. This symposium will comprise:
1) daytime consequences of sleep restriction in school-age children (Corkum); 2) the impact of insomnia on academic performance in adolescents (Gruber), 3) the impact of insomnia on performance through anxiety and depressive symptoms in college and university students (Bastien); and 4) the use of CBT-I in adults to increase productivity in the workplace (Espie).

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify how insomnia effects performance in school

•Recognize how insomnia expresses itself differently in different age groups

•Distinguish between different treatment options for insomnia in different age groups

•Restate the importance of treating insomnia to counteract productivity/performance deficits for further progress in the field

Target Audience
Students, clinicians, psychologists, psychiatrists, physicians

Chairs:

Célyne H. Bastien (Canada)

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**Sleepy children: The impact of sleep restriction on daytime functioning** Penny Corkum (Canada)
4:52PM - 5:12PM	**The associations between sleep and academic performance in adolescents with insomnia** Reut Gruber (Canada)
5:12PM - 5:32PM	**Depressive and anxiety symptoms in college students: Insomnia and performance** Célyne H. Bastien (Canada)
5:32PM - 5:52PM	**The impact of CBT for insomnia on workplace productivity; meta analysis of RCT data on a digital intervention** Colin Espie (United Kingdom)
5:52PM - 6:00PM	**Conclusion**

Symposium, 211

4:30PM - 6:00PM **S49**

S49: Advances in the analysis of clinical polysomnography data

Summary
While remarkable advances have been made in our understanding of the role of sleep in health and disease, there remain considerable knowledge gaps regarding the bases for individual differences in sleep and sleep-related susceptibility to cardiometabolic and cognitive disorders. Addressing these knowledge gaps requires the use and development of hitherto unexplored measurements that can be extracted from polysomnography (PSG) as well as analysis of large data sets of well annotated sleep data linked to a variety of risk factors, outcome, and genetic information.

The first two presentations will focus on technologies that extract new information from polysomnograms. The first speaker will address heart rate variability (HRV) which is emerging as an important metric in understanding the patho-physiology of sleep disorders. Heart rate is modulated by sympathetic and parasympathetic activities during sleep. These activities regulate mean heart rate, heart rate variability, and the beat-to-beat coupling during sleep. By exploiting these modulations with methods in the time domain (mean values), in the frequency domain (very low, low and high frequency), and using non-linear analysis (detrended fluctuation analysis), it is possible to distinguish sleep stages and disorders such as sleep apnea and periodic limb movements syndrome.

The clinically useful information that is currently derived from manual scoring of PSGs is extremely limited, particularly given the complexity and expense of these long studies and the potential for rich, clinically-important information, to exist in the electroencephalogram (EEG). Research studies have already shown the potential importance of some EEG features, for example sleep spindles, in understanding clinical disorders. These, and many others, are potential hidden treasures in the EEG. The second speaker will describe a number of metrics (biomarkers) that have been recently proposed and made available in clinical PSGs. Early results of their use will be presented.

The last two presentations will deal with analyzing large datasets using new exposures to better understand disease pathophysiology. The third speaker will address the application of new PSG analytical approaches to large datasets to transform the way obstructive sleep apnea (OSA) is managed within an individual patient. He will present evidence that the acquisition, storage and analyses of large scale clinical PSG data might improve characterization of OSA patients. He will also provide data on unsupervised approaches evaluating both conventional and novel PSG metrics to understand heterogeneity in OSA, as well as to better define groups with relevant consequences of OSA such as cardiovascular outcomes.

The last presentation will summarize approaches and platforms for aggregating and analyzing large sleep datasets from well characterized cohorts, describing tools for harmonization, exploration and analysis to address emerging scientific questions. As well, the presentation will include early insights gained from using new variables (exposures) in large cohorts to determine the physiological bases for development of hypertension in obstructive sleep apnea.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recall new approaches that aim to extract more clinically useful information from the PSG than is currently possible.

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**Heart rate variability during polysomnography: Methods of assessment and clinical relevance** Thomas Penzel (Germany)
4:52PM - 5:12PM	**EEG analysis: More than just sleep architecture (new EEG biomarkers)** Magdy Younes (Canada)
5:12PM - 5:32PM	**Utilizing PSG signals to characterize obstructive sleep apnea subtypes and severity** Diego Mazzotti (United States)
5:32PM - 5:52PM	**Leveraging existing polysomnographic datasets for discovery and replication** Susan Redline (United States)
5:52PM - 6:00PM	**Conclusion**

Symposium, 212-214

4:30PM - 6:00PM **S50** **S50: Sleep, stroke and vascular dementia**

Summary
This session will provide a comprehensive update on the current state of knowledge of the relationships between sleep disorders and cerebrovascular disease. International experts will provide literature review and clinical algorithms regarding diagnosis and treatment of sleep disorders in the acute and chronic stroke setting. Emerging data will be discussed linking sleep-disordered breathing to the radiographic signature of Binswanger vascular dementia.

The combined conditions of cerebrovascular disease and sleep disorders are extremely common; yet often underdiagnosed and suboptimally treated. Sleep apnea is an independent and modifiable risk factor for stroke and is associated with increased morbidity and mortality in stroke patients. Current data suggests treating this disease may lead to functional and neurologic improvements as well as reduced long-term cardiovascular and cerebrovascular risk. Despite compelling evidence, sleep apnea treatment is still not part of the standard of care in managing ischemic stroke or in recurrent stroke prevention.

This symposium will review critical evidence underscoring the importance of testing and treating sleep disorders in the prevention of cerebrovascular disease and in the post-stroke setting. Faculty in the areas of Sleep Medicine and Cerebrovascular Disease will provide evidence and expert consensus-based strategies in managing sleep-disordered breathing in stroke patients. The evolution of sleep apnea following acute ischemic stroke will be discussed, along with guidance on when to perform definitive testing in this patient population. Guidance on alternative therapies for stroke patients who cannot tolerate PAP will be provided. Data on the links between sleep-disordered breathing and the radiographic signature of Binswanger dementia will also be discussed. Finally, emerging data regarding the bi-directional relationships between restless legs syndrome/periodic limb movements of sleep and cerebrovascular disease will be discussed.

At the conclusion of this symposium, attendees will understand how to incorporate the diagnosis and management of sleep disorders into the care of patients with cerebrovascular disease. Seminal studies, as well as necessary areas for future research, will be highlighted.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate understanding of how sleep apnea serves as a risk factor for stroke and evolves following acute ischemic stroke. Utilize current evidence to guide the appropriate timing for definitive testing and instituting sleep apnea treatments

•Recognize benefits associated with treating sleep apnea in the acute and chronic stroke setting based on current literature

•Discuss the specific challenges of PAP therapy in the stroke population and when to use alternative therapies

•Recall data regarding how untreated sleep apnea exerts its influence as a cerebrovascular risk factor and eventually contributes to the radiographic signature of Binswanger dementia

syndrome/periodic limb movements of sleep and cerebrovascular disease

Target Audience

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**The evolution of sleep disordered breathing after stroke** Devin L. Brown (United States)
4:52PM - 5:12PM	**Treating sleep apnea in the stroke patient: Alternative therapies when PAP isn't an option** Timothy I. Morgenthaler (United States)
5:12PM - 5:32PM	**Sleep apnea and Vascular Dementia of the Binswanger Type: A brewing storm** Antonio Culebras (United States)
5:32PM - 5:52PM	**Relationships between RLS/PLMS and Cerebrovascular Disease** Mark Boulos (Canada)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 216 - 215-216

4:30PM - 6:00PM O20: Mechanisms and sleep loss

Chairs:
Derk-Jan Dijk (United Kingdom)
Igor Timofeev (Canada)

4:30PM - 4:45PM	**SLOW WAVE SLEEP IS AN ALTERED, NOT A REDUCED, STATE OF CONSCIOUSNESS: RESTING STATE NETWORK FUNCTIONAL CONNECTIVITY IN SLEEP** Stuart Fogel (Canada)
4:45PM - 5:00PM	**A NUCLEUS IN THE MIDBRAIN FOR SLEEP-PROMOTION AND REGULATION OF SLEEP HOMEOSTASIS** Su-Rong Yang (China)
5:00PM - 5:15PM	**TASK-DEPENDENT EFFECTS OF THE WAKE MAINTENANCE ZONE ON COGNITION AND ALERTNESS, WITH AND WITHOUT SLEEP LOSS** William McMahon (Australia)
5:15PM - 5:30PM	**CROSS-PARTICIPANT PREDICTION OF VIGILANCE STAGES THROUGH THE COMBINED USE OF WPLI AND WSMI EEG FUNCTIONAL CONNECTIVITY METRICS** Laura Sophie Imperatori (Italy)
5:30PM - 5:45PM	**SLEEP SPINDLE QUALITY REFLECTS SPATIO-TEMPORAL DYNAMICS OF OSCILLATORY ACTIVITY WITHIN CORTICAL NETWORKS** Cristina Blanco-Duque (United Kingdom)
5:45PM - 6:00PM	**UNDER SLEPT AND OVERANXIOUS: THE NEURAL CORRELATES OF SLEEP-LOSS INDUCED ANXIETY IN THE HUMAN BRAIN** Eti Ben Simon (United States)

Oral Abstract, 110

4:30PM - 6:00PM

O21: SBD Measurement

Chairs:
Erna Sif Arnardottir (Iceland)
Kerri Melehan (Australia)

4:30PM - 4:45PM

SLEEP APNEA DIAGNOSIS BASED ON RESPIRATORY RELATED MOVEMENTS
Maziar Hafezi (Canada)

4:45PM - 5:00PM

A POPULATION-BASED STUDY OF PRIMARY CENTRAL SLEEP APNEA
Ioanna Kouri (United States)

5:00PM - 5:15PM

DRUG INDUCED SLEEP ENDOSCOPY: IS THERE A DIFFERENCE IN THE DEGREE OF COLLAPSIBILITY AT DIFFERENT SEDATION LEVELS?
Yao Guang Leow (Singapore)

5:15PM - 5:30PM

BREATHING SOUND AND ANTHROPOMETRIC FEATURES IN COMBINATION ARE PREDICTIVE OF THE POLYSOMNOGRAPHY PARAMETERS
Ahmed Elwali (Canada)

5:30PM - 5:45PM

NEURAL NETWORK ANALYSIS OF NOCTURNAL SPO2 SIGNAL ENABLES EASY SCREENING OF SLEEP APNEA IN ACUTE STROKE AND TRANSIENT ISCHEMIC ATTACK PATIENTS
Akseli Leino (Finland)

5:45PM - 6:00PM

RANDOM FOREST ANALYSIS OF TRACHEAL BREATHING SOUNDS FOR PREDICTING OBSTRUCTIVE SLEEP APNEA
Farahnaz Hajipour (Canada)

Symposium, 217-219

4:30PM - 6:50PM **S51** **S51: Sleep in space**

Summary
Humans have been fascinated with space exploration for thousands of years. With rapid scientific development and inquiry into interplanetary travel in the 20th century fuelled by various political motives, the “Space Race” culminated with Yuri Gagarin as the first human to enter the outer space in 1961. Since then, with over five decades worth of space exploration, much research has uncovered the effects of microgravity and spaceflight on human physiology.

Along with changes to cardiovascular and bone physiology, multiple neurocognitive and neuroanatomical changes are thought to occur under zero-gravity conditions. The associated sensory deprivation and extreme conditions have been shown to significantly affect sleep and circadian rhythms with potentially devastating implications, although the exact mechanisms are as of yet unclear. In this symposium, an internationally renowned set of experts will attempt to tackle some of the big knowns and unknown of this field, and the audience will be able to see some of our unpublished data that points to some new potential mechanisms behind the effects of spaceflight on sleep and its rhythms.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate an understanding of the impact of extreme environments and/or spaceflights on sleep macro-architecture, sleep and circadian rhythms, human neuroanatomy and neurophysiology

•Recall the diversity of currently used Earth models of microgravity and their differential pros and cons in assessing the sleep physiology

•Restate the newest and most state-of-the-art Artificial Intelligence (AI) techniques for assessing astronauts’ mental & physical well-being through remote sensing and on-board equipment

Target Audience
Sleep Physicians, sleep neuroscientists, neurologists, psychiatrists, psychologists, physiologists, space medicine physicists, astronauts and extraterrestrial living enthusiasts

Chairs:

Ivana Rosenzweig (United Kingdom)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:48PM **Causes and consequences of sleep deficiency during spaceflight**

Erin Flynn-Evans (United States)

4:48PM - 5:04PM **Sleep in space**

Chrysoula Kourtidou Papadeli (Greece)

5:04PM - 5:20PM	**The effect of circadian phase on sleep outcomes and medication use during spaceflight** Erin Flynn-Evans (United States)
5:20PM - 5:36PM	**Extended simulated microgravity disrupts sleep and the temporal organization of the human blood transcriptome** Simon Archer (United Kingdom)
5:36PM - 5:52PM	**Functional neuroimaging and physiological network advances in sleep neuroscience for extreme environments and its terrestrial applications** Christos Frantzidis (Greece)
5:52PM - 6:08PM	**The effect of gravity on REM sleep** Alain Gonfalone (France)
6:08PM - 6:24PM	**Changes in sleep rhythms and architecture under conditions of microgravity** Ivana Rosenzweig (United Kingdom)
6:24PM - 6:30PM	**Conclusion**

Poster Abstract, Exhibition - Ballroom BCD

Poster session 3

THE ASSOCIATION BETWEEN SLOW-WAVE ACTIVITY (SWA) AND PROCESSING SPEED IN TODDLERS
Anne Waddle (United States)

CHANGES IN INITIAL, MIDDLE AND LATE INSOMNIA SUBTYPES DURING CBT-I AND CPAP THERAPY IN CO-MORBID INSOMNIA AND SLEEP APNEA (COMISA)
Alexander Sweetman (Australia)

BRAIN ACTIVATION TIME-LOCKED TO SLEEP SPINDLES ASSOCIATED WITH HUMAN COGNITIVE ABILITIES
Zhuo Fang (Canada)

A ROLE FOR ASTROGLIAL CALCIUM ACTIVITY IN SLEEP AND SLEEP HOMEOSTASIS
Ashley Ingiosi (United States)

EFFECT OF THE SELECTIVE MELATONIN MT1 RECEPTOR PARTIAL AGONIST UCM871 IN THE ACTIVITY OF NORAPHINEPRINE NEURONS OF THE LOCUS COERULEUS DURING THE SLEEP/WAKE CYCLE
Martha Lopez-Canul (Canada)

TRANSCRIPTIONAL BASIS FOR RHYTHMIC CONTROL OF HUNGER AND METABOLISM WITHIN THE AGRP NEURON
Jonathan Cedernaes (Sweden)

HACKING THE HUMAN CIRCADIAN SYSTEM WITH MICROFLASHES OF LIGHT
Daniel Joyce (United States)

ADVERSE EVENTS OF PLACEBO FOR PARTICIPANTS IN PHARMACOLOGICAL RCTS FOR INSOMNIA - A SYSTEMATIC REVIEW AND META-ANALYSIS
Christoph Patrick Werner (Australia)

NEURAL CIRCUITS OF CATAPLEXY
Emi Hasegawa (Japan)

EFFECTS OF SLEEP EXTENSION ON DAYTIME BLOOD PRESSURE IN SLEEP-DEPRIVED ADOLESCENTS
Chun Ting Au (Hong Kong)

DEVELOPMENTAL TRAJECTORY OF SLEEP DISTURBANCES IN A SHANK3 MOUSE MODEL OF AUTISM
Hannah Schoch (United States)

TRENDS IN SLEEP-WAKE PATTERNS OF PRIMARY SCHOOL-AGE CHILDREN: A COMPARISON BETWEEN 1996 AND 2016
Ana Allen Gomes (Portugal)

LINKING SLEEP QUALITY TO BRAIN CONNECTIVITY: A MULTIMODAL MRI APPROACH IN NORMATIVE AGEING
Liliana Amorim (Portugal)

EFFECTS OF TWO PHYSICAL ACTIVITY PROGRAMS ON SLEEP QUALITY IN MCI INDIVIDUALS: A PILOT STUDY
Florence Belzile (Canada)

VALIDATION OF THE PERSIAN VERSION OF THE PITTSBURGH SLEEP QUALITY INDEX IN ELDERLY POPULATION
Azita Chehri (Islamic Republic of Iran)

NAPPING, CIRCADIAN TIMING, AND EVENING SETTLING DIFFICULTIES IN EARLY CHILDHOOD
Alexandra Coy (United States)

NOVEL WORD LEARNING AND LEXICAL INTEGRATION IN MILD COGNITIVE IMPAIRMENT: ROLE OF SPINDLES AND SLOW WAVE ACTIVITY IN OVERNIGHT CONSOLIDATION
Carla Haroutonian (Australia)

CAN SLEEP QUALITY PREDICT LOW BACK PAIN INTENSITY OVER TIME? A LONGITUDINAL STUDY WITH OLDER ADULTS
Priscila Kalil Morelhão (Brazil)

ASSOCIATION BETWEEN SLEEP DURATION, BED TIME AND OBESITY IN COMMUNITY-DWELLING HONG KONG CHINESE ELDERLY: A POPULATION-BASED STUDY
Priscilla Ming Yi Lee (Hong Kong)

SUBJECTIVE SLEEP QUALITY AND SLEEP ARCHITECTURE IN AGING
Dominique Lorrain (Canada)

DO NAPS IN YOUNG CHILDREN AFFECT NIGHT-TIME SLEEP OUTCOMES? IF SO, WHEN? AN APPLICATION OF MULTILEVEL MODELLING
Adam Newton (Canada)

ARE PARENTS OF INFANTS WITH SLEEP PROBLEMS AT RISK FOR DAYTIME DYSFUNCTION?
Meg Pillion (Australia)

EFFECTS OF RESISTANCE TRAINING ON N3 SLEEP AND MUSCULAR FUNCTION IN OLDER ADULTS WITH SARCOPENIA: A RANDOMIZED CONTROLLED TRIAL
Ronaldo Delmonte Piovezan (Brazil)

GLUTATHIONE ENZYMES ACTIVITY IN MENOPAUSAL WOMEN WITH INSOMNIA
Natalya Semenova (Russian Federation)

NON-PARAMETRIC ANALYSIS OF REST-ACTIVITY RHYTHMS AND RISK OF INCIDENT MILD COGNITIVE IMPAIRMENT AND DEMENTIA IN OLDER WOMEN
Katie L. Stone (United States)

COMPARISON OF DAYTIME SLEEPINESS AMONG EARLY ADOLESCENTS IN SIX ASIA PACIFIC REGIONS
Keiko Tanida (Japan)

EFFECTS OF MENOPAUSE ON SLEEP SYMPTOMS: CANADIAN LONGITUDINAL STUDY ON AGING
Sheida Zolfaghari (Canada)

SOCIAL JET LAG, SCREEN TIME, PHYSICAL ACTIVITY AND SLEEP QUALITY IN INDIAN YOUNG ADULTS
Kunal Aggarwal (India)

FREQUENCY AND PREDICTORS OF SLEEP DURATION MISPERCEPTIONS: RESULTS FROM THE ELSA-BRASIL STUDY
Aline N Aielo (Brazil)

INFLUENCE OF SIMULATED OBSTRUCTIVE SLEEP APNEA ON THORACIC FLUID VOLUME AND AIRWAYS RESISTANCE IN ASTHMATIC AND HEALTHY SUBJECTS
Xiaoshu Cao (Canada)

GENOMIC IMPRINTING IMPACTS ON SLEEP THROUGHOUT NEURONAL MODULATION OF LATERAL HYPOTHALAMUS IN MICE
Matteo Falappa (Italy)

FUNDAMENTAL SLEEP ARCHITECTURE IN MICE HOLDS THE POTENTIAL TO PREDICT HIGH-FEAR PHENOTYPE AFTER FEAR CONDITIONING
Thomas Fenzl (Germany)

ADENOSINE RECEPTORS IN THE MEDIAN PREOPTIC NUCLEUS OF THE HYPOTHALAMUS AND MEDIAL SEPTUM INCREASE THERMAL HYPERALGESIA
Viviane S. Hambrecht-Wiedbusch (United States)

THE RELATIONSHIP BETWEEN FASTING-INDUCED TORPOR, SLEEP AND WAKE IN LABORATORY MICE
Yige Huang (United Kingdom)

DOPAMINE D1 AND D2 RECEPTORS MEDIATE ANALGESIC AND HYPNOTIC EFFECTS OF L-TETRAHYDROPALMATINE IN A MOUSE NEUROPATHIC PAIN MODEL
Zhi-Li Huang (China)

AN AUTOMATED RANDOM FOREST ALGORITHM FOR SLEEP STAGING USING ADVANCED CARDIORESPIRATORY AND MOVEMENT FEATURES
Sunil Kumar (Switzerland)

HEARTBEAT-RELATED RESPONSES OF FRONTAL CORTICAL NEURONS IN THE SLEEP-WAKE CYCLE IN CATS
Victoria Lavrova (Russian Federation)

VISCERAL COMPLEX OF CENTRAL SLEEP APNEA IN CATS
Alexandra Limanskaya (Russian Federation)

EVENING ACTIVITIES AND SLEEP IN LATE ADOLESCENCE – ECOLOGICAL AMBULATORY ASSESSMENT APPROACH
Erika Maksniemi (Finland)

ANALYSIS OF NIGHTTIME SLEEP FRAGMENTATION OF ACTIGRAPHY REST/ACTIVITY PATTERNS IN HEALTHY, YOUNG SEDENTARY NAPPERS
Melodee Mograss, PhD (Canada)

HOMER AND DMGLURA INTERACTIONS PROMOTE SLEEP IN DROSOPHILA
Nirinjini Naidoo (United States)

SUVN-G3031, A HISTAMINE H3 RECEPTOR INVERSE AGONIST PRODUCES WAKE PROMOTING AND ANTI-CATAPLECTIC EFFECTS IN HYPOCRETIN-2-SAPORIN LESIONED RATS
Ramakrishna Nirogi (India)

A SHORT DEVICE-BASED QUESTIONNAIRE 'SLEEPHUBS CHECK-UP' TO ENGAGE THE GENERAL POPULATION IN UNDERSTANDING MORE ABOUT THEIR SLEEP
Charles Oulton (United Kingdom)

PHYSICAL EXERCISE MODIFIES THE MORPHOLOGY OF SLEEP δ-WAVES: AN ENVELOPE ANALYSIS
Insung Park (Japan)

ANTIBACTERIAL ACTIVITY OF INHIBITORS OF MONOAMINES RE-UPTAKE DEPENDS FROM THEIR ANTI-DEPRESSIVE EFFICACY
Nino Rogava (Georgia)

HOW MUCH SLEEP DOES AN ELITE ATHLETE NEED?
Charli Sargent (Australia)

REM SLEEP AND CATAPLEXY REGULATION IN HCRT AND SEROTONIN TRANSPORTER KNOCKOUT MICE
Ali Seifinejad (Switzerland)

RISK FACTORS FOR COMPLICATIONS OF ENDOSCOPIC SINUS SURGERY FOR CHRONIC RHINOSINUSITIS.
Azizbek Uzokov (Uzbekistan)

GEOGRAPHIC VARIATION IN SHORT SLEEP DURATION AND SLEEP QUALITY: A MULTILEVEL ANALYSIS USING THE 2015-2017 CANADIAN COMMUNITY HEALTH SURVEY
Piotr Wilk (Canada)

NEURAL ACTIVATION OF PUTATIVE SLEEP-WAKE AFFECTING AND RELAXING PROMOTING ODORS
Gaby Badre (Sweden)

THE INCIDENCE OF MALE POSTPARTUM DEPRESSION IS RELATED TO INCOME AND AGE IN A SAMPLE OF AMERICAN FATHERS
Natalie Barnett (United States)

THREE CONSECUTIVE NIGHTS OF RESTRICTED SLEEP: EFFECTS OF MORNING CAFFEINE CONSUMPTION ON MOOD, REACTION TIME AND SIMULATED DRIVING PERFORMANCE
Karly Bartrim (Australia)

INFLUENCE OF ETHNICITY AND SOCIAL STATUS ON STRESS AND SLEEP
Frida Corona (United States)

THE EFFECT OF SLEEP DEPRIVATION ON EMOTIONAL FACIAL VERSUS NONFACIAL STIMULI PROCESSING IN YOUNG ADULTS WITH ADHD
Iris Haimov (Israel)

COMPARATIVE EFFECTS OF SLEEP DEPRIVATION AND ALCOHOL ON DRIVING SIMULATOR PERFORMANCE
Joshua J. Gooley (Singapore)

COGNITIVE PHENOTYPES OF PATIENTS WITH TEMPORAL LOBE EPILEPSY: SLEEP MAY HAVE ITS OWN ROLE TO PLAY
Anupama Gupta (India)

PRESLEEP PHYSIOLOGICAL HYPERAROUSAL IS ASSOCIATED WITH HIGHER REM AND NREM SLEEP EEG FREQUENCIES
Risto Halonen (Finland)

COMMUNICATING SLEEP HEALTH WITH A VIGILANCE TOOLBOX: REVIEW OF BASEBALL TAG AS A VIGILANCE ASSESSMENT AND TEAM-BUILDING ACTIVITY
Monica Hsu (Canada)

EFFECTS OF ACUTE CAFFEINE CONSUMPTION FOLLOWING SLEEP LOSS ON COGNITIVE, PHYSICAL AND OCCUPATIONAL PERFORMANCE: A SYSTEMATIC REVIEW AND META-ANALYSIS
Christopher Irwin (Australia)

EPIDEMIOLOGICAL STUDY OF SLEEP DEPRIVATION, SLEEP HABITS AND SYMPTOMS OF SLEEP DISORDERS IN A SAMPLE OF HIGH SCHOOL STUDENTS FROM THE NATIONAL AUTONOMOUS UNIVERSITY OF MEXICO (UNAM)
Ulises Jiménez Correa (Mexico)

SUSTAINED ATTENTION PERFORMANCE DURING SLEEP DEPRIVATION AND FOLLOWING NAP: ASSOCIATED WITH TRAIT-LIKE VULNERABILITY
Yu Jin Jung (Republic of Korea)

LATE CHRONOTYPE AND DAYTIME SLEEPINESS ARE ASSOCIATED WITH CONSUMPTION OF COFFEE, ALCOHOL, AND SMOKING IN KOREAN HIGH SCHOOL STUDENTS
Daeyoung Kim (Republic of Korea)

DELINEATING THE ROLE OF OSA ON MILD COGNITIVE IMPAIRMENT PROFILES AND MEMORY RECALL PERFORMANCE IN OLDER ADULTS AT-RISK OF DEMENTIA
Aaron Lam (Australia)

24 HOURS OF SLEEP DEPRIVATION IMPAIRS ADAPTATION TO EMOTIONAL CONFLICTS: ERP AND BEHAVIORAL FINDINGS
Yeuk Ching Lam (Hong Kong)

THE INFLUENCE OF COGNITIVE EMOTION REGULATION STRATEGIES ON DEPRESSIVE SYMPTOMS IN BREAST CANCER PATIENTS
Joo Hee Lee (Republic of Korea)

COMMUNICATING SLEEP HEALTH WITH A VIGILANCE TOOLBOX: REVIEW OF THE CLINICAL TEST "TASK-SWITCHING PARADIGM" AS A POSSIBLE "VIGILANCE GAME"
Ruth Liu (Canada)

THE RELATIONSHIP OF NIGHTMARES, INSOMNIA, CATAPLEXY, MIRROR BEHAVIORS, AND PSYCHOLOGICAL DISTRESS TO SUICIDAL IDEATION IN UNDERGRADUATE STUDENTS
Russell Powell (Canada)

ONE NIGHT OF SLEEP CONTINUITY DISRUPTION ENGENDERS IMPAIRMENT IN OVERNIGHT MEMORY CONSOLIDATION AND VIGILANCE BUT NOT EMOTION PERCEPTION OR REGULATION: RESULTS FROM A RANDOMISED, LAB-BASED EXPERIMENTAL STUDY
Matthew J Reid (United Kingdom)

SLEEP DISTURBANCES AND STRESS AMONG THE FOREIGN MEDICAL STUDENTS OF EUROPEAN UNIVERSITY, GEORGIA
Irine Sakhelashvili (Georgia)

INDIVIDUAL DIFFERENCES BETWEEN POOR AND GOOD SLEEPERS ON THOUGHT CONTROL STRATEGIES, OBJECTIVE AND SUBJECTIVE SLEEP QUALITY
Enrico Sella (Italy)

THE IMPACTS OF SLEEP VARIABILITY ON SLEEPINESS, MOOD AND COGNITIVE FUNCTIONING IN YOUNG ADULTS: AN EXPERIMENTAL STUDY
Wanqi Sun (Hong Kong)

MODELLING MELANOPSIN-MEDIATED EFFECTS OF LIGHT ON CIRCADIAN PHASE AND SLEEPINESS
Tahereh Tekieh (Australia)

HOW OUR FAMILY DOCTORS MANAGE CHRONIC INSOMNIA? ANALYSING BIG DATA TO IMPROVE THEIR CLINICAL PRACTICE

STRATEGIES USED BY AIR PASSENGERS TO REDUCE JETLAG AND TRAVEL FATIGUE
Yu Sun Bin (Australia)

INTERNAL CONSISTENCY OF THE LIVERPOOL JETLAG QUESTIONNAIRE
Yu Sun Bin (Australia)

SLEEP COMPLAINTS RELATE TO THE ANXIETY, CARDIOVASCULAR HEALTH, OBESITY AND SUBJECTIVE WELL-BEING IN TRUCK DRIVERS
Natalia Bobko (Ukraine)

EFFECT OF CHRONOPEDAGOGY AND CLINICAL SYMPTOMS ON ACADEMIC PERFORMANCE IN A SAMPLE OF COLLEGE STUDENTS: AN EXPLORATORY STUDY
Roxanne Bolduc Landry (Canada)

EFFECTS OF LIGHT ON DAYTIME SLEEP AFTER 12H NIGHT SHIFT WORK
Su Jung Choi (Republic of Korea)

IMPLEMENTATION AND EVALUATION OF A NAP-AT-NIGHT INTERVENTION FOR FRONT-LINE HOSPITAL STAFF IN CRITICAL CARE
Helen Driver (Canada)

THE EFFECT OF WATER LOADING FOR ACUTE WEIGHT LOSS FOLLOWING FLUID RESTRICTION ON SLEEP QUALITY AND QUANTITY IN COMBAT SPORTS ATHLETES
Ian Dunican (Australia)

RESULTS OF A PHASE 1, 4-PERIOD CROSSOVER, PLACEBO-CONTROLLED, RANDOMIZED, SINGLE DOSE STUDY TO EVALUATE THE SAFETY, TOLERABILITY, PHARMACOKINETICS, AND PHARMACODYNAMICS OF TAK-925, A NOVEL OREXIN 2 RECEPTOR AGONIST, IN SLEEP-DEPRIVED HEALTHY ADULTS, UTILIZING MODAFINIL AS AN ACTIVE COMPARATOR
Rebecca Evans (United States)

TAILORED LIGHTING INTERVENTION TO IMPROVE SLEEP IN PATIENTS WITH DEMENTIA
Mariana Figueiro (United States)

POLYMORPHISM RS2278749 GENE ARNTL ASSOCIATED WITH SOME COMPONENTS OF AFFECTIVE AND SLEEP DISTURBANCES IN MALE POPULATION 25-44 YEARS IN RUSSIA/SIBERIA
Valery Gafarov (Russian Federation)

CAUSAL ANALYSIS OF "WEEKEND CATCH-UP SLEEP" USING 1-WEEK WRIST ACTIGRAPHY
Yuki Goto (Japan)

ASSOCIATION WITH SOCIAL JET LAG AND TIME PREFERENCE OF MIGRAINE ATTACK
Hee-Jin Im (Republic of Korea)

VALIDATION OF THE JAPANESE VERSION OF THE BIOLOGICAL RHYTHMS INTERVIEW OF ASSESSMENT IN NEUROPSYCHIATRY-SELF REPORT FOR DELAYED SLEEP-WAKE PHASE DISORDER
Yuta Kanda (Japan)

THE EFFECT OF EVENING SLEEP FOLLOWING NIGHT SHIFTS ON SLEEP AND ALERTNESS IN NURSES WITH ROTATING SHIFT WORK SCHEDULE: REAL WORLD DATA
Jee Hyun Kim (Republic of Korea)

EVALUATION OF A PORTABLE BLUE/GREEN LIGHT DEVICE FOR PHASE ADVANCING THE CIRCADIAN MELATONIN RHYTHM IN NORMAL SLEEPERS
Leon Lack (Australia)

IMPACTS OF SERUM VITAMIN D LEVELS ON SLEEP AND DAYTIME SLEEPINESS ACCORDING TO WORKING CONDITIONS
Hyuk Joo Lee (Republic of Korea)

SHIFT SCHEDULES, HEALTH STATUS AND QUALITY OF LIFE OF SLEEP TECHNICIANS
Seo-Young Lee (Republic of Korea)

ANALYSIS OF TOTAL REST TIME AND URINARY MELATONIN SECRETION IN SCHOOL CHILDREN
Nathalie Llaguno (Brazil)

CIRCADIAN TAU DIFFERENCES AND RHYTHM ASSOCIATIONS IN DELAYED SLEEP-WAKE PHASE DISORDER AND NON-24-HOUR SLEEP-WAKE RHYTHM DISORDER
Gorica Micic (Australia)

NIGHTTIME LIGHT EXPOSURE AND THE INCIDENCE OF DIABETES MELLITUS: A LONGITUDINAL STUDY OF THE HEIJO-KYO COHORT
Kenji Obayashi (Japan)

TASIMELTEON EFFECTIVE IN TREATING JET LAG DURING TRANSATLANTIC TRAVEL
Christos Polymeropoulos (United States)

THE TIMING OF DAYTIME SLEEP, AND THUS THE TIMING OF DAYTIME LIGHT EXPOSURE, AFFECTS THE SIZE AND DIRECTION OF THE PHASE SHIFT INDUCED BY A WEEK OF NIGHT SHIFTS
Greg Roach (Australia)

WHAT DETERMINES OUR LIGHT EXPOSURE PATTERNS AND HOW DO WE QUANTIFY THEM?
Anne Skeldon (United Kingdom)

THE DAWN OF SOCIAL JETLAG: SLEEP IN INDIGENOUS VILLAGES WITH AND WITHOUT ELECTRIC LIGHTING ON TANNA ISLAND, VANUATU
Andrea N. Smit (Canada)

SLEEP SPINDLES IN LATE CHRONOTYPES
Maria Paola Tramonti Fantozzi (Italy)

INDIRECT TREATMENT COMPARISON OF THE EFFICACY AND SAFETY OF SOLRIAMFETOL, MODAFINIL, AND ARMODAFINIL FOR THE TREATMENT OF EXCESSIVE DAYTIME SLEEPINESS IN OBSTRUCTIVE SLEEP APNOEA
Shay Bujanover (United States)

A QUESTION IS WORTH A THOUSAND WORDS: AN ATTEMPT TO ESTIMATE THE PREVALENCE OF EXCESSIVE SLEEPINESS IN CHILDREN
Alyssa Cairns (United States)

ASSOCIATION OF NEGATIVE AFFECT VERSUS COGNITIVE SYMPTOMS OF THE ZUNG SELF-RATED DEPRESSION SCALE WITH EXCESSIVE DAYTIME SLEEPINESS IN MALE ADULTS WITH OBSTRUCTIVE SLEEP APNEA ON CPAP TREATMENT: A SECONDARY ANALYSIS OF THE SLEEPY RICCADSA COHORT
Yeliz Celik (Turkey)

NAPPING AND ENHANCED WEEKEND SLEEP SCHEDULE AMONG PRESCHOOLERS WITH INSUFFICIENT WEEKDAY SLEEP
Yachuan Huang (Taiwan)

ARE REPORTS OF MENTAL FOG FROM PATIENTS WITH IDIOPATHIC HYPERSOMNIA MEDIATED BY OBJECTIVE MEASURES OF DAYTIME SLEEPINESS?
Thomas Roth (United States)

PREVALENCE AND MORBIDITY OF SLEEPINESS AMONG SLEEP APNEA PATIENTS IN AN ONLINE COHORT
Susan Redline (United States)

THE FACTORS DETERMINING THE QUALITATIVE FEATURES OF DAYTIME SLEEPINESS IN PARKINSON´S DISEASE
Kseniya Shevtsova (Russian Federation)

ADDITIVE EFFECT OF VISUAL FIELD DEFECT AND DAYTIME SLEEPINESS ON MOTOR VEHICLE CRASHES AMONG JAPANESE TAXI DRIVERS
Kiyohide Tomooka (Japan)

SLEEP COHORTS REVIEW OF EVIDENCE (SCORE): A SCOPING REVIEW AND GAPS ANALYSIS DESIGNED TO INFORM FUTURE RESEARCH
Eilis Boudreau (United States)

PROGNOSTIC ROLE OF DISE, POLYSOMNOGRAPHY AND CEPHALOMETRIC PARAMETERS IN IDENTIFICATION OF SURGICAL PREDICTORS ON MULTILEVEL SLEEP SURGERY OF OSA PATIENTS
Ji-Eun Choi (Republic of Korea)

VALIDITY OF TWO RETROSPECTIVE QUESTIONNAIRE VERSIONS OF THE CONSENSUS SLEEP DIARY: THE WHOLE WEEK AND SPLIT WEEK SELF-ASSESSMENT OF SLEEP SURVEYS
Jessica R Dietch (United States)

SLEEP LABORATORY ADVERSE EVENTS OVER A 5 YEAR PERIOD IN A QUATERNARY CARE CENTER
Ralph Downey III (United States)

CAREGIVING AND QUALITY OF SLEEP: DATA FROM THE JAPANESE CIVIL SERVANTS STUDY (JACS) IN JAPAN
Yuko Fujimura (Japan)

THE RELATIONSHIP BETWEEN NASAL RESPIRATORY FUNCTION AND THE MORPHOLOGY OF CRANIOFACIAL AND UPPER AIRWAY IN DIFFERENT MANDIBLE SAGITTAL PATTERN POPULATION
Xu Gong (China)

ASSOCIATIONS OF PSYCHOSOCIAL FACTORS, SHORT SLEEP, INSOMNIA, AND FRAGMENTATION AMONG AFRICAN-AMERICANS, THE JACKSON HEART SLEEP STUDY
Dayna A. Johnson (United States)

TRAUMATIC BRAIN INJURY AND 14-YEAR RISK OF INCIDENT SLEEP DISORDERS AMONG 364, 494 US MILITARY VETERANS
Yue Leng (United States)

LOWER MELATONIN CONCENTRATIONS AND SLEEP QUALITY IN PATIENTS WITH TYPE 2 DIABETES AND OBESITY
Normunds Limba (Latvia)

SLEEP QUALITY AND PAINFUL TEMPOROMANDIBULAR DYSFUNCTION: A CASE CONTROL STUDY
Miguel Meira e Cruz (Portugal)

WORK START TIMES AND SLEEP IN COMMUNITY-BASED ADULTS IN THE UNITED STATES
Lisa J. Meltzer (United States)

EFFECT OF ODOR PRESENTATION BEFORE AWAKENING FROM A SHORT SLEEP ON ALERTNESS
Shinya Okano (Japan)

SLEEP PATTERNS AND DISTRACTORS IN COLLEGE STUDENTS
Nagarajan Ramakrishnan (India)

OBESITY IS NOT AN INDEPENDENT RISK FACTORS OF OBSTRUCTIVE SLEEP APNEA IN ASIAN HYPERTENSIVE PATIENTS
Songkwan Silaruks (Thailand)

PRE-SLEEP COGNITIVE ACTIVITY IN ADULTS: A SYSTEMATIC REVIEW
Luc Beaudoin (Canada)

PSYCHOSOCIAL AND CULTURAL INFLUENCES ON SLEEP HEALTH IN URBAN AMERICAN INDIAN/ ALASKAN NATIVE ADOLESCENTS: PRELIMINARY RESULTS FROM THE NAYSHAW STUDY
Wendy Troxel (United States)

THE IMPACT OF MODERN LIFESTYLE ON SLEEP: THE END OF A MYTH?
Ablo Prudence Wachinou (Benin)

EFFECTS OF PREVENTING FLUID RETENTION IN THE LEGS ON OVERNIGHT AIRWAY NARROWING IN ASTHMA
Azadeh Yadollahi (Canada)

DO INSOMNIA PATIENTS IN INSOMNIA CLINICAL TRIALS ENDORSE DAYTIME SLEEPINESS?
Sonia Ancoli-Israel (United States)

ASSOCIATION OF SNORING CAUSED BY ADENOID HYPERPLASIA WITH BEHAVIOURAL DISTURBANCES IN SCHOOL CHILDREN
Bikram Choudhury (India)

EVALUATION OF A NOVEL TASK PARTICIPATION DIARY AS A METRIC FOR DAYTIME FUNCTIONING IN THE INSOMNIA POPULATION
Kelsey Bickley (Australia)

SLEEP DISTURBANCES IN YOUNG ADULTS WITH A HISTORY OF CHILDHOOD TRAUMATIC BRAIN INJURY: RELATIONSHIP WITH FATIGUE, DEPRESSION, AND QUALITY OF LIFE
Edith Botchway (Australia)

TRAUMA AS AN INSOMNIA PRECIPITATING EVENT AMONG WOMEN VETERANS
Gwendolyn Carlson (United States)

CAN WE PREVENT INSOMNIA?A BRIEF COGNITIVE BEHAVIORAL THERAPY IN AT-RISK ADOLESCENTS
Ngan Yin Chan (Hong Kong)

ACUPUNCTURE FOR TREATMENT OF INSOMNIA: A SYSTEMATIC REVIEWS
Qun Chen (China)

DO ADHD SYMPTOMS AND INSOMNIA INTERACT TO PREDICT IMPAIRED EXECUTIVE FUNCTIONING?
Anthony Cifre (United States)

COGNITIVE-BEHAVIOURAL INTERVENTIONS FOR INSOMNIA IN PRIMARY CARE: A SYSTEMATIC REVIEW
Judith R. Davidson (Canada)

USE OF BLINDED HYPNOTIC TAPERING FOR HYPNOTIC DISCONTINUATION
Jack Edinger (United States)

THE OFF-LABEL USE OF ANTIPSYCHOTICS FOR INSOMNIA DISORDER: A MAJOR PUBLIC HEALTH CONCERN
Maryam El Gewely (Canada)

CIRCADIAN PREFERENCE AS A MODERATOR OF THE EFFECTS OF DIGITAL CBT FOR CHRONIC INSOMNIA
Patrick Faaland (Norway)

INSOMNIA IMPACTS THE PATIENT AND THE HOUSEHOLD: PERCEPTIONS OF THE BURDEN OF INSOMNIA ON NEXT-DAY FUNCTIONING
Anna Ginovker (United States)

VALIDITY AND POTENTIAL CLINICAL UTILITY OF A CONSUMER AND RESEARCH-GRADE ACTIVITY TRACKER IN INSOMNIA DISORDER: OUTSIDE THE LABORATORY
Kellie Hamill (Australia)

EXAMINING THE EFFECTS OF DIGITAL CBT FOR INSOMNIA ON DEPRESSIVE SYMPTOMS IN INDIVIDUALS WITH INSOMNIA SCORING ABOVE CLINICAL CUT-OFF FOR DEPRESSION: A RETROSPECTIVE ANALYSIS OF 3,352 PARTICIPANTS FROM TWO LARGE-EFFECTIVENESS RCTS (OASIS & DIALS)
Alasdair Henry (United Kingdom)

THE INFLUENCE OF THE LENGTH OF AWAKENINGS ON SLEEP ONSET MISPERCEPTION
Lieke Hermans (The Netherlands)

ASSOCIATION BETWEEN WORK PRODUCTIVITY, SLEEP PROBLEMS, AND CHRONOTYPE: CROSS-SECTIONAL STUDY
Yoshiki Ishibashi (Japan)

A COMPARISON OF THE EFFECTS OF CBT-I BETWEEN PRIMARY INSOMNIA AND COMORBID INSOMNIA
Masayuki Iwashita (Japan)

COMPLEMENTARY AND ALTERNATIVE TREATMENTS FOR INSOMNIA/SLEEP DEPRESSION-ANXIETY SYMPTOM CLUSTER: META-ANALYSIS OF ENGLISH AND CHINESE LITERATURE
Xiaowen Ji (Canada)

INVESTIGATION OF DIFFERENCES IN FUNCTIONAL CONNECTIVITY ACROSS SELF-REPORTED SLEEP-WAKE STATES IN PATIENTS WITH INSOMNIA AND GOOD SLEEPER CONTROLS: STUDY INTRODUCTION AND METHODS
Jolynn Jones (United States)

WILL TREATMENT OF INSOMNIA ALSO REDUCE WORK RELATED IMPAIRMENT?
Kaia Kjørstad (Norway)

CORRELATION BETWEEN SMOKING AND INSOMNIA SEVERITY INDEX-INA SCORE IN ACUTE ISCHEMIC SMALL VESSEL STROKE PATIENTS
Nushrotul Lailiyya (Indonesia)

ADHERENCE TO THE QUARTER-HOUR RULE FOR INSOMNIA: IS TIME PERCEPTION AFFECTED BY SLEEP INERTIA?
Dave Laroche (Canada)

INSOMNIA AND BED PARTNER ACCOMMODATION: PRELIMINARY EXPLORATION
Jessica Lebel (Canada)

EFFECTIVENESS OF COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA COMORBID TO PARKINSON'S DISEASE: A FOCUS ON PSYCHOLOGICAL AND DAYTIME FUNCTIONING
Cindy Lebrun (France)

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SLEEP-DISORDERED BREATHING IN ADOLESCENTS WITH OBESITY: WHEN DOES IT START TO AFFECT CARDIOMETABOLIC HEALTH?
Johanna Roche (France)

A FOLLOW-UP STUDY ON THE RELATIONSHIP BETWEEN AGING AND WEIGHT CHANGE ON MITIGATING SLEEP DISORDERED BREATHING IN JAPANESE COMMUNITY MEMBERS: THE TOON HEALTH STUDY
Susumu Sakurai (Japan)

EVALUATING SLEEP APNEA PATIENTS USING A MOBILE APPLICATION DESIGNED TO IMPROVE ADHERENCE TO TREATMENT – THE ESAMOBAPP STUDY
Tânia Sales Marques (Portugal)

PREVALENCE AND RELATED RISK FACTORS OF OBSTRUCTIVE SLEEP APNEA IN POSTMENOPAUSAL WOMEN
Mojahede Salmani Nodoushan (Islamic Republic of Iran)

VALIDATION OF AN ELECTRONIC INSTRUMENT FOR THE TIMELY DETECTION OF SLEEP APNEA HYPOPNEA SYNDROME IN THE MEXICAN POPULATION
María Guadalupe Sánchez Prado (Mexico)

WHO WILL BUY A CONTINUOUS POSITIVE AIRWAY PRESSURE MACHINE IF DIAGNOSED AS OBSTRUCTIVE SLEEP APNEA? DO THE PATIENTS FOLLOW PHYSICIAN'S ADVICE?
Bundit Sawunyavisuth (Thailand)

THE SLEEP QUALITY IN ISCHEMIC STROKE PATIENTS: A CROSS-SECTIONAL STUDY
Ian Shih (Taiwan)

DISTINCTIVE FEATURES PREDICT WORSE NON-INVASIVE NOCTURNAL VENTILATION (NINV) ADAPTATION
Rosalia Silvestri (Italy)

SLOW FREQUENCY EEG ACTIVITY IN OBESITY HYPOVENTILATION SYNDROME
Sheila Sivam (Australia)

HYPOXEMIA AND BRAIN ATROPHY IN OLDER ADULTS WITH SLEEP APNEA
Rosa Sommer (Canada)

THE ASSOCIATION OF CPAP COMPLIANCE AND NOCTURNAL HYPOXEMIA IN THE PERIOPERATIVE PERIOD
Colin Suen (Canada)

ASSOCIATION OF SELF-RATED SLEEP APNEA WITH HYPERTENSION, DYSLIPIDEMIA AND DIABETES MELLITUS: SLEPT STUDY
Chihiro Suzuki (Japan)

IMPACT OF CONTINUOUS POSITIVE AIRWAY PRESSURE OR ORAL APPLIANCE ON PULSE WAVE VELOCITY AND CAROTID ARTERY ATHEROSCLEROSIS FOR THE PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME□A PROSPECTIVE OBSERVATIONAL STUDY FOR FIVE YEARS
Mayumi Suzuki (Japan)

CHOLINERGIC ACTIVITY IN PREGNANT WOMEN WITH OBSTRUCTIVE SLEEP APNEA
Riva Tauman (Israel)

NASAL MASK AVERAGE VOLUME-ASSURED PRESSURE SUPPORT VERSUS CONVENTIONAL BILEVEL RESPIRATORY SUPPORT IN A 10-MONTH-OLD INFANT WITH CONGENITAL CENTRAL HYPOVENTILATION SYNDROME: A CASE REPORT
Ganesh Thambipillay (Australia)

MULTIDISCIPLINARY CARE FOR OBSTRUCTIVE SLEEP APNEA IN THE AGE OF "PERSONALIZED" SLEEP MEDICINE
Annelise Thornton (United States)

CPAP USAGE IS INCREASED AFTER A PSYCHOEDUCATION PROGRAM AT 1 MONTH, BUT NOT AT 4 MONTHS
Julie Tolson (Australia)

SLEEP APNEA PATIENTS EXHIBIT INCREASED NOCTURNAL PLASMA LEVELS OF IL-6 AND TNF-α: EFFECTS OF CPAP, OXYGEN & ANTIOXIDANTS
Theodoros Vassilakopoulos (Greece)

SLOPE OF THE OXYGEN DESATURATION REFLECTS THE PHARYNGEAL COLLAPSIBILITY IN OSA
Daniel Vena (United States)

EFFECTS OF ENDOCANNABINOID RECEPTOR CB1 AND CHRONIC INTERMITTENT HYPOXIA ON THE EXPRESSION OF AUTOPHAGY RELATED PROTEINS LC3 II AND BECLIN-1 IN RAT NERVE CELLS
Bei Wang (China)

THE VALIDITY OF STOP-BANG QUESTIONNAIRE FOR OBSTRUCTIVE SLEEP APNEA IN DIFFERENT RACIAL GROUPS
Rida Waseem (Canada)

AGE-RELATED MORPHOLOGICAL CHANGES IN UPPER AIRWAY IN ADULT PATIENTS WITH OBSTRUCTIVE SLEEP APNEA
Wen Xu (China)

GLYCOLIPID METABOLISM INVOLVED IN THE STAGE SPECIAL ASSOCIATION WITH NOCTURNAL CARDIAC AUTONOMIC CONTROL IN OBSTRUCTIVE SLEEP APNEA
Shankai Yin (China)

A CPAP CLINIC MODEL TO IMPROVE TREATMENT ADHERENCE
Rochelle Zak (United States)

AROUSAL DURING SLEEP IS ASSOCIATED WITH HYPERTENSION IN OBSTRUCTIVE SLEEP APNEA
Ye Zhang (China)

SLEEP QUALITY IN HEMODIALYSIS PATIENTS
Zahra Banafsheh Alemohammad (Islamic Republic of Iran)

THE GENDER-SPECIFIC ROLE OF PROLONGED SLEEP DEFICITS ON ADOLESCENT HEALTH: TWO LONGITUDINAL STUDIES OF YOUTH DEPRESSION AND HEALTH IN WESTERN CANADA
Annalijn I. Conklin (Canada)

KEYS TO IMPROVE HEALTHCARE ASSISTANCE IN SLEEP MEDICINE: CLINICAL CASES WITH COMPARATIVE BETWEEN TRADITIONAL AND MODERN METHODOLOGY
Jesus Escriba Alepuz (Spain)

ASSOCIATION BETWEEN SLEEP DURATION AND THIRST: POPULATION-BASED STUDY
Inha Hwang (Republic of Korea)

SLEEP, TIREDNESS AND SCHOOL ADJUSTMENT AMONG 15-TO 20-YEAR-OLD FINNISH ADOLESCENTS
Laura Kortesoja (Finland)

ASSOCIATIONS BETWEEN OBJECTIVE AND SUBJECTIVE MEASURES OF SLEEP QUALITY AND HEMOGLOBIN A1C IN PROFESSIONAL ATHLETES
Rolf Maijer (United States)

EXPLORING RELATIONSHIPS AMONG SLEEP, EATING, AND PHYSICAL ACTIVITY BEHAVIOURS IN THE POST-SECONDARY POPULATION
Efrosini Papaconstantinou (Canada)

OVERVIEW ON THE USE OF META-ANALYSIS IN SLEEP MEDICINE
Gabriel Natan Pires (Brazil)

THE EFFECTS OF SLEEP DEPRIVATION AND CHRONOTYPE ON THE PERCEPTION OF EMOTIONAL FACIAL EXPRESSIONS – AN EXPERIMENTAL STUDY
Xiaobo Yang (Hong Kong)

SEVERE OBSTRUCTIVE SLEEP APNEA AND ORTHOGNATHIC SURGERY: A CASE OF SUCCESS
Alexandre Almendra (Portugal)

A PRELIMINARY STUDY OF IDENTIFYING THE SITE OF UPPER AIRWAY COLLAPSE IN OSA USING SNORING SIGNALS
Philip de Chazal (Australia)

RESPIRATORY INDUCTANCE PLETHYSMOGRAPHY FOR THE RELIABLE ASSESSMENT OF VENTILATION AND SLEEP APNEA PHENOTYPES IN THE PRESENCE OF ORAL BREATHING
Eysteinn Finnsson (Iceland)

DROWSINESS CHARACTERIZATION BASED ON THE COMBINED ANALYSIS OF EYE MOVEMENT AND HEART RATE VARIABILITY
Clementine Francois (Belgium)

CORRECTIVE PROCEDURES OF THE TONGUE BASE USING SHAVER AND PLASMA-PK TECHNIQUES IN THE TREATMENT OF SNORING AND SLEEP APNEA - OWN EXPERIENCE
Agata Gerwel (Poland)

EVALUATION OF SLEEP APNEA DETECTION FROM A SMARTWATCH IN A PILOT STUDY
Conor Heneghan (United States)

VIEWS OF PATIENTS WITH EPILEPSY ON WEARABLE SEIZURE PREDICTION SYSTEM; IMPACT OF TWO DIFFERENT TYPE OF DEVICES ON SLEEP QUALITY
Miho Miyajima (Japan)

SLEEP/WAKEFULNESS DETECTION USING THE TRACHEAL RESPIRATORY SOUND AND MOVEMENTS
Nasim Montazeri Ghahjaverestan (Canada)

SLEEP IMPROVING EFFECT OF A NOVEL MOTION MATTRESS
Takao Muto (Japan)

THE ASSOCIATION BETWEEN SLEEP-DISORDERED BREATHING AND SHORT-TERM FUNCTIONAL OUTCOMES IN ISCHEMIC STROKE PATIENTS: ASSESSED BY CARDIOPULMONARY COUPLING ANALYSIS USING HOLTER-MONITORING
Jin Oh Na (Republic of Korea)

IMPROVED AUTOMATIC CLASSIFICATION OF SLEEP STAGES IN INFANTS USING HIGH-DENSITY EEG RECORDINGS
Sarah F.* Schoch (Switzerland)

UNOBTRUSIVE SLOW WAVE ACTIVITY MONITORING BY PHASE COUPLING OF RESPIRATORY SINUS ARRHYTHMIA DURING SLEEP USING A PVDF SENSOR
Kyuichi Niizeki (Japan)

THE ACCURACY OF THE THIM DEVICE FOR ESTIMATING SLEEP ONSET WITH GOOD AND POOR SLEEPERS
Hannah Scott (Australia)

RESEARCH PROCESS AND SLEEP APP DESIGN LESSONS LEARNED FROM THE REFLECTIVE EXAMINATION OF A SLEEP STUDY
Zineb Selham (Canada)

THE DREEM2 HEADBAND AS AN ALTERNATIVE TO POLYSOMNOGRAPHY FOR EEG SIGNAL ACQUISITION, BREATHING AND HEART RATE MONITORING AND SLEEP STAGING IN HEALTHY SUBJECTS
Valentin Thorey (France)

YASA (YET ANOTHER SPINDLE ALGORITHM): A FAST AND OPEN-SOURCE SLEEP SPINDLES AND SLOW-WAVES DETECTION TOOLBOX
Raphael Vallat (United States)

CHEAP OPEN HARD- AND SOFTWARE FOR OPEN- AND CLOSED-LOOP STIMULATION IN 16-CHANNEL PSG
Frederik D. Weber (The Netherlands)

SLEEP PATTERNS AND SLEEP DISTURBANCES THROUGHOUT PREGNANCY: AN ACTIGRAPHY STUDY
Jen Chang (United States)

FATIGUE, SLEEP AND OBESITY BEFORE AND AFTER CHEMOTHERAPY IN PATIENTS WITH BREAST CANCER
Zerrin Pelin (Turkey)

SLEEP-DISORDERED BREATHING IN GESTATIONAL HYPERTENSION AND PREECLAMPSIA: IMPACT ON MATERNAL AND FETAL OUTCOMES
Danielle Wilson (Australia)

Affiliated Meeting, 110

6:30PM - 8:00PM **A12**

A12: Australasian Sleep Association (ASA) affiliated symposium

Summary
The aim of this session is to showcase the extraordinary talent that we have in Australasia. Please join us to catch up with colleagues and learn about the ground-breaking Insomnia research currently underway in Australia and New Zealand.

Target audience
All Conference delegates are warmly invited to join colleagues from Australia and New Zealand.

Chairs:
Maree Barnes (Australia)
Melinda Jackson (Australia)

6:30PM - 6:40PM **Welcome**

6:40PM - 7:00PM **Current insomnia research at the Woolcock**
Delwyn Bartlett (Australia)

7:00PM - 7:20PM **Intensive sleep re-training: A novel and effective behavioral treatment of insomnia**
Leon Lack (Australia)

7:20PM - 7:40PM **Cognitive profiles in short-sleep and paradoxical insomnia: An examination in the Raine Study Cohort**
Michelle Olaithe (Australia)

7:40PM - 8:00PM **Preliminary data from Project REST: A partner-assisted CBT-I trial.**
Sean Drummond (Australia)

Administration, 202

6:30PM - 9:00PM

Canadian Sleep Society (CSS) Annual General Membership Meeting

CSS member registration opens at 6:30PM
6:30-7:30PM: Cocktail reception
7:05PM: Special announcement of the launch of the National Campaign on Sleep (CSCN)
7:15 PM Food available
7:30pm-9:00 PM AGM

Panel Discussion, Admin 105 - 105

7:00PM - 9:00PM

A18: Pediatric RLS and Growing Pains Study Group of IRLSSG Chair: Arthur Walters All are welcome to attend.

Affiliated Meeting, 116 - 116-117

7:00PM - 9:00PM **A13**

A13: International Hypersomnolence Investigative Group (IHIG)

Chairs:
David T. Plante (United States)

Scientific Programme

Wednesday, 25 September 2019

07:00AM - 5:00PM

Administration, SRR - 201

Speaker Ready Room

08:00AM - 08:45AM | **Anderson**

Keynote, BR A - Ballroom A

K09: Biomarkers and determinants of drowsy driving: Advances in reducing crash risk

Summary
Drowsiness remains a significant cause of motor vehicle crash, responsible for approximately 20% of all crashes. This talk will examine current approaches to reducing the impact of drowsy driving, including (i) understanding of the characteristics of drowsiness-related motor vehicle crashes, beyond falling asleep (e.g., gaze allocation and distractibility); (ii) an evaluation of the available technologies that map onto these different signatures of impairment; (iii) a look into the future of roadside testing, including the development of novel biomarkers of the drowsy state that yield promise for implementation into road side tests; and (iv) revisiting the associations between subjective awareness of drowsiness and adverse driving events.

08:00AM - 08:02AM

Introduction

Allan Pack (United States)

08:02AM - 08:45AM

Associations between subjective awareness of drowsiness and adverse driving events

Clare Anderson (Australia)

Keynote, 211

08:00AM - 08:45AM Hong K10: Neuroimaging studies in sleep disorders

Multiple modalities and techniques of brain imaging can be used to investigate whether sleep disor¬ders are associated with changes in brain structure or functional/molecular activities. Here we reviewed multimodality neuroimaging findings using magnetic resonance imaging (MRI), functional magnetic resonance imaging (fMRI), diffusion tensor imaging (DTI), single-photon emission computed tomography (SPECT) and positron emission tomography (PET) in major sleep disorders (i.e., obstructive sleep apnea, primary insomnia, narcolepsy, REM sleep behavior disorder, restless legs syndrome). The studies reviewed include neuroanatomical assessments (voxel-based morphometry, surface-based morphometry, and magnetic resonance spectroscopy, etc.), metabolic/functional investigations (PET, SPECT, fMRI), and ligand marker measurements. Based on the current state of the research, we suggest that brain imag¬ing is a useful approach to assess the structural, functional, and molecular cor¬relates of sleep disorder brain. Up-to-date neuroim¬aging techniques therefore provide a worthy tool to gain insight into possible pathophysiological mechanisms of sleep disorders in humans.

08:00AM - 08:02AM **Introduction**

Thien Thanh Dang-Vu (Canada)

08:02AM - 08:45AM **Perspectives of neuroimaging in sleep disorders**

Seung Bong Hong (Republic of Korea)

Symposium, BR A - Ballroom A

09:00AM - 10:30AM **S52**

S52: State-of-the-art of wearable technology and big data to advance sleep and circadian science

Summary
We are facing a new era in which the boom in sensing technology is converging with the exponential growth of the internet. One of the exceptional results is the availability of big data, an unprecedented and overwhelming amount of multidimensional information with the potential of changing and improving the way we approach health and disease.

Technology is changing the way we do science, and as scientists, it is our responsibility to evaluate and determine whether to adopt, regulate and use novel technology. Within the framework of the internet of things, it is now possible to collect a vast amount of sleep and sleep-relevant information outside the restriction of a laboratory setting. Data from mobile surveys, apps designed for cognitive and emotional testing, users' bio-signals (e.g. physical activity, breathing, cardiac function), geolocation, and biospecimens (e.g., saliva) can all be easily collected. Particularly, over recent years, many novel, highly sophisticated and relatively inexpensive consumer wearable devices have been introduced on the market, claiming to measure users' behavior, including sleep. These multisensory devices are able to capture different sources of information that go beyond simple motion, are easy to use, and have the potential for offering an unprecedented window on users' daily health and sleep over long periods of time.

Alarmingly, however, there is little guidance within and outside the sleep community about the use of wearables leading to confusion and controversy about the validity and use of wearable technology in the sleep field. The proposed session aims to explain the current landscape in digital health, provide a critical overview of the state of the art of the use of consumer wearables, and review the main experimental findings of validation studies assessing the performance of novel wearables devices in healthy sleepers and patients with clinical sleep disorders.
Importantly, as part of an ongoing international effort promoted by the Sleep Research Society, pros and cons in the use of these technologies in sleep research and clinical sleep medicine, overview of biomarkers that can quantify objective measures of sleep and circadian physiology in "real-world" environments, and future directions in wearable sleep technology will be extensively discussed in a critical fashion.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the current state-of-the-art of consumer wearable technology in the field of sleep research and clinical sleep medicine

•Demonstrate knowledge about the validity of wearable devices in healthy sleepers and individuals with sleep disorders, and be informed about the pros and cons of using wearable technology in clinical and research settings

•Recognize the unique opportunity to collect and integrate different sources of information, and the potential and the challenges of the big data approach to sleep science

Target Audience
Sleep researchers and clinicians

Scientific Programme

09:00AM - 09:02AM **Introduction**

09:02AM - 09:18AM **Intro to sleep in the digital health revolution**
Sean Drummond (Australia)

09:18AM - 09:34AM **State-of-the art of wearable sleep technology**
Massimiliano de Zambotti (United States)

09:34AM - 09:50AM **Sleep and circadian biomarkers: Toward new opportunities**
Julie Carrier (Canada)

09:50AM - 10:06AM **Sleep faces big data: Potential and challenges**
Shaun Purcell (United States)

10:06AM - 10:22AM **Future direction in wearable sleep technology: Short and long-term goals and needs**
Sean Drummond (Australia)

10:22AM - 10:30AM **Conclusion**

Affiliated Meeting, 106

09:00AM - 10:30AM IRLSSG Diagnostic Methodology Review

Oral Abstract, 116 - 116-117

09:00AM - 10:30AM O22: Insomnia epidemiology and treatment

Chairs:
Leon Lack (Australia)
Julio Fernandez-Mendoza (United States)

09:00AM - 09:15AM **HITTING THE NAIL ON THE HEAD: LONG-TERM EFFECTS OF GROUP CBT-I FOR SCHOOL-AGE CHILDREN SUFFERING FROM INSOMNIA SUBTYPES IN CHILDREN - WHO IMPROVES MOST?**
Angelika Schlarb (Germany)

09:15AM - 09:30AM **CHANGES OF BEHAVIORAL AND EMOTIONAL PROBLEMS IN SCHOOL-AGE CHILDREN WITH CHRONIC INSOMNIA: LONG-TERM EFFECTS OF A RANDOMIZED CONTROLLED DESIGN**
Angelika Schlarb (Germany)

09:30AM - 09:45AM **ARE RESIDUAL INSOMNIA SYMPTOMS PREDICTIVE OF NEW ONSET OF SIGNIFICANT DEPRESSIVE SYMPTOMS? - A POPULATION-BASED STUDY**
Xiaowen Ji (Canada)

09:45AM - 10:00AM **SUPPORTING PATIENT-CENTRED TREATMENT DECISION-MAKING - A PROTOTYPE OF A PATIENT EDUCATION TOOL**
Janet M.Y. Cheung (Australia)

10:00AM - 10:15AM

CAN WE PREVENT INSOMNIA?A BRIEF COGNITIVE BEHAVIORAL THERAPY IN AT-RISK ADOLESCENTS

Ngan Yin Chan (Hong Kong)

10:15AM - 10:30AM

OBJECTIVE SHORT SLEEP DURATION PREDICTS THE EVOLUTION OF POOR SLEEP INTO INSOMNIA IN THE TRANSITION FROM CHILDHOOD TO YOUNG ADULTHOOD: THE PENN STATE CHILD COHORT

Julio Fernandez-Mendoza (United States)

Panel Discussion, 118 - 118-120

09:00AM - 10:30AM **D07**

D07: Capturing standardized outcome measures for registry based single N RCTs (nRCT=l)

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
With an augmented level of awareness of sleep disorders among the public, there has been a rise in requests for sleep studies, application of screening methodologies and use of various apps informing about one's individual sleep/wake-behaviours. Particularly, patients/families use app/smartphone based information to underline or explain their symptoms and get medical attention.

Physicians, working in different geographic areas under different circumstances interpret such data differently. One reason for this dis-concordance is the lack of understanding in regards to sensitivity and specificity of the applied tools. Another reason is that evidence-based outcome measures, are generally derived from epidemiologically but not individually informed data. Therefore, our research consortium is suggesting a paradigm change in behavioural medicine related outcome measures from a 'one-size-fits-all' to a personalized approach, utilizing clinical single-N (n=l) trial platforms, and responding to the recent advances in medicine. The motivation for this paradigm shift is enhanced by (a) studies suggesting that inappropriate and ineffective treatments, not including individual outcome measures, may result in overmedication and poly-pharmacy, thus iatrogenic harm, and (b) modern technologies allowing data collection directly from home - a recent trend, catalyzed by modern apps and smartphones. In this context, randomized clinical single-N trials (nRCT=l) allow the consideration of: (a) classic standardized outcome measures such as sleep latency or sleep efficiency; (b) complications or biological changes; but also (c) capture systematically and rigorously patient oriented "personally meaningful outcomes" that may affect wellness, satisfaction, adherence, and the quality of fife of patients/families.

Therefore, understanding technical and clinical information provided by screening devices and/or information provided by an app, is crucial. It offers significant insight in to pathophysiology in relation to patient symptoms. The purpose of this discussion panel is to provide an overview of currently most frequently used home-based screening and diagnostic methods and suggest a toolbox, which allows combinations, thus collection of individualized information for pre-assessment and monitoring of individualized outcome measures.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Recall pros and cons of information provided by screening devices and/or cell-phone apps, utilizing (1) actigraphy; (2) pulsoxymetry; and (3) video methodologies

•Recognize how personally meaningful outcomes can be tracked with modern technology for supporting decision making and personalizing sleep/wake-behaviour medicine

Target Audience
Physicians (paediatricians, neurologists, pulmonologists, psychiatrists), psychologists, occupational/physio-/behavioural-therapists, pharmacists & pharmacologists

Chairs:

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**The traditional use of actigraphy and modern actigraphy applications in smartphones** Mirja Quante (Germany)
09:18AM - 09:34AM	**The variety of pulsoxymeters and their application in special patient populations** David Wensley (Canada)
09:34AM - 09:50AM	**The use of home-based video-footage to identify contextual and personal factors affecting sleep and to differentiate discomfort and pain** Sue McCabe (Australia)
09:50AM - 10:06AM	**How cell-phone based selfies can be used for vigilance detection** Gerhard Klöesch (Austria)
10:06AM - 10:22AM	**The do’s and don'ts of screening and home monitoring technologies for avoiding misinterpretations** Calvin Kuo (Canada) Mike Van der Loos (Canada)
10:22AM - 10:30AM	**Conclusion**

Symposium, 109

09:00AM - 10:30AM **S53**

S53: Electronic media and sleep: Where are we and where are we headed?

Summary
Over the past 15 years, there has been growing concern about the association between electronic media use and sleep. Meta-analyses show that electronic media use before bedtime is related to shorter sleep duration, longer sleep onset latency, irregular sleep schedules, and daytime fatigue. Although the magnitude of the association may appear to be small at the individual level, it is important to compare findings across populations, to unravel the complex mechanisms underlying them, and to explore sensible prevention strategies. This panel will address these topical questions with data from varying countries, collected via diverse methodological approaches, and identify future steps to take in this research field.

The first speaker, Prof. Lauren Hale, will present an update on the associations between electronic media use and sleep in adolescents. The confluence of (1) environmental and biological challenges to teens' sleep (i.e., earlier school start times and circadian delay), (2) psychological and behavioral changes (e.g., less parental control, higher academic pressure), and (3) their intense preoccupation with screen media has earlier been described as a "perfect storm". As such, teenagers are widely recognized as a risk group when it comes to the effects electronic media on sleep.

The second speaker, Holly Scott, Msc, will discuss the challenges experienced by teenagers disengaging from social media at bedtime. Using focus group research she identified the motivations for late night social media engagement, which led to the development of (1) a validated self-report measure, and (2) a pilot classroom-based program that helps young people identify, reflect on and discuss these concerns with their peer group. Her talk will expand current knowledge on the underlying mechanisms of the effects of social media use on sleep.

The third and fourth speaker will cover current efforts to reduce technology use before bedtime as a sleep intervention. So far, the clinical relevance of the effects of screen media for sleep remain largely unclear, and, consequently, it is unclear whether cutting back on media use before bedtime is a fruitful intervention strategy. This question, and the feasibility of limiting media use in a population of avid screen users, will be addressed by Prof. Michael Gradisar and Prof. Tamar Shochat, respectively. Prof. Gradisar will present results from a smartphone intervention among adolescents in Australia, and Prof. Shochat will offer results from a study comparing the sleep and media use patterns of secular and ultra-orthodox youth in Israel. These talks will be followed by a reflection on current media use and sleep hygiene guidelines.

The final speaker, Dr. Liese Exelmans, will present data from multiple large scale community samples on whether and how electronic media use affects sleep among adults in Belgium. Compared to younger age groups, adults remain an under-researched population on this topic. Looking both at sleep quality and sleep behavior, this talk will discuss effect sizes and explore sleep deprivation as a behavioral issue (i.e., bedtime procrastination), offering alternative strategies for prevention and intervention.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Describe the effects of electronic media on sleep quality and sleep behavior.

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**The association between electronic media use and sleep in adolescents, an update** Lauren Hale (United States)
09:18AM - 09:34AM	**Social media and sleep: the adolescent perspective informing research and education** Holly Scott (United Kingdom)
09:34AM - 09:50AM	**The lesser of many evils: Could a harm minimisation approach to reduce electronic media use improve young people's sleep?** Michael Gradisar (Australia)
09:50AM - 10:06AM	**Limited media exposure is associated with poor sleep patterns in ultra-orthodox female adolescents: The forbidden fruit effect?** Tamar Shochat (Israel)
10:06AM - 10:22AM	**Electronic media use and sleep among adults: Is it all the same?** Liese Exelmans (United States)
10:22AM - 10:30AM	**Conclusion**

Symposium, 121-122

09:00AM - 10:30AM **S54**

S54: Sleep disorders as a risk factor for suicide and the impact of treating insomnia in suicidal patients

Summary
A large and growing literature has established a statistical linkage between sleep disorders and suicidal ideation, suicidal behavior and suicide death. The best-developed evidence is for a relationship between suicide and insomnia and/or nightmares.

The evidence leads to the proposition that a report of worsening of sleep disorders be viewed as a “sentinel event” in the surveillance for risk of suicide. While much of the association between sleep and suicide is driven by research from patient reports, there is some evidence that specific polysomnographic findings and actigraphic findings are also associated with suicide. The observation of a relationship between sleep disorders and suicide begs the need for randomized controlled trials (RCTs) of sleep interventions in suicidal patients as a means of mitigating the risk of suicide, while realizing that the prescription of hypnotics to suicidal patients carries the risk of overdose. The 8-week RCT “Reducing Suicidal Ideation Through Insomnia Treatment (REST-IT)” was conducted to compare the hypnotic zolpidem controlled-release (zolpidem CR) versus placebo in suicidal, depressed outpatients with insomnia, who were also taking an open-label selective serotonin reuptake inhibitor (SSRI). The primary goal of REST-IT was to examine whether targeted treatment of insomnia is safe in this population and would help mitigate suicidal ideation. At the conclusion of randomized treatment, participants were followed weekly for two additional weeks in order to ensure safe transition to “care as usual”. One hundred and three participants were randomized (64 women and 39 men; median age of 41 years). Patient retention was high, with participants completing the majority of scheduled visits. Remarkably, there were no deaths and no suicide attempts, and no major decompensations during the two weeks of observation after participants exited the randomized portion of the study. Strong treatment effects favoring zolpidem CR were seen on measures of insomnia, with a significant advantage for zolpidem CR on one out of two measures of suicidal ideation. This symposium will discuss (1) the epidemiology of sleep and suicide, (2) polysomnographic and actigraphic associations with suicidal ideation and suicide, (3) design features to enhance safety in insomnia-suicide RCTs, (4) the results of REST-IT, as well as (5) implications for future research.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

- Demonstrate an understanding of the link between sleep disorders and suicide
- Discuss the role sleep clinicians in their preparedness to detect risk for suicide
- Describe potential mechanisms explaining the link between select sleep disorders (e.g., insomnia) and suicide
- describe associations between suicide and specific polysomnographic and actigraphic findings
- Recall how to mitigate suicide risks in the design of clinical trials involving sleep patients at risk of suicide
- Restate the impact of zolpidem on suicidal ideation in a RCT
- Describe next steps in the scientific advancement of methods to reduce suicide in insomnia patients

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Overview of sleep disorders and suicide** Christopher Drapeau (United States)
09:22AM - 09:42AM	**Objective sleep markers of suicide risk: Polysomnography and actigraphy** Meredith Rumble (United States)
09:42AM - 10:02AM	**REST-IT methods: The design of randomized clinical trials for suicidal outpatients** Andrew Krystal (United States)
10:02AM - 10:22AM	**REST-IT results – sleep measures and suicidal ideation** William Vaughn McCall (United States)
10:22AM - 10:30AM	**Conclusion**

09:00AM - 10:30AM **S55**

Basic Science Symposium, 211

S55: What is slow-wave activity? And, can we manipulate it to our benefit?

Summary
Slow-wave Activity (SWA) has historically been associated with the homeostatic regulation of sleep. In 1982, Borbely proposed the Two-Process Model of Sleep Regulation which postulated that two biological mechanisms regulate the sleep-wake cycle, with Process S increasing throughout the day and decreasing across the sleep period, representing the homeostatic drive to sleep. Borbely posited that SWA could be considered a putative marker of Process S, as peak SWA in the first NREM period increases with wakefulness, representative of an accumulation of sleep pressure, and subsequently decreases exponentially during sleep, representing dissipation of the sleep drive. Emerging research, however, has begun to suggest that SWA may be more than a marker of sleep homeostasis. The Synaptic Homeostasis Hypothesis, for example, has theorized that EEG slow oscillations, characteristic of SWA, may play a role in regulating neuroplasticity via the homeostatic downscaling of synaptic strength. Additionally, ample evidence from the memory literature has demonstrated a relationship between slow-wave sleep (SWS) and the consolidation of declarative memories, with data from neuroimaging studies suggesting that it is the reactivation of memory traces during slow-wave sleep that is essential to memory consolidation. Moreover, an exciting and developing body of literature has also implicated SWA in a bidirectional relationship with amyloid-β.

Because SWA has been suggested to be associated with numerous important brain functions, it is only natural that researchers have questioned whether its manipulation can be used to both experimentally test its function or enhance its effects. In an elegant set of studies, it was shown that slow-wave sleep could be selectively disrupted using an auditory stimulation paradigm. Using this approach, they demonstrated that SWA could be significantly reduced without decreasing total sleep time. More recently, it has also been shown that SWA can be selectively enhanced using a closed-loop auditory stimulation method.

This SWA enhancement has been shown to improve memory function and increase immune function. In the proposed session, we seek to discuss the most current theories about the nature and function of SWA, and examine whether SWA manipulation through various means can serve to elucidate its function or be used to yield positive outcomes.
Soeakers will discuss the relationship between SWA and the modulation of plasticity. Bjorn Rasch will present a theoretical account and data on how thoughts, imaginations and affective states before sleep could affect subsequent SWS and SWA. Guang Yang will discuss how learning experiences and subsequent slow wave sleep regulate the plasticity of synapses and neurons. Bryce Mander will present work linking SWA to the deposition and regulation of amyloid-β in preclinical stages of Alzheimer's disease (AD), and will further demonstrate the importance of this relationship for hippocampus-dependent memory. Jennifer Goldschmied will present data on the effects of slow-wave disruption, and Eden Debellemaniere will discuss novel findings from closed-loop auditory stimulation studies.

This symposium aims to integrate the most recent SWA findings cutting across multiple levels of analysis, and demonstrate the importance of SWA to ultimately propose that the study of SWA is essential to the investigation of the role of sleep, more broadly.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Experience and sleep-dependent synaptic plasticity** Guang Yang (United States)
09:18AM - 09:34AM	**Bidirectional links between slow wave activity and β-amyloid pathology and their functional significance** Bryce Mander (United States)
09:34AM - 09:50AM	**I want to sleep deeper! How does cognition affect slow-wave sleep?** Björn Rasch (Switzerland)
09:50AM - 10:06AM	**Selective slow-wave disruption in healthy and depressed samples** Jennifer Goldschmied (United States)
10:06AM - 10:22AM	**Manipulating SWS with auditory stimulation: From basic knowledge to field studies** Eden Debellemaniere (France)
10:22AM - 10:30AM	**Conclusion**

09:00AM - 10:30AM **S56**

Symposium, 212-214

S56: Obstructive sleep apnea, cognitive dysfunction & neurodegeneration: Current understanding

Summary
Sleep is increasingly recognized as an important factor in brain health. Obstructive sleep apnea (OSA) causes intermittent hypoxia and sleep fragmentation, which may both affect brain structure and function. OSA affects at least 20% of individuals after the age of 65. The harmful effects of disturbed sleep on brain health are particularly important for older individuals with OSA. With an aging population and increasing prevalence of neurodegenerative disorders and dementia, it is a public health priority to identify risk factors for cognitive decline and optimize strategies to maintain brain health.

Recent cohort studies suggest that OSA is a risk factor for stroke, mild cognitive impairment, Alzheimer's disease and Parkinson's disease. Prevention through treatment of risk factors is currently the main intervention for reducing the incidence of dementia. Therefore, how obstructive sleep apnea affects brain health and whether its treatment can slow neurodegeneration are highly relevant questions.

In this session, we focus on the aging brain and the link between obstructive sleep apnea, brain health, cognitive decline, dementia and neurodegeneration. We present preliminary results of obstructive sleep apnea treatment, which can slow, stop or reverse neurodegenerative processes accentuated by obstructive sleep apnea, even in individuals already affected by a neurodegenerative disease.

The first speaker will describe epidemiologic studies linking OSA to cognitive decline and dementia, and describe potential pathophysiological mechanisms that could explain the link between OSA and cognitive decline.

The second speaker will review the neuropsychological effects of OSA and compare similarities and differences with other disturbances predisposing to cognitive dysfunction such as chronic sleep deprivation and insomnia, and with other respiratory disorders such as COPD. In addition, a comparison will also be made with specific deficits most commonly found in neurodegenerative disorders such as Alzheimer's and Parkinson's diseases. Effects of OSA treatment will be reviewed.

The third speaker will summarize the evidence from neuroimaging studies showing how OSA can lead to brain dysfunction, including structural and functional abnormalities, and the effects of OSA treatment. Implications for cognitive function in aging will be discussed.
The fourth speaker will describe the relationship between OSA and biomarkers of cognitive decline, and how biomarkers could be used to study the impact of OSA and its treatment on progression to dementia.
The last speaker will focus on Parkinson's disease, the second most common neurodegenerative disorder, and review studies suggesting OSA affects cognitive function also in this context, an effect which appears remediable with OSA treatment. Moreover, preliminary evidence will be discussed suggesting OSA may affect overall progression of neurodegeneration.

Learning Objectives

•Explain the proposed mechanisms whereby OSA can predispose

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:18AM	**Does OSA cause cognitive dysfunction and dementia? Epidemiology & mechanisms** Ivana Rosenzweig (United Kingdom)
09:18AM - 09:34AM	**Cognitive defects associated with OSA: Comparison with other sleep disturbances, COPD and degenerative disorders** Melinda Jackson (Australia)
09:34AM - 09:50AM	**Neuroimaging evidence of OSA effects on the brain** Nadia Gosselin (Canada)
09:50AM - 10:06AM	**OSA and dementia: Biomarker evidence** Ricardo Osorio (United States)
10:06AM - 10:22AM	**OSA in Parkinson's disease** Marta Kaminska (Canada)
10:22AM - 10:30AM	**Conclusion**

Symposium, 216 - 215-216

09:00AM - 10:30AM **S57**

S57: Effects of perinatal sleep modulation in the mother and offspring: Evidences from preclinical research

Summary
The sleep pattern presented by women during pregnancy and postpartum is substantially different than what is observed in other periods of life. In general, women complain of reduced sleep quality and quantity, as well as present an increased prevalence of sleep disorders such as obstructive sleep apnea, restless legs syndrome and insomnia. Among the possible reasons are the anatomo-physiological alterations during the gestation, the increased demands by the newborn, and social and cultural factors that might impact sleep.

Clinical studies have suggested that disturbed sleep during the puerperium (either by sleep deprivation or sleep disorders) might lead into important outcomes to both the mother and child. The correct understanding of the impacts of disturbed sleep during pregnancy and postpartum is of major importance, in order to provide a better maternal-infant care. However, due to the nature of this period, both ethical and methodological issues preclude the performance of sleep-related interventional clinical studies.

Preclinical animal research plays an important role in increasing the knowledge about the consequences of disturbed sleep during pregnancy. In a general sense, both physiological aspects of pregnancy and postpartum and sleep-related variables are comparable between human beings and rodents models, which assure a translational potential for these studies. Additionally, preclinical studies assure ethical and methodological conditions that are not possible in clinical research.
This field of research has been growing considerably with a surge in the number of articles addressing perinatal sleep in animal models in the last few years. In a general sense, preclinical animal research has been useful to demonstrate how problematic sleep disturbances might be to both the mother and the offspring. We now have evidences that sleep deprivation might lead into important outcomes in behavioral, hormonal, electrophysiological, metabolic and epigenetic levels. Also, recent studies are focusing in describing mechanisms that regulate sleep specifically during this life period.

The current symposium intends to present and discuss the most recent evidences and results regarding perinatal sleep modulations and possible outcomes, achieved by means of preclinical animal studies. For that, we aim to bring together researchers from four different countries to share their experiences and results on the use of animal models in perinatal sleep research. Each lecture will be focused on the relationship of sleep during pregnancy and/or postpartum and a different outcome.

By the course of these lectures, the audience should have learned about the most recent advances in the field, understanding how alterations in perinatal sleep might lead into deleterious outcomes to both mother and offspring. Additionally and probably more important, the audience should be able to understand the applicability of animal models on the research about sleep during pregnancy and postpartum, being capable to translate these data into potential clinical findings.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Demonstrate understanding of the applicability and recognize the usefulness of preclinical animal models on the research about sleep

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Sleep during pregnancy and postpartum and its relationship with maternal behavior** Gabriel Natan Pires (Brazil)
09:22AM - 09:42AM	**Functional impact of sleep apnea during pregnancy in mother and offspring: Epigenetic modifications associated with metabolic disorders** Rene Cortese (United States)
09:42AM - 10:02AM	**Preoptic sleep regulation during the postpartum period** Luciana Benedetto (Uruguay)
10:02AM - 10:22AM	**Prenatal sleep deprivation and immature neuronal network in full term rat newborn** Kamalesh K. Gulia (India)
10:22AM - 10:30AM	**Conclusion**

Oral Abstract, 110

09:00AM - 10:30AM O23: Cardiometabolic and renal factors

Chairs:
Najib Ayas (Canada)
Maree Barnes (Australia)

09:00AM - 09:15AM	**INTERRELATIONSHIPS AMONG COMMON PREDICTORS OF CARDIOVASCULAR DISEASES IN PATIENTS OF OSA□A LARGE-SCALE OBSERVATIONAL STUDY** Yingjun Qian (China)
09:15AM - 09:30AM	**INFLUENCE OF APOLIPOPROTEIN A-I AND B GENETIC VARIATIONS ON INSULIN RESISTANCE, METABOLIC SYNDROME IN OBSTRUCTIVE SLEEP APNEA** Xinyi Li (China)
09:30AM - 09:45AM	**ASSOCIATION BETWEEN OBSTRUCTIVE SLEEP APNEA AND LIPID METABOLISM DURING REM AND NREM SLEEP** Huajun Xu (China)
09:45AM - 10:00AM	**ASSESSING RISK OF FATALITY IN CHRONIC HEART FAILURE PATIENTS, USING NOCTURNAL PERIODICITY BIOMARKER OF CARDIOPULMONARY COUPLING** Hugi Hilmisson (United States)
10:00AM - 10:15AM	**LONG TERM EFFECTS OF WEIGHT LOSS ON OBSTRUCTIVE SLEEP APNEA IN ADULTS WITH TYPE 2 DIABETES AND OVERWEIGHT/OBESITY: 10-YEAR RESULTS OF THE SLEEP AHEAD STUDY** Samuel T. Kuna (United States)

10:15AM - 10:30AM

IMPACT OF KIDNEY TRANSPLANTATION ON SLEEP APNEA SEVERITY: A PROSPECTIVE CONTROLLED POLYSOMNOGRAPHIC STUDY

Raphael Heinzer (Switzerland)

Symposium, 217-219

09:00AM - 10:30AM **S58**

S58: Sleep and memory over the lifespan

Summary
The aim of this symposium is to discuss the current state of knowledge on developmental aspects of sleep for memory consolidation and information processing over the lifespan. We are in the outstanding situation to present sleep and memory data in children, adolescents, young and elderly adults. By discussing the impact of the developmental processes on the relationships between sleep and memory, we can open up new avenues for sleep and developmental research. Kerstin Hoedlmoser will focus on developmental changes in the microstructure of sleep, i.e. sleep spindles and slow oscillations, which are key players in the sleep-dependent memory consolidation process.

Recently, it was found that the precise timing of sleep spindles within slow oscillation up-states is crucial for sleep-dependent memory consolidation and that this precise timing deteriorates with aging. The time window with the most rapid and drastic changes to sleep spindles and slow oscillations, however, is during puberty. So far it has not been investigated whether and how slow oscillation-spindle-coupling changes from childhood to adolescence and whether it influences sleep-dependent memory consolidation. Moving forward on the course of human ontogeny, Michael Chee will share data that adds to our understanding of how diurnal sleep can benefit memory encoding especially in adolescents and young adults.

Sleep deprivation can affect the processing of visual information even for items that are responded to. Poorer capture of peripheral information, weaker inhibition of distracters, lesser rate of processing and poorer quality of information representation contribute to poorer encoding. Chee's talk will provide recent findings, that an afternoon nap can restore encoding performance for declarative material in sleep-restricted adolescents. A nap can also yield later recall that is comparable to cramming over the same period. The sleep architecture correlates to test performance will be reviewed. Philippe Peigneux will report on studies in young healthy adults investigating the boundary cognitive and neurophysiological conditions that determine the efficiency of cueing recently learned memories during sleep (targeted memory reactivation) and the brain capacity to process external information and develop novel associations (hypnopedia) during sleep, and sleep-dependent learning-related changes in brain structure. Finally, Rebecca Spencer will raise the question whether in elderly people encoding deficits contribute to age-related changes in sleep-dependent memory consolidation. Sleep-dependent consolidation is reduced with aging, particularly for procedural learning tasks. Given well-known changes in memory encoding with aging, Spencer’s talk will present data on the relationship between aging-related encoding deficits and changes in sleep-dependent consolidation.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate an understanding of the developmental changes in sleep macro- and micro-architecture across the lifespan and their significance

•Recognize ways in which sleep can affect memory encoding, consolidation and retrieval and how effects might evolve across life

sleep and factors which influence this

•Evaluate the quality of different study designs used in the sleep and memory literature (longitudinal vs. cross-sectional; sleep

Scientific Programme

09:00AM - 09:02AM	**Introduction**
09:02AM - 09:22AM	**Functional impact of developmental changes in sleep microstructure on memory** Kerstin Hoedlmoser (Austria)
09:22AM - 09:42AM	**Sleep benefits on memory encoding in adolescents and young adults** Michael Chee (Singapore)
09:42AM - 10:02AM	**Boundaries for memory cueing and processing capabilities during sleep** Philippe Peigneux (Belgium)
10:02AM - 10:22AM	**Do encoding deficits contribute to age-related changes in sleep-dependent memory consolidation?** Rebecca Spencer (United States)
10:22AM - 10:30AM	**Conclusion**

Symposium, 220 - 220-222

09:00AM - 10:30AM **S59**

S59: Shift work in transportation systems

Summary
Shift work in transportation systems (like flight traffic, train services, road and bus transport, sea transport and freight traffic) is regulated in so-called Working Time Regulations (WTR). WTRs normally lay down on a minimum of legal requirements. These include, how to organize working time. Some workers in certain sectors, such as the aviation industry and mobile workers in road and sea transport are currently excluded from normal WTR and are subject by specific regulations, which advice special working times.

Normally workers, who are doing safety-critical work on the airport, railways etc. are underlying specific Airway, Railway and other Transport Systems Safety Regulations. These regulations differ in the various countries, but mostly they include arrangements to prevent serious consequences arising from tired/fatigued employees and therefore endanger safety.

It‘s not however sufficient to rely on the above described requirements to ensure that they fulfil the obligations for health and safety in regard to shift-working arrangements. Organizing and planning of shift work should also include employers’ general duties for health, safety and welfare at work.

Our symposium shall include an overview about the shift work and its guideline, which based on principles of occupational and sleep medicine. Furthermore, it shall include an update of sleep in shift workers; the presentation of different Working Time Regulations for aircrews and road transport staff (e.g. like truck drivers) and their scientific evaluation.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Use shift work guidelines, which are based on principles of occupational and sleep medicine, and working Time Regulations for shift work in transportation systems

•Demonstrate an understanding of sleep in shift workers

•Recall Working Time Regulations for Aircrews and Road transport staff (e.g. like truck drivers)

Target Audience
Sleep specialists, occupational medicine specialists

Chairs:

Andrea Rodenbeck (Germany)
Daniel Aeschbach (Germany)

09:00AM - 09:02AM **Introduction**

Scientific Programme

09:02AM - 09:22AM
Sleep in shift workers: Results from the updated, evidence-based German Guideline on Shift Work and Health
Céline Vetter (United States)

09:22AM - 09:42AM
Aircrew scheduling and sleepiness - a large EU study
Torbjörn Åkerstedt (Sweden)

09:42AM - 10:02AM
Interaction effects of workload and time awake on aircrew fatigue – implications for duty time regulation
Daniel Aeschbach (Germany)

10:02AM - 10:22AM
The EU driving and rest period regulation and truck drivers' sleep and sleepiness
Mikael Sallinen (Finland)

10:22AM - 10:30AM
Conclusion

Technologist Program, 223-224

09:00AM - 10:30AM
T11: CPAP compliance around the world (workshop)

Chairs:
Shalanda Mitchell (United States)
Michael Eden (United States)

09:00AM - 10:30AM
CPAP compliance around the world
Laree Fordyce (United States)
Angelica Benitez (Colombia)
Alanna Cornish (United States)

Exhibition, Exhibition - Ballroom BCD

10:00AM - 4:00PM
Exhibition 3
Exhibition

Scientific Programme

Symposium, BR A - Ballroom A

10:45AM - 12:15PM **S60**

S60: New approaches in treating OSA in young subjects

Summary
Teenagers and young adults are recognized more and more with Sleep-Disordered-Breathing (SDB) and Obstructive-Sleep-Apnea (OSA) with polysomnograms showing low apnea-hypopnea-index (AHI) but clear complaints [inattention, hyperactivity, difficulty to concentrate, to memorize, poor-sleep, daytime tiredness, sometimes daytime sleepiness]. Historically, 60% of adenotonsillectomy [T&A] procedures have been performed in pre-pubertal years or evaluation show tonsil≤ stage 2. Evaluation of oro-facial structures indicates the presence of anatomical issues that are available for treatment. These treatments involve a multi-disciplinary team and sleep clinic follow-up to appreciate successes and failures of the approach. The most common anatomic exam finding is a narrow hard palate, normally at birth infant have a palatal width of 20 mm and by puberty at least 25mm width, after early prematurity, the most common cause of abnormal oro-facial development is a short lingual frenulum. Such abnormality can be recognized by performing measurement with variable position of the tongue and mouth, once demonstration of short frenulum a combination of exercise stretching the frenulum should be started before surgical “disinsertion” and must be continued for several months after it, with evaluation of objective SDB gain.

Abnormal maxillary growth may be present after rapid-maxillary or bi-maxillary expansion, Midface retrusion creates a size deficiency problem in the upper airway that has been improved in children using surgical midface advancement and orthopedic protraction of the maxilla. Recently introduced bone anchored maxillary protraction (BAMP) uses implant inserted devices in the jaws to bring the maxilla forward against a backward pressure to the lower jaw. The use of BAMP is a strategy to treat maxillary retrusion and children with obstructive sleep apnea.
In teenagers and young adults with OSA and narrow hard palate maxillary expansion is more challenging due to skull maturation resulting in increased resistance to suture separation. Endoscopically-assisted surgical –expansion allows maxillary expansion with limited invasiveness compare to previous surgical proposals and valid results avoiding usage of CPAP.

Prematurity is a very common cause of early OSA reeducation of orofacial muscle strength is a critical step in allowing palatal growth and expansion. However. Myofunctional therapy (MFT) is very difficult to apply in young children with usually poor compliance. A neutral mandibular advancement device with tongue beads used only during the sleep period has been tried for over a year in comparison to MFT and has allowed normal growth and development in this group of non-compliant children

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Perform a valid evaluation of the palate; recognize short lingual frenulum and perform appropriate treatment of this abnormality with appropriate follow-up protocol

•Recognize abnormal maxillary growth in10 to 14 years old and understand the indication and treatment of maxillary retrusion with bone-anchored-maxillary-expansion

•Demonstrate an understanding of the indication and the results obtained with little invasive maxillary expansion using endoscopic-assisted-surgical expansion in older teenagers and young adults with persistence or new development of OSA

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Orofacial growth and OSA** Shannon Sullivan (United States)
11:03AM - 11:19AM	**Short lingual frenulum, mouth breathing and maxillofacial development** Audrey Yoon (United States)
11:19AM - 11:35AM	**Maxillary retrusion with treatment with bone-anchored-maxillary-expansion** Stacey Quo (United States)
11:35AM - 11:51AM	**Maxillary expansion using endoscopic-assisted-surgical expansion** Kasey Li (United States)
11:51AM - 12:07PM	**Neutral-mandibular-advancement-device with tongue beads used only during the sleep as myofunctional treatment** Yu-Shu Huang (Taiwan)
12:07PM - 12:15PM	**Conclusion**

Oral Abstract, 116 - 116-117

10:45AM - 12:15PM O24: Pediatrics

Chairs:
Shelly Weiss (Canada)
Tamar Shochat (Israel)

10:45AM - 11:00AM	**SCHOOL START TIME CHANGE AND MOTOR VEHICLES CRASHES IN ADOLESCENT DRIVERS** Saadoun Bin-Hasan (Kuwait)
11:00AM - 11:15AM	**UNFAVOURABLE SLEEP CHARACTERISTICS AND ADIPOSITY IN CHILDREN: DOES PARENTAL WEIGHT STATUS MAKE A DIFFERENCE?** Lijuan Xiu (Sweden)
11:15AM - 11:30AM	**ASSOCIATIONS BETWEEN ELECTRONIC MEDIA USE AND SLEEP IN HONG KONG PRESCHOOL CHILDREN** Qiu-Ye Lan (China)
11:30AM - 11:45AM	**EFFECTIVENESS OF PLAY2SLEEP WITH MOTHERS AND FATHERS OF INFANTS AGED 5 MONTHS: A MIXED METHODS STUDY EXAMINING THE EFFECT OF AN INTERVENTION DESIGNED TO IMPROVE PARENT-CHILD INTERACTION ON INFANT SLEEP** Elizabeth Keys (Canada)

11:45AM - 12:00PM	**EFFECTS OF SHORT DAYTIME NAP ON COGNITIVE PERFORMANCE AND DAYTIME BEHAVIOURS IN PRIMARY SCHOOL CHILDREN** Jiaxin Wei (Hong Kong)
12:00PM - 12:15PM	**BEHAVIOURAL PROBLEMS, FUNCTIONAL ABILITY AND COGNITIVE FUNCTION IN CHILDREN WITH DOWN SYNDROME AND SLEEP PROBLEMS** Jasneek Chawla (Australia)

Symposium, 118 - 118-120

10:45AM - 12:15PM **S61**

S61: Why the role of sleep in memory consolidation is overrated

Summary
There is a plethora of evidence and broad consensus that sleep plays a specialized and perhaps critical role in the consolidation of memories, that is, the conversion of temporary, labile memory traces into long-lasting neural engrams. Important mechanisms thought to mediate memory consolidation during sleep include: the hormonal milieu (particularly low cortisol levels); specific patterns of oscillatory brain activity (e.g., spindles, sharp wave-ripples, delta activity, slow oscillations); neuronal replay or reactivation of encoding-related network activity; and synaptic potentiation occurring during sleep. It is thought that, together, these mechanisms ensure that information acquired during the waking state is reinforced and transformed into long-term memories during subsequent sleep.

Despite strong evidence, the sleep-memory consolidation hypothesis has faced a steady stream of critical commentaries and contradictory evidence. By drawing from several diverse but complementary approaches, the symposium will highlight inconsistent and contentious issues, emphasizing both empirical and theoretical challenges to the sleep-memory hypothesis. The following lines of arguments will be explored:

1. Plasticity mechanisms (e.g., lowered cortisol, sharp wave-ripples, delta activity, slow oscillations) thought to mediate synaptic and behavioral memory consolidation during sleep also operate during wakefulness; empirical data demonstrate that these mechanisms can induce consolidation in the absence of behavioral and polysomnographic sleep (Dringenberg).
2. The state of quiet waking, in particular, appears to share similarities with sleep in terms of the activation of consolidation mechanisms; at least under some conditions, periods of quiet waking (eyes-closed rest) can lead to memory benefits similar to those observed with sleep; thus, sleep might not be a uniquely required state for consolidation (Wamsley).
3. Examinations of the parallels between sleep and states of general anesthesia in both non-human animals and humans also challenge the role of sleep in memory consolidation; based on physiological mechanisms and behavioral measures, states of sleep and anesthesia are incompatible with any form of cognitive processing, including memory consolidation (Vertes).
4. Aquatic mammals can exhibit an adaptive suppression of sleep for prolonged (days to months) periods. Fur seal switching from terrestrial to aquatic life lose REM sleep, and total sleep deprivation for 4.5 days does not cause detectable impairments of general health or cognitive functions. Thus, sleep does not appear to play an obligatory role in cognitive performance and memory functions in fur seals and some other aquatic mammals (Lyamin).

The arguments presented in this symposium can be summarized as follows: (a) consolidation mechanisms are active during both sleep and wakefulness; (b) quiet waking is particularly effective in facilitating consolidation; (c) sleep may severely restrict or prevent the occurrence of cognitive operations; and (d) some mammals can suppress sleep for prolonged periods without apparent impairments in cognitive functioning, including learning and memory. Thus, both empirical observations and theoretical arguments challenge the notion of a truly specialized or critical role of sleep in memory consolidation. Rather, sleep may fall along a continuum of behavioral states that vary in the effectiveness to permit or actively facilitate effective consolidation in neural circuits.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Consolidation mechanisms are active during wake and sleep** Hans C. Dringenberg (Canada)
11:07AM - 11:27AM	**Memory consolidation is facilitated by waking rest** Erin J. Wamsley (United States)
11:27AM - 11:47AM	**No cognitive processing in unconscious states: Sleep is no exception** Robert P. Vertes (United States)
11:47AM - 12:07PM	**A phylogenetic approach to understanding REM sleep function** Jerome Siegel (United States)
12:07PM - 12:15PM	**Conclusion**

Symposium, 109

10:45AM - 12:15PM **S62**

S62: The role of sleep in aging: Molecular insights related to inflammation

Summary
Sleep provides the body time to rest, repair, and restore at both the system and cellular level. One of the factors that remarkably affects sleep is aging. Significant alterations in sleep patterns and the quantity and quality of sleep are found as people get older. The elderly population has been found to have a higher prevalence of sleep disturbances such as insomnia, obstructive sleep apnea and overall sleep complaints. These sleep alterations have been found by longitudinal studies to be associated with mortality and other age-related conditions and diseases. Although the sleep pattern of the elderly is well-known, the relationship between sleep and the aging-related mechanisms is not completely clarified.

On the other hand, not getting quality sleep may disrupt these restorative processes and lead to greater wear and tear, and eventually contribute to disease risk. Numerous studies have linked short sleep duration, poor sleep quality, and/or insomnia to increased risk for cardiovascular disease, diabetes, and mortality; however the mechanisms are not clearly defined. Biological aging precipitates disease and death, and inadequate sleep may also influence these aging processes. One such mechanism is cellular senescence, which can cause chronic inflammation through the senescence-associated secretory phenotype (SASP), a phenomenon called “inflammaging”. The SASP has many of the paracrine effects one would expect from a pro-inflammatory stimulus, which can be highly deleterious, causing local and potentially systemic inflammation, disrupt tissue architecture, and can cause the exacerbation of telomere attrition and oxidative stress. Therefore, it is suggested that the SASP is the main driver of age-related inflammation and ultimately is associated with a higher risk of cancer and other age-related disorders. This could suggest a bidirectional relationship between sleep and aging, in which sleep disturbances could be triggered and trigger cellular aging. In this sense, this symposium aims to provide the most recent advance regarding the molecular mechanisms of sleep related to aging.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the evidence of disturbed sleep as a triggering factor for accelerated aging

•Discuss underlying mechanisms for the interactions between sleep and age-related diseases

•Assemble the tools to age-related biomarkers that can be used as predictors of sleep disturbances

Target Audience
General audience in the field of sleep medicine, particularily attendees whose research is focused on molecular pathways of sleep related to aging

Chairs:

Sergio Tufik (Brazil)

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Effects of sleep on age-related conditions** Ronaldo Delmonte Piovezan (Brazil)
11:07AM - 11:27AM	**Sleep disturbances and biological aging: The wear and tear of insufficient sleep** Judith Carroll (United States)
11:27AM - 11:47AM	**Telomere length as a marker of sleep disturbances: A link between sleep and cellular senescence** Priscila Farias Tempaku (Brazil)
11:47AM - 12:07PM	**Mechanisms underlying the association between sleep-wake disruptions and Alzheimer's disease** Jonathan Cedernaes (Sweden)
12:07PM - 12:15PM	**Conclusion**

Symposium, 121-122

10:45AM - 12:15PM **S63**

S63: Biology and biomarkers of unexplained hypersomnolence

Summary
Unexplained hypersomnolence, in which patients are excessively sleepy, often with prolonged sleep duration, is commonly encountered in the practice of sleep medicine. Idiopathic Hypersomnia, the quintessential disorder of unexplained hypersomnolence, is likely a heterogenous disorder with multiple potential underlying causes.

This symposium will present cutting-edge research regarding the biology and biomarkers associated with unexplained hypersomnolence, with a primary focus on Idiopathic Hypersomnia (IH). Dr. Lynn Marie Trotti of Emory University will present on GABA-related hypersomnolence, and the evidence that at least some proportion of patients with IH may have abnormal potentiation of the GABA-A receptor. Data supporting the use of GABA antagonists, flumazenil and clairithromycin, in IH will also be discussed. Dr. Nathan Cross of Concordia University will present recent data on neuroimaging in cases of excessive daytime sleepiness, with specific focus on altered regional cerebral blood flow in IH. Dr. Robert Thomas of Harvard University will present emerging data that many patients with IH may have circadian rhythm dysfunction as a core feature of the disorder. Finally, Dr. David Plante of the University of Wisconsin-Madison will present recent high-density EEG data examining regional reductions in slow wave activity, which may represent a process that occurs in persons with excessive daytime sleepiness, regardless of the presence or absence of comorbid psychiatric illness.

As a collection of talks, this symposium will present emerging data that suggest potential biological processes that may be responsible for unexplained hypersomnolence. In addition, this symposium will suggest future research directions in this exciting area.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe recent evidence for altered GABA-A activity and circadian period in Idiopathic Hypersomnia.

•Recognize the brain structures neuroimaging and high-density electroencephalography have demonstrated to be abnormal in persons with unexplained hypersomnolence .

•Demonstrate an understanding of the evidence in support of novel treatment strategies directed towards aberrant biology in Idiopathic Hypersomnia.

Target Audience
Clinicians and Researchers with interest in central disorders of hypersomnolence

Chairs:

David T. Plante (United States)

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**GABA-related hypersomnolence** Lynn Marie Trotti (United States)
11:07AM - 11:27AM	**Neuroimaging findings in sleep deprivation and hypersomnolence** Nathan Cross (Canada)
11:27AM - 11:47AM	**Altered circadian period in idiopathic hypersomnia** Robert Thomas (United States)
11:47AM - 12:07PM	**Altered local slow wave activity in hypersomnolence disorder: A transdiagnostic process?** David T. Plante (United States)
12:07PM - 12:15PM	**Conclusion**

10:45AM - 12:15PM **S64**

Basic Science Symposium, 211

S64: The relationship between sleep and torpor: Circuits and mechanisms linking thermoregulation and sleep switch

Summary
The primary aims of this symposium are to address the regulation of torpor, its relationship with sleep and to discuss the common neural mechanisms underlying thermoregulation, sleep and energy homeostasis. Torpor is a unique adaptation to harsh environmental conditions, characterised by a controlled reduction in metabolic rate to levels well below basal metabolic rate, and profound attenuation of physiological functions, wherein body temperature can drop to within a few degrees of ambient temperature.

Torpor is a strictly regulated process, yet the mechanisms that regulate this dramatic physiological state remain poorly understood. In mammals, sleep and energy metabolism are intimately linked, as evidenced by the numerous bidirectional connections between the neural circuits that govern these processes. The maintenance of waking and sleep is regulated by several subcortical structures, which provide neuromodulatory action on the forebrain.

Critically, all of these homeostatic centres are also implicated in the expression of torpor. Wakefulness and sleep are also shaped by the interaction of two processes: the homeostatic process, and the circadian process, which provides a temporal framework for specific waking behaviours, sleep and metabolism. Behaviourally, torpor resembles sleep, but the relationship between these two fundamental states of the organism remains controversial. While it appears that torpor is a state neurophysiologically distinct from both waking and sleep, evidence suggests that torpor and sleep are closely related. For example, while torpor bouts are often initiated from deep sleep, daily torpor in Djungarian hamsters is followed by deep sleep with high EEG slow-wave activity. In this symposium the speakers will review the knowledge about regulatory mechanisms of sleep, thermoregulation and torpor, and will discuss the effects of torpor on the brain and sleep regulation. In perspective, elucidating neural mechanisms of torpor and clarifying the relationship between torpor and sleep will benefit numerous clinical applications and open novel perspectives for inducing hypometabolic states in humans.

The first speaker, Prof Clifford B. Saper, (Harvard Medical School, Boston, USA) will describe the role of hypothalamic preoptic nuclei in sleep and thermoregulation. Then, Prof. William Wisden (Imperial College, London, UK) will outline the circuitry through which an external thermal stimulus may induce sleep and will discuss state-dependent mechanisms of body temperature regulation in mice. Prof. Giovanna Zoccoli (University of Bologna, Italy) will discuss the role of orexins, hypothalamic neuropeptides involved in sleep, body temperature and food intake regulation, in torpor and in sleep alterations accompanying torpor. Prof. Vladyslav Vyazovskiy (University of Oxford, UK) will describe the effects of torpor on cortical neural dynamics and sleep homeostasis, emphasizing differences and similarities in the cortical activity between sleep and torpor in mice. Finally, Prof. Kelly L. Drew (University of Alaska Fairbanks, USA) will describe molecular mechanisms of torpor and arousal in true hibernating species, focusing on adenosine, which is implicated in both energy homeostasis and regulation of sleep.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Describe basic physiological mechanisms underlying sleep regulation

•Identify the role of the hypothalamus in sleep and body

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Sleep and thermoregulatory control by the preoptic area** Clifford B. Saper (United States)
11:03AM - 11:19AM	**Neural circuitry binding sleep and temperature regulation** William Wisden (United Kingdom)
11:19AM - 11:35AM	**Orexins as a link between thermoregulation, sleep and torpor** Giovanna Zoccoli (Italy)
11:35AM - 11:51AM	**The relationship between torpor and sleep: focus on cortical network activity and sleep homeostasis** Vladyslav Vyazovskiy (United Kingdom)
11:51AM - 12:07PM	**Neurochemical mechanisms driving sleep and thermoregulation in the circannual rhythm of hibernation** Kelly Drew (United States)
12:07PM - 12:15PM	**Conclusion**

Scientific Programme

10:45AM - 12:15PM **S65**

Symposium, 212-214

S65: Reconsidering NREM parasomnia: Toward a better understanding of pathophysiology and treatment

Summary
NREM parasomnias are frequent sleep disorders. Usually NREM parasomnias occur during childhood and early adolescence and disappear with aging. But in up to 2-4% they occur in adults with sometimes relevant, psychosocial consequences. In contrast to REM behavior disorder NREM parasomnias are not associated with neurodegeneration. Their pathophysiology is not well understood. Animal models do not exist so far. One SPECT study and few EEG studies could confirm a coexistence of wake and sleep stages during NREM parasomnia episodes. One imaging study showed hypoperfusion during episodes of sleepwalking within the frontal lobe and parietal cortex and activation of the cingulate and thalamus. If these neuroanatomical correlates are the cause or consequence is still unclear. Hypoperfusion of the frontal cortex may explain inhibited response to external stimuli and that of the vermis the inadequate motor behavior.

Electrophysiological findings suggest that fragmented sleep with reduced slow wave sleep causes increased slow wave sleep pressure leading to increased susceptibility to incomplete arousal. Recently polysomnographic findings were correlated to behavior showing that arousal leading to wake state allow patients to recall dreams associated with the NREM motor behavior, whereas arousals with diffuse EEG causes confusion. Intracerebral recordings with stereo-EEG of patients with epilepsy and NREM parasomnia confirmed the imaging results. Local fast wake-like EEG activations were recorded in the motor and cingulate cortices while bursts of sleep-like delta waves persisted in the frontal, hippocampal and parietal associative cortices. In one case thalamic activation preceded cortical activation. The extent to which other cortical and subcortical networks may disturb the persistence of slow wave activity in the thalamocortical circuit seems to be of importance for the type of arousal.

Both imaging and EEG studies give the key structure for the creation of an animal model for NREM parasomnia. Genetics contribute to the disorder, but seem to be very heterogeneous. An association to the HLA system was found and opens a possible link to neuroimmunology.

Until today different therapies have been proposed, but so far none of the therapies has been evaluated in a systematic study and results are conflicting reflecting the gap of knowledge in NREM parasomnia.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate an understanding of the current knowledge about the pathophysiology in different dimensions
- imaging
- electrophysiology
- genetics

•Recognize an animal model based on recent findings

•Explain the current approaches in therapy
- current treatments and what we learn from them
- future therapy strategies

•Interpret and use the approaches to establish diagnostic tools

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Animal models for NREM parasomnia** Pierre-Hervé Luppi (France)
11:03AM - 11:19AM	**Imaging findings and behavior in NREM parasomnia** Régis Lopez (France)
11:19AM - 11:35AM	**Is there a genetic link to NREM parasomnia?** Anna Heidbreder (Germany)
11:35AM - 11:51AM	**Neuronal networks from intracerebral recordings** Steve A. Gibbs (Canada)
11:51AM - 12:07PM	**New approaches in polysomnography analysis of NREM parasomnia** Geert Mayer (Germany)
12:07PM - 12:15PM	**Conclusion**

Symposium, 216 - 215-216

10:45AM - 12:15PM **S66**

S66: Social aspects of sleep

Summary
A growing number of studies within sleep research are focusing on social aspects. In this symposium, four speakers at the intersection of sleep and social psychology will present the most up-to-date research in this burgeoning field. This integrative focus includes social effects of sleep deprivation, as well as social determinants of sleep. The speakers are all at the forefront of this research area, and will review the current literature, as well as present new unpublished findings.

In the first talk, Dr. Axelsson will review the field and present data on how sleepiness and sleep loss are related to the drive for social behavior. Dr. Sundelin will follow this presentation by presenting work on interpersonal communication during sleep deprivation, and how this relates to social impressions of someone who is sleep deprived. Dr. Ben Simon will then discuss how sleep deprivation triggers a behavioral and neural phenotype of loneliness that can be perceived by others, and make them feel lonelier as a consequence. Following this model of a self-reinforcing cycle of loneliness, Dr. Prather will present findings on the impact of social rejection on subjective and objective measures of sleep. These findings regard social rejection on a wider scale, such as discrimination, as well as more interpersonal social rejection, indicating that these experiences negatively affect both sleep quality and quantity.

Together, these presentations cover several social aspects of sleep, specifically how communication and negotiation skills are affected by sleep loss, and how the resulting social impressions of sleep-deprived individuals may contribute to a cyclic effect of poor sleep and poor social experiences.

Learning Objectives
Upon completion of this CME activity, attendees should be able to:

•Identify the impact of sleep deprivation on the social interest and social evaluation of others.

•Demonstrate understanding of the effects of sleep deprivation on interpersonal communication and negotiation outcomes.

•Identify the relevant neural networks associated with increased social withdrawal following sleep loss.

•Describe the current literature linking sleep and social rejection, including racial discrimination.

Target Audience
Researchers in the field of social aspects of sleep and sleep loss, including those with a focus in the cognitive and emotional domain, practitioners working with sleep-related issues, and anyone interested in the basic research on social effects and determinants of sleep

Chairs:

Tina Sundelin (Sweden)

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Does sleep loss and sleepiness drive social behavior?** John Axelsson (Sweden)
11:07AM - 11:27AM	**Effects of sleep loss on interpersonal communication and social impressions** Tina Sundelin (Sweden)
11:27AM - 11:47AM	**Sleepless and alone: The neural correlates of social withdrawal without sleep** Eti Ben Simon (United States)
11:47AM - 12:07PM	**The impact of social rejection on subjective and objective measures of sleep** Aric Prather (United States)
12:07PM - 12:15PM	**Conclusion**

Oral Abstract, 110

10:45AM - 12:15PM O25: Pregnancy and SBD

Chairs:
R John Kimoff (Canada)
Helena Hachul (Brazil)

10:45AM - 11:00AM	**PREVALENCE OF OBSTRUCTIVE SLEEP APNEA IN OBESE PREGNANT WOMEN AND ITS EFFECTS ON PREGNANCY-RELATED COMPLICATIONS** Hee Jung Kim (Republic of Korea)
11:00AM - 11:15AM	**SLEEP-DISORDERED BREATHING IN GESTATIONAL HYPERTENSION AND PREECLAMPSIA: IMPACT ON MATERNAL AND FETAL OUTCOMES** Danielle Wilson (Australia)
11:15AM - 11:30AM	**PLACENTAL OXYGEN TRANSFER REDUCES HYPOXIA/REOXYGENATION SWINGS IN FETAL BLOOD IN A SHEEP MODEL OF GESTATIONAL SLEEP APNEA** Ramon Farre (Spain)
11:30AM - 11:45AM	**REAL-WORLD EVIDENCE OF IMPROVED PREGNANCY OUTCOMES WITH PAP THERAPY FOR GESTATIONAL SLEEP APNEA** Mihaela Bazalakova (United States)
11:45AM - 12:00PM	**SNORING DURING PREGNANCY AS A PREDICTOR OF FUTURE OBSTRUCTIVE SLEEP APNOEA: A CASE-CONTROL STUDY** Yu Sun Bin (Australia)
12:00PM - 12:15PM	**MATERNAL SLEEP POSITION IN THE THIRD TRIMESTER OF PREGNANCY AND THE RISK OF STILLBIRTH** Robin Cronin (New Zealand)

Symposium, 217-219

10:45AM - 12:15PM **S67**

S67: Depression and sleep: New insights in measurement and treatment

Summary
Depression is highly comorbid with sleep disturbances and shares many overlapping daytime symptoms (e.g., concentration difficulties, reduced sleep, fatigue). In particular, individuals with comorbid depression and insomnia represent a challenging group to treat, as insomnia may predate the depression, and can contribute to suboptimal treatment response, remain after successful depression treatment, and contribute to depressive relapse. Therefore, valid and reliable measurement of sleep disturbance in this population is critical to better understand the mechanisms underlying the relationship between these two related but distinct conditions and has important treatment implications.

For instance, various sleep parameters (e.g., sleep duration, sleep efficiency, and circadian rhythm disruptions) are distinct and may differentially influence depression, yet their effects on depression response have not been comprehensively studied. Approaches have focused on using retrospective, self-reported measures to assess sleep disturbance in individuals with depression and have largely ignored the assessment of other related factors (e.g., circadian factors) or other methodologies (e.g., pupillometry). This symposium describes the latest research on approaches to measurement in depression and sleep. Topics include measurement of insomnia improvement in those with insomnia and depression; multifaceted, prospective measurement of sleep and circadian factors in sleep and depression, with a focus on evaluating bidirectional relationships; the importance of measuring specific insomnia beliefs in over and above general negative cognitive style in comorbid insomnia and depression; a comparison of self-reported and pupillometric assessments of sleepiness in individuals with depression; and the importance of measuring circadian preference as it relates to treatment outcome following cognitive behavioral therapy for insomnia in individuals with comorbid insomnia and depression.

Attendees will learn about how advances in the measurement of sleep in depression has furthered our understanding of the key role that various sleep disturbances play in maintaining depression, the importance of measuring insomnia-specific beliefs when assessing comorbid insomnia and depression, as well as the importance of valid and reliable measurement of sleep and circadian factors in predicting treatment response in those with comorbid insomnia and depression. Measurement is a critical component of evidence-based assessment and treatment, and investigation into novel methods of measuring sleep disturbance in depression with increased validity and reliability is pertinent when comorbidity is the norm, rather than the exception. The importance of the findings from this symposium is underscored by the implications they have on both the assessment and treatment of sleep and circadian disturbance and depression.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize multitrait, multimethod measurement of depression and sleep in those with sleep disruption.

•Identify the importance of insomnia specific beliefs in predicting insomnia severity in the comorbid depression and insomnia.

•Recall the mixed results with regards to CBT-I in the treatment of comorbid depression and insomnia.

•Discuss the potential importance of evaluating circadian

Scientific Programme

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:03AM	**Predicting insomnia improvement in those with comorbid insomnia and depression** Colleen Carney (Canada)
11:03AM - 11:19AM	**Multifaceted measurement of sleep and circadian factors in sleep and depression** Daniel Taylor (United States)
11:19AM - 11:35AM	**Specificity of insomniatypic beliefs in predicting insomnia severity in those with depression** Nicole Carmona (Canada)
11:35AM - 11:51AM	**Self-reported sleepiness versus pupillometricly measured sleepiness in depression** Kathryn Roecklein (United States)
11:51AM - 12:07PM	**Circadian preference as a moderator of depression outcome following cognitive behavioral therapy for insomnia plus antidepressant medications** Lauren Asarnow (United States)
12:07PM - 12:15PM	**Conclusion**

Symposium, 220 - 220-222

10:45AM - 12:15PM **S68**

S68: On light, circadian rhythms and health

Summary
Light is the dominant cue for synchronizing the circadian clock (Roenneberg, Kantermann, Juda, Vetter, & Allebrandt, 2013), through an active process called entrainment. A central pacemaker in the hypothalamic suprachiasmatic nucleus (SCN) generates circa 24-hour rhythms in multiple aspects of physiology and behavior, including the timing of sleep and wakefulness. While humans have evolved under a 24-hour solar day and night, we now spend the majority of our time within constructed environments with artificial lighting. Indoor lighting conditions can disrupt stable circadian entrainment, adversely affecting our sleep, health and well-being.

This symposium, chaired by Dr. Myriam Juda (Psychology Department at Simon Fraser University), will discuss novel multi-component research strategies in the field of circadian biology, that are currently being developed with the aim of improving health and well-being in the general population.

The first two talks will focus on advances and novel approaches to measuring quantities central to circadian biology. Dr. Till Roenneberg (Institute of Medical Psychology at the University of Munich) will report on his growing actimetry database (currently around 20,000 days and nights in 600 participants). With the possibility of concurrently recording activity and light by wrist-worn devices, we now can analyze objectively recorded light-sampling behavior and relate it to objectively recorded sleep-wake behavior. These analyses contain great day-to-day detail, including the relationships between sleep timing, sleep structure, photoperiod and social schedules.

Dr. Céline Vetter (Department of Integrative Physiology at the University of Colorado) will introduce her novel, data-driven approach to quantify light exposure in real-life settings, and demonstrate its usefulness in relation to sleep behavior, mood, and physical health.

Next, Dr. Kenneth Wright (Department of Integrative Physiology at the University of Colorado) will discuss the influence of daylight-saving time on exposure to sunlight and potential consequences for circadian timing, health and safety.

Lastly, we will embark on considering implications of circadian biology as it pertains to specific medical applications. Dr. Elizabeth Klerman (Department of Medicine at Harvard Medical School) will report on two new studies investigating the effects of timing of induction on labor duration and interactions of light exposure on melatonin concentrations and uterine contractions in late-term pregnancy. Since light can suppress melatonin, there may be implications for the use of melatonin agonists or antagonists and lighting conditions in changing the number of uterine contractions and possibly labor duration.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Demonstrate basic concepts in circadian biology: the circadian clock and entrainment

•Recall circadian disruption and its consequence to our health

health

•Discuss the applicability of circadian biology and light therapy in medical interventions

10:45AM - 10:47AM	**Introduction**
10:47AM - 11:07AM	**Epidemiology of human light-sampling behaviour** Till Roenneberg (Germany)
11:07AM - 11:27AM	**Daylight saving time and light exposure** Kenneth Wright (United States)
11:27AM - 11:47AM	**A novel data-driven approach to probe the link between light and health** Céline Vetter (United States)
11:47AM - 12:07PM	**Circadian rhythms, light, melatonin, and pregnancy** Elizabeth Klerman (United States)
12:07PM - 12:15PM	**Conclusion**

Technologist Program, 223-224

10:45AM - 11:30AM T12: Medical ethics (workshop)

Chairs:
Michael Eden (United States)
Shalanda Mitchell (United States)

10:45AM - 11:30AM	**Medical ethics** Michael Eden (United States)

Technologist Program, 223-224

11:30AM - 12:30PM T13: Dealing with the difficult patient

Chairs:
Shalanda Mitchell (United States)
Michael Eden (United States)

11:30AM - 12:30PM	**Dealing with the difficult patient** Yuichi Inoue (Japan)

Symposium, BR A - Ballroom A

12:30PM - 2:00PM **S69**

S69: Is narcolepsy a spectrum disorder including IH, NT2 and NT1?

Summary
This symposium will address the possibility that some forms of Idiopathic Hypersomnia (IH) and Narcolepsy Type 2 (NT2) may have subtle loss of hypocretin neurons compared with Narcolepsy Type 1 (NT1) and therefore IH, NT2 and NT1 are part of a condition of a Narcolepsy Spectrum Disorder.

Hypocretin is integral to the pathophysiology of narcolepsy and we will review the current understanding of hypocretin in the control of sleep and wakefulness and discuss what is currently known about hypocretin loss in central neurological disorders of excessive sleepiness.

Should some forms of IH be considered a subtype of narcolepsy? Similarities in clinical presentation, electrophysiological similarities, and the association of REM sleep phenomena of IH, NT2 and NT1 with hypocretin loss will be discussed.

Are environmental triggers of narcolepsy similar in IH, NT2 and NT1, therefore leading to a similar pathophysiology? If IH, NT2 and NT1 are all part of a narcolepsy spectrum disorder, are excessive sleepiness and the degree of REM sleep abnormalities associated with the severity of hypocretin loss? Is the cataplexy of NT1 a manifestation of a high degree of neuronal hypocretin loss, and are the REM sleep manifestations of NT2, and the excessive sleepiness of IH due to lesser degrees of hypocretin loss?

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the impact of the hypocretin system in health and in narcolepsy

•Identify whether hypocretin loss contributes to the clinical features of idiopathic hypersomnia (IH), narcolepsy type 2 (NT2) and narcolepsy type 1 (NT1)

•Recall the pathogenesis (environmental factors in particular) for the development of narcolepsy

•Recognize the clinical features of IH, NT2 and NT1

Target Audience
Sleep specialists, psychologists, technicians

Chairs:

Ulf Kallweit (Germany)
Michael Thorpy (United States)

12:30PM - 12:32PM **Introduction**

Scientific Programme

12:32PM - 12:52PM	**Hypocretin neurons in health and disease** Mehdi Tafti (Switzerland)
12:52PM - 1:12PM	**The neuronal and csf hypocretin associations with REM sleep phenomena and narcolepsy** Thomas Scammell (United States)
1:12PM - 1:32PM	**Environmental factors for the development of narcolepsy and IH** Fang Han (China)
1:32PM - 1:52PM	**Similarities in the clinical features of IH, NT2 and NT1** Yves Dauvilliers (France)
1:52PM - 2:00PM	**Conclusion**

Panel Discussion, 118 - 118-120

12:30PM - 2:00PM **D08** **D08: Telemedicine in sleep medicine**

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
Sleep medicine has been an expanding discipline during the last few decades. The prevalence of sleep disorders is increasing, and sleep centers are expanding in hospitals and in the private care environment to meet the demands. Sleep medicine has evidence-based guidelines for the diagnosis and treatment of sleep disorders. However, the number of sleep centers and caregivers in this area is not sufficient. Many new methods for recording sleep and diagnosing sleep disorders have been developed. Many sleep disorders are chronic conditions and require continuous treatment and monitoring of therapy success. Cost-efficient technologies for the initial diagnosis and for follow-up monitoring of treatment are important. It is precisely here that telemedicine technologies can meet the demands of diagnosis and therapy follow-up studies. Wireless recording of sleep and related biosignals allows diagnostic tools and therapy follow-up to be widely and remotely available.

Moreover, sleep research requires new technologies to investigate underlying mechanisms in the regulation of sleep in order to better understand the pathophysiology of sleep disorders. Home recording and non-obtrusive recording over extended periods of time with telemedicine methods support this research. Telemedicine allows recording with little subject interference under normal and experimental life conditions.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Background for telemedicine applications in sleep medicine

•Compliance with therapy in sleep apnea using telemedicine

•Telemedicine applications for insomnia

•Smartphone applications use in sleep medicine reviewed systematically

Target Audience
Pulmonologists in sleep medicine, sleep specialists, sleep technologists

Chairs:
Babak Amra (Islamic Republic of Iran)

12:30PM - 12:32PM **Introduction**

12:32PM - 12:48PM	**Telemedicine: What can be achieved through engineering** Thomas Penzel (Germany)
12:48PM - 1:04PM	**Telemedicine guideline in sleep medicine** Christoph Schoebel (Germany)
1:04PM - 1:20PM	**Global prevalence of OSA estimation – importance for telemedicine applications** Atul Malhotra (United States)
1:20PM - 1:36PM	**Diagnostic telemedicine applications** Ingo Fietze (Germany)
1:36PM - 1:52PM	**The smartphone tool: Consumer and diagnostic apps** Babak Amra (Islamic Republic of Iran)
1:52PM - 2:00PM	**Conclusion**

Pediatric Symposium, 109

12:30PM - 2:00PM **S70**

S70: Sleep and mental health in adolescents

Summary
Adolescence, covering the second decade between childhood and adulthood, is a period of fundamental development in brain and behavior, and also a time of increased vulnerability to mental health problems. Good quality and sufficient sleep is critical for optimal mental health; sleep complaints are a key symptom of psychiatric disorders, and shorter sleep is a known risk factor for depression, substance use disorders, and suicide. Given the substantial changes that occur in sleep across adolescence, with shorter sleep duration, later bedtimes, and altered sleep composition in older adolescents, it is important to focus on sleep-mental health associations during this period to ultimately determine whether sleep modifications are effective at lowering risk for mental health issues.

This symposium brings together experts in the area of sleep and mental health in adolescence, who will present new research, considering experimental, observational, and clinical data. Dr. Franzen will present research showing the impact of insufficient sleep on affective functioning and associations between sleep and suicidality in ultra-high risk adolescents. Dr. Goldstone will present longitudinal data in adolescents showing the bidirectional relationships between sleep and mental health issues, particularly in relation to substance use (alcohol and marijuana). Dr. Ivenenko will present research about the interactions between sleep, emotional regulation and attention in adolescents, in the context of attention deficit disorder. Finally, Dr. Allen will discuss the potential pathways that lead from insomnia to the development of mental health issues, particularly anxiety and depression, in adolescence, also considering the efficacy of cognitive-behavioral sleep interventions in at-risk adolescents.

This symposium provides a unique focus on the importance of sleep for mental health, considering adolescence as a critical period when individuals are vulnerable to the development of mental health issues, on the one hand, but also amenable to benefit from treatment interventions that work by modifying behaviors such as sleep, on the other.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Identify bidirectional links between sleep and mental health issues during adolescence
- Demonstrate knowledge about the relationship between short sleep and effective functioning and suicidality risk in adolescents
- Demonstrate knowledge about the contribution of poor sleep to the exacerbation of cognitive, emotional, and social deficits in adolescents with ADHD
- Identify who benefits most from cognitive-behavioral sleep interventions in adolescents at-risk for mental health issues

Target Audience
Researchers, trainees, and clinicians

Chairs:

Fiona Baker (South Africa)

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:52PM	**Sleep and affective functioning in adolescents** Peter Franzen (United States)
12:52PM - 1:12PM	**A longitudinal view on relationships between sleep, substance use, and mental health in adolescents** Aimee Goldstone (United States)
1:12PM - 1:32PM	**The role of sleep in attention deficit hyperactivity disorder in adolescents** Anna Ivanenko (United States)
1:32PM - 1:52PM	**Efficacy of sleep interventions in at-risk adolescents** Nicholas Allen (United States)
1:52PM - 2:00PM	**Conclusion**

Symposium, 121-122

12:30PM - 2:00PM **S71**

S71: Neuroscience and neuroimaging insights into central disorders of hypersomnolence

Summary
Central disorders of hypersomnolence are characterized by excessive daytime sleepiness despite normal timing of nocturnal sleep. This symposium will cover the latest neuroscience and neuroimaging findings in these disorders: narcolepsy type 1 & 2 (NT1 & NT 2) and idiopathic hypersomnia (IH).

While NT1 originates from a selective loss of hypothalamic hypocretin-producing neurons, the pathophysiology underlying NT2 and IH remains to be fully elucidated. It is probable that different causes may lead to these phenotypes. All are diagnosed according to the current International Classification of Sleep Disorders - third edition (ICSD-3). This classification distinguishes NT2 and IH based upon one neurophysiological test: the Multiple Sleep Latency Test (MSLT). Clinically, the distinction between NT2 and IH is not clear. Furthermore, the current classification makes no distinction between IH with a short versus a long sleep time. The current classification might actually reflect the pathophysiology of distinct disease entities or might arbitrarily split a heterogeneous group of patients. More understanding of the psychophysiology of these disorders is thus very much needed.

This symposium will cover the latest neurobiological and neuromaging findings, which can help to improve classification and can shed light on the neural mechanisms involved in the regulation of sleep, vigilance and alertness. The chairperson and the proposed speakers represent clinical and fundamental experts in the field worldwide and together will highlight both findings of their recent research and provide an overview of the field.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Idenitfy the current limitations in the clinical and pathophysiological distinction between central disorders of hypersomnolence

•Recall the different types of anatomical and functional assessments provided by neuroimaging and basic science in the study of central disorders of hypersomnolence

•Discuss the latest neurobiological and neuroimaging insights into the pathophysiology of narcolepsy type 1, type 2 and idiopathic hypersomnia

Target Audience
Both basic sleep scientists and sleep clinicians, with interest ranging from basic and neuroimaging findings in central disorders of hypersomnolence to clinical phenotypes

Chairs:

Rolf Fronczek (The Netherlands)

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:52PM	**Classifying and diagnosing central disorders of hypersomnolence** Rolf Fronczek (The Netherlands)
12:52PM - 1:12PM	**Mechanisms of sleepiness and cataplexy in narcoleptic mice** John Peever (Canada)
1:12PM - 1:32PM	**Structural and functional MRI findings in narcolepsy** Ysbrand Van Der Werf (The Netherlands)
1:32PM - 1:52PM	**Functional and structural neuroimaging of idiopathic hypersomnia** Thien Thanh Dang-Vu (Canada)
1:52PM - 2:00PM	**Conclusion**

Symposium, 211

12:30PM - 2:00PM **S72**

S72: Infra-slow oscillations: The keepers of sleep?

Summary
Infra-slow oscillations (ISOs) are periodic alterations in electrophysiological signals reoccurring in cycles that range from 10 to 100 s (corresponding frequencies, 0.01 to 0.1 Hz). Their spontaneous generation in the brain has been observed during both waking and sleep states, in both humans and animals, across brain structures and spatial scales. ISOs include, but are not limited to, the dynamics of single unit firing rates, the periodic variations in the direct electrical potential, amplitude coupling across frequencies, hemodynamic activities, pupil size changes, and leg movement activity during sleep. This makes ISOs interesting candidates for translational approaches in the field concerning sleep disorders.

In this symposium we will share our insights into the recent advances of this new field from both, the basic and clinical researcher's perspective. We address four overarching questions: First, how do ISOs signal varying levels of arousability in sleep and are related to the micro- and macrostructure of sleep? Second, how do the cerebral and peripheral correlates of ISOs during sleep relate to each other? Third, what potential functions ISOs might indicate or convey? And fourth, how the strikingly similar findings of ISOs in rodent vs human sleep lead the way towards novel translational approaches concerning the dynamic regulation of healthy and disordered sleep.

The first presentation deals with a 0.02 Hz-oscillation during sleep that was previously identified in mice and confirmed in humans. It divides the non-REM of mice into periods of fragility and continuity based on the resilience to an acoustic noise. We will explore whether this oscillation is a generalizable hallmark of non-REM fragility in mice that shapes the microarchitectural organization of natural sleep through setting time windows permissive for non-REM termination.

The second presentation will focus on how the fluctuations of pupil size and other measures of the autonomic nervous system are related to the changes in sleep states and arousability. We will compare and discuss data acquired in naturally sleeping mice and humans.

The third presentation will deeply classify the 0.02 Hz-oscillation in human non-REM in signal property changes of polysomnography data regarding its presence, properties and cross-frequency and -modality relations. We will explore these alterations and relations in larger human population samples and focus on cross-sectional life-time changes (childhood, adolescence, adult, middle aged, elderly), its potential bearing on general memory consolidation and on clinical populations with subtle sleep and memory alterations (e.g. patients with major depression or schizophrenia).

The fourth presentation will complete the bridge from bench to bed by addressing the role of infra-slow oscillations in sleep disorders such as insomnia and sleep-related movement and respiratory disorders. We will compare ISOs between healthy and disordered sleep and explore their potential role in the diagnosis and treatment of sleep disorders.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recall infra-slow periodicities in band-limited power dynamics of rodent and human non-REM sleep and their peripheral correlates

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:52PM	**The 0.02 Hz oscillation times spontaneous transitions out of non-REM sleep** Anita Lüthi (Switzerland)
12:52PM - 1:12PM	**Pupil size as a robust readout for cortical states changes in mice and humans** Daniel Huber (Switzerland)
1:12PM - 1:32PM	**Deep description of infra-slow alterations in human non-REM sleep, dismantling age and mental health** Frederik D. Weber (The Netherlands)
1:32PM - 1:52PM	**Infra-slow oscillations in healthy and disordered sleep** Stephany Fulda (Switzerland)
1:52PM - 2:00PM	**Conclusion**

Symposium, 212-214

12:30PM - 2:00PM **S73**

S73: Upper airway stimulation therapy for obstructive sleep apnea: Theoretical considerations, clinical evidence, and implementation strategies

Summary
Upper airway stimulation (UAS) is a novel technique for the treatment of select patients with severe obstructive sleep apnea (OSA) who have been unable to tolerate CPAP. It involves an implanted device, which stimulates the hypoglossal nerve to enhance pharyngeal muscle tone, and thereby relieve upper airway obstruction, during sleep.

This symposium is an in-depth and comprehensive review UAS, including its theoretical basis, proof-of-concept validation studies, clinical trials, and postmarketing experience. It will also provide attendees with practical guidelines for the implementation of an UAS program and for the treatment of patients utilizing this device. Faculty members are leading experts in this field, and represent Centers with the highest level of clinical and research experience with this treatment. Below is an outline:

•Neurophysiology of the upper airway and the mechanism of upper airway stimulation in the treatment of OSA
UAS exploits the pathway of "inadequate muscle activation" to prevent obstruction in the upper airway during sleep. UAS moves the hyoid upward and forward, with a predictable increase in the oro-pharygeal area but an unexpected increase in the velopharyngeal airway, confirming an action of the hyoid apparatus on potential sites of multisite collapse in OSA

•Efficacy and safety: A summary of clinical studies and experience
The clinical trials encompassed 126 patients; in the ensuing 2 years, published studies have added more than 150 patients to the database; results with be summarized in terms of efficacy and safety

•Patient screening, selection, and surgical device implantation
Established recommendations for the evaluation and selection of patients, including patient characteristics, polysomnographic criteria, and use of drug induced sleep endoscopy, will be summarized. More recent modifications will also be summarized, which expand the scope of the procedure to candidates previously considered not appropriate. The surgical implantation process will be demonstrated and reviewed.

• Post-operative management and long-term considerations
This session will review guidelines surrounding stimulator programming, following implantation, to provide optimal therapy. This relies on polysomnographic voltage titration. It will also review advanced strategies to address unsuccessful titrations and adverse effects. Finally, it will address long term followup strategies.

•Practical aspects of initiating an upper airway stimulation program
These include critical issues for the success of such a program, including obtaining administrative support, setting up an environment of multidisciplinary professional collaboration, financial assistance for patients, among other

Ample opportunity will be provided for audience participation and discussion with faculty members. Audience members will be

gauge course effectiveness.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:48PM	**Neurophysiology of the upper airway and the mechanism of upper airway stimulation** Nico de Vries (The Netherlands)
12:48PM - 1:04PM	**Efficacy and safety: A summary of clinical studies and experience** Maurits Boon (United States)
1:04PM - 1:20PM	**Patient screening, selection, and surgical device implantation** Maurits Boon (United States)
1:20PM - 1:36PM	**Post-operative management and long-term considerations** Clemens Heiser (Germany)
1:36PM - 1:52PM	**Practical aspects of initiating an upper airway stimulation program** Olivier Vanderveken (Belgium)
1:52PM - 2:00PM	**Conclusion**

Symposium, 216 - 215-216

12:30PM - 2:00PM **S74**

S74: Sleep, mental health, and performance in elite athletes

Summary
The issue of sleep in elite athletes has received increased attention in recent years for several reasons, including (1) the recognition by the athletics community that sleep is important to performance, (2) the recognition of the sleep community that athletes represent a population with unique characteristics that are worth studying, and (3) the recognition by sleep health interventionists that see the athletics population as an ideal context for developing healthy sleep interventions.
This symposium proposes to provide an update regarding the developments in this area, especially in the contexts of mental health, assessment, and implementation. The first presentation will focus on connections between sleep and mental health in athletes and discuss the highlighting of sleep factors in the forthcoming IOC mental health consensus statement. The second presentation will focus on emerging issues in assessment – namely that many measures developed for the general population may not apply well to athletics; this session will explain why and what can be done scientifically to better handle this issue. The third presentation will address the issue of treating common sleep problems in athletes, and the challenges faced when implementing intervention programs. Finally, there will be a presentation on the current state of the science and practice on dealing with jet lag, which is a major problem for athletes, especially given international travel.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Conceptualize the relationships between sleep and mental health in the context of elite athletes

•Recognize the unique challenges and opportunities regarding assessment of sleep and related factors in athletes

•Recognize some of the unique situational factors that play a role in implementing interventions and how they may be overcome

•Identify the limitations of current approaches to jet lag in athletics populations and consider strategies for implementing interventions

Target Audience
Clinicians interested in treating sleep problems with athletes or working with athletics (or other) organizations or researchers interested in real-world applications of sleep interventions and challenges

Chairs:

Michael Grandner (United States)
Charles Samuels (Canada)

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:52PM	**Mental health in elite athletes and the role of sleep: An update on the international olympic committee consensus statement on mental health** Michael Grandner (United States)
12:52PM - 1:12PM	**Assessment of sleep in elite athletes: Standardized approaches for when everyone is an outlier** Charles Samuels (Canada)
1:12PM - 1:32PM	**Treating sleep problems and disorders in elite athletes: Adaptive solutions to varied clinical challenges** Jonathan Charest (Canada)
1:32PM - 1:52PM	**Travel and sport: Current approaches to optimizing performance in the context of travel** Ian Dunican (Australia)
1:52PM - 2:00PM	**Conclusion**

Symposium, 217-219

12:30PM - 2:00PM **S75**

S75: Role of sleep and sleep therapies in the pathogenesis and outcomes of neurologic disorders

Summary
The role of sleep and sleep therapies in the pathogenesis and outcomes of several highly prevalent neurologic disorders associated with substantial morbidity and healthcare costs is becoming increasingly established. Bidirectional relationships between sleep and neurologic disorders represent a critical opportunity to impact outcomes in neurologic populations. While the prevalence of sleep-disordered breathing in some neurologic populations exceeds general population estimates, routine screening is rare and appreciation of the diagnostic and therapeutic challenges posed by neurologic disease is lacking. The goal of this symposium is to bolster awareness of the expanding role of sleep and sleep therapies on the pathogenesis and outcomes of neurologic disorders.

Speakers will discuss the impact of sleep and its treatments including sleep apnea, insomnia and circadian rhythm disorders on prevalent neurologic disorders emphasizing the role of sleep on brain health and existing evidence exploring effects of sleep therapies on neurologic outcomes. The faculty will focus on Alzheimer's disease (AD)/Mild cognitive impairment (MCI), stroke, traumatic brain injury (TBI), and epilepsy reviewing firmly established clinical, neurobiological and electrophysiological relationships and cutting edge literature underscoring the expanding role of sleep in the neurosciences.

Madeleine Grigg-Damberger, MD will discuss recent studies which identify: 1) sleep fragmentation, short sleep duration and excessive daytime sleepiness as early biomarkers for MCI, incipient AD, and future cognitive decline; 2) how increased cerebrospinal fluid (CSF) orexin levels parallel cognitive decline and sleep deterioration in AD; and 3) how sleep loss in AD alters CSF beta-amyloid (Aβ) dynamics, decrements in NREM 3 sleep decrease clearance of Aβ from brain, and intermittent nocturnal hypoxemia increases Aβ production.

Brian Murray, MD will review: 1) increasing evidence in large prospective populations that untreated OSA is an independent risk factor for ischemic stroke particularly in adults younger than 50 years of age; 2) the roles of OSA in increasing arterial stiffness, atrial fibrillation, damaging carotid endothelium, and intermittent hypoxemia triggering the production of reactive oxygen species; and 3) whether early PAP therapy truly improves long-term rehabilitative and survival outcomes.

Nancy Foldvary-Schaefer, DO, MS will review: 1) crucial links between late-onset or poorly controlled epilepsy and unrecognized OSA; 2) recent studies which confirm PAP therapy can improve seizure control; 3) and the relationship between sleep and sudden unexpected death in epilepsy (SUDEP).

Christian Baumann, MD will discuss: 1) the most prevalent sleep-wake disturbances associated with traumatic brain injury; 2) the role of disturbed sleep on morbidity; and 3) the impact of sleep-related interventions on recovery in patients with traumatic brain injury.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Identify how and why short sleep duration, fragmented sleep, varying degrees of intermittent nocturnal hypoxemia, and excessive daytime sleepiness (EDS) in older adults are associated with Minimal Cognitive Impairment, incident Alzheimer's disease and rates of

Scientific Programme

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:48PM	**Role of sleep in the neurobiology of Alzheimer's disease and mild cognitive impairment** Madeleine Grigg-Damberger (United States)
12:48PM - 1:04PM	**Stroke and sleep: Pathogenic mechanisms and treatment effects** Brian Murray (Canada)
1:04PM - 1:20PM	**Traumatic brain injury: What's sleep got to do with it?** Christian Baumann (Switzerland)
1:20PM - 1:36PM	**Practical implications of sleep and sleep therapies on epilepsy** Nancy Foldvary-Schaefer (United States)
1:36PM - 1:44PM	**Conclusion**

Symposium, 220 - 220-222

12:30PM - 2:00PM **S76**

S76: The future of assessing fitness to drive in sleep disorders

Summary
Sleepiness is the key cause of 20% of road accidents. Obstructive sleep apnea and shift work clearly increase the risk of sleepiness-related road crashes and are common in commercial drivers, with many patients still driving without treatment. There is substantial individual variability in the impact of these factors on sleepiness and driving impairment. Subjective sleepiness may help to identify individuals at high risk of road crashes, particularly sleepiness while driving, however, responses may be falsified when drivers are concerned about the impact on their license or work. The maintenance of wakefulness test (MWT) is the current standard for objectively measuring sleepiness, and is related to driving impairment in sleep apnea although there is only limited evidence relating it to crash risk.

This symposium will present new data from a large cohort evaluating the relationship between subjective sleepiness, polysomnographic measures, MWT results and crash risk, providing the most robust results for using these measures to assess fitness to drive.

The MWT is based on assessing sleepiness from EEG sleep latency on a single day in the laboratory. The symposium will present the following data on novel measures and paradigms to objectively assess sleepiness in sleep disorders patients. The assessment of sleep latency, vigilance and simulated driving performance following sleep deprivation discriminates which sleep apnea patients are vulnerable to restricted sleep and their daytime driving performance. Novel analysis of the nocturnal EEG in sleep apnea patients can also determine which individuals have impaired daytime driving.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify the impact of sleep disorders on road safety and motor vehicle crash risk

•Recognize the individual variability in sleep disorders on the impact of crash risk

•Recall how to use current biomarkers to assess individual road safety and crash risk and fitness to drive, including the latest evidence for these measures

•Recall novel paradigms and biomarkers for assessment of alertness, sleepiness and assessing fitness to drive and the current evidence for these measures

Target Audience
Clinical sleep specialists, road safety and occupational sleep researchers, occupational physicians, and policymakers

Chairs:

Mark Howard (Australia)

12:30PM - 12:32PM	**Introduction**
12:32PM - 12:52PM	**The impact of sleep restriction and sleep disorders in road safety** Markku Partinen (Finland)
12:52PM - 1:12PM	**What are the best biomarkers to determine fitness to drive in sleep apnea?** Pierre Philip (France)
1:12PM - 1:32PM	**Novel methods to assess alertness failure and driving risk in sleep apnea** Andrew Vakulin (Australia)
1:32PM - 1:52PM	**Occular biomarkers for prediction and monitoring alertness in sleep apnea and shift work** Mark Howard (Australia)
1:52PM - 2:00PM	**Conclusion**

Keynote, BR A - Ballroom A

2:00PM - 2:45PM Malhotra K11: Sleep apnea endotypes and phenotypes: Use of new technology in obstructive sleep apnea

Summary
Obstructive sleep apnea(OSA) afflicts up to 1 billion people worldwide. OSA treatment is clearly beneficial yet limited by variable efficacy and/or incomplete adherence to therapy. We have used a mechanistic approach to understand the endotypes underlying OSA with a view towards personalizing treatment based on individual characteristics. Using microRNAs, plasma exosomes, metabolomics and microbiome assessment, we are working to understand basic mechanisms underlying disease to identify which patients are at risk of particular complications, allowing more sophisticated trial designs in the future. We are further using Big Data to assess real world patient outcomes and to implement new technologies to optimize adherence with existing technologies.

2:00PM - 2:02PM	**Introduction** Najib Ayas (Canada)
2:02PM - 2:45PM	**Sleep apnea endotypes and phenotypes: Use of new technology in obstructive sleep apnea** Atul Malhotra (United States)

Keynote, 211

2:00PM - 2:45PM | **Dauvilliers** | **K12: From somnolence in the general population to narcolepsy**

Hypersomnolence is a frequent multidimensional complaint with either excessive daytime sleepiness and/or excessive quantity of sleep. It is associated with altered quality of life, accidents, and often with cardiovascular, psychiatric and neurodegenerative pathologies. Many different sleep and non-sleep causes are associated with hypersomnolence. The criteria currently used for its presence and the related disorders need to be improved and revised. Its evaluation requires rigorous clinical and neurophysiologic approaches; however, there is no gold standard measurement and no quantifiable biologic markers. The more severe causes of central disorders of hypersomnolence are narcolepsy type 1 and type 2, idiopathic hypersomnia, being all orphan sleep disorders. The main pathophysiologic feature is thought to reflect a deficiency of arousal systems, rather than an overactivity of sleep systems or an imbalance between both. However, there are large gaps in our understanding of the neurobiological causes of hypersomnolence and its associated disorders except for narcolepsy type 1 with impaired neurotransmission of hypocretin/orexin, by a probable autoimmune process. The biologic hallmarks of other central hypersomnias remain unknown. We need to 1/ better understand what determines an individual's sleep need and identify biological markers for the different forms of hypersomnolence, 2/ better precise how disorders of hypersomnolence progress over years, and 3/ better define and understand the proposed association between depression, disorders of attention, fatigue and hypersomnolence.

2:00PM - 2:02PM **Introduction**

Jaques Montplaisir (Canada)

2:02PM - 2:45PM **From somnolence in the general population to narcolepsy**

Yves Dauvilliers (France)

Technologist Program, 223-224

2:00PM - 3:30PM | **T14: Differential diagnosis**

Chairs:

Michael Eden (United States)
Shalanda Mitchell (United States)

2:00PM - 3:30PM **Differential diagnosis**

Thomas Penzel (Germany)

Scientific Programme

Symposium, BR A - Ballroom A

3:00PM - 4:30PM **S77**

S77: Brain iron as a central factor in the pathophysiology of RLS: Emerging evaluation methods and therapeutic opportunities

Summary
A number of epidemiological and clinical studies support the notion that a brain iron dysregulation, despite normal peripheral iron, plays a key role in the pathophysiology of RLS. Such a concept is also supported by an increasing number of experimental and animal data. In addition, new, large multicentric studies show a complete, long-lasting remission of RLS symptoms for some patients when this brain iron deficit is addressed by treatment with intravenous iron.

The present symposium will discuss the latest concepts on brain iron homeostasis, along with very recent studies that show how a brain iron deficit causes an increased corticostriatal hyperexcitability by means of changes in extracelular adenosine, leading to a hyperdopaminergic and hyperglutamatergic state. It will also discussed methods to evaluate brain iron homeostasis in RLS. The Symposium will discuss most recent neuroimaging data (3 and 7 Tesla MRI), identification of critical brain regions, and the goals and safety of iron treatments. Preliminary data will be presented on transcraneal sonography of the substantia nigra which demonstrate its potential as a new clinical tool predicting benefit from intravenous iron treatment.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the mechanisms regulating brain homeostasis

•Discuss current existing methods to evaluate brain iron

•Identify the emerging therapeutic opportunities to treat refractory RLS

Target Audience
Neurologists, sleep specialists, healthcare providers

Chairs:
Diego García-Borreguero (Spain)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:22PM **Brain iron deficiency relation to dopamine dysfuntion and augmentation in RLS**
Christopher Earley (United States)

3:22PM - 3:42PM **Brain iron dysregulation in RLS relation to brain adenosine and glutamate**
Sergi Ferre (United States)

3:42PM - 4:02PM	**MRI evaluation of regional brain iron relation to RLS symptoms and iron treatments** Richard Allen (United States)
4:02PM - 4:22PM	**Transcraneal sonography evaluation of substantia nigra iron: A potential clinical tool to predict IV iron treatment outcome** Celia Garcia-Malo (Spain)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 116 - 116-117

3:00PM - 4:30PM O26: Technology

Chairs:
Christoph Schoebel (Germany)
Max Hirshkowitz (United States)

3:00PM - 3:15PM	**AUTOMATED SLEEP STAGE CLASSIFICATION USING AN ADAPTIVE PATIENT-DEPENDENT ALGORITHM BASED ON PHYSICIAN-MIMICKING PROCESS** Jade Vanbuis (France)
3:15PM - 3:30PM	**BENEFITS AND RISKS OF SLEEP-TRACKERS: EVALUATION OF 7 DEVICES** Philippe Cabon (France)
3:30PM - 3:45PM	**AUTOMATIC ESTIMATION OF HEART RATE FROM HEART SOUNDS DURING SLEEP** Muammar Kabir (Canada)
3:45PM - 4:00PM	**DEEP LEARNING ENABLES ACCURATE SLEEP STAGING BASED ON A SINGLE FRONTAL EEG CHANNEL** Henri Korkalainen (Finland)
4:00PM - 4:15PM	**THE HYPNODENSITY GRAPH: A NEW REPRESENTATION OF SLEEP SCORING BASED ON MULTIPLE MANUAL EXPERT SCORINGS AND ESTIMATED BY ARTIFICIAL INTELLIGENCE** Peter Anderer (Austria)
4:15PM - 4:30PM	**VALIDATION OF AN EYE MOVEMENT DETECTOR AND INTER-RATER VARIABILITY OF THE MANUAL SCORING OF DIFFERENT TYPES OF NOCTURNAL EYE MOVEMENTS** Julie Christensen (Denmark)

Panel Discussion, 118 - 118-120

3:00PM - 4:30PM **D09**

D09: Innovative therapies for obstructive sleep apnea care delivery world wide

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
Obstructive Sleep Apnea (OSA) is highly prevalent disorder associated with myriad of adverse cardiovascular and psychosocial outcomes. The degree to which we impact OSA patients depends not only on the strength of science, but also upon how the care is delivered. OSA care delivery is constantly evolving, is multidimensional and requires collaboration with many stakeholders. There is a considerable heterogeneity in the way OSA care is delivered across the world.

This discussion panel will discuss novel, cost effective and efficient methods of OSA management worldwide and will discuss some of the barriers and opportunities in different health care environments related to their countries. This will provide an opportunity to share unique best practices for OSA care delivery spanning from reporting quality measures, evolving OSA health care from volume to value care model, ambulatory care models, team based approach and the role of non-sleep providers in the care for OSA.

Topics will include
1. Introduction to the quality measures for OSA in United States (US). Novel methods of OSA delivery such as sleep apnea management (SAM) group clinic in US will be discussed.
2. Volume to value based model of health care for OSA delivery in US. Population health initiatives and team based care approach of OSA in US.
3. Current OSA health care delivery in United Arab Emirates (UAE) and Asia. Barriers of effective healthcare, need and measures for improving OSA health care in UAE/ Asian countries.
4. Current diagnostic and therapeutic strategies in Canada: Barriers, facilitators, and opportunities in a “universal” healthcare environment.
5. Novel strategies for sleep health service delivery that have been developed in Australia, i.e. the evidence for ambulatory care models for OSA, including the potential role for health care providers other than sleep physicians (i.e. sleep specialist nurses and primary care physicians) in OSA diagnosis and management.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify novel and emerging methods of OSA health care delivery world wide

•Recognize current management strategies for OSA in different countries

•Identify opportunities to improve OSA care pertaining to different health care environment

Target Audience
Sleep providers, physician extenders, providers who provide sleep care

Chairs:

Harneet K. Walia (United States)

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**Introduction to the quality measures and sleep apnea management group clinic for OSA** Harneet K. Walia (United States)
3:18PM - 3:34PM	**Volume to value based model and population health initiatives for OSA in US** Nancy Foldvary-Schaefer (United States)
3:34PM - 3:50PM	**Current OSA health care delivery in United Arab Emirates (UAE) and Asia** Preeti Devnani (United Arab Emirates)
3:50PM - 4:06PM	**Current diagnostic and therapeutic strategies in Canada for OSA** Brian Murray (Canada)
4:06PM - 4:22PM	**Novel strategies for sleep health service delivery in Australia** Ching-Li Chai-Coetzer (Australia)
4:22PM - 4:30PM	**Conclusion**

Symposium, 109

3:00PM - 4:30PM **S78**

S78: The impact of short and disturbed sleep on pain: New mechanistic insights, sex differences, and clinical implications

Summary
Short or disturbed sleep has been well established as a behavior that increases hyperalgesia and the risk of developing chronic pain. Chronic pain conditions are one of the primary health problems worldwide, and together with the high prevalence of individuals cutting back on sleep duration or suffer from disturbed sleep, advancing our mechanistic understanding is crucial in the development of strategies aiming to prevent pain augmentation secondary to sleep loss.

This symposium will focus on new findings that contribute to our mechanistic understanding of the sleep-to-pain directionality. Emphasis will be placed on the effects of pharmacological agents (i.e., caffeine, ibuprofen, morphine) in modulating the impact of disturbed sleep on pain, the role of disturbed sleep in postsurgical pain and opioid analgesia, and on the question of whether women and men differ in their pain, fatigue, and inflammatory responses to disturbed sleep.

The purpose of this scientific symposium is to highlight recent advances in the sleep-pain field and their clinical implications with respect to the management of chronic pain, postsurgical pain, and the opioid crisis. The symposium will feature a renowned group of experts in the sleep-pain field. In addition, this scientific session will stimulate the pursuit of approaches to translate novel findings into the clinical setting.

Dr. Monika Haack is an Associate Professor at Harvard Medical School, Boston, and will organize and chair the symposium. She will present new data on sex differences in the inflammatory, pain, and fatigue responses to chronic short and disturbed sleep, which will enhance our understanding of the female preponderance of many chronic pain conditions.

Dr. Giancarlo Vanini is a Research Assistant Professor in Anesthesiology at the University of Michigan, and will show that sleep disruption prior to surgery worsens postsurgical pain in animals and that adenosine signaling plays a critical role in the prevention of these effects. He will also discuss ongoing studies aiming at identifying mechanisms by which sleep loss facilitates the transition from acute to chronic pain.

Dr. Chloe Alexandre is an Instructor at Johns Hopkins University, Baltimore, and will present data on the effects of wake-promoting (caffeine, modafinil) and analgesic agents (ibuprofen, morphine) on hyperalgesia in chronically sleep deprived animals, which reveal an unsuspected critical role of alertness in setting pain sensitivity.

Dr. Michael Smith is a Professor of Psychiatry, Neurology & Nursing, Johns Hopkins University, School of Medicine, and Director of the Center for Behavior and Health. He will provide evidence that sleep may play a role in impaired pain inhibition in clinical pain populations, present new data indicating that sleep disruption may attenuate the analgesic effects of morphine, and discuss the implications of this research for the opioid crisis.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize that short or disturbed sleep increases pain sensitivity and the risk of chronic pain development

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Do women and men respond differently to short or disrupted sleep? Inflammation, pain, and fatigue** Monika Haack (United States)
3:22PM - 3:42PM	**Preoperative sleep disruption worsens surgical pain in the rat: Role of preoptic adenosine signaling in sleep-pain interactions** Giancarlo Vanini (United States)
3:42PM - 4:02PM	**Effects of acute and chronic sleep disturbance on pain sensitivity and analgesic treatments in mice** Chloe Alexandre (United States)
4:02PM - 4:22PM	**The effects of sleep disruption and loss on endogenous analgesia and opioidergic pain control** Michael Smith (United States)
4:22PM - 4:30PM	**Conclusion**

Symposium, 121-122

3:00PM - 4:30PM **S79**

S79: Protective and risk factors of treating insomnia in youth

Summary
Insomnia is common among children, adolescents, and young adults, but pharmacological treatments are often not a preferred option. Furthermore, treating insomnia in youths compared to adults can provide additional challenges that can be extrinsic (such as environmental or social factors) or intrinsic (high comorbidity with psychiatric illnesses).

This symposium will first give an overview of the myriad of extrinsic and intrinsic factors that can influence young people's sleep. The second talk will discuss non-pharmacological management of NREM-related parasomnias in young children, especially night terrors or sleepwalking. NREM-related parasomnias are specifically disorders of arousal from NREM sleep, and extrinsic factors such as co-sleeping, breastfeeding, or sleep disorders of the co-sleeping parent may serve as triggering factors for these disorders. Additionally, there may be interactions with intrinsic factors, such as dysfunctional beliefs of parents that catastrophize sleep disturbance in children. The third talk will discuss cognitive-behavioral therapy for insomnia, in targeting sleep disturbance in the context of treating depression in adolescents. This talk will discuss the evidence of CBTI for insomnia in adolescents and share preliminary findings from a clinical trial of CBTi for comorbid insomnia and depression in youths. The fourth talk will discuss treatment for bedtime procrastination in young adults. Bedtime procrastination is defined as the delaying of bedtime than originally intended without any external reason for delaying bedtime. The talk will discuss a treatment protocol that is in development based on integrating evidence-based treatment, such as motivational interviewing and behavior modification principles targeted toward reducing bedtime procrastination. The final talk will discuss the negative impact of mobile phone use on sleep and mood. This talk will summarize the current evidence of various mobile phone use behaviors on sleep and mood, with emphases on prospective data and intervention data. In particular, the speaker will address a recent large prospective study in young college students, where long mobile phone use was associated with a number of sleep and mood problems.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Identify protective and risk factors associated with treatment of insomnia in children, adolescents, and young adults

•Identify the influence of extrinsic factors affecting children's sleep

•Recognize non-pharmacological treatments that can be applied to children, adolescents, and young adults

•Recognize the impact of mobile phone technology on mental health and sleep in children, adolescents, and young adults

•Recall novel treatment targets in the modern world that can be a problem for sleep in adolescents and young adults, such as bedtime procrastination due to mobile phone use

Target Audience
Sleep researchers, clinicians, students

Chairs:

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:22PM	**Identifying protective and risk factors to improve the sleep health of the young** Kate Bartel (Australia)
3:22PM - 3:42PM	**Non-pharmacological management of parasomnia in children** Seockhoon Chung (Republic of Korea)
3:42PM - 4:02PM	**Cognitive-behavioural therapy for comorbid insomnia and depression in adolescents** Shirley Xin Li (Hong Kong)
4:02PM - 4:22PM	**Mobile phone use and sleep and mood disturbances in adolescents and young adults** Jihui Zhang (Hong Kong)
4:22PM - 4:30PM	**Conclusion**

Basic Science Symposium, 211

3:00PM - 4:30PM **S80**

S80: Functional networks of the sleepy and sleeping brain

Summary
Over the last decades, a particular attention has been paid on the functional brain networks associated with brain states and their dynamics across changes of sates of vigilance. This global perspective of the brain activity, which accounts for the brain mechanisms underlying the functional integration of the segregated activities, has been recently extended to the sleep state. For instance, studies demonstrated a significant increase in local cortical functional connectivity (FC) during NREM sleep whereas long-range cortico-cortical FC decreases with the descent from wakefulness to slow-wave sleep. Cognitive impairments and sleep disorders can be also associated with abnormal FC and altered interactions between functional brain networks.

The aim of this symposium is to discuss new advancements in our understanding of how cerebral networks, from micro to macro scales, are modulated the transitions between sleep stages, in various conditions of aging and sleep disorders. From the spiking activity to the local field potentials of neural populations, Umberto Olcese will present recent findings on how directional transfer of information varies between wakefulness and sleep, across various scales in space and time. Raphael Vallat will then address the sleep inertia, i.e. the transition from sleep to awakening. Beside significant correlations between functional magnetic resonance imaging (fMRI) and EEG functional connectivity measures of the awakening brain, this presentation will also show significant correlations between the behavioural aspects of sleep inertia and measures of the cerebral functional connectivity at awakening (in both EEG and fMRI).

On a more clinical setting, the presentation from Dr. Luigi Ferini-Strambi will describe the effects of obstructive sleep apnea (OSA) on working-memory performance and brain connectivity. This presentation will show how much the changes in effective functional connectivity during a working memory challenge may provide new biomarker on the mechanisms supporting preserved performance despite functional (and structural) brain changes in patients with OSA. Finally, Julie Carrier will present on the effects of age on cerebral functional connectivity during sleep, using EEG (imaginary coherence) and fMRI-EEG. She will also discuss how functional connectivity during sleep may be a marker of cognitive integrity in older individuals.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss the usual metrics used in functional connectivity (FC) applied to sleep research

•Restate the cerebral integration processes during sleep and transition to wakefulness from cellular scale activities to macroscopic functional connectivity networks

•Recall the contributions of functional connectivity studies to our understanding of the functions of sleep with aging

•Recognize the functional connectivity as a biomarker of particular sleep disorders (i.e.OSA)

Target Audience
Clinicians and confirmed researchers, doctoral and post-doctoral

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**An overview in functional connectivity in recent sleep studies** Jean-Marc Lina (Canada)
3:18PM - 3:34PM	**From action potentials to neural oscillations: how brain regions exchange information across wakefulness and sleep** Umberto Olcese (The Netherlands)
3:34PM - 3:50PM	**The neural correlates of sleep inertia** Raphael Vallat (United States)
3:50PM - 4:06PM	**Abnormal brain connectivity and cognitive performance in OSA** Luigi Ferini-Strambi (Italy)
4:06PM - 4:22PM	**NREM sleep functional connectivity: A window on the aging brain** Julie Carrier (Canada)
4:22PM - 4:30PM	**Conclusion**

Pediatric Symposium, 212-214

3:00PM - 4:30PM **S81**

S81: Sleep health disparities among children across three continents

Summary
The social ecology model (SEM) is a theory-based framework for understanding the complex and interactive effects of personal, interpersonal, community and social factors on behavior that is commonly used to examine heath disparities. Framed by the SEM, this symposium aims to present research on sleep health disparities among children in three countries.

Individual factors such as children's self-regulation, emotion-regulation, and temperament have been well reported with respect to sleep health. However, minimal studies have examined children's biological stress response system in relation to sleep health. Furthermore, there is a paucity of research describing individual sleep characteristics among children living with socioeconomic adversity. The first presentation will report sleep characteristics and the associations between sleep characteristics and biomarkers of stress response among toddlers living with socioeconomic adversity.

At the interpersonal level, children's sleep is affected by parental psychopathology and sleep disturbances. Accumulating evidence suggests that parents with high adverse childhood experiences (ACE) are likely to develop psychopathology and sleep disturbances as well as parenting difficulties that may compromise children's sleep. The second presentation includes results from a longitudinal and prospective cohort of 262 mother-child dyad from the prenatal period to child age 6 years in Shanghai, China. The impact of parental ACEs on sleep development in young children will be discussed.

At the community level, disrupted sleep can contribute to the cycle of disadvantage. Environmental conditions (noise, light) and circumstances (family disruption, trauma) disrupt children's sleep and capacity to regulate emotions and behavior. Nearly a third of young children living in disadvantaged communities in Australia report being 'tired and hungry'. This study presents data from a consultation in a remote community characterized by high levels socioeconomic adversity. The focus is sleep insecurity and co-design of community interventions to support sleep health.

Childcare is impacted by social policies and plays a significant role in the lives of young children, setting trajectories for health and development. Yet few studies have examined childcare sleep practices and their impacts. The third presentation reports findings from the first comprehensive data set on children's sleep within diverse Australian communities collected during two large observational studies. Results indicate a divergence between childcare sleep practices and normative patterns of sleep development, especially in lower socioeconomic settings. The findings raise questions about the impacts of social disparity in the quality of childcare care environments on sleep development.

In summary, sleep is a foundation for a happy, stable, healthy and inclusive social life. The family plays a major role in shaping children's sleep behavior, and the family dynamic interacts with externalities, such as the demands of work, education, neighborhood and broader social participation. As such, the child, their family, and cultural context are each key factors in a strong social fabric. Sleep provides an opportunity to understand the impact of care environments on the child in a new way, and identifies new points for change to reinforce family function, health, and social harmony. This approach, drawing upon the SEM model could have impacts in the broader community, especially for those families experiencing adversity.

Learning Objectives

Scientific Programme

3:00PM - 3:02PM	**Introduction**
3:02PM - 3:18PM	**Individual determinants of sleep in children living with socioeconomic adversity** Monica Roosa Ordway (United States)
3:18PM - 3:34PM	**The impact of parental adverse childhood experiences on children's sleep in China** Guanghai Wang (China)
3:34PM - 3:50PM	**Sleep insecurity within Australian communities and co-design of community interventions to support children's sleep health** Karen Thorpe (Australia)
3:50PM - 4:06PM	**Social impact on children's health: The role of childcare** Sally Staton (Australia)
4:06PM - 4:22PM	**Cross cultural (Asian, Australian, American) differences of SEM model of sleep: Putting it all together** Simon Smith (Australia)
4:22PM - 4:30PM	**Conclusion**

Symposium, 216 - 215-216

3:00PM - 4:30PM **S82** **S82: Targeting sleep to improve mental health**

Summary
According to the World Health Organization (WHO), mental disorders are among the most prevalent and devastating disorders worldwide. Critically, less than one-half of patients show full remission with current first-line mental health treatments, indicating the need for additional research to elucidate mechanisms and develop novel therapies.

The aim of this symposium is to interrogate the proposal that targeting sleep has the potential to improve mental health. This concept is based on the longstanding observation that mental disorders and sleep difficulties, primarily in the form of insomnia, are strongly associated. Building upon advances in both the basic and clinical sciences it is now time to systematically test whether modifying sleep can improve mental health. The symposium integrates a range of approaches; from novel randomized controlled clinical trials of sleep-based interventions to improve mental health (in adults and adolescents), to basic science aspects of sleep and memory and the potential of using non-invasive brain stimulation techniques during sleep to treat major depression. Together, the symposium aims at advancing our understanding on the potential of sleep-based interventions to treat mental disorders, which would be of high public health relevance.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the strong bi-directional clinical association of sleep and mental disorders

•Restate some possible psychosocial and neural mechanisms of this interaction

•Discuss the potential of sleep-based interventions to improve mental health and future research directions

Target Audience
Neuroscientists, clinicians, psychologists, medical doctors, and clinicians from related fields

Chairs:
Christoph Nissen (Switzerland)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:22PM **The effect of treating sleep in depression on emotion perception: Results from a randomized controlled trial of cognitive behavioural therapy for insomnia**
Matthew J Reid (United Kingdom)

3:22PM - 3:42PM	**Text messages to maintain sleep, circadian, and health improvement 12-months following treatment for adolescents with an eveningness chronotype: A randomized controlled trial** Michael Dolsen (United States)
3:42PM - 4:02PM	**Sleep and memory in medicated vs. unmedicated patients with major depression** Leonore Bovy (The Netherlands)
4:02PM - 4:22PM	**Closed-loop modulation of sleep slow waves to treat major depression** Christoph Nissen (Switzerland)
4:22PM - 4:30PM	**Conclusion**

Oral Abstract, 110

3:00PM - 4:30PM O27: Young or new investigator awards

Chairs:
Carlos Schenck (United States)
Célyne H. Bastien (Canada)

3:00PM - 3:15PM	**SLEEP DURATION AND BREAST CANCER INCIDENCE: RESULTS FROM THE MILLION WOMEN STUDY AND A META-ANALYSIS OF PUBLISHED STUDIES** Angel Tsz Yan Wong (United Kingdom)
3:15PM - 3:30PM	**BRAIN ACTIVATION TIME-LOCKED TO SLEEP SPINDLES ASSOCIATED WITH HUMAN COGNITIVE ABILITIES** Zhuo Fang (Canada)
3:30PM - 3:45PM	**HACKING THE HUMAN CIRCADIAN SYSTEM WITH MICROFLASHES OF LIGHT** Daniel Joyce (United States)
3:45PM - 4:00PM	**SLEEP FRAGMENTATION, ACCELERATED AGING AND INCREASED ACTIVATION OF MICROGLIA, AND COGNITIVE IMPAIRMENT IN OLDER ADULTS** Kirusanthy Kaneshwaran (Canada)
4:00PM - 4:15PM	**ADVERSE EVENTS OF PLACEBO FOR PARTICIPANTS IN PHARMACOLOGICAL RCTS FOR INSOMNIA - A SYSTEMATIC REVIEW AND META-ANALYSIS** Christoph Patrick Werner (Australia)
4:15PM - 4:30PM	**TRANSCRIPTIONAL BASIS FOR RHYTHMIC CONTROL OF HUNGER AND METABOLISM WITHIN THE AGRP NEURON** Jonathan Cedernaes (Sweden)

Symposium, 217-219

3:00PM - 4:30PM **S83**

S83: Cluster analysis, biomarkers, and physiologic phenotyping: Towards a precision medicine approach to OSA?

Summary
The purpose of this symposium is to discuss cutting edge techniques that may help pave the way for a precision medicine approach to OSA in the not too distant future. Specifically, this symposium will summarize recent data and the future of using circulating biomarkers, deep physiologic phenotyping, and symptom/PSG cluster analysis in directing treatment and predicting adverse outcomes in patients with OSA. The hope is that eventually, these may be used to tailor specific (e.g., sedatives, anti-inflammatories) or more aggressive OSA treatment in certain patient sub- groups.

In addition, identification of high risk sub-groups may help direct future randomized controlled trials in the field by enriching these trials with patients at greater risk of adverse outcomes (intervention trials of cardiovascular disease prevention, for instance). The speakers/chairs are experts in these fields (clinicians, epidemiologists, physiologists), there is global representation (Australia, Canada, USA), with a mix of junior and senior investigators.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss the current literature in terms of the strengths and limitations of cluster analysis, biomarkers, and deep physiologic phenotyping with respect to OSA

•Recognize how these techniques could be used in the future to tailor OSA care using a precision medicine approach

•Identify how these techniques could be used in the future to help design clinical trials in the area

Target Audience
Physicians (sleep apnea), sleep technologists, CPAP providers, health administrators and researchers

Chairs:

Tetyana Kendzerska (Canada)
Glen Foster (Canada)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:22PM **Cluster analysis of symptoms and polysomnographic data: A useful predictive tool?**

Klar Yaggi (United States)

Scientific Programme

3:22PM - 3:42PM	**Can biomarkers be used to predict adverse outcomes in patients with OSA?** Najib Ayas (Canada)
3:42PM - 4:02PM	**Deep phenotyping using PSG: Limitations and future promises** Scott Sands (United States)
4:02PM - 4:22PM	**Towards a precision based medicine approach to OSA** Robert L. Owens (United States)
4:22PM - 4:30PM	**Conclusion**

Symposium, 220 - 220-222

3:00PM - 4:30PM **S84** **S84: Sleep & fatigue in healthcare professionals**

Summary
Sufficient and restorative sleep is a prerogative for well-being and adequate functioning in private and professional life. Lack of sleep causes daytime sleepiness, fatigue, attention deficits, memory disturbance and/or increased risk of accidents and mistakes. Fatigue and consecutive impairments are common in healthcare professionals, in whom maximum performance and productivity is expected on a 24-hour basis. Prolonged hours of duty on call, reduced opportunities for sleep with minimal recuperation time and/or shift work contribute significantly to impairments in physical, cognitive and emotional functioning in this population.

Modern societies expect performance and productivity on a 24-hour basis and destructive, detrimental and/or disadvantageous effects include those on personal health and well-being. Health and safety, performance of job-related tasks, and professionalism can be involved. The implementation of effective strategies for fatigue management on a personal and system wide level is challenging.

In our symposium we suggest to adopt successful fatigue management strategies from other occupational settings and adapt them to the health care environment. In the starting talk, we want to clarify the terminology of fatigue and related concepts, which are used with different connotations in various scientific areas. Then we give an overview of available research strategies for the evaluation of sleep conditions. We update on the causes and consequences of unhealthy, non-restorative and insufficient sleep in healthcare professionals and sum up by a review of the consequences of fatigue on professional life.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

- Recognize the terminology of fatigue and related concepts
- Restate successful fatigue management strategies
- Discuss an overview of available research strategies for the evaluation of sleep conditions
- Recall the causes and consequences of unhealthy, non-restorative and insufficient sleep in healthcare professionals, and on the consequences of fatigue on professional life

Target Audience
Sleep specialists, occupational medicine specialists, technicians

Chairs:

Kneginja Richter (Germany)
Takeshi Tanigawa (Japan)

3:00PM - 3:02PM **Introduction**

3:02PM - 3:22PM	**Delimitation fatigue, sleepiness and tiredness** Peter Geisler (Germany)
3:22PM - 3:42PM	**Even night owls need sleep! Why night owls and morning larks need different work schedules: Different technologies and devices of sleep and fatigue measurements** Gerhard Klöesch (Austria)
3:42PM - 4:02PM	**Fatigue and fatigue-related accidents in healthcare professionals** Maritta Orth (Germany)
4:02PM - 4:22PM	**Sleep, well-being and ill-health in healthcare** Takeshi Tanigawa (Japan)
4:22PM - 4:30PM	**Conclusion**

Technologist Program, 223-224

3:45PM - 5:00PM T15: Modalities of treatment (workshop)

Chairs:
Shalanda Mitchell (United States)
Michael Eden (United States)

3:45PM - 5:00PM	**Modalities of treatment** Sharon Keenan (United States)

Basic Science Symposium, BR A - Ballroom A

4:30PM - 6:00PM **S85**

S85: Genetics of sleep and its disorders: An update

Summary
Over the last two years, there has been substantial advances in knowledge of common genetic variants associated with different aspects of sleep (e.g., sleep duration) and with specific sleep disorders, in particular, insomnia. Moreover, new approaches are being implemented based on institutions with large biobanks.

This symposium will discuss the following: recent findings published in high impact journals such as Nature Genetics (these are based on GWAS analyses from data from the UK Biobank) (Saxena); what these findings mean in terms of causative genes and how to go from gene variants so identified to identifying the causative genes (Gehrman); identifying extreme phenotypes that facilitate a novel approach to elucidating rare gene variants. This will be illustrated for obstructive sleep apnea (Magalang). How to use large biorepositories to identify gene variants in patients in whom there are existing genetic data for both common and rare variants (Pack). This is currently being applied to obstructive sleep apnea.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Develop an understanding about the role of common and rare genetic variants

•Identify the implications of recently published findings from GWAS analyses of data in the UK Biobank

•Recognize the next steps to be taken to identify the causative genes

•Develop comprehension of the concept of extreme phenotypes and how these can be used to identify causative genes

•Identify the infrastructure that has been developed to facilitate genetic research and how this can be used to identify genes conferring risk or protection for OSA.

Target Audience
Clinical investigators, basic investigators, clinicians

Chairs:

Allan Pack (United States)

4:30PM - 4:32PM **Introduction**

4:32PM - 4:52PM **Recent advances in elucidating common genetic variants associated with sleep and sleep disorders**

Richa Saxena (United States)

4:52PM - 5:12PM	**Going from GWAS to identifying causative genes** Philip R. Gehrman (United States)
5:12PM - 5:32PM	**Identifying extreme phenotypes: Using obstructive sleep apnea as an example** Ulysses J. Magalang (United States)
5:32PM - 5:52PM	**Utilizing large biobanks for studies of the genetics of sleep disorders** Allan Pack (United States)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 116 - 116-117

4:30PM - 6:00PM O28: Narcolepsy

Chairs:
Brian Murray (Canada)
Fang Han (China)

4:30PM - 4:45PM	**THE PHARMACOKINETICS OF ONCE-NIGHTLY CONTROLLED-RELEASE SODIUM OXYBATE (FT218): OVERVIEW OF RESULTS FROM FOUR PHASE 1 STUDIES** Michael Thorpy (United States)
4:45PM - 5:00PM	**EVALUATION OF ABUSE POTENTIAL OF THE NARCOLEPSY MEDICATION PITOLISANT** Jeffrey Dayno (United States)
5:00PM - 5:15PM	**EFFICACY AND SAFETY OF JZP-258 IN A PHASE 3 DOUBLE-BLIND, PLACEBO-CONTROLLED, RANDOMISED-WITHDRAWAL STUDY IN ADULTS WITH NARCOLEPSY WITH CATAPLEXY** Richard Bogan (United States)
5:15PM - 5:30PM	**A PHASE 1 SINGLE ASCENDING DOSE STUDY OF A NOVEL OREXIN 2 RECEPTOR AGONIST, TAK-925, IN HEALTHY VOLUNTEERS (HV) AND SUBJECTS WITH NARCOLEPSY TYPE 1 (NT1) TO ASSESS SAFETY, TOLERABILITY, PHARMACOKINETICS, AND PHARMACODYNAMIC OUTCOMES** Rebecca Evans (United States)
5:30PM - 5:45PM	**DEFINING DISRUPTED NIGHTTIME SLEEP (DNS) IN PEDIATRIC NARCOLEPSY** Kiran Maski (United States)
5:45PM - 6:00PM	**MODIFIED MAINTENANCE OF WAKEFULNESS TEST (MWT) SHOWS ENHANCED VISUAL CORTICAL ACTIVATION IN PATIENTS WITH NARCOLEPSY TYPE 1: AN FMRI-EEG STUDY** Jari Gool (The Netherlands)

Panel Discussion, 118 - 118-120

4:30PM - 6:00PM **D10**

D10: Sleep medicine in Latin America: Past, present and future

Discussion Panels allow for a more informal presentation in a conversational style that includes pro/con discussions and audience participation without extensive data presentation.

Summary
1996 the American Medical Association recognized sleep medicine as a Medical Specialty, however research in sleep started much earlier. The advances in science and technology contributed to the expansion of knowledge about sleep medicine. With the development of electroencephalography, neurophysiology and neurochemistry, the understanding of sleep and sleep disorders has increased exponentially in the last century. In 1961 the Association for the Psychophysiological Study of Sleep (APSS), composed of a group of clinical sleep researchers was founded, followed in 1971 by the European Sleep Research Society (ESRS) and in 1986, the foundation of the Latin American Sleep Society (LASS). Latin America constitutes 9% of the world's population. Research has shown that people from Latin American countries can be at higher risk of some sleep disorders, and there are some medical and social conditions unique to Latin American countries, yet data presenting these findings if often lacking.

In this panel discussion founders and leaders of Latin American Sleep Medicine societies will present data on past, present and future of sleep medicine in Latin America.

Panelists include Dr. Marisa Pedemonte, Professor in Physiology at CLAEH University (Centro Latinoamericano de Economía Humana) and vice-president of the Federation of Latin American Sleep Societies, Dr. Darwin Vizcarra, Associate Professor at the Universidad Peruana Cayetano Heredia and President and Founder of the Peruvian Sleep Society, Dr. Pablo Brockmann president of the Chilean sleep society, has pioneered and led research in Latin America, and Dr. Dalva Poyares, president of the Brazilian Sleep Society.

Learning Objectives
Upon Completion of this CME activity, participants should be able to:

•Identify the history and development of sleep medicine in Latin America

•Comprehend the uniqueness of research in Latin America

•Construct awareness about the future projects and growth of sleep medicine in latin America

Target Audience
Sleep physicians of all subspecialties; sleep trainees with interest in global health; researches and academicians seeking collaborative opportunities in Latin America

Chairs:

Lourdes DelRosso (United States)

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**The road from neuroscience to sleep medicine** Marisa Pedemonte (Uruguay)
4:52PM - 5:12PM	**Sleep societies and training programs in Latin America** Darwin Vizcarra (Peru)
5:12PM - 5:32PM	**Current research and innovation in Latin America** Pablo Brockmann (Chile)
5:32PM - 5:52PM	**The future of sleep medicine in Latin America** Monica Levy Andersen (Brazil)
5:52PM - 6:00PM	**Conclusion**

Pediatric Symposium, 109

4:30PM - 6:00PM **S86**

S86: Global perspectives on adolescent sleep and health: Predictors, treatments and policies

Summary
Sleep disorders are common among adolescents around the world, including insomnia, delayed sleep-wake phase disorder, and insufficient sleep syndrome. In order to improve sleep among adolescents, it is essential to understand the biological and environmental factors that contribute to sleep disorders, and there is a critical need to develop and validate novel interventions to improve sleep duration and sleep quality in this age group.

This symposium brings together international experts on adolescent sleep disorders, examining both contributing factors and interventions for adolescents from multiple perspectives. First, Dr. Candice Alfano will present longitudinal data from a study of 70 adolescents who underwent comprehensive sleep and psychiatric evaluation as children. She will examine early predictors of adolescent sleep patterns, chronotype, and mental health outcomes. Next, Dr. Ed de Bruin will discuss treatment for adolescent insomnia, comparing delivery approaches, the additional effects of mindfulness-based techniques, and the impact of treatment on mental health outcomes. This will be followed by the presentation of two novel interventions for the circadian phase delays that are common during adolescence, yet are often difficult to treat. Dr. Allison Harvey will present results from a randomized controlled trial of a Transdiagnostic Sleep and Circadian Intervention to modify the impact of adolescent evening preference (“night owls”) on sleep and health outcomes. Dr. Michael Gradisar will discuss the use of bright light therapy and physical activity to improve sleep and mental health outcomes for adolescents with delayed sleep-wake phase disorder – specifically, he will examine what mechanisms may link an improvement in sleep with a decline in depression symptoms. Finally, Dr. Lisa Meltzer will present longitudinal data from before and after a large school district in the United States delayed high school start times, demonstrating the importance of this major policy shift on sleep and health outcomes among adolescents.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize predictors of sleep patterns, chronotype, and mental health outcomes in adolescents

•Describe how CBT-I with mindfulness improves insomnia and mental health outcomes in adolescents

•Identify innovative treatments for delayed circadian phase in adolescents, and how these treatments impact adolescent health

•Discuss the importance of delaying high school start times on adolescent sleep and well-being

Target Audience
Sleep medicine physicians, psychologists, and nurses interested in evidence-based strategies to improve sleep in adolescents; sleep and circadian researchers interested in predictors and outcomes of adolescent sleep; sleep health advocates, educators and policy makers interested in improving adolescent sleep health

Chair:
Lisa J. Meltzer (United States)

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:48PM	**Pre-pubertal sleep patterns forecast adolescent sleep preferences and mental health functioning** Candice A. Alfano (United States)
4:48PM - 5:04PM	**Sleep problems from early adolescence to emerging adulthood: Developmental patterns and predictors** Mari Hysing (Norway)
5:04PM - 5:20PM	**Modifying the impact of eveningness chronotype ('night-owls') in youth: A randomized controlled trial** Allison G. Harvey (United States)
5:20PM - 5:36PM	**Bright light therapy and physical activity for adolescents with delayed sleep-wake phase disorder: Effects on sleep and depression symptoms** Cele Richardson (Australia)
5:36PM - 5:52PM	**Impact of delaying high school start times on adolescent sleep and health** Lisa J. Meltzer (United States)
5:52PM - 6:00PM	**Conclusion**

Symposium, 121-122

4:30PM - 6:00PM **S87**

S87: REM Sleep Behavior Disorder and REM sleep without atonia across the lifespan

Summary
Isolated/idiopathic REM sleep behavior disorder (iRBD) involves clinical dream enactment and its neurophysiologic signature is polysomnographic REM sleep without atonia (RSWA). In older adults, iRBD and RSWA are strongly associated with synucleinopathy neurodegenerative diseases with an up to 75-91% risk for phenoconversion to Parkinson disease, dementia with Lewy bodies, and multiple system atrophy, and in most elderly iRBD is thought to represent a prodromal syncleinopathy.

However, through the lifespan RBD and RSWA may have more heterogeneous causes. Recent evidence from preclinical studies has shown that in infants and young children, REM sleep atonia is yet developing, so that muscle activity and phasic twitching during REM sleep may be a manifestation of motor network plasticity and motor circuit mapping. Through the first decade of life, children manifest a higher amount of RSWA than adults, presumably due to normal continuing development of central nervous system REM atonia control.
However, in some exceptional cases, children and adolescents may have forms of apparent REM sleep behavior disorder related to non-synucleinopathy pathologies including narcolepsy, neurodegenerative disorders, or medication-induction.

In younger (less than 50 years of age) adults, rbd also appears to have a more heterogenous clinical expression with relatively even involvement between women and men (vs. a strong male predominance in adults older than 50 years of age), and greater associations with antidepressant use and co-morbid autoimmunity. Recent studies of autoimmune encephalopathies in particular have suggested that RBD is a relatively frequent consequence of CNS autoimmunity in syndromes such as the IgLON5, DPPX, and voltage-gated potassium channel (especially LGI1 and Caspr2) autoimmunity syndromes.

Finally, normative polysomnography studies in adults have shown that isolated RSWA without clinical dream enactment is relatively common, involving between 15-25% of community dwelling adults, which roughly parallels the prevalence of incidental Lewy body disease in pathologic studies in the community. Could it be that isolated RSWA, in addition to isolated/idiopathic RBD, also reflects a state of prodromal Lewy body disease?

This symposium will feature the clinical expressions and implications of iRBD and RSWA throughout the lifespan, beginning with preclinical evidence for its involvement in normal human development of cerebral motor mapping; progressing to a review of basic animal models demonstrating the structural, neurochemical, and neurophysiologic characteristics that may underlie human RBD pathophysiology; and finishing with the varying clinical presentations, neurophysiologic characteristics, prognostic implications, and treatment strategies for RBD and RSWA in children, adolescents, and younger and older adults, including its strong association with synucleinopathies.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Discuss the role of REM sleep atonia and phasic muscle activity in the developing brain for motor circuit mapping

•Recognize the structural, neurochemical, and neurophysiological basis underlying human RBD pathophysiology from review of

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**RSWA and RBD: Preclinical evidence for roles in normal motor development and disease** Pierre-Hervé Luppi (France)
4:52PM - 5:12PM	**RSWA and RBD in children and adolescents** Suresh Kotagal (United States)
5:12PM - 5:32PM	**REM sleep behavior disorder in younger and older adults** Erik K. St. Louis (United States)
5:32PM - 5:52PM	**Isolated RSWA: Normal variant or prodromal synucleinopathy?** Birgit Hogl (Austria)
5:52PM - 6:00PM	**Conclusion**

Symposium, 211

4:30PM - 6:00PM **S88** **S88: Neuroscience of dreaming**

Summary
Conscious experience varies strikingly across the sleep-wake cycle, but also during sleep. While dreaming, we are functionally disconnected from the environment, and experience characteristic cognitive impairments and emotional intensifications. Traditionally, dreaming has been linked to the wake-like electroencephalographic activity of REM sleep, however it has become increasingly clear that dreaming can also occur in NREM sleep, challenging the understanding of the neural correlates of conscious sleep experiences. In this symposium, several recent lines of investigation will shed new light on the neuroscience of dreaming.

First, Francesca Siclari will present a series of studies investigating the neural correlates of dreaming using a serial awakening paradigm and high-density EEG recordings. She will show how local EEG features, including spectral power in different frequency bands, slow waves and spindles relate to the presence and absence of dreaming, and to specific dream contents. The results suggest that local EEG correlates may account for the presence of conscious experiences in behavioral states with radically different global EEG signatures.

Second, Perrine Ruby will explore the cerebral correlates of dream recall frequency. She will present EEG, PET and EEG-fMRI investigations of participants with high and low dream recall frequency, allowing to identify cerebral traits associated with high dream recall frequency. She will conclude that the cerebral activity during sleep but also at wake in the minutes following awakening seem to impact our ability to report dreams.

Third, Benjamin Baird will focus on the phenomenon of lucid dreaming, i.e. the state of becoming aware of the fact that one is dreaming during ongoing sleep. Despite having been physiologically validated for decades, the neurobiology of lucid dreaming is still poorly characterized. The talk will discuss recent neuroimaging findings that converge with previous results in providing preliminary evidence for a role of anterior prefrontal, parietal and temporal cortices in lucid dreaming. Furthermore, studies suggest that a state of the brain conductive to lucid dreaming can be induced pharmacologically with acetycholinesterase inhibition. Finally, recent findings will be discussed that illustrate the potential of lucid dreaming as a useful methodology for the cognitive neuroscience of consciousness.

Fourth, Leonore Bovy will explore emotional processes occurring during sleep and dreaming. She will emphasize that sleep not only supports a plethora of physical restorative and cognitive processes but also is also pivotal for regulating mood and emotions. In particular REM sleep and dreaming have been associated with this emotional function of sleep. The talk will in particular address in how far the presence of metacognition during sleep - i.e. lucid dreaming - is associated with mood in the following morning.

Together, the talks of this symposium will elucidate the brain basis of different kinds of dream experiences, and will highlight several novel approaches in the neuroscientific investigation of cognitive processing during sleep.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

neuroscientific dream research

•Conceptualize, plan, execute and analyze neuroscientific studies on dreaming

Scientific Programme

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**The EEG correlates of dreaming** Francesca Siclari (Switzerland)
4:52PM - 5:12PM	**The cerebral correlates of high dream recall frequency** Perrine Ruby (France)
5:12PM - 5:32PM	**The cognitive neuroscience of lucid dreaming** Benjamin Baird (United States)
5:32PM - 5:52PM	**Emotion and metacognition during sleep** Leonore Bovy (The Netherlands)
5:52PM - 6:00PM	**Conclusion**

Symposium, 212-214

4:30PM - 6:00PM **S89**

S89: Is obstructive sleep apnea a primary care disease?

Summary
Obstructive sleep apnea (OSA) is highly prevalent and has significant medical consequences, including poor quality of life and an increased risk of cardiovascular disease and motor vehicle crashes. OSA patients use the healthcare system more frequently than the general population, with annual healthcare costs exceeding age- and sex-matched controls two- to threefold. Treatment of OSA improves health outcomes and is cost effective. Patients in many jurisdictions experience long delays for diagnosis and treatment of OSA, due to a demand for care exceeding the supply of sleep specialist physicians. These delays are problematic for a disease with a high prevalence, high rate of underdiagnosis, significant risk for adverse health outcomes and for which there are therapies that could mitigate this risk. Without a significant increase in the supply of sleep physicians, there is a need to explore new service delivery models that could improve timely access to OSA care.

Management of OSA by primary care providers (PCPs) is one such innovation that is a major focus of current research and a source of much debate. Management of OSA by PCPs aligns with patient preference for care within the medical home but must be balanced by potential barriers that have been identified in research, such as gaps in PCPs' clinical knowledge of OSA, lack of confidence in managing OSA, or time constraints. The shift of OSA management into primary care settings represents a departure from the traditional paradigm in which OSA is considered to be strictly in the domain of sleep specialists; thus, translating existing research into the implementation of primary care delivery models for OSA requires multidisciplinary collaboration between clinicians, researchers and patients.

The aim of the proposed symposium is to provide a state-of-the-art, multi-national review of PCP management of OSA, drawing from both published evidence and experience with implementation. Each speaker is a leader in research on primary care delivery models for OSA and will provide a unique perspective from work within their country.

Learning Objectives
Upon completion of this CME activity, participants should be able to:

•Recognize the burden of OSA and implications for timely access to care

•Describe the current evidence for the management of OSA by primary care providers

•Recall the barriers and facilitators related to primary care management of OSA as identified by providers and patients

•Discuss innovative models of care to address current challenges with OSA management in primary care

Target Audience
Clinicians and researchers interested in health service delivery for OSA, frontline providers managing patients with OSA

Chair:
Sachin R. Pendharkar (Canada)

4:30PM - 4:32PM	**Introduction**
4:32PM - 4:52PM	**Diagnosis and treatment of OSA by primary care providers: The Australian experience** Ching-Li Chai-Coetzer (Australia)
4:52PM - 5:12PM	**Effectiveness of different models of primary care management of OSA: Lessons from Spanish randomized controlled trials** Fernando Masa (Spain)
5:12PM - 5:32PM	**Challenges to the effective implementation of primary care management of OSA** Vishesh K. Kapur (United States)
5:32PM - 5:52PM	**Community-based management of sleep disordered breathing in Alberta, Canada: Stakeholder perspectives and an integrated model of care** Sachin R. Pendharkar (Canada)
5:52PM - 6:00PM	**Conclusion**

Oral Abstract, 216 - 215-216

4:30PM - 6:00PM O29: Neurological sleep disorders

Chairs:
Luigi Ferini-Strambi (Italy)
Marco Zucconi (Italy)

4:30PM - 4:45PM	**TASIMELTEON DEMONSTRATES EFFICACY IN IMPROVING SLEEP DISTURBANCES OF INDIVIDUALS WITH SMITH-MAGENIS SYNDROME (SMS)** Changfu Xiao (United States)
4:45PM - 5:00PM	**SLEEP SPINDLES AND K-COMPLEX ACTIVITIES ARE DECREASED IN SPINOCEREBELLAR ATAXIA TYPE 2: RELATIONSHIP TO MEMORY AND MOTOR PERFORMANCES** Roberto Rodríguez-Labrada (Cuba)
5:00PM - 5:15PM	**BREATHEMND-1 STUDY: A PROSPECTIVE STUDY TO SYSTEMATICALLY ASSESS THE NATURE AND TIME COURSE OF SLEEP DISORDERED BREATHING AND RESPIRATORY FAILURE IN PATIENTS WITH MOTOR NEURONE DISEASE** Vinod Aiyappan (Australia)
5:15PM - 5:30PM	**DEMENTIA RISK IS HIGHER WITH ACTIGRAPHY DERIVED POOR SLEEP BUT NOT 24-HOUR ACTIVITY RHYTHM DISTURBANCE** Annemarie I Luik (The Netherlands)
5:30PM - 5:45PM	**BEHAVIORAL AND REGIONAL EEG FEATURES OF PARASOMNIA EPISODES IN DISORDERS OF AROUSAL** Jacinthe Cataldi (Switzerland)

5:45PM - 6:00PM

SLEEP AND FATIGUE IN THE FIRST YEAR AFTER TRAUMATIC BRAIN INJURY IN THE ELDERLY
Simon Beaulieu-Bonneau (Canada)

Oral Abstract, 110

4:30PM - 6:00PM

O32: Sleep breathing disorders: Clinical

Chairs:
Matt Naughton (Australia)
Douglas Bradley (Canada)

4:30PM - 4:45PM

DIFFERENTIAL ASSOCIATIONS OF SLOW WAVE SLEEP AND AMYLOID BURDEN WITH COGNITIVE IMPAIRMENT IN OBSTRUCTIVE SLEEP APNOEA: A PET IMAGING STUDY
Melinda Jackson (Australia)

4:45PM - 5:00PM

SLEEPINESS ASSESSED VIA CONTINUOUS OCULAR ALERTNESS MEASURES IN OBSTRUCTIVE SLEEP APNOEA PATIENTS DURING REGULAR ON ROAD DRIVING
Jennifer Cori (Australia)

5:00PM - 5:15PM

THE COGNITIVE DYSFUNCTION IN EARLY PARKINSON'S DISEASE WITH OBSTRUCTIVE SLEEP APNEA HYPOPNEA SYNDROME
Yun Shen (China)

5:15PM - 5:30PM

STRUCTURAL RISK FACTORS FOR OBSTRUCTIVE SLEEP APNEA AT DIFFERENT LEVELS OF OBESITY
Liyue Xu (China)

5:30PM - 5:45PM

DELINEATING THE ROLE OF OSA ON MILD COGNITIVE IMPAIRMENT PROFILES AND MEMORY RECALL PERFORMANCE IN OLDER ADULTS AT-RISK OF DEMENTIA
Aaron Lam (Australia)

5:45PM - 6:00PM

THRESHOLDS FOR CLINICALLY MEANINGFUL CHANGES ON THE EPWORTH SLEEPINESS SCALE AND MAINTENANCE OF WAKEFULNESS TEST SLEEP LATENCY
Gert Jan Lammers (The Netherlands)

Oral Abstract, 217-219

4:30PM - 6:00PM

O30: Pharmacological interventions

Chairs:
Russell Rosenberg (United States)
Gary Zammit (United States)

4:30PM - 4:45PM

SENESCENCE-ACCELERATED MOUSE PRONE-8 SAMP8 MICE AS A PRECLINICAL MODEL FOR IRREGULAR SLEEP WAKE RHYTHM DISORDER AND EFFICACY OF THE DUAL OREXIN (HYPOCRETIN) RECEPTOR ANTAGONIST LEMBOREXANT

Carsten T. Beuckmann (Japan)

4:45PM - 5:00PM

THE EFFECT OF MORPHINE ON SLEEP: IS THERE A GENETIC EFFECT? - AN RCT STUDY

David Wang (Australia)

5:00PM - 5:15PM

TASIMELTEON DEMONSTRATES EFFICACY TO TREAT JET LAG DISORDER IN AN 8 HOUR PHASE ADVANCE CLINICAL STUDY

Christos Polymeropoulos (United States)

5:15PM - 5:30PM

HIGH DOSE ZOPICLONE DOES NOT CHANGE OSA SEVERITY, THE RESPIRATORY AROUSAL THRESHOLD, GENIOGLOSSUS MUSCLE RESPONSIVENESS OR NEXT-DAY SLEEPINESS AND ALERTNESS IN SELECTED PEOPLE WITH OSA

Sophie Carter (Australia)

5:30PM - 5:45PM

LONG-TERM EFFECTS OF SOLRIAMFETOL ON QUALITY OF LIFE IN PARTICIPANTS WITH EXCESSIVE DAYTIME SLEEPINESS ASSOCIATED WITH NARCOLEPSY OR OBSTRUCTIVE SLEEP APNOEA

Atul Malhotra (United States)

5:45PM - 6:00PM

CLINICALLY RELEVANT EFFECTS OF SOLRIAMFETOL ON EXCESSIVE DAYTIME SLEEPINESS: A POST-HOC ANALYSIS OF THE MAGNITUDE OF CHANGE IN CLINICAL TRIALS IN ADULTS WITH NARCOLEPSY OR OBSTRUCTIVE SLEEP APNOEA

Russell Rosenberg (United States)

Oral Abstract, 220 - 220-222

4:30PM - 6:00PM

O31: Circadian disorders

Chairs:

Diane Boivin (Canada)
Jeanne Duffy (United States)

4:30PM - 4:45PM

DNA METHYLATION IN BLOOD LEUKOCYTES AS PUTATIVE BIOMARKERS FOR INSUFFICIENT SLEEP

Alexandra Lahtinen (Finland)

4:45PM - 5:00PM

CLOCK AND BMAL1 GENES EXPRESSION IN THE HYPOTHALAMUS OF SLEEP-DEPRIVED PREGNANT WISTAR RATS AND THEIR OFFSPRING

David Ehichioya (Nigeria)

5:00PM - 5:15PM

LARGE WHOLE GENOME SEQUENCING STUDY IDENTIFIES NOVEL VARIANTS ASSOCIATED WITH INTRINSIC CIRCADIAN PERIOD IN HUMANS

Sanda Smieszek (United States)

Scientific Programme

5:15PM - 5:30PM

ALTERATION OF NAD+-SIRT1 PATHWAY AS BIOMARKERS OF CIRCADIAN DISRUPTION IN SHIFT WORKERS

Mingzhu Fang (United States)

5:30PM - 5:45PM

CHRONOTYPE, MTNR1B GENE POLYMORPHISM RS10830963, AND THE RISK OF TYPE 2 DIABETES: A CROSS-SECTIONAL STUDY IN UK BIOBANK

Xiao Tan (Sweden)

5:45PM - 6:00PM

PHASE RELATIONSHIPS BETWEEN DIM LIGHT MELATONIN ONSET AND SLEEP MARKERS DETERMINED FROM ACTIGRAPHY, SLEEP DIARIES AND THE MUNICH CHRONOTYPE QUESTIONNAIRE

Andrew Reiter (Australia)

Social Event, BR A - Ballroom A

6:00PM - 7:00PM

Closing ceremony

The Closing Ceremony will be in Ballroom A of the Vancouver Convention Center. All participants and exhibitors are invited to join. Before leaving, enjoy discussing the latest science and research you discovered at World Sleep 2019, as well as a special presentation from the hosts of the next congress: World Sleep 2021.