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NSC

17th NORDIC SLEEP CONFERENCE JOINTLY ORGANIZED WITH THE CONGRESS OF THE ESTONIAN SLEEP MEDICINE ASSOCIATION

24 – 26 May, 2017
Tallinn, Estonia

Investing in your future
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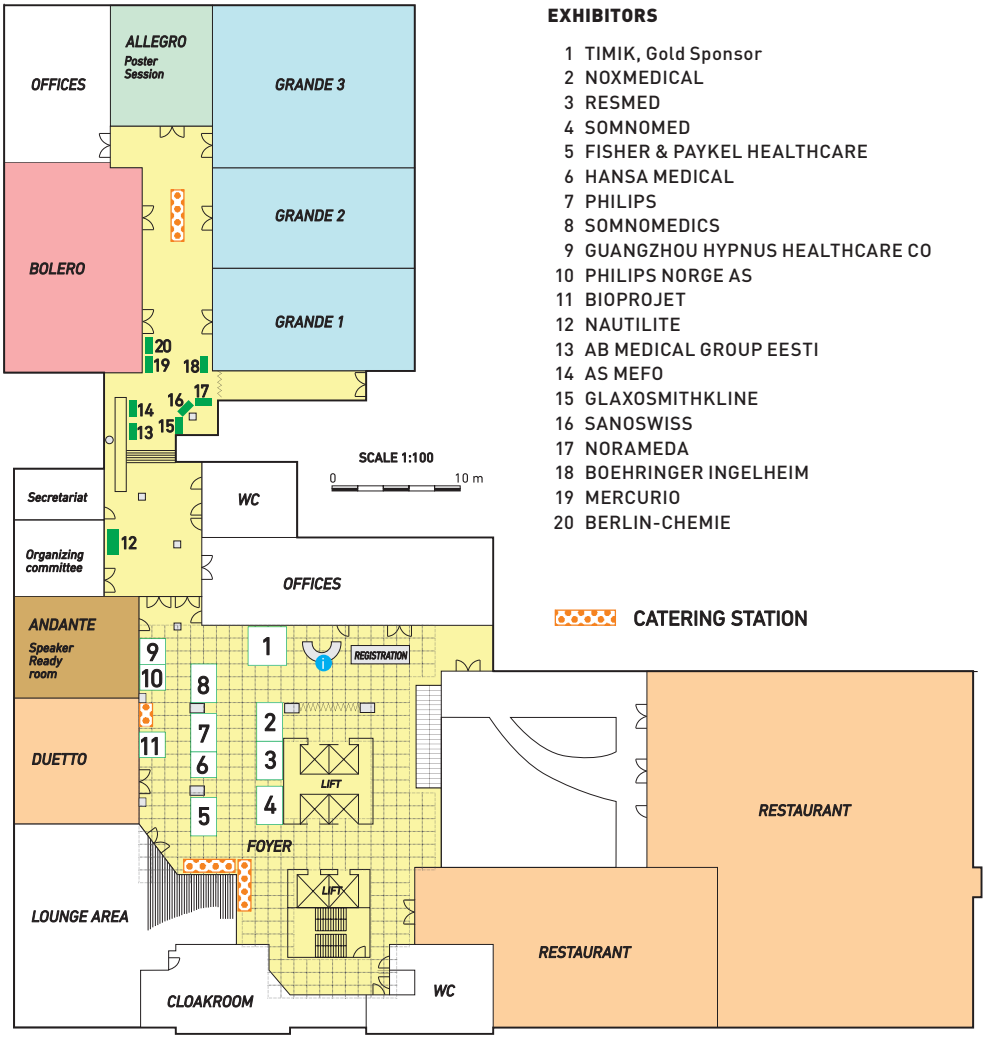
NORDIC SLEEP CONFERENCE 2017

Sokos Hotel Viru Conference Centre



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CATERING STATION

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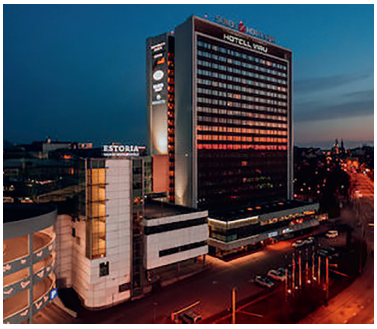

Scientific Committee of the Nordic Sleep Conference 2017

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Conference Organizer

Eesti Unemeditsiini Selts
Estonian Sleep Society

Estonian Sleep Medicine Association

Dear Colleagues and Friends,

On behalf of the Nordic Sleep Society and the Local Organising Committee it is our pleasure to welcome you to the **17th Nordic Sleep Conference** organised by **the Estonian Sleep Medicine Association**. This conference will be held first time in Estonia. It will take place at the Viru Conference Centre which is centrally located in close proximity to the major city attractions.

Thanks to the input of leading Nordic Sleep Specialists and invited speakers the programme will contain news in basic sleep science, hot topics in clinical sleep medicine, as well as several courses to meet multiple educational needs in sleep (scientists, physicians, psychologists, nurses/technicians, dentists), sponsored symposia as well as a large industry exhibit. This congress will give you a great opportunity to keep in touch with your Nordic colleagues and develop your clinical and scientific network at a short distance from your daily practice. We shall continue with the tradition of the Young Investigator Symposium and the Nordic Championship in Sleep Medicine. For the first time the Best Poster Award will be nominated.

Tallinn has the crisp and noble atmosphere and is known for its superbly preserved medieval city centre, listed as a UNESCO World Heritage Site. The city has a rich cultural scene, beautiful surroundings and plenty of galleries, cafes and restaurants of many kinds to welcome the visitors.

An active social programme will feature the Opening Ceremony and a Conference Dinner in the Tallinn Seaplane Harbour, Maritime Museum.

We are proud to host the congress in Estonia, where sleep medicine and sleep research is developing at a fast pace. We are particularly happy that the representatives of Nordic sleep societies have accepted us as a member. May is usually an attractive month to explore and enjoy the beauty and hospitality of Tallinn and our small country.

Looking forward to warmly welcome you to Estonia.

Erve Sõõru
President of the Estonian Sleep Medicine Association
Chairman of the Organising Committee

Acknowledgements

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General Information

VENUE:

Original Sokos Hotel Viru
The Conference Centre is located on the 2nd floor.

The conference venue is located in the heart of Tallinn, next to the Old Town.
Viru has been a symbol and milestone through the ages – a legend, in which you feel the real heart of Tallinn.

Location: Viru väljak 4 (Viru Square 4), Tallinn

SECRETARIAT OPENING HOURS:

Wednesday, May 24 / 08.00 -19.30
Thursday, May 25 / 08.00 – 18.30
Friday, May 26 / 08.00 – 13.30

CONFERENCE WEBSITE: www.nsc2017.ee

INTERNET: Sokos Hotel Viru Conference Centre has free wifi.

EXHIBITION OPENING HOURS:

Wednesday, May 24 / 09.00 – 19.30
Thursday, May 25 / 08.00 – 18.00
Friday, May 26 / 08.00 – 13.00

BADGES: The participant name badge will be provided at the registration desk. Your personal badge is your entrance ticket to all sessions and exhibition, and also for lunches and coffee according to the programme. Please remember to always wear your badge.

MEALS: Coffee and snacks are served in the exhibition hall during coffee breaks. Lunches on 24 and 25 May are served in the conference centre, in restaurant Merineitsi, which is located next to the exhibition hall. Grab&Go lunch on 26 May is served in exhibition hall.

USEFUL PHONE NUMBERS: In case of emergency, always call 112.
It is a free call which will connect you to the police, fire brigade or ambulance.

TAXI: Tallink Taxi: +372 640 8921
(You can also order Tallink taxi via free smartphone app “Taxofon”);

Tulika Taxi: +372 612 0000

You will always find taxis waiting in front of the conference venue.

TALLINN TOURIST INFORMATION CENTRE: Niguliste 2, Tallinn, Estonia;
Ph: + 372 645 7777; E-mail: visit@tallinn.ee; www.visittallinn.ee;
www.facebook.com/VisitTallinn; www.twitter.com/VisitTallinn

Social Programme

Wednesday / 24 May, 2017 at 17.30

WELCOME RECEPTION

Will be held in the conference centre where you will find ample opportunity to meet old friends and make new acquaintances.

The Welcome Reception will include musical entertainment, snacks and beverages. The Welcome Reception will be held in the exhibition area and is included in the registration fee if marked upon registration (pre-registration in mandatory).

Thursday / 25 May, 2017 at 20.00

CONFERENCE DINNER

Will be held in the Tallinn Seaplane Harbour.

The Seaplane Harbour accommodates one of Europe's grandest maritime museums. You are invited to see the authentic submarine Lembit from the 1930s, the century-old steam-powered icebreaker Suur Tõll, a Short 184 seaplane, mines, cannons and many other life-sized exhibits. The museum and the Seaplane Hangar have been recognised with a number of awards: Estonia's Most Tourist-Friendly Museum 2012, Europa Nostra Grand Prix 2013, Special Commendation from the European Museum of the Year 2014, and a number of others.

Bus transfer will be organised for delegates from hotel to the Tallinn Seaplane Harbour (in front of the conference venue at 19.00) and back to the hotels.

3 courses buffet dinner including beverages.

Place: Vesilennuki 6, Tallinn

Programme at glance

Wednesday, 24 May

Educational course programme

8.00 – 8.30	Registration (Educational courses)				
	BOLERO	**ANDANTE**	**GRANDE I**	**GRANDE III**	**DUETTO**
8.30-10.00	C.1 - A	C.2 - A	C.3 - A	C.4 - A	C.5 - A
	Non-pharmacological interventions for the sleep	Treatment of orofacial myofunctional disorders-a teamwork	Epidemiological methods in sleep research	Management of nasal ventilation in sleep medicine	Pediatric sleep medicine – PSC scoring basic course
10.00-10.30	Coffee break (course participants)				
10.30-12.00	C.1 – B	C.2 – B	C.3 – B	C.4 – B	C.5 - B
	Non-pharmacological interventions for the sleep	Treatment of orofacial myofunctional disorders- a teamwork	Epidemiological methods in sleep research	Management of nasal ventilation in sleep medicine	Pediatric sleep medicine – PSC scoring basic course
12.00-13.00	Lunch (Restaurant Merineitsi) (course participants)				

Main conference programme

11.00-13.00	Registration				
	BOLERO	**ANDANTE**	**GRANDE I-III**		**DUETTO**
13.00-13.15			Conference opening		
13.15-15.00			S.1		C.5 - C
			Young scientist symposium		Pediatric sleep medicine – PSC scoring basic course
15.00-15.30	Coffee break and poster viewing				
15.30-17.00	S.2		S.3	S.4	C.5 - D
	Sleep and pain		Oral presentations	Hypersomnolence research, diagnoosis and treatment – comorbid disorders and lifestyle issues	Pediatric sleep medicine – PSC scoring basic course
17.00-19.30	WELCOME RECEPTION				

Thursday, 25 May

	BOLERO	ANDANTE	GRANDE I	GRANDE III	DUETTO
8.30-10.00	S.5		S.6		S.7
	Traffic safety, sleepiness and sleep disorders: epidemiology, causes and countermeasures		Online treatment of insomnia		Oral presentations
10.00-10.30	Coffee break and Poster session I (odd numbers: 1; 3; 5; ...)				
10.30-12.00			CS.1	CS.2	
			Randomized Clinical Trials with Cardiovascular endpoints in Obstructive Sleep Apnea – Friends or Foes?	Treating Sleep Apnea with 100% Digital MRD (Mandibular repositioning device)	
12.30-13.00	Lunch (Restaurant Merineitsi)				
13.00-14.30			S.8	S.9	
			Comorbid OSA and insomnia	Sleep in children	
14.30-15.00	Coffee break and poster viewing				
	CS.3			S.10	S.11
15.00-16.30	Nocturnal Blood pressure Fluctuations determined by PTT(pulse transit time): Reliable Method – new Insights			Pharmacotherapy of sleep disorders and pharmacologic research in sleep disorders	How light affects sleep, circadian rhythms and mood regulation
16.45-18.00			The Nordic Championship in Sleep		

19.15-19.30	Bus transfer to the Conference Dinner (in front of the conference venue)
20.00-00.00	Conference dinner at Tallinn Seaplane Harbour

Friday, 26 May

	BOLERO	ANDANTE	GRANDE I	GRANDE III	DUETTO
8.30-10.00	CS.4			S.13	S.12
	ONE FINGER, ONE SIGNAL, ONE ANALYSIS - On the use of the PAT signal in the clinical setting			Telemedicine in sleep disorders	Implications of early life conditions in suspectibility to anxiety and depression
10.00-10.30	Coffee break and Poster session II (even numbers: 2; 4; 6; ...)				
10.30-12.00	CS.5			S.14	S.15
	The argument for COAT (MAD) as first line treatment for OSA			Sleep in neurodegenerative diseases	Disrupting sleep and circadian systems: Effects on molecular measures
12.00-13.00			K.1 – Keynote lecture		
			Quality of sleep and development psychiatric disorders in general population: Molecular genetic correlates		
13.00-13.30			S.16		
			Closing symposium 18th Nordic Sleep Conference 2019 announcement		
13.30-14.00	Grab & Go Lunch				

Programme

Wednesday, 24 May

8.30-10.00		**PARALLEL EDUCATIONAL COURSES**
	C.1-A	**Non-pharmacological interventions for the sleep** *Chair: Bjørn Bjorvatn, Norway*
	C.1-1 - C.1-2	Bright light therapy for circadian rhythm sleep-wake disorders. *Bjørn Bjorvatn, Norway* Advances in combining cognitive behavioral treatment of insomnia with mindfulness based therapies. *Tuuliki Hion, Estonia*
	C.2-A	**Treatment of orofacial myofunctional disorders-a teamwork** *Chairs: Triin Jagomägi, Estonia; Heisl Vaher, Estonia; Hanna Mäkinen; Finland*
	C.2-1 - C.2-2	A role of an orthodontist in the team. *Triin Jagomägi, Estonia* A role of ENT in the team. *Heisl Vaher, Estonia*
	C.3-A	**Epidemiological methods in sleep research** *Chairs: Markku Partinen, Finland; Poul Jørgen Jennum, Denmark*
	C.3-1 - C.3-2	Clinical epidemiological studies. *Markku Partinen, Finland* ESADA as an example of a collaborative database. *Ludger Grote, Sweden; Tarja Saaresranta, Finland*
	C.4-A	**Management of nasal ventilation in sleep medicine** *Chairs: Tarja Saaresranta, Finland; Erve Sõõru, Estonia*
	C.4-1 - C.4-3	Nurse has a key role in CPAP compliance. *Jenny Theorell-Haglöw, Sweden* CPAP and sexuality. *Marian Petersen, Denmark* Pulmonologist´s advice for nasal problems in OSA patients. *Hanna-Riikka Kreivi, Finland*
	C.5-A	**Pediatric sleep medicine- PSC scoring basic course.** *Paul Murphy*
10.00-10.30		Coffee break (course participants)
10.30-12.00		**PARALLEL EDUCATIONAL COURSES continue**
	C.1-B	**Non-pharmacological interventions for the sleep** *Chair: Bjørn Bjorvatn, Norway*
	C.1-3 - C.1-4	Internet-based cognitive behavioral therapy for insomnia. *Susanna Jernelöv, Sweden* Non-pharmacological interventions for other sleep disorders. *Ståle Pallesen, Norway*
	C.2-B	**Treatment of orofacial myofunctional disorders-a teamwork** *Chairs: Triin Jagomägi, Estonia; Heisl Vaher, Estonia; Hanna Mäkinen; Finland*
	C.2-3 - C.2-4	A role of somnologist in the team. *Heisl Vaher, Estonia* A role of a myofunctional therapist in the team. SLP. *Hanna Mäkinen, Finland*
	C.3-B	**Epidemiological methods in sleep research** *Chairs: Markku Partinen, Finland; Poul Jørgen Jennum, Denmark*
	C.3-3	Surveys and register-based studies. *Poul Jørgen Jennum, Denmark* General discussion: Is there a place for a common Nordic quality database in sleep disorders
	C.4-B	**Management of nasal ventilation in sleep medicine** *Chairs: Tarja Saaresranta, Finland; Erve Sõõru, Estonia*
	C.4-4 - C.4-6	Air leak with PAP therapy, diagnosis, side effect and management. *Adel Bachour, Finland* CPAP does not work: when should we give up, change PAP mode or choose another treatment option? *Ulla Anttalainen, Finland* Monitoring long-term compliance of CPAP treatment. *Tarja Saaresranta, Finland* Discussion
	C.5-B	**Pediatric sleep medicine- PSC scoring basic course.** *Paul Murphy*
12.00-13.00		Lunch (course participants)

13.00-13.15	O 1	**CONFERENCE OPENING** Welcome address. *Erve Sõõru, President of Estonian Sleep Medicine Association*
13.15-15.00	L 1 - L 6	**Young scientist symposium** *Chairs: National Sleep Society Presidents from DK, ES, FI, IS, NO, SE* DENMARK - Sleep disturbances in trauma-affected refugees - prevalence and perspectives on treatment. *Hinuga Sandahl* ESTONIA - Drivers of daytime sleepiness in creative R&D employees. *Marko Virkebau* FINLAND - Retirement - a window of opportunity for better sleep? *Saana Myllyntausta* ICELAND - Beyond the AHI - The relationship between snoring and symptoms. *Erna Sif Arnardóttir* NORWAY - The dark side of chronotherapy; effective treatment for mania. *Tone Elise Gjøtterud Henriksen* SWEDEN - Sleep deprivation and cerebrospinal fluid proteins. *Martin Olsson*
13.30-15.00	C.5-C	**Pediatric sleep medicine- PSC scoring basic course.** *Paul Murphy*
15.00-15.30		Coffee break and poster viewing
15.30-17.00		**PARALLEL SESSIONS**
	S.2	**Sleep and pain** *Chairs: Morten Engstrøm, Norway; Tarja Porkka-Heiskanen, Finland*
	L 7 - L 10	Why is sleep relevant for pain? A review of possible mechanisms. *Tarja Porkka-Heiskanen, Finland* Sleep and headache. *Trond Sand, Norway* How experimental sleep restriction affects pain perception and physiology. *Kristian B Nilsen, Norway* New RLS phenotype in women with CWP? *Romana Stehlik, Sweden*
	S.3	**Oral presentations** *Chairs: Katrin Sonn, Estonia; Rain Jõgi, Estonia*
	L 11 - L 14	Severity of individual obstruction events increases with age in patients with obstructive sleep apnea. *Leppänen Timo, Finland* Is hormone replacement therapy associated with better quality of sleep in women? Results from a large cross-sectional Norwegian study (HUNT 3). *Milada Cvancarova Småstuen, Norway* Work arrangement related drivers of happiness in creative R&D employees. *Marit Rebane, Estonia* Bedroom habits and sleep preferences among Norwegian adults-age and sex differences. *Siri Waage, Norway*
	S.4	**Hypersomnolence research, diagnosis and treatment - comorbid disorders and lifestyle issues** *Chair: Tuuliki Hion, Estonia*
	L 15 - L 17	Hypersomnias in neurological disorders. Mechanism and causes. *Poul Jørgen Jennum, Denmark* Hypersomnias in Psychiatric diseases. *Juha Markkula, Finland* Hypersomnias. Diagnose and management. *Markku Partinen, Finland* Discussion
	C.5-D	**Pediatric sleep medicine- PSC scoring basic course.** *Paul Murphy*
17.00-19.30		**WELCOME RECEPTION** At the conference centre

Thursday, 25 May

8.30-10.00		**PARALLEL SYMPOSIA**
	S.5	**Traffic safety, sleepiness and sleep disorders: epidemiology, causes and countermeasures** *Chairs: Erve Sõõru, Estonia; Göran Kecklund, Sweden*
	L 18 - L 21	Occupational sleep medicine: work hours, sleepiness and sleep - implications for traffic safety. *Göran Kecklund, Sweden* The EU directive on OSAS and driving license: the Estonian approach. *Erve Sõõru, Estonia* Sleep Disordered Breathing and driving safety – epidemiology, diagnostic and therapeutic implications. *Ludger Grote, Sweden* How to manage driver fatigue in transport: individual and organizational strategies. *Mikael Sallinen, Finland*
	S.6	**Online treatment of insomnia** *Chair: Håvard Kallestad, Norway*
	L 22 - L 25	The norse trials. *Håvard Kallestad, Norway* Long-term effects of online CBT-I. *Susanna Jernelöv, Sweden* A review of the efficacy of internet-delivered CBT-I. *Robert Zachariae, Denmark* Somnify. *Harald Hrubos-Strøm, Norway*
	S.7	**Oral presentations** *Chair: Tuuliki Hion, Estonia*
	L 26 - L 30	Adults with ADHD suffer from a wide range of different sleep problems. *Bjørn Bjorvatn, Norway* Changes in Quality of Life in individuals with narcolepsy in Norway after H1N1-influensa epidemic in 2009- a 2-year prospective cohort study. *Sebjørg Hesla Nordstrand, Norway* Analyses of autoantigens and genetic associations in Pandemrix®-induced narcolepsy. *Alexander Lind, Sweden* Effects of pain treatment on sleep in people with dementia and depression: a placebo-controlled randomized clinical trial. *Kjersti Marie Blytt, Norway* The effects of working 8 hours on/8 hours off on seafarer sleep and fatigue. *Wessel van Leeuwen, Sweden*
10.00-10.30		Coffee break and Poster session I (odd numbers: 1; 3; 5; ...)
10.30-12.00		**PARALLEL SPONSORED SYMPOSIA**
	CS.1	**Symposium is organized by Philips Nordic** Randomized Clinical Trials with Cardiovascular endpoints in Obstructive Sleep Apnea – Friends or Foes? *Chair: Jan Hedner, Ludger Grote*
		Introduction: RCTs when how why. Relevant CV conditions – framing in the area of discussion. *Jan Hedner, Sahlgrenska University Hospital, Goteborg, Sweden* Data and consequences Serve-HF Study. *Ludger Grote, Sahlgrenska University Hospital, Goteborg, Sweden* Data and consequences SAVE study. *Harald Hrubos-Ström, Akershus University Hospital, Oslo, Norway* Data and consequences RICCADSA study. *Yüksel Peker, Marmara University, Istanbul, Turkey* Sum-up. Panel discussion. Synthesize a two-sentence recommendation. *Ludger Grote, Sahlgrenska University Hospital, Goteborg, Sweden*
	CS.2	*Symposium is organized by Resmed* **Treating Sleep Apnea with 100% Digital MRD (Mandibular repositioning device)**
		Narval CC a 100% digital MRD. *Karene Valentin, Narval CC European Sr Produc manager* Narval CC 2 years follow-up results from the ORCADES study. *Dr Bruno Navailles, Dental Sleep specialist, ENT / maxillo surgeon, France* Narval CC next step in innovation: European IOS pilot results presentation. *Dr Bruno Navailles*
12.00-13.00		Lunch
		NORDIC EARLY CAREER NETWORK LUNCH *Chair: Katrin Sonn* My journey from sleep technologist to sleep counselor. Helping children and adults to get over their sleep problems using CBT-I, CBT and Mindfulness techniques. *Kene Vernik, Estonia*

13.00-14.30		**PARALLEL SYMPOSIA**
	S.8	**Co-morbid OSA and insomnia** *Chair: Bjørn Bjorvatn, Norway*
	L 31 - L 34	Co-morbid sleep apnea and insomnia in the Akershus Sleep Apnea Diagnostics and Treatment Evaluation study. *Harald Hrubos-Strøm, Norway* Insomnia subtypes and OSA - associations and treatment effects. *Erla Björnsdóttir, Iceland* Is OSA with insomnia symptoms more dangerous than OSA with sleepiness? *Tarja Saaresranta, Finland* The effects of a self-help book for insomnia in patients with comorbid OSA and insomnia. *Bjørn Bjorvatn, Norway*
	S.9	**Sleep in children** *Chair: Karoline Lode-Kolz, Norway*
	L 35 - L 38	Sleep in children. What do we know and what not? *Juulia Paavonen, Finland* Diagnosing the hyperactive child who snores, literature review. *Karoline Lode-Kolz, Norway* Sleep disorders in children with autism. *Sören Berg, Denmark* Sleep and ADHD in children. *Eeva Aronen, Finland*
14.30-15.00		Coffee break and poster viewing
15.00-16.30		**PARALLEL SYMPOSIA**
	S.10	**Pharmacotherapy of sleep disorders and pharmacologic research in sleep disorders** *Chairs: Katrin Sonn, Estonia; Eva Lindberg, Sweden*
	L 39 - L 41	Pharmacotherapy of insomnia. *Sören Berg, Denmark* Pharmacotherapy of RLS. *Ludger Grote, Sweden* Pharmacotherapy of OSA. *Jan Hedner, Sweden* Panel discussion
	S.11	**How light affects sleep, circadian rhythms and mood regulation** *Chair: Janne Grønli, Norway*
	L 42 - L 45	Sleep dynamics in rats after exposure to short or long day. *Janne Grønli, Norway* Poor sleep due to evening use of electronic devices: myth or reality? *Christian Benedict, Sweden* Blue-blocking glasses as additive treatment for mania, a randomized placebo-controlled trial. *Tone Elise Gjøtterud Henriksen, Norway* Morningness-eveningness pay gap in creative R&D employees. *Aaro Hazak, Estonia*
	CS. 3	*Symposium is organized by SOMNOmedics* **Nocturnal Blood pressure Fluctuations determined by PTT (pulse transit time): Reliable Method – new Insights**
		Introduction - Importance of continuous nocturnal blood pressure measurement. *Markku Partinen, Vitalmed Helsinki Sleep Clinic, Finland* Continuous, undisturbed long-term Blood pressure Measurement – Problems and Perspectives. *Gert Küchler, CEO SOMNOmedics GmbH, Germany* Apnea related nocturnal blood pressure fluctuations and superposition of the systolic blood pressure - higher risk for hypertension and cardiovascular events? *Gert Küchler, SOMNOmedics GmbH, Germany* PLM related nocturnal blood pressure fluctuations. *Markku Partinen, Vitalmed Helsinki Sleep Clinic, Finland* Validation. *Gert Küchler, SOMNOmedics GmbH, Germany*
16.45-18.00		**The Nordic Championship in Sleep**
19.15-19.30		Bus transfer to the Dinner (in front of the conference venue)
20.00-00.00		**CONFERENCE DINNER** At the Tallinn Seaplane Harbour, Maritime museum

Friday, 26 May

8.30-10.00		**PARALLEL SYMPOSIA**
	S.12	**Implications of early life conditions in suspectibility to anxiety and depression** *Chair: Jelena Mrdalj, Norway*
	L 46 - L 49	Electrophysiological impairments after maternal separations in male and female rats. *Jelena Mrdalj, Norway* Sleep and Behavior in Cross-Fostering Rats: Developmental and Sex Aspects. *Olena Santangeli, Finland* Implication of NOTCH1 Gene in Susceptibility to Anxiety and Depression. A translational study. *Janne Grønli, Norway* Sleep and depression in adolescents: results from clinical studies. *Anna Sofia Urrila, Finland*
	S.13	**Telemedicine in sleep disorders** *Chairs: Ulla Anttalainen, Finland; Tuuliki Hion, Estonia*
	L 50 - L 52	Telemedicine in Estonia. *Madis Tiik, Estonia* Use of Estonian eHealth platform for development of new e-services. *Peeter Ross, Estonia* Wireless telemonitoring of CPAP treatment in OSA. *Ulla Anttalainen, Finland* Panel discussion: Developments in telemedicine in sleep
	CS.4	*Symposium is organized by Timik Medical* **ONE FINGER, ONE SIGNAL, ONE ANALYSIS - On the use of the PAT signal in the clinical setting**
		The PAT signal - Physiological and patophysiological applications. *Jan Hedner, Sahlgrenska University Hospital, Goteborg, Sweden* Monitoring sleep and breathing with the WatvhPAT. Practical clinical examples. *Ludger Grote, Sahlgrenska University Hospital, Goteborg, Sweden* The WatchPAT for clinical follow-up of OSA patients. *Richard Harlid, Aleris sleep clinic, Stockholm, Sweden* Novel diagnostic functions embedded in the WatchPAT analysis. *Hartmut Schneider, John Hopkins Medicine*
10.00-10.30		Coffee break and Poster session II (even numbers: 2; 4; 6; ...)
10.30-12.00		**PARALLEL SYMPOSIA**
	S.14	**Sleep in neurodegenerative diseases** *Chairs: Michaela D Gjerstad, Norway; Marielle Zoetmulder, Denmark*
	L 53 - L 55	Sleep in the healthy aging. *Marielle Zoetmulder, Denmark* Sleep changes in early Parkinson's disease: an overview. *Michaela D. Gjerstad, Norway* Sleep in Nursing home patients with dementia and clinical depression. *Kjersti Marie Blytt, Norway*
	S.15	**Disrupting sleep and circadian systems: Effects on molecular measures** *Chair: Andrea Rørvik Marti, Norway*
	L 56 - L 59	Simulated shift work and protein synthesis in the rat brain. *Andrea Rørvik Marti, Norway* Shift work: genetic risk and epigenetic consequences. *Tiina Paunio, Finland* How shift work affect hormone secretion and diurnal rhythms in nurses and police officers. *Marie Aarrebo Jensen, Denmark* Cross-tissue specific molecular effects of acute sleep loss in humans. *Jonathan Cedernaes, Sweden*
	CS.5	**Sponsored symposium** *Symposium is organized by SomnoMed* The argument for COAT (MAD) as first line treatment for OSA *Jagdeep Bijwadia MD MBA, Chief Medical Officer Somnomed, Assistant Professor University of Minnesota Division of pulmonary critical care and sleep, President of Minnesota Sleep Society*
12.00-13.00	K1	**Keynote lecture** Quality of sleep and development psychiatric disorders in general population: Molecular genetic correlates *Prof Jaanus Harro, University of Tartu, Estonia*
13.00-13.30	S.16	**Closing symposium** Poster awards Closing symposium 18th Nordic Sleep Conference 2019, announcement
13.30-14.00		Lunch

Keynote lecture

26 May, 12.00-13.00, Grande hall

Professor Jaanus Harro, MD, PhD
Professor and Head of the Division of Neuropsychopharmacology at the Department of Psychology, University of Tartu. His research is devoted to the neurobiology of affective disorders, including molecular genetics.

L 60

Quality of sleep and development of psychiatric disorders in general population: Molecular genetic correlates

Harro, Jaanus[1], Kurrikoff, Triin[1], Laas, Kariina[1], Vaht, Mariliis[1], Veidebaum, Toomas[2],

[1]University of Tartu; [2]National Institute for Health Development

Disturbed sleep is among the symptoms of a variety of psychiatric disorders and intuitively it is easy to assume that poor sleep contributes to their development; nevertheless, a causal link is not easy to establish. In the longitudinal Estonian Children Personality Behaviour and Health Study that has a very high coverage of the eligible population we conducted the MINI structured interview at age 25 to reveal lifetime incidence of affective, anxiety and substance use disorders. Expectedly, occurrence of psychiatric disorders by early adulthood was cross-sectionally associated with sleep problems in this population-representative sample. Sleep problems and poor sleep hygiene had however already been present in childhood with higher probability. For example, sleep had been shorter at age 9 years in subjects who later developed alcohol use disorder, and parents had reported a higher degree of morning tiredness in those children who by young adulthood had met criteria for either affective, anxiety or alcohol use disorders. Examination of the moderating role of functional variants of candidate genes such as SLC6A4, NPSR1, COMT, VMAT1, HCRTR1 and GABRA2 revealed trajectories of mental health development that may inform precision medicine.

L 7

Why is sleep relevant for pain? A review of possible mechanisms.

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It is no news that pain reduces quality of sleep but can bad quality sleep increase pain?

During sleep, cortical activity declines. The decrease in cortical activity is important already in preparation for sleep. Cortical activity is maintained by three basic mechanisms: the activity of the “waking nuclei”, the information flow through the thalamus and hormonal arousal. Pain can effectively increase the activity of each of these systems, offering mechanisms by which sleep is disturbed.

Both epidemiological and experimental evidence shows that short/inadequate sleep can increase pain and decrease pain threshold. The mechanisms are not well understood, but some speculations can be presented. One possibility is through inflammatory responses, another via changes in neuronal plasticity.

Improving sleep may offer an efficient way to alleviate pain and prevent the development of chronic pain syndromes.

L 8

Sleep and headache

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Short (or long) sleep may act as a migraine attack trigger, and yawning and drowsiness is often reported in the premonitory phase. However, sleep may also relieve migraine symptoms. The majority of cluster headache attacks commence at night, but the old hypothesis about a relation between attack onset and REM has not been confirmed. One rare primary headache type, hypnic headache, is associated with only nightly brief attack.

“Sleep-apnoea-headache” is recognized as an entity in the international headache classification: ICHD-3. “Morning-headache” describes a preferred onset time that may occur in several headache disorders.

Insomnia symptoms are clearly more prevalent in both migraine and tension-type headache patients compared to healthy controls. Objective polysomnographic sleep and arousal measures are generally normal in interictal migraine and TTH, but subtle changes suggest that many patients suffer from a relative sleep deprivation.

Longitudinal epidemiological studies disclose bidirectional associatiosn between insomnia and headache. Insomnia increases the relative headache risk by 40-70%, while the severe/frequent headache increases the risk for insomnia by 100-160%. Lack of sleep seem to interfere with physiological pain control system within CNS, and this knowledge has renewed the interest for cognitive behavioral insomnia treatments in headache disorders.

L 9

How experimental sleep restriction affects pain perception

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Objectives: Sleep restriction and insomnia are associated with increased pain perception, ie. hyperalgesia. The objective for our research is to increase knowledge on the mechanisms for sleep restriction related hyperalgesia.

Methods : We have studied the effect of partial sleep restriction and night work in healthy subjects and shift workers in a paired cross-over design. Measures of pain sensitivity are obtained before and after two nights of partial sleep restriction/night work. 22 healthy individuals and 53 nurses in rotating shift work participated. The sensitivity to electrically induced pain, heat pain, cold pain, pressure pain as well as measures of endogenous pain inhibition has been measured. Sleepiness and vigilance were also assessed.

Results : Experimental sleep restriction and night-shift work increase pain sensitivity. The effect sizes are comparable for experimental and work related sleep restriction, but varies for different pain modalities. Our findings do not indicate that endogenous pain inhibition is reduced after sleep restriction. The increased electrical pain could not be explained by a difference in habituation. Increased cortical responses to painful electrical stimulation is possibly related to reduced desynchronization within the somatosensory cortex after partial SR.

Conclusions: Changes in pain sensitivity after partial sleep restriction and night work is measurable with clinically relevant effect sizes. The mechanisms are not known.

L 10

New RLS phenotype in women with CWP?.

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BACKGROUND: Chronic widespread Pain (CWP) has been associated with an increased prevalence the Restless Legs Syndrome (RLS). We aim to address if CWP is a risk factor for the development of RLS and to identify potential underlying mechanisms in the association between CWP and RLS. The overall aim of our research during the past years is to explore if RLS in women with CWP constitutes a specific RLS phenotype.

METHOD: Women with CWP (n=31) and controls without CWP (n=23) were randomly selected from a population based sample (n=3060) characterized for CWP and RLS. Two year incidence of RLS, current pain intensity (Visual Analogue Scale (VAS)), daytime sleepiness (Epworth Sleepiness Scale (ESS)) and psychiatric comorbidity (Hospital Anxiety and Depression Scale (HADS)) were assessed. Morning cortisol, ferritin and fasting glucose concentrations were determined. Overnight polygraphy addressed airflow limitation and attenuations of finger pulse wave amplitude (PWA>50%) and PLM. Generalized Linear Model assessed the effect of RLS controlled for age, BMI, and CWP status.

RESULTS: RLS incidence was higher in CWP (n=12 (39%)) compared with controls (n=2 (9%)). RLS was associated with elevated ESS score (β=3.1±1.3, p=0.018), HADS Depression score (β=3.9±1.1, p<0.001) and VAS pain score (β=31.3±7.4mm, p<0.001) (all GLM). CWP was associated with higher cortisol (464±141 versus 366±111nmol/l, p=0.011) and fasting glucose (6.0±0.8 versus 5.4±0.7mmol/l, p=0.007) compared with controls. Flow limitation during sleep was higher in CWP (35.2±22 vs. 21.3±34min, p=0.022) as was PWA>50% (Index 11.2±8 vs. 6.1±2events/hour, p=0.048) when compared with controls.

CONCLUSION: In women with CWP incident RLS was common and was independently associated with sleepiness, depression and pain. Elevated morning cortisol and finger arterial vasoconstriction during sleep suggested an activated adrenal medullary system in subjects with CWP independent of RLS-status. RLS status did not influence ferritin levels or PLM index. We hypothesise that RLS in CWP may describe a new RLS phenotype.

L 11

Severity of individual obstruction events increases with age in patients with obstructive sleep apnea

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Objectives: Age is a risk factor of obstructive sleep apnea (OSA) [1]. OSA progresses over time [2] albeit also conflicting results have been reported [3]. However, effect of age on individual obstruction event severity is still unknown. Methods: Polygraphies of 1090 patients with Apnea-Hypopnea Index (AHI)≥5 recorded at Kuopio University Hospital between 1992-2003 were reanalyzed. Effect of age on the severity of OSA and obstruction events was evaluated in general, for OSA severity categories, and for different age groups. The impacts of BMI, gender, smoking, sleepiness, snoring, hypertension, heart failure and supine sleep were considered. Results: In general, AHI and durations of obstruction events increased with increasing age (B≥0.108, p≤0.010). In more detailed analysis, AHI increased with age only in moderate OSA category (B=0.075, p=0.022), albeit durations of apneas increased in mild and severe OSA categories (B≥0.076, p≤0.038). Durations of hypopneas increased with age in mild and moderate categories (B≥0.105, p≤0.038) and durations of desaturations (B≥0.120, p≤0.013) in all OSA categories. Conclusions: Obstruction event severity depends strongly on age. Therefore, considering the severity of obstruction events could be beneficial when assessing long-term effects of treatments and prognosticating the disease progression.

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L 12

Is hormone replacement therapy associated with better quality of sleep in women? Results from a large cross-sectional Norwegian study (HUNT 3)

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Objectives: Women's menopause represents a particularly vulnerable period of life regarding sleep problems. Use of hormone replacement therapy (HRT) might elevate some of the symptoms of the menopause. Therefore, the aim of this study was to investigate possible association between HRT and good quality sleep in Norwegian women. Other factors, as satisfaction with life, neuroticism, and selected life style factors were also investigated.

Methods: Data were obtained from the Health Study in Nord-Trøndelag (HUNT3, 2006-2008), and linked to data from the Norwegian Prescription Database. Of the 27756 females, 1732 (6.2%) used HRT. Data on sleep quality were measured using the following 4 questions: During the last three months how often have you; 1) difficulties with falling asleep at night, 2) wake up repeatedly during the night, 3) awake early and cannot fall asleep again, 4) felt sleepy during the day. Good sleep quality was defined as reporting sleep symptoms never/rarely or sometimes. Data were analyzed using logistic regression.

Results: Our data did not reveal any statistically significant association between use of HRT and good sleep quality. However, lower levels of neuroticism, not smoking, living with a partner and high level of life-satisfaction, but not exercising, were associated with higher odds for good sleep quality.

Conclusions: Our results suggest that life-satisfaction and level of neuroticism are the strongest predictors of good sleep; however use of HRT was not.

L 13

Work arrangement related drivers of happiness in creative R&D employees

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Objectives: The main objective of our study is to explore the connection between sleeping according to one´s inner circadian rhythm and the perceived levels of happiness, joy and optimism. Additional questions examine in what ways flexible working schedules, teleworking, duration of the employment contract and other work arrangements affect employee happiness.

Methods: Based on our original repeated survey among Estonian creative R&D employees on a sample of 146 individuals from eleven entities, we present ordered probit and ordinary least squares regression estimates of the drivers of happiness, joy and optimism.

Results: The availability of distance work options appears to have a substantial positive impact on happiness as well as joy and optimism among creative R&D employees. The positive effect is further amplified by the availability of flexible working time options. The higher the creative intensity of their work, the happier the R&D employees appear to be. Employees with a permanent contract are happier. Family size has a positive effect while age tends to have a negative effect on happiness. Evening type employees appear to feel joy from their daily life less often than their morning type colleagues – potentially due to genetic factors, and their time use preferences deviating from social norms.

Conclusions: Our study draws attention to the potential of increasing employee happiness by providing them flexible working time and working place options, as well as considering their individual differences in sleep patterns in work arrangements.

L 14

Bedroom habits and sleep preferences among Norwegian adults-age and sex differences

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Objectives: To estimate the prevalence of different bedroom habits and preferences in a general adult population, and to explore whether these preferences vary with age and sex.

Methods: A cross-sectional telephone survey among 1001 out of 1599 (response rate 63%) randomly selected adults (50.2% females, mean age 47.5 years) was conducted. Questions about bedroom habits and preferences had different response alternatives (yes/no; up to eight alternatives). Participants were divided into four age groups (18–29; 30–44; 45–59; 60+ years). Chi-square statistics were used for comparisons.

Results: Females (p=0.038) and older participants (p=0.003) more often rated their bed as very good compared to males and younger participants, respectively. More females than males reported that the comforter (p=0.004), pillow (p<0.001) and mattress (p=0.001) were important for their sleep. The older the participant, the higher was the proportion answering “very important” to these bed characteristics (comforter p=0.005, pillow p=.005, mattress p<0.001). Furthermore, the older the participants were, the colder was the reported bedroom temperature (p<0.001). During winter, 48.5% of participants 60+ years reported a bedroom temperature of ≤12 degrees Celsius. When trying to fall asleep, most participants preferred lying on the side. Fewer older compared to younger participants preferred lying on the stomach (p<0.001).

Conclusions: We found major age and sex differences in bedroom habits and preferences.

L 16

Hypersomnias in psychiatric diseases

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Complaints of increased need of sleep or excessive daytime sleepiness are common with psychiatric disorders, affective disorders in particular. In the psychiatric DSM 5 -classification hypersomnia is listed as a diagnostic criterion in for example (atypical) major depressive disorder, persistent depressive disorder and premenstrual dysphoric disorder. Criteria for Hypersomnolence disorder, along with a number of other disorders of sleep and wakefulness are included in the manual as well.

On the other way around, psychological symptoms and comorbid psychiatric disorders are common in central disorders of hypersomnolence and many other "organic" hypersomnolence-associated disorders, such as sleep apnea. All in all, the relationship between hypersomnia and psychiatric diseases appears to be complex and close.

However, a plethora of conseptual, methodological and other issues make this relationship, in fact, quite obscure. For example the consept of hypersomnia itself is not unequivocal, as the term is commonly used in the meaning of a symptom (hypersomnolence) as well as to denote hypersomnia as a disorder,

This presentation aims to explore the relationship of hypersomnia, hypersomnolence and psychiatry in the light of literature and clinical experiences of the speaker.

L 18

Occupational sleep medicine: work hours, sleepiness and sleep - implications for traffic safety

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Occupational sleep medicine is growing clinical field and concerns the importance of sleep-wake and circadian factors for workplace safety, productivity and employee health. One of the key research questions in occupational sleep medicine is to increase the understanding of determinants of driver fatigue and sleepiness in professional drivers, train drivers, seafarers and aviation pilots. However, the goal is not only to understand the causes and consequences of poor and insufficient sleep, and circadian disruption, but also to implement evidence-based and effective fatigue risk management that mitigates the risks associated with night work, extended work shifts, time zone crossings, occupational stress (high workload) and untreated sleep diagnosis among employees with safety critical work. These topics will be covered in the present symposium. The aim with this presentation is to review how work scheduling and 24/7 operations affect sleep quality (including sleep duration), subjective and physiological sleepiness, and driving performance in relation to road transport.

L 19

The EU directive on OSAS and driving license: the Estonian approach

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Obstructive sleep apnea is one of the most frequent sleep-disorder. Untreated patients are 2-7 times more likely to cause traffic accidents. The aim of the obstructive sleep apnea screening is to prevent and reduce the risk of serious car accidents. The EU directive has been made available in Estonia which orders screening of obstructive sleep apnea during medical checkup of drivers. Applicants or drivers in whom a moderate or severe obstructive sleep apnea syndrome is suspected shall be referred to further authorized medical advice.The Estonian Sleep Medicine Association made a guideline for nationwide Estonian eHealth system - Electronic Health Record. It`s powerful tool for doctors, granting them easy access to patient records from a single electronic file. By logging into the Patient Portal (with an ID Card), they can review their past doctor visits and current prescriptions etc. and receive general health advice. E-prescription, also for medical devices are centralized, paperless system for issuing and handling medical prescriptions. 98% of all medicine is issued using a digital prescription.This efficient system is connected without paperwork, doctor visits and caves an untold amount of time and effort. Doctors can prescribe medicine and medical devices electronically and then at the pharmacy or provider patients need to do is to present their ID Card. The disease can be diagnosed and treatment can be started and managed. Patients receiving appropriate treatment and with appropriate compliance can get their driving licence under regular care and control.

L 21

How to manage driver fatigue in transport: individual and organizational strategies

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Driver fatigue is a well-known safety hazard in all modes of transport. This paper reviews individual and organizational strategies to manage fatigue in transport and the level of research evidence on their effectiveness.

A search of original and review articles published in Medline between 2000–2017 using the search terms (“road” or “rail” or “aviation” or “maritime”) and (“sleepiness” or “fatigue” or “drowsiness”) and (“management” or “countermeasures”) was conducted. Articles had to be published in English and peer-reviewed, with an abstract available.

The search resulted in 542 papers of which 45 proved relevant. The organizational measures included shift scheduling, safety culture, fatigue management technology, education, and development of working conditions and sleeping facilities. The individual measures included pre-duty sleep, on-duty measures (e.g., napping, caffeine), health behaviors, and screening for sleep-wake disturbances. The most convincing evidence was found for on-duty napping and caffeine intake. Only limited evidence was found for the organizational measures, excepting shift scheduling.

There is a wide range of organizational and individual fatigue management strategies available but the current knowledge of their usefulness in transport is rather limited. The fatigue research should focus more on producing applicable knowledge especially on the effectiveness and feasibility of organizational fatigue countermeasures.

L 26

Adults with ADHD suffer from a wide range of different sleep problems

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Objective: Compare the occurrence of sleep problems among adults with attention-deficit/hyperactivity disorder (ADHD) and a control group, and to study the impact of current ADHD medication use and ADHD subtype.

Method: 268 clinically ascertained adult ADHD patients and 202 randomly selected controls. Sleep problems were self-reported using validated questions (Global Sleep Assessment Questionnaire). Chi-square/logistic regressions with adjustment for sex/age.

Results: ADHD patients reported more sleep problems than controls: lifetime occurrence of sleep problems (82.6 vs 36.5%) and hypnotics use (61.4 vs 20.2%), current sleep duration <6 hours (26.6 vs 7.6%), and current excessive daytime sleepiness, cataplexy, loud snoring, breathing pauses during sleep, restless legs, and periodic limb movements in sleep (significant odds ratios 1.82-14.55 depending on sleep variable). Current use of ADHD medication was associated with significantly better sleep quality and less cataplexy compared to not using medication. Patients with inattentive ADHD subtype reported significantly better sleep quality and less restless legs than patients with hyperactive/impulsive subtypes.

Conclusion: Adults with ADHD reported a very high occurrence of diverse sleep problems. Patients using ADHD medication were more satisfied with their sleep than patients not using medication. Our comprehensive exploration underlines the importance of screening for sleep disorders in the diagnostic assessment of ADHD.

L 27

Changes in Quality of Life in individuals with narcolepsy in Norway after H1N1-influensa epidemic in 2009 - a 2-year prospective cohort study

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Objective: Cross-sectional studies show lower Quality of Life (QoL) in individuals with narcolepsy-type-1 (NT1). In this 2-year prospective cohort study at a tertiary care center we aimed to describe changes in QoL in individuals that developed NT1 in Norway after the H1N1-influensa epidemic in 2009.

Methods: NT1 diagnosis was based on International classification of sleep disorders, 3rd edition. QoL was evaluated with Pediatric Quality of Life Inventory, a survey consisting of a Total Score, 2 domains and 4 sub-domains with ranges from 0, 100, at baseline (T1) and follow-up (T2). Median (IQR) follow-up time 22 (3) months.

Results: 31 (18 females), mean (SD) age 14.6 (4.8) answered questionnaires at T1 and T2. Mean Total Score significantly improved by 5.9 (95 % CI: 0.4, 11.4), mainly driven by improvements in the subdomains Physical Functioning and School Functioning, 9.8 (3.0, 16.5) and 7.5 (1.0, 13.9) respectively. Individuals with Total Score below group-mean (SD) 64.4 (18.6) at T1 improved significantly at T2. This improvement was significantly larger than in individuals with higher than group-mean at baseline 12 (1, 22). Improvement in Total Score below group-mean was shown in sub-domains School and Emotional Functioning, but not in Physical and Social Functioning at T2, giving an increase in Total Score of 11.7 (0.7, 22.7), age and gender adjusted.

Conclusion: In this prospective cohort study at a tertiary care center, QoL was improved after 2 years of follow-up.

L 28

Analyses of autoantigens and genetic associations in Pandemrix®-induced narcolepsy

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Introduction: Narcolepsy is a chronic sleep disorder characterized by the loss of hypocretin producing neurons. Genetic associations with HLA DQB1*06:02 and TCR-polymorphism suggests an autoimmune origin, however target autoantigen remains unknown. Candidate autoantigens includes Tribbles homolog 2 (TRIB2), Proopiomelanocortin/alpha-melanocyte-stimulating-hormone (POMC/a-MSH), Hypocretin 1 and 2.

Objectives: Serum samples from post-Pandemrix® narcolepsy patients (n=28) and healthy family members (n=62) were obtained in 2015-2017. Aims were to

1) determine autoantibody levels towards TRIB2, POMC, Hypocretin 1 and 2
2) determine genetic association between narcolepsy and HLA DQB1*06:02(rs9271366) or TCR-polymorphism (rs1154155)

Methods: Radiobinding assays and TaqMan® SNP genotyping.

Results: Autoantibody levels towards candidate autoantigens were low and did not differ between patients and family members for TRIB2, POMC, Hypocretin-1 or Hypocretin-2. HLA DQB1*06:02 association was 27/28 (96%) among patients compared to 40/62 (67%) among controls (p=0.002). TCR-association were 27/28 (96%) among patients and 54/62 (92%) among controls (p=0.659).

Conclusions: Autoantibodies towards previously suggested narcoleptic autoantigens couldn't be confirmed in these narcolepsy patients. In contrast, it was observed that HLA DQB1*06:02 but not TCR, associated with narcolepsy. These results emphasize the need of further studies to determine the autoantigen and genetic risk, as well as the autoimmune mechanisms behind Pandemrix®-induced narcolepsy.

L 29

Effects of pain treatment on sleep in people with dementia and depression: a placebo-controlled randomized clinical trial

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Objective: Investigate if there is an effect of pain treatment on sleep in people with dementia and depression. Methods: A multicentre, double-blind, placebo-controlled randomized, two-armed clinical trial. Residents from 47 nursing homes in Norway were included if they had dementia according to Mini Mental Status Examination (score < 20) and depression according to the Cornell Scale for Depression in Dementia (score ≥ 8) (control group, n=51; intervention group, n=57). People in the intervention group received active stepwise pain treatment; those who were not using analgesics were allocated to receive paracetamol (3 g/day), those who already used pain treatment were allocated to buprenorphine transdermal system (max. 10 ug/hour/7 days). People in the control group received either placebo tablets or placebo transdermal patches. Main outcome was sleep as assessed by actigraphy one week prior to and one week after treatment. Between-subject treatment effects were analyzed by 2x2 ANOVAs. Results: In the intervention group, sleep efficiency (SE) (70% to 72%), sleep onset latency (SOL) (33 to 24 min) and early morning awakening (EMA) (49 to 40 min) improved compared with the control group (SE, 70% to 67%; SOL, 47 to 60 min; EMA, 31 to 35 min). Treatment effects were significant ($p<0.01$, $p<0.05$, $p<0.05$, respectively).

Conclusion: Compared to placebo, pain treatment increased sleep as measured with actigraphy.

L 30

The effects of working 8 hours on/8 hours off on seafarer sleep and fatigue

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Introduction: This study investigates how working 8 hours on/8 hours off (8/8) relates to working 6 hours on/6 hours off (6/6) in terms of sleep and fatigue among seafarers.

Method: 39 seafarers (aged 48 ± 12 years) divided over 5 dredger vessels participated. Half of them worked 6/6 for 3 weeks and, after a 3 week leave, shifted to working 8/8 for 3 weeks during their routine operations in the English Channel/ River Thames. The other half followed this sequence in the opposite order. Sleepiness (Karolinska Sleepiness Scale, KSS), stress and fatigue were rated every 2 hrs. A daily sleep diary was filled in, actigraphs were worn, and usage of fatigue countermeasures was asked for.

Results: Working 6/6 was associated with higher sleepiness than working 8/8 (4,0 ± 1,8 versus 3,2 ± 1,5). Stress and fatigue levels were similarly affected. Sleep diaries indicated better sleep while working 8/8 as compared to 6/6. Actigraphy indicated even longer sleep while working 8/8 (324 ± 106 min) than when working 6/6 (256 ± 105 min). All possible fatigue countermeasures were less frequently used while working 8/8. Coffee consumption, for instance, was 14% lower under 8/8 working conditions.

Discussion: Working time regulations do not allow 8/8 to occur at sea. However, thanks to the dispensation we were provided with to carry out the current study, we have now shown that 8/8 is a better watch keeping system in this particular working regime than 6/6 in terms of sleep and fatigue.

L 32

Insomnia subtypes and OSA - associations and treatment effects.

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To assess the changes of different insomnia subtypes among patients with obstructive sleep apnea (OSA) from starting treatment with positive airway pressure (PAP) to a two-year follow-up.

705 adults with OSA were assessed prior to and two years after starting PAP treatment. All subjects underwent a medical examination, type 3 sleep study and answered questionnaires on health and sleep before and 2 years after starting PAP treatment. The change in prevalence of insomnia symptoms by subtype were assessed by questionnaire and compared between individuals who were using or not using PAP at follow-up.

Symptoms of middle insomnia were most common at baseline and improved significantly among subjects using PAP (from 59.4% to 30.7%, $p<0.001$). Symptoms of initial insomnia tended to persist, regardless of PAP treatment and symptoms of late insomnia were more likely to improve among subjects not using PAP. Subjects with symptoms of initial and late insomnia at baseline were less likely to adhere with PAP (odds ratio (OR) 0.56, $p = 0.007$, and OR 0.53, $p<0.001$, respectively).

PAP treatment significantly reduced symptoms of middle insomnia. Symptoms of initial and late insomnia, however, tended to persist regardless of PAP treatment and had a negative effect on adherence. Targeted treatment for insomnia may be beneficial for patients with OSA comorbid with insomnia and has the potential to positively affect adherence to PAP.

L 33

Is OSA with insomnia symptoms more dangerous than OSA with sleepiness?

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Obstructive sleep apnoea (OSA) is a multifactorial disorder with a complex underlying physiology and manifests with different clinical phenotypes. The prevalence of insomnia comorbid with OSA is high. Recent data from the Icelandic OSA cohort and the pan-European ESADA cohort suggest that that OSA patients with insomnia or insomnia-like symptoms may have higher burden of cardiovascular and other comorbidities despite less severe OSA in terms of apnoea-hypopnoea index compared to sleepy OSA patients. Recent reports also suggest that OSA patients with insomnia sypmtoms may have lower adherence in continuous positive airway pressure (CPAP) treatment, which could result in worse outcome in these patients.

L 34

The effects of a self-help book for insomnia in patients with comorbid OSA and insomnia

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Objective: Obstructive sleep apnea (OSA) is a common sleep disorder usually treated with continuous positive airway pressure (CPAP). Many OSA patients also suffer from insomnia. CPAP treatment may be problematic in patients with comorbid OSA and insomnia. This project evaluates the effects of a self-help book for insomnia in patients with this comorbidity, and who are being treated with CPAP. The main aims are to evaluate whether the self-help book improves sleep parameters and CPAP adherence.

Methods: A randomized controlled trial (RCT) comparing a self-help book for insomnia with sleep hygiene advice in patients with comorbid OSA and insomnia. All patients also receive CPAP treatment. A total of 180 patients will be consecutively randomized to either the self-help book (n=90) or sleep hygiene advice (n=90). Data from validated questionnaires (Bergen Insomnia Scale, Insomnia Severity Scale) are collected before and after about three months. In addition, objective data about OSA severity and CPAP adherence are recorded after these three months.

Results: So far, a total of 158 patients have been included. We cannot break the randomization code until all patients have completed the study. Thus, so far no results can be presented.

Conclusion: Many patients with OSA have comorbid insomnia. This comorbidity may hinder CPAP adherence. Thus, treatment modalities improving sleep and reducing insomnia symptoms may be beneficial for CPAP adherence, and thereby reduce OSA severity.

L 36

Diagnosing the hyperactive child who snores

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Chalumeau Frederic, Centre d'etude du sommeil–Antony, FRANCE Attention deficit hyperactivity disorder (ADHD) is often associated with sleep disorders. Patients with primary sleep disorders often present hyperactivity and/or attention deficit symptoms. Indeed, obstructive sleep disorder breathing (SDB)as respiratory effort related arousals, hypoventilation disorder, and obstructive sleep apnea syndrome with poor sleep quality can mimic ADHD in children. In this case, inattention and hyperactivity behavior are induced by sleep disorders but do not constitute a clinical diagnosis of ADHD. Therefore, it can sometimes be difficult for the clinician to distinguish between a diagnosis of ADHD with comorbid sleep disorder and a sleep disorder that mimics ADHD symptoms.

Our objective is to review the principle studies exploring the relations between ADHD and obstructive SDB and propose a decision tree for clinicians. When ADHD is associated with SDB we recommend treatment of the SDB before considering a psychstimulant targeting ADHD. The patient should after a three months period be reexamined for ADHD and adequate treatement initiated. This work was done on the behalf of The French Society for Sleep Research and Sleep Medecine in order to establish the National French Guidelines. It was published in Archives de Pediatrie February 2017.

L 38

ADHD and Sleep in Children

Eeva Aronen

Children with ADHD are more likely than healthy controls to experience sleep-related problems like sleep onset difficulties, parasomnias and primary sleep disorders (e. g. sleep disordered breathing). These problems are usually transient, but for a small amount of children with ADHD they are persistent. Co-occurring internalizing and externalizing comorbidities and poor parental mental health are among the risk factors for sleep problems in children with ADHD. With regard to stimulant medication the results are inconsistent: according to some studies use of medication is a risk factor for sleep problems in children with ADHD, when other studies show evidence to the contrary.

ADHD symptoms and sleep problems are connected in many ways, though it is difficult to prove directions of causalities between them. Most likely the relationship between ADHD and sleep problems is bidirectional: sleep problems can cause or exacerbate symptoms of inattention and hyperactivity, and these symptoms can affect the amount and quality of sleep. One explanatory mechanism for the effects of sleep problems on symptoms of ADHD is that sleep deprivation affects the functional connectivity in frontal brain regions important to attention and impulse control. With regard to emotional problems in children with ADHD, there is some evidence of a bidirectional relationship between sleep and internalizing or externalizing problems, but the evidence is still rather week.

L 42

Sleep dynamics in rats after exposure to short or long day

Janne Grønli[1], Louise Haugen Bjerrum[1], Torhild Thue Pedersen[1], Tone Henriksen[1], Andrea Marti1, Jelena Mrdalj[1]

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Light, through the atypical intrinsically photosensitive retinal ganglion cells (ipRGCs), influences behaviors that are essential for our health and quality of life. The circadian clock is synchronized to the solar day, tracking seasonal changes, and regulation of sleep. Changes to short or long photoperiod lead to problems in circadian rhythms and sleep. However, the influence of light on sleep dynamics is little understood. Here, it will be presented the influence of shortened (4hrs light; 4L/20D) or prolonged (20hrs light; 20L/4D) photoperiod, in two different light conditions (white and blue light) on distinct changes in sleep (sleep-wake pattern and EEG markers of sleep drive), and circadian rhythmicity of body temperature (period length). The protocol used consisted of normal housing of rats in 12L/12D light cycle (white light condition), exposure to 7 days with short - or long photoperiod, in either white or blue light conditions, and 14 days of recovery in normal 12/12LD cycle (white light condition). Consequences on waking behavior and particularly whether repeated blue light exposure leads to waking impairments, and the time it takes to recover such changes will also be presented.

L 43

Poor sleep due to evening use of electronic devices: myth or reality?

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Dim light onset occurring during evening hours is an important environmental cue for the brain to prepare the transition from wakefulness to sleep. However, as a result of industrial progress, nowadays we expose ourselves to bright light conditions even during evening hours, e.g. due to the use of electronic devices. Several epidemiological studies have associated evening use of screen-based technologies with impaired nocturnal sleep. In recent years, blue light emitted by electronic devices has been proposed as underlying mechanism, as it suppresses the release of the sleep-promoting hormone melatonin. However, results have been mixed. With this in mind, our lab at Uppsala University sought to investigate if reading on a self-luminous tablet vs. reading in a physical book during evening hours would alter sleepiness, melatonin secretion, nocturnal sleep, as well as electroencephalographic power spectral density during early slow-wave sleep. There were no differences in sleep parameters and pre-sleep saliva melatonin levels between the tablet reading and physical book reading conditions. Bright light exposure during daytime has previously been shown to abolish the inhibitory effects of evening light stimulus on melatonin secretion. With this in mind, our null finding could be explained by the fact that in the present study subjects had been exposed to bright light during daytime hours before evening reading on the tablet. Based on our study it can be concluded that conditions such as daytime light preload can alter the effect of blue light on sleep.

L 44

Blue-blocking glasses; effective as ad-on treatment for bipolar mania

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Objectives: Orange blue-blocking (BB) glasses are a novel treatment option for mania, a condition that is difficult to treat effectively with medication alone. BB-glasses inhibit light signal to the circadian system from a retinal receptor specialized in detecting blue light as daytime signal. We aimed to examine the effect of BB glasses for patients in a manic state. Methods: In a randomized controlled trial, patients with bipolar mania were recruited and assigned to BB glasses or placebo (clear glasses) as ad-on treatment from 6 p.m. to 8 a.m. for seven days, Young Mania Rating Scale (YMRS) was used for daily assessment of symptoms, and motor activity was assessed by actigraphy. Results: From Feb 2012 to Feb 2015, 32 patients were enrolled. Eight patients dropped out and one was excluded, resulting in 12 patients in the BB group and 11 patients in the placebo group. The difference between the groups was evident after only three days (P=0.042) and increased throughout the intervention. YMRS items most directly related to activation declined first. The motor activity declined significantly in the BB-group as compared to healthy controls, mirroring the temporal decline in YMRS-scores. Conclusions: This RCT shows that BB glasses are effective in reducing manic symptoms, and also suggests that blue light in the evening and night plays a role in maintaining manic activation. (Bipolar Disorders, May, 2016)

L 45

Morningness-eveningness pay gap in creative R&D employees

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Objectives: People are different in their morningness-eveningness patterns, and these may be difficult to change for the individual. Statutory and company level working time regulations, operating times of entities, and norms regarding the timing of events have an impact on the behaviour of individuals, regardless of their morningness-eveningness. This may give rise to morningness-eveningness driven inequality among people. Our paper is concerned with the drivers of salary levels of creative R&D employees, including their morningness-eveningness type.

Methods: We present fully observed recursive structural equation estimates as well as ordered probit regression estimates of the drivers of salary levels, based on data from our original repeated survey of Estonian creative R&D employees on a sample of 149 individuals from eleven entities.

Results: Employees of evening type appear to have a lower probability of getting higher levels of salary, compared to employees with no distinct morningness-eveningness profile. Simultaneously, we find support to a strong gender pay gap, with female employees having an average 13-15% lower probability of earning the higher levels of salary. Age is another strong determinant of the salary level.

Conclusions: We provide some insight on the existence of morningness-eveningness pay gap – a novel phenomenon not addressed in previous research, which is a potential addition to sources of unfair wage differences next to the gender and age pay gaps.

L 46

Electrophysiological impairments after maternal separations in male and female rats

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Early life environment has a vast impact on development and adult functioning. Exposure to different early life conditions may profoundly influence the developing brain in lasting ways, giving rise to behavioural and neurobiological differences in adulthood.

This presentation will focus on the sex specific importance of different early life conditions for adult brain activity during sleep and wakefulness. To mimic different early life conditions we utilize maternal separation model in rats. Rats were exposed to either long maternal separations (180 minutes) or brief maternal separations (10 minutes) once a day during postnatal days 2 to 14. Electroencephalogram (EEG) and electromyogram (EMG) were recorded in the adult age (approximately 90 days old). Male offspring with a history of long maternal separations demonstrated a sleep-wake non-specific reduction in EEG power, compared to offspring exposed to brief maternal separations. In contrast to male rats, female rats exposed to long- or brief maternal separations displayed similar EEG characteristics during both sleep and wakefulness in their adulthood. The results show that early life conditions modulate the brain functioning in long-lasting ways in a sex-dependent manner. The impact of exposure to later life challenges will be discussed.

L 47

Sleep and Behavior in Cross-Fostering Rats: Developmental and Sex Aspects

Santangeli, Olena[1], Lehtikuja, Henna[1], Palomäki, Eeva[1], Wigren, Henna-Kaisa[1], Paunio Tiina[1,2], Porkka-Heiskanen, Tarja[1]

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Objectives. Sleep disturbances associated with adverse early life experience can persist for years after the stressful events. But, the mechanisms that underlie the long-lasting vulnerability of sleep are still poorly understood.

Methods. Cross-fostering (CF) technique was used as a model of early life stress experience reflecting poor child-parent relationships. Sleep and behavior together with molecular markers (brain-derived neurotrophic factor (BDNF) gene expression and adenosine) in male and female rats during adolescence and adulthood were assessed.

Results. During spontaneous sleep in the light and dark periods of the day REM sleep onsets were increased in both male and female CF rats compared to respective controls. Total duration of REM and NREM sleep in CF rats was also elevated in the light period. Sleep homeostasis was not affected, but baseline adenosine level in the basal forebrain decreased in both male (by 35%) and female (by 25%) CF rats compared to controls. CF rats did not show considerable changes in behavior, but tended to have a decreased level of BDNF gene expression in the basal forebrain.

Conclusions. Even when the consequences of adverse early life events cannot in adulthood be detected from behavioral signs used to monitor depression/anxiety, they at molecular level leave permanent changes in brain, as in the present study evidenced by decreased adenosine level. Sleep, particularly REM sleep, is the most sensitive behavioral indicator of the early life stressful events.

L 48

Implication of NOTCH1 Gene in Susceptibility to Anxiety and Depression. A translational study.

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Adverse life events contribute to the development of multiple forms of psychopathology, but the genetic contributions to disorder susceptibility following these events remains unclear.

In this translational study, we first examined gene expression in the brain of rodents exposed to different early life conditions using microarray assays. Hypothesizing that genes revealing changes in expression may have relevance for psychiatric symptoms later in life, tag SNPs of resulting candidate genes were genotyped and tested for their association with symptoms of anxiety and depression (Hospital Anxiety and Depression Scale) in a sample of 361 sexual abuse victims, using multinomial logistic regression. False discovery rate was applied to account for multiple testing, with q value of 0.05 accepted as significant.

Four genes were showing differential expression among animals subjected to different early life conditions as well as having potential relevance to psychopathology following such events: Notch1, Gabrr1, Plk5 and Zfp644. In the human sample, significant association was observed for two NOTCH1 tag SNPs: rs11145770 (OR= 2.21, q= 0.043) and rs3013302 (OR= 2.15, q=0.043).

The findings provide preliminary evidence that NOTCH1 may be implicated in the susceptibility to pathology developed following adverse life events. The study also underscores the potential importance of animal models for future studies on the health consequences of early life events and the mechanisms underlying increased risk for psychiatric disorders.

L 49

Sleep and depression in adolescents: results from clinical studies

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Objectives. The aim of this series of studies was to examine the relationship between sleep and depression in adolescents. Further, we sought to examine the neurobiological links between sleep and depression during adolescence.

Methods. The first sample of 166 depressed adolescent outpatients was followed-up during one year in naturalistic settings, and their sleep was assessed with self-report questionnaires. The second clinical sample of 19 adolescent boys underwent polysomnography, actigraphy, and proton magnetic spectroscopy (1H MRS) of frontal brain regions.

Results. The prevalence rate of sleep complaints among depressed adolescents was high, but sleep disturbances at baseline did not lead to poorer clinical outcome during follow-up. Depressed boys had a flattened pattern of slow wave activity dissipation through the night. They were also subjectively evening-prone, but showed earlier phases in actigraphic recordings. Lower frontal cortical myo-inositol correlated with both depression severity and poor sleep.

Conclusions. Sleep disturbances and depression are closely linked during adolescence. The homeostatic regulation of sleep may be impaired in adolescent depression. Depressed adolescents may suffer from a circadian mismatch between the late-prone subjective rhythm and the early-prone objectively measured activity. Frontal cortex myo-inositol may be linked both to the pathophysiology of depression and concomitant sleep symptoms among maturing adolescents.

L 56

Simulated night shift work leads to impaired translation initiation and reduces expression of the plasticity marker Arc in prefrontal cortex but not hippocampus – a rat model

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Night shift work is associated with impaired alertness. Recently we reported a degraded waking state during simulated night shift work in rats. This could not be explained by sleep loss alone, as the total sleep time across 16h following work was similar in simulated night- and day shift work. Could impaired wake function be due to disruption of plasticity processes in the brain, such as protein synthesis? The circadian clock protein BMAL1 is identified as a promoter of mRNA translation initiation, the most regulated step of protein synthesis. We aimed to investigate effect of time-of-day and simulated shift work on markers of translation initiation.

Rats were exposed to 8h forced activity, either during rest (RW) or active (AW) phase. Following the third work shift, tissue was collected from prefrontal cortex (PFC) and hippocampus in workers and time-matched controls (AW-ZT0; RW-ZT12) and analysed with m7GTP-pulldown and western blot.

PFC expressed a stronger time-of-day variation in protein synthesis markers than hippocampus. AW did not alter markers of protein synthesis. RW significantly reduced phosphorylation of cap-bound BMAL1 and its regulator S6K1 in PFC, and reduced levels of the plasticity associated protein Arc. No significant effects were observed in hippocampus.

The results suggest that there are time-of-day and brain-region specific variation in translation initiation, and that the PFC is especially vulnerable to RW. The reduction in the translational promoter BMAL1 observed in PFC may explain the impaired wake functioning during night shift work.

L 59

Cross-tissue specific molecular effects of acute sleep loss in humans

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Chronic sleep curtailment has been associated with an increased risk of metabolic pathologies such as type-2 diabetes and obesity. However, while sleep loss can promote weight gain in humans, it can concomitantly promote sarcopenia. To probe the potential underlying mechanisms, we have investigated molecular and genetic changes in essential metabolic tissues in healthy young human subjects in response to acute sleep loss. We find acute sleep loss alters levels of metabolic as well as structural proteins in skeletal muscle, providing a potential mechanism for a parallel reduction in systemic insulin sensitivity. Whereas proteomic alterations indicate increased muscle breakdown in response to acute sleep loss, protein expression changes in subcutaneous adipose tissue are instead suggestive of increased anabolic activity. These tissue-specific protein-level changes are also reflected in metabolite levels of metabolic fuel sources across adipose tissue, skeletal muscle and blood. In combination with previous findings of altered circadian clock gene regulation in response to sleep loss, we find further evidence that acute sleep loss induces tissue-specific changes in molecular components of the circadian clock that regulate metabolic fuel utilization. In sum, we provide mechanistic insight into how sleep loss and circadian misalignment may increase the risk of metabolic diseases while promoting sarcopenia.

L 1

Sleep disturbances in trauma-affected refugees – prevalence and perspectives on treatment

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Sleep disturbances are often referred to as the hallmark of Posttraumatic Stress Disorder (PTSD). Sleep disturbances affect the efficacy of first-line PTSD treatment and may constitute a risk factor for poor outcome of psychiatric treatment. Although PTSD is prevalent in refugees, studies on sleep disturbances in trauma-affected refugees are scarce. The aim of this presentation is to explore sleep disturbances in trauma-affected refugees by presenting findings on sleep disturbances in trauma-affected refugees from three consecutive trials carried out at Competence Centre for Transcultural Psychiatry (CTP). Furthermore a review of the existing literature on treatment of sleep disturbances in trauma-affected refugees will be presented and perspectives on state of the art treatment will be discussed.

In a sample of 752 trauma-affected refugees undergoing psychiatric treatment at CTP 99% reported sleep disturbances. This delineated sleep disturbances as the most prevalent symptom and indicated that sleep disturbances are a prominent part of the PTSD symptom structure in refugees. We identified only a small number of studies on treatment of sleep disturbances in trauma-affected refugees and further research on treatment is needed – promising treatments such as Imagery Rehearsal Therapy are currently being tested in a randomised controlled trial at CTP.

L 2

Drivers of daytime sleepiness in creative R&D employees

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Objectives: Working conditions for R&D employees contribute to the utilisation of their creative potential and impact their individual wellbeing. The first hypothesis of our paper is that higher working time flexibility reduces daytime sleepiness. Our second hypothesis is that administrative and other non-creative tasks distract the employee, and result in higher daytime sleepiness. Furthermore, we aim to investigate the effect of morningness-eveningness type of the employee on his/her daytime sleepiness.

Methods: We present fully observed recursive structural equation estimates as well as ordinary least squares and probit regression estimates, based on data from our original repeated survey of Estonian creative R&D employees on a sample of 153 individuals from eleven entities.

Results: Compared to those working under fixed working schedules, employees with a flexible working time option exhibit averaged 2.1 points lower scores on our adjusted sleepiness scale, inspired by the Epworth Sleepiness Scale (ESS). Creative intensity of work is strongly negatively related to the employee's daytime sleepiness. Evening type employees were significantly sleepier at daytime compared to morning type employees. Men had on an average 0.9 points lower scores on the adjusted sleepiness scale compared to women.

Conclusions: Our results indicate that improvements in work arrangements may reduce considerably the occurrence of daytime sleepiness among R&D employees.

L 3

Retirement – a window of opportunity for better sleep?

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Objectives: Retirement from work offers an opportunity for positive changes in sleep, as working hours no longer dominate sleep timings and work-related stressors are removed. This study aimed at examining changes in sleep difficulties during the transition from full-time work to statutory retirement.

Methods: Data from the Finnish Public Sector study were used. The study population consisted of 5,807 public sector employees who retired on statutory basis in 2000–2011. The participants answered on the Jenkins Sleep Problem Scale in four possible survey waves around retirement. Both the prevalence of any sleep difficulty and four specific sleep difficulties were examined.

Results: Before retirement, 30% of the participants reported having sleep difficulties. Prevalence of any sleep difficulty decreased during retirement transition and the risk ratio (RR) for having sleep difficulties in the study wave following retirement was 0.89 (95% confidence interval [CI] 0.85–0.94), compared to the study wave preceding retirement. From the specific types of sleep difficulties, there was a decrease in waking up too early in the morning (RR 0.76, 95% CI 0.69–0.82) and nonrestorative sleep (RR 0.47, 95% CI 0.42–0.53), whereas there was no change in difficulties falling asleep or difficulties maintaining sleep.

Conclusions: This longitudinal study suggests retirement indeed being a window of opportunity for better sleep, as a decrease in sleep difficulties was observed following retirement.

L 4

Beyond the AHI – The relationship between snoring and symptoms

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Objectives: The prevalence of obstructive sleep apnea (OSA) in the general population is high. However, little relationship is found between the apnea-hypopnea index (AHI), and symptoms such as sleepiness. Our study aims to compare the role of snoring compared to the AHI on subjective sleepiness and other sleep symptoms in a general population cohort.

Methods: A general population sample of 40-65 year old Icelanders performed a type 3 sleep study and a questionnaire. Habitual snoring was defined as ≥3 nights a week.

Results: Among 400 participants, not previously diagnosed with OSA, 59.0% had no OSA, 25.0% had mild OSA and 16% had moderate-to-severe OSA. 42% of the cohort were defined as habitual snorers. They had higher Epworth Sleepiness Scale scores on average than nonsnorers (7.7±4.0 vs. 6.4±4.0, p=0.003) and were more likely to have excessive sleepiness (31.6% vs. 20.6%, p=0.02). Habitual snorers were more also likely to report a dry mouth when awakening (24.1% vs. 14.9%, p=0.03) and nocturnal gastroesophageal reflux (10.0% vs. 3.8%, p=0.02). These differences were not found in relation to OSA categories. Regression analyses adjusting for age, gender and BMI confirmed the findings. When further divided into loud or non-loud habitual snorers, these differences were more pronounced.

Conclusion: Subjective sleepiness, dry mouth and reflux in the general population is associated with reported habitual snoring and the loudness of the reported snoring but not to AHI. Further analysis based on objective snore measurements vs. reported snoring and symptoms are pending.

P 1

AirSense 10 AUTOSET for Her ® treatment may increase CPAP compliance in female OSAS patients

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Objectives: We investigated whether specifically for females designed auto-adjusting positive airway pressure device (AirSense 10 AUTOSET for Her ®, ResMed) has impact on compliance and efficacy.

Methods: We recruited female patients with flow limitation in cardiorespiratory polygraphy and compliance difficulties in treatment. Of them, 15 used fixed continuous positive airway pressure (CPAP) devices and 4 auto-adjusting positive airway pressure (APAP) devices. They were transferred to AirSense 10 AUTOSET for Her ® treatment at sleepnurse´s appointment. Their CPAP adherence and efficacy with previous devices was compared with a novel APAP device.

Results: We have 19 female patients on AUTOSET for Her ® treatment and everyone (100%) is continuing after median of 122 days. Patients´ mean age was 52 years and mean BMI 31,8 kg/m2 at the time of diagnosis. Median sleepiness score in the Epworth Sleepiness Scale (ESS) was 12 and median Apnea-Hypopnea Index (AHI) was 4,8/h at the time CPAP treatment was started. Median usage hours with previous devices were 3,3 and with AUTOSET for Her ® 6,1. Median change in usage hours was + 3,0. There was significant increase in usage hours between devices (3,3 hours vs. 6,1 hours, p=0,00452). Average residual AHI did not differ between devices (1,2/h vs. 1,6/h).

Conclusions: 89% of patients increased hours of CPAP use with AUTOSET for Her ® device compared with previous devices. Patients who were non-compliant with previous devices used AUTOSET for Her ® device more than 5 h/night. Efficacy of treatment did not differ between devices.

**(at the time this study was made, no longer work there as sleepnurse)*

P 2

Periodic limb movements during sleep and cerebral small vessel disease: A preliminary study

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Background: Periodic limb movements during sleep (PLMS) are involuntary, highly stereotypical, and regularly occurring movements interrupting sleep. PLMS is accompanied by a rise in pulse rate and blood pressure by activated sympathetic adrenergic system. On this theoretical basis, we wanted to investigate the relationship between PLMS and cerebral small vessel disease (SVD).

Methods: We conducted a retrospective analysis of polysomnography-proven 56 consecutive PLMS patients at Seoul National University Boramae Hospital between January 2004 and February 2016. Inclusion criteria were registration of adequate brain MRI within one year from/to PSG date. We excluded those with (1) a new neurological event occurred between PSG date and MRI, (2) a previous history of infarction/ICH/SAH (3) a previous parenchymal change by head trauma, and (4) Parkinsonism. We rated the total MRI burden of SVD on an ordinal scale from 0 to 4, by counting the presence of each of the 4 MRI features of SVD: lacunes, microbleeds, perivascular space, and white matter hyperintensities.

Results: Of the 56 patients 28 are men and 33 are women. Twenty-five patients are grouped as mild PLMS and 31 as moderate-to-severe. Though there is no group difference in the each individual SVD category, there is a significant difference in the sum of SVD score. Subject size may have an impact on this result.

Conclusions: PLMS may be associated with SVD. A larger prospective study would warrant a definitive conclusion.

P 3

Infants with dispensed hypnotics have a greater risk of developing hyperkinetic disorder in school age

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Introduction: Sleep problems are common in infancy and 3 % of infants are prescribed hypnotic drugs. It is well known that children with hyperkinetic disorder/ ADHD often have sleep problems and recent studies indicate that poor sleep even in infancy could be a risk factor for development of behavioral problems in childhood.

Objective: To investigate if sleep problems in infancy, as measured by dispensed hypnotics, could be a risk factor for hyperkinetic disorder in school age.

Methods: In this retrospective cohort study all Norwegian children born between 2004 and 2010 were included, a total of 488 286 individuals. Information on dispensed hypnotic drugs in the age 0-3 years was collected from the Norwegian Prescription Database, and diagnoses of hyperkinetic disorder(ICD-10 F90) from 5 years of age and until the end of 2015 was collected from the Norwegian Patients Registry. The data was analysed using cox regression.

Results: The hazard ratio (HR) for hyperkinetic disorder was for all hypnotic drugs was 1.94 (95% CI 1.7-2.2) for girls and 1.74(95% CI1.6-1.9) for boys. For alimemazine the HR was 4.09 (95% CI 3.1-5.4) for girls and 2.74(95% CI2.3-3.3) for boys.

Conclusions: Children who were dispensed hypnotics in infancy had an increased risk of being diagnosed with hyperkinetic disorder in school age. Girls dispensed the sedative antihistamine alimemazine had a 4-fold increased risk of hyperkinetic disorder later.

P 4

Indicators of the structure of nocturnal sleep in patients with cerebrovascular disorders

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To assess the structure of nocturnal sleep in patients with cerebral vascular accident by ischemic type in the basin of the middle cerebral artery, as well as chronic vascular pathology of the brain caused by impaired blood supply due to occlusive internal carotid artery (ICA) were examined in 10 patients (median age was 53.80±4.83) for 1-3 days after stroke with the absence of hemodynamically significant stenosis and occlusion of the ICA and 20 patients (average age – 48.60±2.28) with chronic vascular pathology with the presence of occlusive lesions of the ICA. Polygraphic study of nocturnal sleep was performed using the “Neuron-Spectrum-5/EP” firm “Neurosoft” (Russia) or on the device “Delta Flash”, the company “Deltamed” (France) according to the recommendations of the international Association of clinical neurophysiologists. The study showed that the cerebrovascular disorders at the acute stage of the disease in 100% of cases are reported violation of the structure of nocturnal sleep associated with impaired functional activity of the diencephalon, as well as more caudal (mesencephalon and brainstem) of the brain. At the same time, in chronic vascular disease (in the presence of occlusive lesions of the ICA) in 40% of cases – violations of the structure of night sleep is almost not observed, which is probably connected with the system of organization of the cerebral vessels, able to carry out a redistribution of blood flow in favor of the active, urgent at the moment areas of the brain associated with the regulation cycle "sleep-wake".

P 5

Information processing speed after continuous positive airway pressure (CPAP) treatment in obstructive sleep apnea (OSA)

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Objectives: In our systematic review information processing speed of OSA patients was reduced in 50% of the studies when compared to healthy controls. In this study, we examined OSA patients' information processing and psychomotor speed before and after CPAP treatment compared to the controls.

Methods: A full-night polysomnography and a neuropsychological assessment were conducted in 45 newly-diagnosed OSA patients before CPAP treatment and in 20 healthy controls. All participants were right-handed male at working age. Patients were considered compliant when using CPAP regularly at least 4 h/night. Twenty-two patients met this criteria. The compliant patients and controls went through a neuropsychological re-assessment after 6 months. Information processing speed was assessed using Digit Symbol, Trails A and Rapid Visual Information Processing (RVP) from Cambridge Neuropsychological Test Automated Battery.

Results: The severity of OSA ranged from mild to severe with a mean apnea-hypopnea index of 41. On average, patients used CPAP for 6 h/night. Patients' and controls' information processing and psychomotor speed showed no statistically significant difference at the first assessment. Patients improved the sensitivity and accuracy to response in time-pressured RVP-task during follow-up significantly more than controls. Changes in tasks requiring psychomotor speed remained non-significant.

Conclusions: CPAP improved speed and accuracy of response in a task demanding sustained attention although the change remained minor. Psychomotor performance remained stable.

P 6

Sleep and fatigue among Swedish commercial airline pilots

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Introduction: New EASA flight time limitations came into force February 2016 and were introduced to protect airline crew against fatigue. This study aims to evaluate the current severity of sleep and fatigue problems among Swedish commercial airline pilots.

Method: A web survey was sent out to 975 pilots (all members of the Swedish Airline Pilots Association that work under the EASA-FTL rules); 598 (61%) completed the survey containing questions about working conditions, sleep, health, and fatigue. 92% of respondents were men, 96% had permanent employment, 73% worked full time as a pilot.

Results: 83% of respondents like their work as a pilot much/very much, while 82% consider their workload to be relatively to very high. 80% have experienced dayshifts of >13h, which posed a (big) problem to 90% of them. Other problems include early morning shift (problematic for 89% of the 96% having experienced them), evening shifts (problem for 73%), and nightshifts (problem for 97%). 97% of pilots feel their working times disturb sleep and 83% have made errors in the cockpit as a consequence of fatigue. 70% feel they get insufficient recovery during working weeks and 74% get insufficient sleep.

Discussion: Our results raise concern about the amount of sleep and recovery Swedish pilots get. Fatigue levels are high and contribute to in-flight errors being made. It cannot be ruled out that this poses an even bigger problem in the rest of Europe with a considerably more congested airspace than Sweden.

P 7

Obstructive sleep apnea in children referred for adenotonsillectomy

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Objectives: Adenotonsillectomy is one of the most common surgical procedures performed in children. The indications for surgery are either recurrent throat infections or hypertrophy of the tonsils/adenoid vegetation. Hypertrophy of the tonsils/adenoid vegetation can lead to obstructive sleep apnea (OSA). In children with OSA adenotonsillectomy is regarded as the first choice of treatment. However, studies in recent years have shown that the procedure does not always have the expected effect. Children with OSA are at greater risk for complications from the procedure. There is disagreement regarding the need for sleep studies in children prior to surgery to verify an OSA diagnosis, today less than 10 % have polysomnography (PSG).

The main purpose of this study is to describe the prevalence of OSA among children referred for adenotonsillectomy. Further to evaluate whether different clinical symptoms can predict the diagnosis.

Methods: This is a prospective cohort study involving children between 2 and 5 years who are referred for adenoidectomy and/or tonsillectomy. The patients included are randomly selected among the referred children.

PSG with video recordings and an otorhinological examination are performed in all children.

Results: 100 children will be included in the study. The data collection is still ongoing and the final results will be presented.

Conclusions: Preliminary results suggest a high prevalence of OSA in children referred for adenotonsillectomy.

P 8

Prevalence of several somatic diseases depends on the presence and severity of obstructive sleep apnea

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Objective: Investigate the prevalence of heart attack, angina pectoris, stroke, hypertension, diabetes mellitus, chronic obstructive pulmonary disease, asthma and obesity in relation to the presence and severity of obstructive sleep apnea (OSA).

Methods: 1887 patients, mean age 48.6 years, referred to a university hospital on suspicion of OSA. Self-reported questionnaire about whether the patients had been diagnosed with different comorbidities. OSA was diagnosed with a standard respiratory polygraphic sleep study (type 3 portable monitor). The patients' weight, height and blood pressure were objectively measured.

Results: 37.9% did not have OSA (AHI<5), 29.6% mild OSA (AHI 5-14.9), 17.3% moderate OSA (AHI 15-29.9), and 15.2% severe OSA (AHI≥30). The prevalence of heart attack, angina pectoris, hypertension, measured systolic blood pressure ≥140 mmHg, measured diastolic blood pressure ≥90 mmHg, diabetes mellitus and obesity (body mass index≥30) were higher with greater OSA severity (all $p<0.01$). This was not the case for stroke, chronic obstructive pulmonary disease and asthma. After adjusting for sex, age, alcohol and smoking in the logistic regressions, hypertension, measured systolic blood pressure ≥140 mmHg, measured diastolic blood pressure ≥90 mmHg and obesity remained positively associated with OSA severity.

Conclusion: Obesity and hypertension, conditions easy to clinically assess, appear as central comorbidities with greater OSA severity.

P 9

BMI, Shift Work Schedule and Night Work Load: A 4-year longitudinal study

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Introduction: Our longitudinal study looks at differences in weight gain between different shift-rotations and with respect to cumulative night work exposure.

Methods: This prospective study of Norwegian nurses had follow up after 4 years. Male nurses and pregnant nurses at time of BMI measurements were excluded. Nurses own estimation of number of nights worked the last year were recorded yearly. A sum score was calculated, and yearly average night shift load calculated. The nurses were divided into three ordinal groups (<1 night/year; 1-20; >20) with respect to yearly night work load (n=315; n=252; n=285, respectively). We had four shift groups: day only (n=56), day and evening (n=264), 3-shift rotation (n=385), and night only (n=36). We analyzed the data with paired t-tests and regression models adjusting for BMI at baseline, age, marital status, children living at home, and average hours worked/week.

Results: Night workers (mean BMI difference (md)=1.53 (0.88-2.19), p<0.0001), 3-shift workers (md=0.46 (0.30-0.62), p<0.0001) and Day and Evening workers (md=0.48 (0.19-0.77), p<0.0001) all had significant weight gain during the follow up period. Day workers had a non-significant weight gain. Night workers had significantly higher weight gain compared to day workers (B=1.20 (0.26-2.14), p=0.012). For cumulative night work exposure: <1 nights/year (md=0.50 (0.25-0.75) p=0.001), 1-20(md=0.53 (0.23-0.83) p=0.001), and >20(md=0.60 (0.35-0.84) p<0.0001).

Conclusion: Our longitudinal data suggest that night work is associated with a larger weight gain than day work.

P 10

Sleep problems through childhood and current sleep habits in children born extremely premature - A Norwegian national population based study

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Objectives: To study if children born extremely premature (EP) have different sleep habits and different prevalence and nature of sleep problems than children born at term, and how neurodevelopmental disabilities (NDD) affect sleep in children born EP.

Methods: A Norwegian national cohort of children born EP (gestational age <28 weeks or birth weight <1000 g) and a cohort of unselected reference children born at term were compared. Questions on current sleep habits and prevalence of sleep problems throughout childhood until 11 years of age were asked at 11 years for both groups. In addition, the EP group was assessed clinically at 5 years of age.

Results: The sleep habits of the children in the two groups were different. Throughout childhood, the EP children had a higher prevalence of sleep- problems than the controls (26% vs.14%, p<0.001). The prevalence was higher for the EP children with no NDD (n=93, 20%) than for the controls, and increased with increasing NDD to 67% (p= 0.015) for those with severe NDD.

Conclusion: Even EP children with no NDD had more sleep problems during childhood and different sleep habits at 11 years of age than the reference group. The prevalence of sleep problems increased with increasing NDD.

P 11

Consolidation of visual episodic memories is associated with rem duration in late adolescence

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Memory consolidation during sleep is sensitive to emotional content, and differs between children and adults. We investigated the associations between visual episodic memory consolidation and habitual sleep duration and quality, as well as sleep architecture and spindle activity in late adolescence.

182 adolescents (75 boys; age 16.9, SD0.1y) from the community-based Glaku-cohort participated in an overnight sleep-EEG and 8-night actigraphy study. 100 high and low arousal images from IAPS were presented in the evening, with next morning recall from 200 images.

We used SomnoPlus device with 6 channels to measure sleep EEG during one night, and AW7 actigraphs to measure sleep over an 8-night period. Sleep staging was conducted manually.

After controlling for age and sex, longer REM duration and higher percentage of REM were associated with better recall of both high and low arousal images. We found no associations between recall function and actigraphy-measured sleep quality and duration over the 10-day follow-up, nor with spindle activity.

During adolescence, REM sleep plays an important part in visual memory consolidation, independently of the emotional content. Spindle activity during S2 did not associate with specific high- or low-arousal visual episodic memories. Even though sufficient sleep is required for optimal cognitive performance, the habitual sleep quantity and quality did not associate with visual episodic memory consolidation in this age group.

P 12

Insomnia in Norwegian film-, TV and commercial directors

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Objectives: The aim of the study was to examine the role of anxiety, depression, negative stress, and personality in insomnia symptoms among Norwegian film-, TV- and commercial directors. No previous study has investigated sleep in the film and TV industry, despite demanding work conditions.

Methods: An online questionnaire was distributed to central film institutions in Norway, amongst others the Directors Guild of Norway, about 400 were invited and 77 directors participated in the study. We assume that the sample comprise about 19 % of the total population of film, TV- and commercial directors in Norway. The directors completed a questionnaire measuring personality traits, negative stress, anxiety, depression and insomnia with validated instruments. Multiple regression analysis was used to analyze the data.

Results: A total of 13% (10 respondents) fulfilled the criteria for clinical insomnia according to their answers on the questionnaire. Initial correlation analyses indicated that neuroticism, distress, anxiety and depression were positively correlated to insomnia symptoms, however in the regression model, including all variables, only neuroticism and perceived stress reached significance.

Conclusion: Perceived stress was more important for insomnia, than anxiety and depression in this sample of film- TV- and commercial directors. This has implications for treatment of sleep problems in this group of workers.

P 13

Effects of work arrangement on sleep regimen in creative R&D employees

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Objectives: Traditional "nine-to-five" working schedules do not account for employees' individual characteristics. We seek to identify what type of creative R&D employees suffer from the adverse effects of work arrangements on their sleep regimen.

Methods: We present ordinary least squares and ordered probit regression estimates as well as recursive structural equation estimates of the employees' perceived level of sleep regimen distraction by work. The study is based on data from a repeated survey among Estonian creative R&D employees. The sample comprises 153 individuals from eleven entities.

Results: We find evening type people to be significantly more distracted by the adverse effects of work on their sleep regimen. Female employees have a 6% higher probability of perceiving their work to limit strongly their sleep schedule. Employees having flexibility in both their working time and working place feel significantly less impacted by the work driven constraints on their sleep regimen. Employees with a higher creativity intensity of work appear less affected by the limitations that work sets on their sleep, in comparison to employees with a higher share of administrative and other non-creative tasks.

Conclusions: The quality of sleep of evening type as well as female employees being adversely impacted by their working arrangements means potential underutilisation of their creative abilities. Granting working time and working place flexibility as well as avoiding allocation excessive administrative duties to creative R&D employees may have a major positive impact on improving their sleep, thus expectedly contributing to the improvement of their wellbeing and work results.

P 14

Sleep disturbances in trauma-affected refugees – prevalence and perspectives on treatment

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Sleep disturbances are often referred to as the hallmark of Posttraumatic Stress Disorder (PTSD). Sleep disturbances affect the efficacy of first-line PTSD treatment and may constitute a risk factor for poor outcome of psychiatric treatment. Although PTSD is prevalent in refugees, studies on sleep disturbances in trauma-affected refugees are scarce. The aim of this presentation is to explore sleep disturbances in trauma-affected refugees by presenting findings on sleep disturbances in trauma-affected refugees from three consecutive trials carried out at Competence Centre for Transcultural Psychiatry (CTP). Furthermore a review of the existing literature on treatment of sleep disturbances in trauma-affected refugees will be presented and perspectives on state of the art treatment will be discussed.

In a sample of 752 trauma-affected refugees undergoing psychiatric treatment at CTP 99% reported sleep disturbances. This delineated sleep disturbances as the most prevalent symptom and indicated that sleep disturbances are a prominent part of the PTSD symptom structure in refugees. We identified only a small number of studies on treatment of sleep disturbances in trauma-affected refugees and further research on treatment is needed – promising treatments such as Imagery Rehearsal Therapy are currently being tested in a randomised controlled trial at CTP.

P 15

Sleep and work mastery in relation to self-scheduling, and knowledge of health risks, among female shift workers

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Objectives: The aim was to reveal if the female worker had been informed of the health risks involved with working night shift, and if possibility of choosing shift-schedule, which included or excluded night shifts, had an effect on the worker's sleep, work mastery and satisfaction.

Method: A total of 570 female health workers at several hospitals in Norway were asked to complete an online questionnaire about shift work, information of the health risks involved with shift work, self-scheduling, shift work sleep disorder, work mastery and work satisfaction. Of these, 288 women participated, and 216 (mean age 40.85 years, SD 10.59) replied they had been working night shift for over one year. Data was analyzed with chi-square and independent samples t-tests.

Results: 92 (41.4 %) of the 216 women said they had not been informed of the health risks involved with working shift. Those who were allowed to choose or exclude themselves from working night shifts had a significantly higher score of perceived work mastery ($p<.05$, 4.33, SD=.52), and lower scores on shift work disorder ($p<.05$, 21/59, 35.6 %), compared to the workers who were not free to choose. Work satisfaction, and information about health risks were unrelated to self-scheduling.

Conclusion: Many female shift workers are not familiar with the health risks they are exposed to. It is suggested more general awareness is needed. Self-scheduling seem to show benefits in regards to work mastery and shift work disorder.

P 16

The effect of mucosal local anaesthesia administered to tongue base, soft palate and nose on sleep apnea

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Objectives: To define the influence of mucosal local anesthesia on sleep apnea, which administered to different upper airway areas. We hypothesized that desensitization of mechanoreceptors in upper airway would lead to sleep apnea.

Materials and Methods: 40 healthy adult subjects (21 females and 19 males) were included in the study. We measured change in total and supine apnea-hypopnea indexes, oxygen saturation, and sleep effectiveness after administration of bupivacaine injection to following areas: (1) soft palate (SP), (2) nose (N), (3) tongue base (TB), (4) all parts (AP).

Results. Desensitized mechanoreceptors in all groups led to increase AHI scores but significant increases were observed in TB and AP groups when compared the baseline scores.

Conclusions. Desensitization of upper-airway mechanoreceptors showed that local mechanoreceptor mechanisms located in tongue base importantly modulate the upper airway collapsibility.

P 17

The effect of individual differences and partial sleep deprivation on cognitive and affective functioning: Preliminary results from the SLEEPIC Study

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Objectives: To examine the effects of individual differences and partial sleep deprivation on cognitive and affective functioning.

Methods: 60 healthy individuals between 18-35 years of age will be included. Here we report results from the first 15. Data was collected over 11 consecutive days. On day 1, participants completed questionnaires measuring individual differences, sleep and health. They also received sleep diaries and actigraph watches, performed a continuous performance test (Conners CPT-3), and completed the PANAS state version to measure affect. The CPT-3 and PANAS was also performed on day 4, 8, 9 and 11. On day 8, the average sleep duration was calculated for each participant, and they were instructed to sleep 2 hours less than the previous 3 days.

Results: 9 sleep deprived participants (SDs) complied to the sleep deprivation, while 6 participants slept 1-2 hours longer than instructed (nonSDs). Repeated measures ANOVAs showed that, after partial sleep deprivation, both groups had lower positive affect compared to baseline, but only SDs had lower scores on reaction time and number of commission errors as measured with the CPT-3. Moreover, nonSDs had lower scores on positive affect at baseline compared to SDs.

Conclusions: Partial sleep deprivation affects executive and affective functioning, and intended sleep deprivation may have a negative effect on affective function. However, these results should be treathed with caution due to the small sample size.

P 18

Akershus Sleep Apnoe Diagnostic Evaluation

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The aim of this study is to compare the automatic scoring results of an esophageal probe based polygraph, Apnoegraph Spiro (Spiro Medical), to the manually scored results of a NoxA1 polysomnograph recorded simultaneously.

Exclusion criteria were: age under 18 years, prior treatment of obstructive sleep apnoea syndrome, electronic implants and lack of understanding of the Norwegian language. Cohorts were recruited from a consecutive, clinical population arriving at Akershus University Hospital, department of Otorhinolaryngology, sleep section, between September 2015 and October 2016.

Perliminary results: 259 patients (185 male, 71%) agreed to participate, mean age 46,9 years, Standard deviation (SD) 11,8. A randomized draw was performed on evenings when more than one person consented to participate, as only one double registration could be performed each night.

A recording with at least 4 hours of good signal quality on both recorders was defined as successful. The total number of double recordings fulfilling these criteria are still under preparation. Technical problems occurred in both diagnostic systems. However, synchronization with two simultaneous bluetooth signals may have contributed to a higher proportion of unsuccessful double registrations than expected.

P 19

Physical activity moderates the relationship between Insomnia and symptoms of depression among adolescents: Results from a community sample

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Objectives: The aim was to study the interaction between insomnia and physical activity in symptoms of depression among adolescents.

Methods: A total of 1494 individuals between 16 and 24 years of age (M = 17.80, SD = 1.11, 58 % girls) participated in a large, internet-based study. The data collection took place in 2013. The questionnaire included measures of physical activity (PA), insomnia (BIS), and symptoms of depression (MDI). Regression analysis with symptoms of depression as dependent variable, with PA, and BIS*PA as predictors were performed after centering PA and BIS. Age and gender was included as control variables.

Results: Insomnia was a strong predictor of symptoms of depression ($\beta = .56$, $p < .01$). PA was negatively ($\beta = .09$, $p < .01$), and PA*BIS was positively related to MDI ($p < .01$). The relationship between insomnia and symptoms of depression was strongest in the group with the lowest level of physical activity.

Conclusions: Insomnia is a strong predictor of symptoms of depression, especially among adolescents who have low levels of physical activity.

P 20

Association of sleep time in supine position with apnea-hypopnea index as evidenced by successive polysomnography

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Purpose The purpose of this study is to evaluate the impact of body position during sleep on apnea-hypopnea index (AHI) and night-to-night variability in polysomnography (PSG) parameters.

Methods Totally, 30 patients with obstructive sleep apnea syndrome (OSAS) were assessed prospectively with succes- sive PSGs performed. The patients were categorized as in- creased (group A), decreased (group B), and unchanged (group C) AHI between the first and second PSG evaluations performed at least 1-week interval.

Results The mean AHI values were significantly higher in the second night (p = 0.02). A change in AHI was found in almost 85 % of the patients between two successive measurements. According to multivariate and correlation analyses and differ- ences in total AHI in supine position (r = 0.897), it was found that the influence of the supine position was the primary factor contributing to the night-to-night variability. Supine AHI, non-supine AHI, and non-supine time findings did not add any significance on total AHI.Conclusions The variability observed in the AHI seems relat- ed to amount of sleeping time spent in supine position, sug- gesting that mean AHI alone is not that reliable in the accurate diagnosis of OSAS severity. A thorough evaluation of AHI in supine and non-supine positions is needed in order to under- stand better the severity of OSAS.

P21

QT interval variability index during different sleep stages in patients with obstructive sleep apnea

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Introduction: The aim of the study was to investigate the impact of obstructive sleep apnea (OSA) on the ECG QT interval variability (marker of electrical instability) during wake-sleep stages.

Methods: Polysomnographic recordings of 28 (13 male, 15 female) patients with OSA and 30 (15 male, 15 female) patients without OSA were analyzed. The algorithm to measure the QT variability index was QTVI = log10 (QTv/QTm²/ RRv/RRm²), it was calculated as means of 2 awake, 3-4 non-rapid eye movement (NREM) and 3 rapid eye movement (REM) sleep episodes (each 300 s).

Results: The ANOVA analyzis revealed that the QTVI was higher in OSA than in non-OSA patients – the statistical difference was reached for males while awake (P = 0.001) and for females in all wake-sleep stages (awake P = 0.001, NREM P = 0.002, REM P < 0.001). Significant gender differences in the QTVI mean values existed in OSA patients during sleep (NREM -0.9±0.4 vs. -0.3±0.5, P < 0.001; REM -1.1±0.3 vs. -0.3± 0.5, P < 0.001), but not while awake (-0.7±0.4 vs -0.3±0.7, P = 0.085; males vs. females, respectively).

Conclusions: OSA is associated with increased QT interval variability. REM sleep per se does not increase QT variability. Applying the non-invasive ECG marker QTVI for arrhythmogenic risk stratification could provide valuable prognostic information.

P 22

AirSense 10ForHer and Airview in sleep apnea: personal experiences, case reports: night asthma and mild sleep apnea

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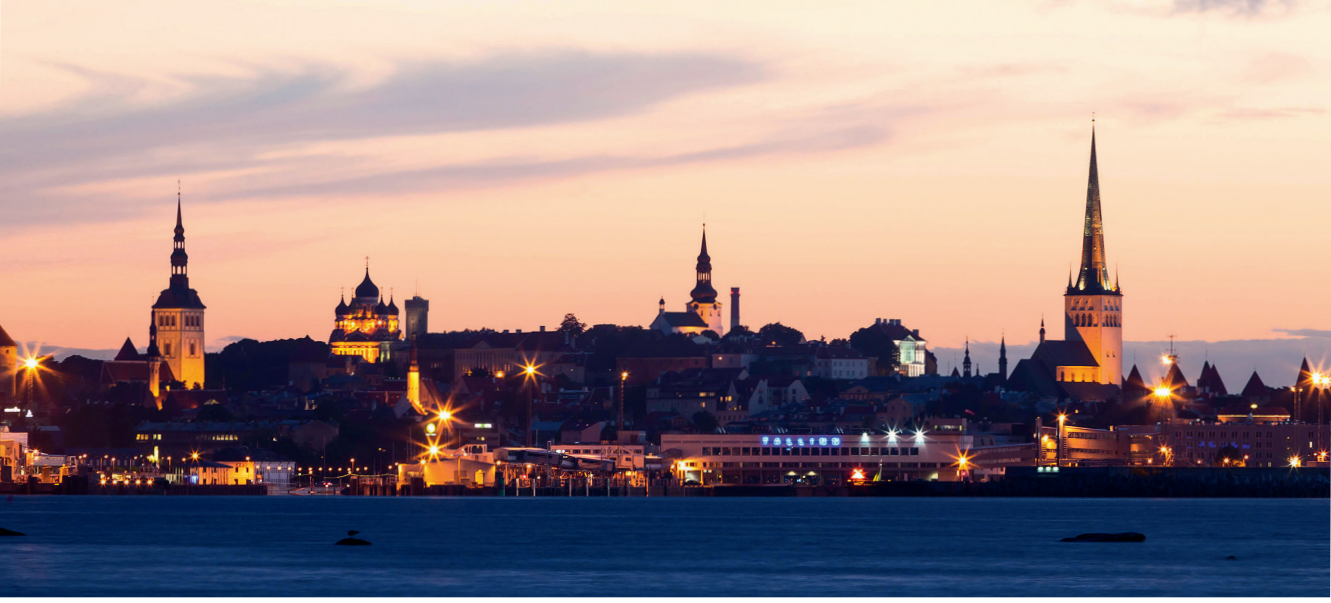
Diagnostics of sleep apnea have been started at the private clinic Trinitas in Turku with home night pulse oximetry during two nights in Autumn 2016 and with AirSense 10 (Autoset for Her)in 2017 with Airview with good experiences in sleep apnea with S9 Autoset,in combination of sleep apnea and chronic airway obtruction with feeling of suffocation at night releaved by AirSense 10 Autoset for Her as well as in mild upper airway obstruction with heavy tiredness relieved after 2-3 nights treatment.

Case reports with equipment from RESMED including Airview are presented.



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List of participants / Index

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10	Ulla	Anttalainen	Finland	L 52; C 4-5; S 13
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17	Christian	Benedict	Sweden	L 43, L 59
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20	Søren	Berg	Norway	
21	Thomas	Berge	Norway	
22	Jagdeep	Bijwadia	USA	
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37	Niklas	Eklund	Denmark	
38	Morten	Engstrøm	Norway	S 2
39	Satu	Eskelinen	Finland	
40	Päivi	Falin	Finland	
41	Ieva	Filipova	Latvia	
42	Eldbjørg	Fiske	Norway	
43	Hilde	Fossum	Sweden	
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46	Himanshu	Garg	India	
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51	Janne	Grønli	Norway	L 42; L 44; L 46; L 48; L 56; S 11
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61	Mari-Kaarina	Hiltunen	Finland	
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64	Harald	Hrubos-Strøm	Norway	L 25; L 31; P 18
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66	Jekaterina	Ivanova	Estonia	
67	Marily	Jaagor	Estonia	
68	Martti	Jaanus	Estonia	
69	Triin	Jagomägi	Estonia	C 2; C.2-1
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73	Rain	Jõgi	Estonia	S 3
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75	Marko	Järvinen	Finland	
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80	Håvard	Kallestad	Norway	L 22; S 6
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82	Mare	Kaps	Finland	
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112	Karoline Cecilie	Lode-Kolz	Norway	S 9; L 36
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114	Juha	Markkula	Finland	L 16
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117	Kersti	Meldre	Estonia	
118	Sari	Melkko	Finland	P 1

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132	Georgios	Nikolakaros	Finland	
133	Meri	Nikolakaros	Finland	
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181	Julia	Shulga	Estonia	
182	Tiina	Siilak	Estonia	
183	Priit	Siinmaa	Estonia	
184	Karine	Sinander	Sweden	
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Welcome to the

18th NORDIC SLEEP CONFERENCE 2019

OSLO 23 – 25 MAY

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About Estonia and Tallinn

Tallinn was first mentioned in 1154. Estonia's UNESCO world heritage capital city Tallinn was granted city rights in the 13th century by the King of Denmark. Since then, the streets of Tallinn have seen many world powers, from the Danes and Swedes to Germans, and tsarist and Soviet Russia. Tallinn Old Town is filled with medieval houses and alleyways and is still protected by the remnants of the city wall. The wealth of architecture in Tallinn means that there are many legends and stories to explore.

Estonians tend to be at least bilingual, and according to recent studies, are among the best English speakers in Europe. Many visitors tend to think that Estonians speak elvish. This magical sounding language is in fact Estonian, belonging to the Finno Ugric branch of European languages.

Estonians love their forests, bogs and all the creatures that live there such as lynxes, brown bears, wolves, foxes, rabbits and deer. It's right to say that Estonians come with a tree hugging trait.

Estonia has a population of just 1.3 million. Being among the least densely populated countries in Europe, Estonia makes for a great nature and city break destination for those looking to stretch out their limbs and enjoy some peace and solitude.

Estonian Song Celebration dates back to 1869, attracting thousands of singers in every 5 years. Estonian Song and Dance Celebration is the local signature event and a reason why Estonians are often referred to as the "singing nation". The uniqueness of this mesmerising event has even earned the song and dance celebration a place at UNESCO's prestigious list of Intangible Cultural Heritage.

E-Estonia. From voting to signing documents online, Estonia implements hassle free and modern approach to running one's errands. This means less bureaucracy, while adding more transparency and efficiency in some vital sectors such as healthcare and education. Estonian programmers have been behind the creation of digital brands such as Skype, Hotmail and more recently Transferwise. Estonia has declared internet access a human right, it has a thriving IT start-up culture and has digitally streamlined an unprecedented number of public services for citizens and businesses.

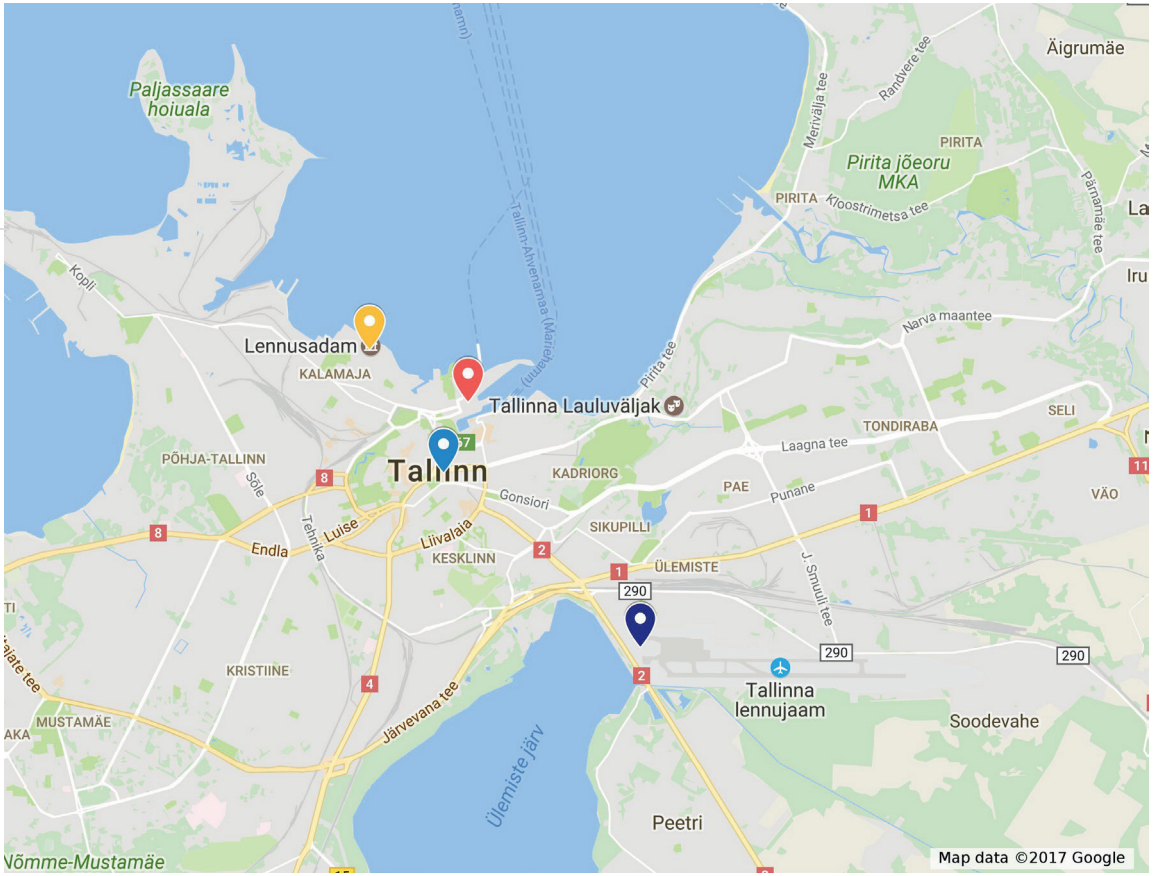
The Republic of Estonia is the first country to offer e-Residency – a transnational digital identity available to anyone in the world interested in administering a location-independent in administering a location-independent business online. E-Residency additionally enables secure and convenient digital services that facilitate credibility and trust online.

We wish you all a pleasant stay in Tallinn and hopefully you return home with bright memories, inspiration for further plans and we welcome you back to Estonia.

NSC 2017

NSC venues

- Sokos Hotel Viru
- Tallinn Airport
- Tallinn Seaplane Harbour
- Port of Tallinn



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Simple Reliable Accurate

Well validated automatic algorithm based scoring. FDA approved for automatic diagnosis of central sleep apnea. Based on the PAT technology, which is endorsed by the new AASM guidelines.

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May 26th 08:30-10:00 – Index: CS.4 Room: BOLERO

One finger
One signal
One analysis

On the use of the PAT signal in the clinical setting

Chairman: Jan Hedner

The PAT signal - Physiological and patophysiological applications. – *Jan Hedner* - Prof./ Sahlgrenska University Hospital, Goteborg, Sweden

Monitoring sleep and breathing with the WatchPAT. Practical clinical examples. – *Ludger Grote* - Ass. Prof./ Sahlgrenska University Hospital, Goteborg, Sweden

The WatchPAT for clinical follow-up of OSA patients. – *Richard Harlid* MD.- Aleris sleep clinic, Stockholm, Sweden

Novel diagnostic functions embedded in the WatchPAT analysis. – *Hartmut Schneide*r - MD., PHD - John Hopkins Medicine

Symposium is organized by Timik Medical and Itamar Medical

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