

likely of all the twelve inverted models. Model inversion of the five node model showed that older subjects had significantly increased inhibition of pyramidal cells ( $p < 0.05$ ) with reduced modulation of this activity within the right inferior frontal gyrus ( $p < 0.02$ ).

**Conclusion:** Deterioration in frontal-based control mechanisms caused attenuation of MMN with age. Impairment of cortical dynamics in the right inferior frontal gyrus on stimulus change provided a neurobiological mechanistic explanation for the reduction of MMN and attention control in the ageing brain.

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#### Abstract – WCN 2013

No: 1127

#### Topic: 36 – Other Topic

#### Polysomnographic sleep parameters in an aging population

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**Introduction:** Although many studies have shown the evolution of sleep parameters across the lifespan, not many have included a representative sample of the general population. The objective of this study was to describe changes in sleep patterns in the general population of Sao Paulo throughout adulthood.

**Methods:** We selected a representative sample of the city of Sao Paulo, Brazil that included both genders and an age range of 20–80 yrs. This sample included 1024 individuals that were submitted to polysomnography (PSG) and structured interviews. We sub-divided our sample into 5-year age groups.

**Results:** Total sleep time, sleep efficiency, percentage of REM sleep and slow wave sleep showed a significant age-related decrease ( $p < 0.05$ ). WASO, arousal index, sleep latency, REM sleep latency, and the percentage of stages 1 and 2 showed a significant increase ( $p < 0.05$ ). Furthermore, AHI increased and oxygen saturation decreased with age. The reduction in the percentage of REM sleep significantly correlated with age in women, while the reduction in the percentage of slow wave sleep correlated with age in men. The PLM index increased with age in men and women.

**Conclusions:** Sleep structure and duration underwent significant alterations throughout the aging process in the general population. There was an important effect of age on sleep respiratory parameters and PLM index. In addition, men and women showed similar trends but with different effect sizes.

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#### Abstract – WCN 2013

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#### Topic: 36 – Other topic

#### Incidence and mechanisms of traumatic brain injury and the relationship with psychological health among Ontario adolescents

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**Background:** Limited population based data is available on the prevalence of adolescent traumatic brain injury (TBI) and its adverse psychological correlates.

**Objective:** To describe lifetime prevalence, the mechanisms of injury, and links between self-reported TBI and mental health, suicidality, bullying and other conduct behaviours among a population based sample of adolescents.

**Methods:** Data were derived from 4735 questionnaires administered to 7th and 12th graders as part of the 2011 Ontario Student Drug Use and Health Survey.

**Results:** In total, 19.5% of adolescents reported a TBI in their lifetime. Sports injuries were the most likely mechanism for mTBI among all reported causes (55.8%, 95% CI: 46.9, 4.2). When holding constant sex and grade, adolescents with TBI had significantly greater odds for reported elevated psychological distress (OR = 1.51), attempting suicide (OR = 3.39), seeking counselling through a crisis help line (OR = 2.10), and being prescribed medication for anxiety, depression or both (OR = 2.43). Moreover, they had higher odds of being victimized through bullying at school (OR = 1.70), being cyber-bullied (OR = 2.05) or being threatened with a weapon at school (OR = 2.90), compared with adolescents who never had a TBI. Adolescents with TBI had also higher odds of victimizing others and engaging in numerous violent and non-violent conduct behaviours.

**Conclusion:** High rates of TBI among adolescents in the general population, its high association with team-sports and adverse psychological effects highlight the need for urgent prioritization of prevention efforts.

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#### Abstract – WCN 2013

No: 992

#### Topic: 36 – Other topic

#### Unselected brain imaging in suspected meningitis delays lumbar puncture, can prolong hospitalisation and may increase antibiotic costs - a pilot study

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**Background:** Antibiotics reduce mortality in bacterial meningitis; a lumbar puncture (LP) will demonstrate that many patients with suspected meningitis do not need them; but delays reduce chances of culture, particularly if  $> 8$  h. Guidelines advise a LP without brain imaging unless specific features are present.

**Objective:** We assessed the duration of hospitalisation and inpatient costs incurred with delays in LP in a Northwest of England teaching hospital.

**Methods:** We screened the cerebrospinal fluid (CSF) database to identify patients with suspected meningitis over 3 months (07–09/2010). Data were recorded from clinical case notes; costs were calculated with established datasets and the British national formulary.

**Results:** 142 patients were screened; 35 had a suspected CNS infection; 10 had a CNS infection proven: 3 bacterial meningitis; 4 aseptic meningitis and 3 viral encephalitis.

Brain imaging delayed the LP for 19 (54%), (11.08 vs 5.29 hrs,  $p = 0.10$ ); ten (53%) did not need imaging. 11 (42%) of those given antibiotics before the LP were delayed  $> 8$  h.

For patients with aseptic meningitis and those who had a CNS infection excluded, without prior antibiotics, the delay in LP increased duration of hospitalisation ( $r = 0.94$ ,  $p = 0.02$  and  $r = 0.96$ ,  $p = 0.01$  respectively).

Overall there was no trend with LP delays and antibiotic cost. However, 4 patients had antibiotics continued despite negative

cultures; 2 of whom had the LP delayed >8 h, with an antibiotic cost of £215.96.

**Conclusion:** Inappropriate brain imaging often delayed the LP; in patients who did not need antibiotics this led to longer hospitalisation.

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**Abstract – WCN 2013**

**No: 1141**

**Topic: 36 – Other topic**

**Worldwide record of REM sleep time in a patient with pedunculopontine nucleus area (PPNa) stimulation**

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**Background:** PPNa stimulation improves gait disorders and mildly increases REM sleep and alertness in previous series.

**Objective:** To evaluate nighttime sleep with and without PPNa stimulation.

**Patients and methods:** Four patients (3 female, 1 male, 46–69 y old) with Parkinson's disease for 9–22 years had PPNa stimulation for gait disorders. Underwent sleep monitoring after 2 months with and without deep brain stimulation (DBS), in a double blind randomized cross over manner. After 9 months under chronic DBS, male patient had 4 additional sleep monitoring with stimulation on again (n = 2), and 1 and 6 nights after stimulation was stopped. Active contacts were located via normalized MRI.

**Results:** In the male patient, who had the clearest benefit on gait, REM sleep percentage was 49% (REM sleep time: 210 min; normal values: 17–23%) of total sleep time with stimulation, and 0% without. REM sleep was still increased 9 months later with continuous PPNa stimulation (41% of REM sleep on stimulation). It decreased to 30% after one night and to 9% after 6 nights without stimulation. In the 3 other patients REM sleep was 4–22% without stimulation and 0–21 % with stimulation. The active contacts had similar localization in the 4 patients.

**Conclusion:** This dramatic, supranormal (twice higher than the higher bound in normal adults), durable and reproducible increase of REM sleep time with PPNa stimulation, followed by a progressive return to low values when stimulation is stopped, suggests that the PPNa stimulates 'REM sleep on' systems (possibly in the subcoeruleus nucleus).

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**Abstract – WCN 2013**

**No: 513**

**Topic: 36 – Other topic**

**Neurological lesions in children of KYIV, born on the year of catastrophe in chernobyl**

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**Object:** To study influence of small-scale irradiation on nervous state of growing organism in children.

102 children born in 1986–1997 years have been examined in dynamics.

At age of 6–7 years in 62% of children autonomous disorders on subclinical level have been observed: 33% with sympaticotonic type and 33% with parasympaticotonic type. Children were irritated and tired quickly, concentration of attention was bad.

With sympaticotonic direction of vegetative reactions index Kerdo increased essentially (up to  $42.3 \pm 3\%$ ). Considerable disbalance of cardiovascular tests was noted. In subgroup of these children 23% had congenital orthopedic pathology of spine and lower extremities were marked. With vagoinsular direction of vegetative reaction in children of this age group congenital defects of locomotor and support were less often (14% of cases).

On other hand chronic disorders of bronchopulmonary system and gastroenteric tract (made up 38% of cases) prevailed. With secondary examination of children at the age of 16–17 years it was noted that vegetative dysfunction (mainly with sympaticotonic type) was observed only in 27% of examined children but they had more often disorders connected with locomotor an support, namely: chondrosis of vertebrosacral spine, dysplasia of vertebrae and large joint of limbs, flatness of anterior part of feet, congenital deformities, syndrome of congenital dysplasia of connective tissue on subclinical level. When patients are at the age of 26–27 years dysfunction of autonomous nervous system has reached only 12%. Sympaticotonic and vagoinsular were almost equally divided among them.

Small-scale irradiation affect mainly autonomous nervous system on subclinical level.

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**Abstract – WCN 2013**

**No: 1204**

**Topic: 36 – Other topic**

**Lewy neurite-like structures are rarely associated with Lewy body pathology at the brainstem of multiple system atrophy (MSA)**

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**Background:** Two major differences of synuclein pathology between multiple system atrophy (MSA) and Lewy body disease (LBD) are the location of abnormal  $\alpha$ -synuclein aggregation, mainly glial or neuronal, and existence of the peripheral organs involvement. We found a case of MSA with numerous Lewy neurite-like swollen structures (MSA neurites). However, it is unclear whether these swollen neurite of MSA are related with Lewy body pathology or not and provide some insights of the relationship between MSA and Lewy body pathology.

**Objectives and methods:** To clarify the characteristics of the swollen neurites of MSA, we examined 160 autopsy confirmed cases of MSA at our institute. Patient characteristics: age of death  $67.3 \pm 8.3$  years; disease duration to death  $7.4 \pm 4.1$  years. Clinical phenotype was MSA-C (predominant cerebellar involvement) in 84, MSA-P (predominant parkinsonism) in 71. Tissue blocks were taken from the brainstem, and HE staining and immunohistochemical staining for phosphorylated alpha-synuclein were used. We examined for the presence of MSA neurites and Lewy bodies in the brainstem.

**Results:** Ten cases (6.3%) showed Lewy bodies: 4 cases in the IIIrd nucleus, 7 cases in the locus coeruleus. Twenty two cases (14%) showed MSA neurites; 20 cases in the IIIrd nucleus, no cases in substantia nigra. Only one case with MSA neurites had Lewy body pathology.

**Conclusion:** Lewy neurite-like swollen neurites might be one of the characteristic findings of MSA rarely combined with Lewy body-related pathology.

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