11th NoSCoS Congress
JUNE 3rd-6th 2009 • VIBORG • DENMARK

PROGRAMME
PROGRAMME
Wednesday, June 3rd

12.00 – 13.00  NoSCoS Board Meeting
13.00 – 14.00 NoSCoS Counsil Meeting
13.00 – 14.00 Registration

<table>
<thead>
<tr>
<th>14.00 – 15.00</th>
<th>Workshop</th>
<th>Workshop</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pressure ulcer</td>
<td>Intrathelcal baclofen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>15.00 – 16.00</th>
<th>Workshop</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obesity</td>
</tr>
</tbody>
</table>

16.00 – 16.30  Coffee break
16.30 – 17.30  Workshop
               SCIM

18.30 -  Get together party
PROGRAMME
Thursday, June 4th

08.00 - 09.30  Registration and coffee
09.30 - 10.00  Opening ceremony
10.00 - 10.50  **Lars Sullivan Memorial Lecture:**  
 **Chair:** Stefán Yngvason  
 Spinal Cord Injury - Past, Present and Future  
 *Past president of ISCoS* Dr. William Donovan
10.50 - 11.00  Break
11.00 - 12.30  **Pain in SCI**  
 **Chairs:** Inger L. Johannesen, Nanna Finnerup

| 11.00 - 11.45  | **State of the Art Lecture**  
 Ninna Finnerup |
|----------------|----------------------------------|
| 11.45 - 12.30  | **Oral presentations**  
 M. Mladovic  
 C. Baastrup  
 I. Lidal  
 **Workshop**  
 Dressing technique |

12.30 - 13.30  Lunch
13.30 - 15.00  **Sexuality – women**  
 **Chairs:** Sigrún Knútsdóttir, Margareta Kreuter

| 13.30 - 14.30  | **State of the Art Lecture**  
 Margaretha Kreuter |
|----------------|----------------------------------|
| 14.30 - 15.00  | **Oral presentations**  
 A. Gunnbjorg  
 M. von Linstow |

15.00 - 15.30  **Coffee break**  
 Posters and exhibition
15.30 - 16.30  **Sexuality and fertility – men**  
 **Chairs:** Fin Biering-Sørensen

| 15.30 - 16.15  | **State of the Art Lecture**  
 Jens Sønksen |
|----------------|----------------------------------|
| 16.15 - 16.30  | **Oral presentation**  
 Jens Sønksen |

16.30 - 17.30  **Workshop**  
 Pain  
 **Workshop**  
 Pulmonary rehabilitation
18.30 -  
 **Welcome reception**
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08.00 - 13.00</td>
<td><strong>Bladder function</strong>&lt;br&gt;Chairs: Pål Ingvarsson, Hans Jørgen Kirkeby&lt;br&gt;This session is sponsored by Coloplast</td>
</tr>
<tr>
<td>08.00 - 08.45</td>
<td><strong>State of the Art Lecture</strong>&lt;br&gt;Hans Jørgen Kirkeby</td>
</tr>
<tr>
<td>08.45 - 09.30</td>
<td><strong>Understanding the Neurogenic Bladder</strong>&lt;br&gt;Elisabeth Farelly</td>
</tr>
<tr>
<td>09.30 - 09.45</td>
<td><strong>Break</strong></td>
</tr>
<tr>
<td>09.45 - 10.30</td>
<td><strong>Oral presentations</strong>&lt;br&gt;Chairs: Elisabeth Farelly&lt;br&gt;Pål Ingvarsson&lt;br&gt;H.J. Kirkeby&lt;br&gt;T. Nielsen&lt;br&gt;E. Opisso</td>
</tr>
<tr>
<td>10.30 - 11.00</td>
<td><strong>Coffee break</strong>&lt;br&gt;Posters and exhibition&lt;br&gt;Campaign film aiming at preventing accidents</td>
</tr>
<tr>
<td>11.00 - 11.45</td>
<td><strong>Workshop</strong>&lt;br&gt;Pressure mapping – ways to use it&lt;br&gt;Chairs: Hans Jørgen Kirkeby&lt;br&gt;Rikke M. Hansen&lt;br&gt;CG. Xiao&lt;br&gt;Reconstruction of reflex pathways to the atonic bladder</td>
</tr>
<tr>
<td>11.45 - 12.00</td>
<td><strong>Dorte Clemmensen</strong>&lt;br&gt;Study protocol</td>
</tr>
<tr>
<td>12.00 - 13.00</td>
<td><strong>Oral presentations</strong>&lt;br&gt;M. Nabipour&lt;br&gt;S. Savolainen&lt;br&gt;K. P. Hammerstad&lt;br&gt;E. J. Erlandsen</td>
</tr>
<tr>
<td>13.00 - 14.00</td>
<td><strong>Lunch</strong></td>
</tr>
</tbody>
</table>
14.00 – 15.15  **Bowel function**  
*Chairs: Stefán Yngvason, Klaus Krogh*

14.00 – 14.45  **State of the Art Lecture**  
*Klaus Krogh*

14.45 - 15.15  **Oral presentations**  
*P. Faaborg*  
*P. Christensen*

15.15 – 15.45  **Coffee break**  
*Posters and exhibition*

15.45 – 17.15  **Epidemiology**  
*Chairs: Inger L. Johannesen, Ellen M. Hagen*

15.45 - 16.30  **State of the Art Lecture**  
*Ellen Merete Hagen*

16.30 - 17.15  **Oral presentations**  
*S. Knútsdóttir*  
*E. Ahonelemi*  
*R. M. Hansen*

19.00 -  **Congress banquet**  
*Golf Salonen*
PROGRAMME
Saturday, June 6th

09.00 – 09.45  Data Sets
   Chair: Ninna Finnerup

09.00 – 09.45  State of the Art Lecture
   Fin Biering-Sørensen

09.45 – 10.30  Free papers
   Chair: Finn Biering-Sørensen,
Páll Ingvarsson
   Oral presentations
   D. Barthélemy
   H. Gregersen
   P. Tederko
   Patient organizations
   Chair: Jane Horsewell
   V. Rasmussen
   L. A. Fjellheim

10.30 – 11.00  Coffee break
   Posters and exhibition
   Campaign film aiming at preventing accidents

11.00 – 11.45  Free papers
   Chair: Sigrún Knutsdottir, Inger L. Johannesen
   Oral presentations
   T. Tørhaug
   W. Chorkrathin
   V. Lankauskiene

11.45 – 12.45  NoSCoS general meeting

12.45 – 13.00  Closing ceremony

13.00  Lunch
11th NoSCoS Congress
JUNE 3rd-6th, 2009 • VIBORG • DENMARK

ORAL PRESENTATIONS
### ORAL PRESENTATION

### INDEX

### SPEAKERS AND TOPICS

<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahoniemi, E.</td>
<td>Mortality and causes of death after traumatic spinal cord injury (TSCI) in Finland.</td>
<td>37</td>
</tr>
<tr>
<td>Aune, G.</td>
<td>How do we inform women with SCI about fertility, pregnancy and Motherhood?</td>
<td>9</td>
</tr>
<tr>
<td>Barthélemy, D.</td>
<td>Walking Disabilities following lesion of the corticospinal tract in persons with incomplete SCI.</td>
<td>40</td>
</tr>
<tr>
<td>Biering-Sørensen, F.</td>
<td>State of the Art Lecture - Data sets.</td>
<td>39</td>
</tr>
<tr>
<td>Baastrup, C. S.</td>
<td>Measuring pain after spinal cord injury in animal models: Development of The Place-escape-avoidance paradigm in central pain.</td>
<td>4</td>
</tr>
<tr>
<td>Chorkrathin, W.</td>
<td>Attitudes of health professionals towards patients with substance abuse problems.</td>
<td>47</td>
</tr>
</tbody>
</table>

NoSCoS 2009
Christensen, P.
Sacral nerve stimulation for neurogenic bowel dysfunction - a care report.

Clemmensen, D.
Lumbosacral nerve anastomosis am. Xiao - a protocol.

Donovan, W.
Lars Sullivan Memorial Lecture

Erlandsen, E. J.
Serum Cystatin C: An improved estimator of glomerular filtration rate in patients with spinal cord injury.

Farrelly, E.
Understanding the neurogenic bladder - assessment of bladder function after spinal cord injury and continued monitoring the urinary tract function.

Finnerup, N. B.
State of the Art Lecture - Pain in spinal cord injury.

Fjellheim, L. A.

Faaborg, P.
Long-term outcome and safety of transanal irrigation for neurogenic bowel dysfunction.

Gregersen, H.
Satisfaction with upper-limb surgery in persons with tetraplegia.

Hagen, E. M.
State of the Art Lecture - Epidemiology of traumatic SCI.

NoSCoS 2009
Hammerstad, K. P.  
Risks of bacteriuria and urinary tract infection 
associated with neurogenic bladder dysfunction.  

Hansen, R. M.  
Spinal Cord Injury in Westdenmark.  

Kirkeby, H. J.  
State of the Art Lecture - Bladder function.  

Kirkeby, H. J.  
Continent catheterizable channels with Mitrofanoff and 
Monti-technique. Indications and patient selection.  

Knútsdótter, S.  

Kreuter, M.  
State of the Art Lecture - Sexuality women. 
Sexuality and sexual life in women with spinal cord injury.  

Krogh, K.  
State of the Art Lecture - Bowel function 
Neurogenic bowel dysfunction - symptoms, pathophysiology 
and treatment.  

Lankauskiene, V.  
The influence of verticalization on ortostatic reactions of the patients with 
cervical part spinal cord injuries.  

Lidal, I. B.  
Health-related quality-of-life in persons with longstanding 
traumatic spinal cord injury in Norway.  

Lindstow, M. von  
Spina Bifida and sexuality.  

NoSCoS 2009
Mladenovic, M.
GABA-producing hNT2.17 cell line in treatment of neuropathic pain and-like behavior after severe contusive SCI in the rat.

Nabipour, M.
Autoaumentation of the bladder in neurogenic and nonneurogenic bladder dysfunction.

Nielsen, T.
Bladder neck closure/urethral occlusion in intractable incontinence.

Opisso, E.
Neurogenic detrusor overactivity (NDO).

Rasmussen, V.
Report from RYK - a consumer organization.

Savoleinen, S.
Physiotherapeutical approach to management of bladder and bowel symptoms after incomplete SCI.

Sønksen, J.
State of the Art Lecture - Sexuality fertility - men.

Sønksen, J.
Vibratory ejaculation in 169 spinal cord injured men and home insemination of their partners.

Tederko, P.
Repeatability of clinical examination according to standard neurological classification of spinal cord injury.

Tørhaug, T.
Does arm crank and wheelchairergometry produce similar VO2

Xiao, C. G.
Reconstruction of reflex pathways to the atonic bladder.

NoSCoS 2009
Thursday 4 June 2009

10.00-10.50

Lars Sullivan Memorial Lecture.

William Donovan, Post President of ISCoS, Professor, MD
The Institute for Rehabilitation and Research, Houston, TX, USA


ABSTRACT TEXT:
Like most other topics, in order to acquire a complete understanding of spinal cord injury (SCI), one must appreciate the events that comprise its past, present and future. This “trinity of time” for SCI has a most interesting past, an exciting present and a very promising future. In this presentation, the nihilistic attitudes toward this condition that prevailed from antiquity until the middle of the twentieth century will be described as well as how these attitudes affected three prominent individuals in more recent times. The contributions of seven of the physicians whose dedication and vision helped reverse these opinions will be highlighted. Some of the significant developments now at hand, that provide for better longevity and a more meaningful life for persons with SCI will be mentioned and finally, a summary of our present knowledge of the barriers to regeneration of the CNS of adult mammals and the research in animals and humans currently under way to overcome these barriers will be presented. This, in turn may one day be regarded as the groundwork that discovered the key that unlocked the secrets of neural regeneration.

NoSCoS 2009
State of the Art Lecture.

Pain in Spinal Cord Injury.

Nanna Brix Finnerup, associate professor, MD

ABSTRACT TEXT:
PAIN IN SPINAL CORD INJURY
Chronic pain has substantial effects on the quality of life of spinal cord injured (SCI) patients. Several types of pain may severely affect rehabilitation, daily activities, social relations, sleep, and mood and require a multidisciplinary approach to treatment.
The most common types of musculoskeletal pain related to SCI are secondary overuse syndromes and pain related to muscle spasms and spasticity. Visceral pain has a late onset and little is known about underlying mechanisms. Neuropathic pain can be defined as 'pain arising as a direct consequence of a lesion or disease affecting the central somatosensory system'. Neuropathic pain is divided into at- and below- level pain which may have different underlying mechanisms. TCAs and gabapentin/pregabalin are first drug choices for neuropathic pain in SCI. Given the established efficacy of SNRIs in peripheral neuropathic pain, this drug class may be considered where TCAs are not tolerated and opioids are also a possibility if other treatments fail. This talk will discuss the epidemiology, mechanisms, and treatment of SCI pain with special focus on neuropathic pain.
NAME:
Maja Mladenovic

ABSTRACT TITLE:
GABA-producing hNT2.17 cell line in treatment of neuropathic pain - like behavior after severe contusive SCI in the rat.

AUTHOR(S):
M. Mladenovic, H. Hultborn, F. Biering-Sørensen, M.J. Eaton

ABSTRACT TEXT:
Purpose: To test the effect of gamma-aminobutyric acid (GABA) producing human cell line on development and reversal of tactile allodynia and thermal hyperalgesia following spinal cord contusion injury in rats.
Methods: A moderate-severe spinal cord contusion injury in rats performed with New York University Impactor. The human neuronal NT2 cell line was used as a source for a unique cell line that synthesizes and secretes/releases the inhibitory neurotransmitters GABA and glycine.
Approximately 1 million differentiated hNT2.17 cells were transplanted in the rat lumbar subarachniodal space. Sensory behaviour testing methods were applied weekly before and following spinal cord injury.
Results: For tactile allodynia a significant treatment effect was found. For thermal hyperalgesia no treatment effect could be shown, as the animals were too weak to be investigated in a sufficient manner.
Conclusion: GABA synthesized by hNT2 cells can possibly help restitution of damaged postsynaptic inhibitory control after spinal cord injury. However the presented animal model should be further elaborated in order to optimise treatment effect.
NAME: Cathrine Baastrup

ABSTRACT TITLE: Measuring pain after spinal cord injury in animal models: Development of The Place-escape-avoidance paradigm in central pain.

AUTHOR(S): C. S. Baastrup, C. Mørsk-Møller, N. B. Finnerup

ABSTRACT TEXT: Introduction
Neuropathic pain following spinal cord injury (SCI) in humans can be severe, disabling and difficult to treat. With a prevalence of 50%, chronic pain presents a significant health care issue.

Pain sensation comprises both a sensory-discriminative and an affective-motivational component, where the latter can be extremely difficult to measure in experimental models. Ideally an experimental pain setting enables the animal to express the experiences and level of pain through voluntary behavior, but neither good nor validated models for measuring central pain exist. The place-escape avoidance model (black and white box), is a possible model under development and has previously been characterized in a peripheral pain model.

Method
The black and white box behavioral test aims to determine the intensity of perceived pain by measuring the repression of natural place preference to avoid mechanically evoked pain. Rats are tested once in a 60x30x30cm biased box with one black side (natural preference) and one white side (natural avoidance) for 30 min. 3-5 weeks after SCI. Mechanical stimulation of either the (1a) test or (1b) reference spot or with (2a) non-painful or (2b) painful intensity is applied every 15 sec in the black or white side, respectively. Primary outcome is the time spent in each side, no. of crossings and total distance travelled.

NoSCoS 2009
Animals and injury model

1. Spinal cord contusion: Male Sprague-Dawley 200g rats received a SCI by dropping a 10g rod 25mm unto the exposed spinal cord at T9-10 bone segment. The SCI rats are compared to a group of sham operated animals.

2. Spinal cord compression and quisqualate injury: 3 groups of female Long-Evans hooded 200 g rats had either a) 0.4 x 0.4 x 1.5 mm of expandable material inserted bilat in anterior lateral quadrant of medulla, b) 0.8 \( \&\#956; \) intramedulla quisqualate injection or c. combination of a) and b) in the exposed spinal cord at T9-10 bone segment. The SCI rats are compared to naïve animals.

Results

SCI contusion rats stayed in the white side of the box for longer than the sham rats when stimulated at level, and SCI and sham rats stayed almost exclusively in the black side of the box when stimulated below level, indicating at- but not below- level pain.

SCI compression and QUIS injury: No group difference was detectable when stimulated below level with non-painful in white side and painful in black side, indicating no below level pain.
Thursday 4 June 2009

12.15-12.30

NAME:
Ingeborg B. Lidal

ABSTRACT TITLE:

AUTHOR(S):
I.B. Lidal, M. Veenstra, N. Hjeltnes, F. Biering-Sørensen.

ABSTRACT TEXT:
Purpose: The aim of the study was to assess health-related quality-of-life (HRQOL) in persons with longstanding spinal cord injury (SCI) in Norway. A second objective was to study self-reported health problems in the same group.
Methods: A follow-up study of persons with traumatic SCI admitted to Sunnaas Rehabilitation Hospital 1961-82. HRQOL was assessed with the Norwegian SF-36 Health Survey. The results were compared with Norwegian norm data adjusted to age and gender.
Results: A total of 165 persons (i.e. 70%) accepted to participate. 82% were males, mean age at follow-up was 50 (±61617;10.1 (Standard Deviation)) years and the mean time since injury was 27 (±61617;4.3) years. 30% of the participants had tetraplegia AIS (ASIA (American Spinal Injury Association) Impairment Scale) A-C and 55% paraplegia AIS A-C. The results showed that persons with SCI experienced significantly decreased HRQOL compared to Norwegian norm data and especially concerning the subscales for Physical Functioning, Bodily Pain, General Health, and Vitality. HRQOL of individuals reporting health problems or symptoms was worse than those of individuals reporting no health problems at all.
Conclusions: HRQOL is decreased in persons with longstanding SCI, and especially in persons with co-morbidity conditions.
ABSTRACT TEXT:
Sexuality is an important aspect of life for all people, including those with a disability. The degree and type of sexual dysfunction after a spinal cord injury (SCI) depends on the gender and the level and completeness of the lesion. Comparatively little research on sexuality in the SCI population has focused specifically on sexual concerns of women. This may be explained by the male predominance in this population and the more apparent changes in men’s physiological sexual response. There has, however, been a growing acknowledgement of the sexual concerns of women with SCI. The studies conducted have shown that there are many changes in the women’s sexuality and sexual life, mainly of physical and medical characteristics, but also psychological such as altered body-image and attractiveness, decreased self-esteem, and role reversal. The studies have also shown that in spite of the many changes it is possible for women with a SCI to have an active and satisfying sexual life.

It is obvious that women, who are able to overcome the physical restrictions and mental obstacles due to the injury, can regain an active and positive sexual life together with a partner.

Many women with SCI express dissatisfaction with the quality and quantity of sexuality-related rehabilitation services. Involvement of the partner in sexual rehabilitation programmes is very rare. Sexual information and counselling should be available both during initial rehabilitation and later when the women have returned to their homes. The time considered as best suited for information on sexual matters after injury are, however, highly individual. Many of the women agree that information should be given during initial rehabilitation, be initiated by the staff, and be on an individual basis. Films, books and other written information should be easily available at the spinal unit. As sexual needs and concerns may not become evident until after returning home to the partner or when trying to find a new partner, it is also important to have continued opportunities for further discussions and counselling after discharge.
At this point, the women's individual experiences, expectations and attitudes can be focused on. Specific and concrete solutions can be discussed concerning how to optimise sexual stimulation (physical and mental) to enhance sexual pleasure and satisfaction for the women – and their partners. An awareness and understanding of an alternative model of sexual arousal and response, elucidating the role of psychological and interpersonal circumstances on sexuality, may help the women to recognise, appreciate and address the potential consequences of the spinal cord injury.
Thursday 4 June 2009

14.30-14.45

NAME:
Gunnbjorg Aune

ABSTRACT TITLE:
How do we inform women with SCI about fertility, pregnancy and motherhood?

AUTHOR(S):
G. Aune

ABSTRACT TEXT:
PURPOSE
The purpose of this study was to explore how women with SCI are informed from specialists within SCI rehabilitation about fertility, pregnancy and motherhood.

METHODS
Interviews with mothers with SCI in Norway.
E-mail and telephone contact with colleges at various SCI rehabilitation centers in Scandinavia asking how they inform their patients about the subject.

RESULTS
In the interviews the women say that they were told during the rehabilitation period that SCI would not affect their fertility. When it comes to planning to have children, they find it difficult to find information about how SCI will affect their pregnancy. There are indications that the information given should be more structured and more accessible.

There seems to be a need for higher focus on the subject in the rehabilitation centers, and hopefully this study will be a contribution.

NoSCoS 2009
Thursday 4 June 2009

14.45-15.00

NAME:
Michael von Lindstow

ABSTRACT TITLE:
Spina Bifida and sexuality.

AUTHOR(S):
von Lindstow M, Biering-Sørensen F, Liebach A, Seitzberg A, Lind M

ABSTRACT TEXT:
Objective: To evaluate the satisfaction with sexual life, factors influencing sexual life and self assessed sufficiency of sexual counselling among persons with spina bifida (SB) in Eastern Denmark.
Material: Fifty-three persons with SB were examined and interviewed. This corresponds to 74% of the 1965-84 cohort born and still living in Eastern Denmark. Results: 51% (27) of the persons with SB lacked a, or had a malfunctioning sexual life. 45%(24)of the whole group stated that they were satisfied with the state of their sexual life. Five of the 24 persons, who were satisfied with their sexual life belonged to the group with lacking or malfunctioning sexual life.
Persons in a relationship were more satisfied with their sexual life than persons without a partner and found it more important to be in a relationship than persons without a partner.
Participants with lower spinal cord lesions were more satisfied with their sexual life than persons with more proximal lesions.
Faeces incontinence, but not urine incontinence, was negatively correlated to a satisfying sexual life in the total group of participants, in the group with a partner, but not in the group without a partner.
49% stated they did not receive an adequate sexual instruction in school and 32% of the participants (18-35 years of age) still lacked information concerning sexuality and SB.
This indicates further needs for sexual instruction and counselling of this group of spinal cord injured.

NoSCoS 2009
ABSTRACT TEXT:
New understanding of the physiology and treatment of orgasmic, erectile and ejaculatory dysfunctions has improved the prospects for a better sexual and fertility function in spinal cord lesioned (SCL) men. However, there is still a significant need for expanding the research field within the areas of sexuality and fertility.

Orgasm is altered or impossible to achieve in the majority of SCL men. Erection may be partial or absent and fertility severely impaired due to anejaculation and poor semen quality. Each condition alone and in combination has the potential to interfere with the ability of the SCL individual and their partner to have a satisfying sexual life and to have children.

Recently, it was shown that autonomic stimulation with Mitodrine, an alfa1-adrenergic agonist, enhances the orgasm rate in SCL men when combined with antegrade ejaculation induced by penile vibratory stimulation (PVS).

Erection might be achieved by mechanical systems, such as vacuum pumps. Also drugs such as PDE-5-inhibitors tablets as well as intracavernosal injection of prostaglandin E1 has been shown to have significant positive effect on erectile function in many SCL men. If these treatment options fail penile implants might be an effective alternative.

For fertility purposes antegrade ejaculation can be obtained by PVS in approximately 80% of all SCL men with an intact ejaculatory reflex arc (above T10). Electroejaculation may be successful in obtaining ejaculate from men with all types of SCL, including men who are missing major components of the ejaculatory reflex arc. Because vibratory stimulation is very simple in use, non-invasive, does not require anaesthesia and is preferred by the patients when compared to electroejaculation, PVS is recommended to be the first choice of treatment in SCL men.
Usually semen analyses demonstrate low sperm motility rates in the majority of SCL men. However, intravaginal home insemination with semen obtained by PVS in order to achieve successful pregnancies may be an option for some SCL men and their partners. The majority of SCL men with poor semen quality will further enhance their fertility potential when using either PVS or electroejaculation combined with assisted reproduction techniques such as intrauterine insemination or in vitro fertilization with or without intracytoplasmic sperm injection. The reported overall pregnancy rate per cycle is about 25%. It should be noted that this rate is similar to the pregnancy rate per cycle during natural procreation in healthy couples wanting to become pregnant (25-30%) although assisted ejaculation procedures and reproduction techniques are required for SCL men and their partners.

The proper choice of treatment should be made through coordinated efforts of different specialities, which may involve urology, gynaecology, andrology and rehabilitation. It should be noted that the most effective reproduction technique might not be the best treatment for all couples. Therefore, when proceeding onto higher levels of reproduction techniques, it is also of importance to inform the couples about possible side effects from hormonal ovulation induction as well as problems related to multiple births.

During the years clinical observations have shown a reduction in lower extremity spasticity and spasms following reflex ejaculation induced by PVS. Furthermore, some very interesting observations were made while measuring the urinary bladder and urethral sphincter pressures during vibratory induced ejaculation in SCL men. Application of the vibrator to the penis resulted in prompt and forceful contraction of the pelvic floor and periurethral muscles and suppression of neurogenic urinary bladder overactivity. The applicability of external vibration to induce pelvic floor contraction and decrease urinary bladder overactivity through the pudendal nerve was therefore theorized. The results from studies concerning the effects of PVS on spasticity, pelvic floor contraction and bladder capacity in SCL as well as none-SCL persons will be presented.
16.15-16.30

NAME:
Jens Sønksen

ABSTRACT TITLE:
Vibratory ejaculation in 169 spinal cord injured men and home insemination of their partners.

AUTHOR(S):

ABSTRACT TEXT:
PURPOSE: To present the last 20 years' experience from penile vibratory stimulation (PVS) and vaginal self-insemination at home in SCI men and their partners. The data originate from two European and two American centers.

METHODS: Men with SCI and their healthy female partners seeking treatment for infertility were evaluated for this study. The main outcome measures were total motile sperm count, time to pregnancies, numbers of pregnancies and miscarriages.

RESULTS: A total of 169 SCI men (median age 32 yrs, range 22-44) and their partners (median age 29 yrs, range 19-36) were included in the study. The median total motile sperm count was 31 million (range 1-426). Overall, 73 of the 169 couples (43%) achieved 99 pregnancies with delivery of 90 healthy babies (88 singletons and 1 pair of twins). The median time to pregnancy was 1.2 years (range 0.1-8.2). A total of 10 miscarriages in 9 couples were noted.

CONCLUSION: Based on the largest study of its kind to date, it is concluded that PVS combined with vaginal self-insemination may be performed as a viable, inexpensive option for assisted conception in couples in whom the SCI male partner has adequate semen parameters and the female partner is healthy.
Friday 5 June 2009

08.00-08.45

State of art Lecture.

Bladder function in Spinal Cord Injury.

Hans Jørgen Kirkeby, MD

ABSTRACT TEXT:

Background:
The bladder needs attention in almost all patients with spinal cord injury (SCI), myelomeningocele or other conditions where the spinal cord or lumbar/sacral nerve roots have been injured.

The aim of treatment is creation of a condition where the bladder is emptied regularly with clean intermittent catheterization (CISC), and where the bladder is able – without hyperactive contractions - to contain at least 3-500 ml of urine. Prevention of renal damage is of utmost importance, and it is still worth remembering that renal insufficiency was a major cause of death in SCI-patients before the era of active bladder management which started 50-75 years back.

The aim of bladder management is creation of a low pressure bladder without infection through
- prevention of renal damage (secure low pressure bladder without infection)
- introduction of CISC
- creation of acceptable bladder volume (>3-500 ml)
- treatment of incontinence (stress or urge)
- prevention of urinary tract infections (UTIs)

CISC is introduced as early as possible in order not to have to use indwelling catheters. Good volume/low pressure is secured by anticholinergics, botox or bladder augmentation (autoaugmentation or Clam-enterocystoplasty).

NoSCoS 2009
Bladder capacity may be increased with pharmacological agents:

- trospium chloride (Spasmolyt, Spasmoplex)
- tolterodin (Detrusitol)
- oxybutonine pads (Kentera pads)
- solifenacin (Vesicare)
- darifenacin (Emselex)
- oxybutonin (Ditropan) – in DK for specialists only
- intravesical treatment?

Surgical treatments include Botox- injections into the detrusor-muscle, and 300 units of botox usually doubles bladder capacity and reduces hyperactive contractions greatly for 6-9 months. The treatment may be repeated regularly. Permanent increase of bladder capacity may be achieved by autoaugmentation (detrusormyectomy) or Clam-ileocystoplasty.

Through Mitrofanoff or Monti-procedures alternative channels for catheterization through the abdominal wall is created. Such channels will make it possible for females to self-catheterize very simple and independent of toilets etc. Even tetraplegic patients - males as well as females - with poor hand function may be made selfreliant with respect to selfcatheterisation with a Mitrofanoff or a Monti channel.

Stress incontinence, which is seen in patients with cauda equina lesions or myelomeningocele, can be managed by sling procedures. Urethral closure may be performed if an alternative catheterization channel is created (Mitrofanoff or Monti-procedure).

This state of the art lecture will guide you through different ways to manage the non-complicated bladder as well as urinary tract problems in SCI-patients and others with neuropathic bladder.
FRIDAY 5 JUNE 2009

08.45-09.30

NAME:
Elisabeth Farrelly

ABSTRACT TITLE:
Understanding the neurogenic bladder.

AUTHOR(S):
E. Farrelly

ABSTRACT TEXT:
The healthy bladder is characterized by elasticity, ample blood flow, an intricate system of receptors and nervous connections and a protective mucous membrane. Healthy surroundings of muscle, connective tissue, protective fat layers, and secretory glands aid in ensuring optimal functioning. The lower urinary tract (LUT) is a well trimmed unit characterized by close synergism. The signal-ling system includes a few basic types of responses to stimuli: sensory and motor overactivity, underactivity, pain or unpleasant sensations of different qualities. Our interpretation of bladder signals is dependent on healthy nervous connections, an adequate learning process during childhood and adequate functioning of the cerebral cortex. The neurogenic bladder has the same set-up, but exists in a new environment. Communication lines are altered. Surrounding structures may behave in a different way. The mechanics of filling and emptying will often invite irritating and infectious agents. Bladder signals may be re-routed through other organs and distorted by the time they reach the cortex.
Recent scientific advances include new information on the close communication between CNS centers which influence various vital body organs. Findings concerning bladder function will be discussed.
The healthy LUT is subject to age-related changes. The neurogenic bladder is influenced both by age and by gradual alterations caused by neurogenic dysfunction.
The presentation will show how to understand bladder language through the new neurogenic filter.
In a study of bladder function in a regional prevalence group of subjects with traumatic SCI, 410 patients participated, including all levels and grades of SCI. Data will be presented on “bladder language”, complications and intervention in the prevalence group.

NoSCoS 2009
Symptoms of bladder dysfunction are often generalised and susceptible to misunderstanding. Proper management demands an understanding of "bladder language" and of the impact of neurogenic bladder dysfunction on the entire body and psyche.
NAME:
Hans Jørgen Kirkeby

ABSTRACT TITLE:
 Continent catheterizable channels with Mitrofanoff and Monti-technique. Indications and patient selection.

AUTHOR(S):
H. J. Kirkeby

ABSTRACT TEXT:
Introduction: Clean intermittent selfcatheterisation (CISC) is used by most para-/tetraplegic patients and others with problems with bladder emptying. The CISC-procedure can be greatly facilitated by creation of a Mitrofanoff or Monti-channel to the abdominal wall, and some patients, especially tetraplegics, will not be able to perform CISC through the urethra due to poor hand function. Furthermore, patients with loss of urethra or with otherwise intractable stress incontinence, who would earlier have had a urine diversion, will with a Mitrofanoff- or a Monti-channel be able to maintain a normal bladder function under the use of CISC. The appendix is highly useful for creation of this channel as demonstrated by Mitrofanoff () but if the appendix has been removed the Monti-technique with use of ileum for the creation of a continent catheterisable channel makes an almost equivalent solution.

Patients: A total of 50 adult patients (40 females and 10 males) with spinal cord injury/myelomeningocele or other type of congenital or aquired CNS-disease (age 16-62 yrs.) underwent a Mitrofanoff or a Monti-procedure in the period from 1992-2007. Thirtyfive patients had spinal cord injury (13 tetraplegia, 22 paraplegia), 9 had spina bifida/myelomeningocele, and 6 had other diseases.

Results: Mitrofanoffprocedures were performed in 36 and Monti-procedures in 14 patients. Surgical channel-correction was performed in 10 patients while 12 had a YV-correction of the cutaneous stoma due to stenosis. Three patients died of unrelated causes and 2 had a Bricker diversion. NoSCoS 2009
At the end of this study 45/50 patients had functioning channels, 37 without revision.
The indication for the procedure was mainly to make it possible for the patients to become selfreliant, i.e. to be able to perform CISC without any assistance. Another common indication was facilitation of bladder emptying. Thus all patients, after having had the Mitrofanoff or Monti-procedure performed, were able to perform CISC remaining sitting in the wheelchair. A few patients had the procedure performed as a rescue after irreparable urethral damage where the urethra was surgically closed.

Conclusions: Mitrofanoff- and Monti-procedures were valuable treatment options when CISC wanted to be facilitated or made possible. Revision/repair-surgery was needed to an acceptable extent.


Gowda BD, Agrawal V, Harrison SC. The continent, catheterizable abdominal


Friday 5 June 2009

10.00-10.15

NAME:
Tommy Nielsen

ABSTRACT TITLE:
Bladder neck closure/urethral occlusion in intractable incontinence.

AUTHOR(S):
T. Nielsen, H. J. Kirkeby, T. M. Jørgensen

ABSTRACT TEXT:
Introduction
Patients with neuropathic bladder due to spinal cord injury, spina bifida/myelomeningocele or other diseases sometimes suffer from intractable stress incontinence, which can be a massive physical and psychological strain. Urine-diverting surgery (UDS) with Mitrofanoff or Monti techniques are established modalities in patients with neuropathic bladder in many centers. In this group of patients retropubic bladder neck closure (BNC) or transvaginal urethral occlusion (UC) may be valuable modalities that should be introduced in case of otherwise intractable stress incontinence.

Material & Method
Between 1998 and 2008 a total of 60 patients with para- or tetraplegia of traumatic or other origin had urine-diverting surgery performed. The surgery consisted of either the Mitrofanoff (n=45) or the Monti (n=15) procedures and of the 60 patients 18 (30%) were treated with BNC/UC.

Results
In the group of patients who had the Mitrofanoff procedure performed 12 patients (27%) were treated with BNC/UC. 5 of these patients (42%) had BNC performed at the time of UDS and in the remaining seven patients (58%) BNC/UC was performed at a later time (mean 1121 days, 95%CI 71-2170 days). A total of five patients needed later surgical revision/re-occlusion (mean 694 days, 95%CI 151:1236). In the group of patients who had the Monti procedure performed 6 patients (40%) were treated with BNC/UC. 5 patients (83%) had the procedure performed at the time of UDS and in one patient it was performed at a later time (293 days).

NoSCoS 2009
Only one patient needed surgical revision/re-occlusion that was performed 590 days after BNC/UC.

Conclusion
BNC/UC are valuable modalities in patients with otherwise intractable stress incontinence in relation to spinal cord injuries. Full continence is secured and surgical revision rates are acceptable.
NAME:
Eloy Opisso

ABSTRACT TITLE:
Neurogenic detrusor overactivity (NDO).

AUTHOR(S):
E. Opisso, A. Borau, NJM Rijnsoever

ABSTRACT TEXT:
Neurogenic detrusor overactivity (NDO) is a common consequence of several neurological disorders. It has been shown that event driven electrical stimulation of pudendal nerve afferents can be used to suppress the involuntary detrusor contractions and increase bladder capacity. Several biosignals have been tested as a trigger event with different results. However, none resulted in a successful trigger due to a lack of either reliability or feasibility. On paper external urethral sphincter (EUS) EMG has shown to be both feasible and reliable. The goal of this study was to investigate whether EUS EMG controlled dorsal/penile nerve stimulation can suppress undesired detrusor bladder contractions. EUS EMG was recorded in patients using wire electrodes. The EMG was processed online to control an electrical stimulator. In addition, patients had two surface electrodes on the penile/clitoral nerve. Patients underwent two filling cystometries. The first one was without stimulation. The second one was with EMG controlled stimulation. Of 3 SCI subjects recruited, two showed NDO. Compared to filling 1, average bladder capacity in filling 2 was 160% higher. The study shows that EUS EMG can be both reliable and feasible trigger event to control dorsal penile/clitoral nerve stimulation to suppress undesired bladder contractions and in turn to increase bladder capacity.

NoSCoS 2009
Friday 5 June 2009

11.00-11.45

Invited speaker:
Chuan-Gui Xiao, MD, Professor and Chairman

ABSTRACT TITLE:
Reconstruction of reflex pathway to the atonic bladder.

AUTHOR(S):
C. G. Xiao

ABSTRACT TITLE:
NAME:  
Dorte Clemmensen

ABSTRACT TITLE:  
Lumbo-sacral nerve anastomosis am. Xiao - suggestions for an international prospective protocol.

AUTHOR(S):  
Dorte Clemmensen

ABSTRACT TEXT:  

NoSCoS 2009
12.00-12.15

NAME:
Mehdi Nabipour

ABSTRACT TITLE:
Autoaumentation of the bladder in neurogenic and non neurogenic bladder dysfunction.

AUTHOR(S):
M. Nabipour, T. M. Jørgensen, H. J. Kirkeby

ABSTRACT TEXT:
Autoaugmentation of the urinary bladder (detrusomyectomy) constitutes an alternative to enterocystoplasty a.m. Clam for patients with small bladder capacity or hyperactivity in neurogenic bladder dysfunction, as well as other nonmalignant bladder disease.

Materials:
Autoaugmentation/detrusomyectomy was performed in 41 ptts. (16-72 yrs, median 47 yrs.) from January 2003 to September 2007 in our department. All patients were seen 3, 6 and 12 months postoperatively with clinical and urodynamic records except one patient. Primary urodynamic records showed 21 with hyperactive bladder (neurogenic bladder), 2 with small bladder capacity, and 12 with both hyperactive bladder and small bladder capacity. One patient had uncharacteristic results, 3 had normal preoperative urodynamic test and in 1 case no preoperative urodynamic records was made.

Results: NABIPOUR M, JORGENSEN TM AND KIRKEBY HJ.
12/21 ptts. (57%) with neurogenic hyperactive bladder and normal capacity developed normal bladder function after surgery clinically as well as urodynamically, while 9/21 ptts. (43%) showed continued symptoms and no benefit of the operation. 14 ptts. had hyperactivity and/or small bladder capacity, but only 4 (29%) of them were clinically satisfied and 10 ptts. (71%) showed continued symptoms.
2 ptts with small bladder capacity without hyperactivity had no effect after the operation neither clinically nor urodynamically.
Autoaugmentation managed to increase bladder capacity of 3/11 ptts. (27%) ptts. with both hyperactivity and small bladder capacity but failed to increase the bladder capacity in 8/11 ptts. (72%).

NoSCoS 2009
Conclusion:
A retrospective analysis based on clinical control and urodynamic records showed that autoaugmentation was an effective treatment in 54-57% of patients with neurogenic bladder and in 27% of patients with small bladder capacity (non-neurogenic bladder).
Friday 5 June 2009

12.15-12.30

NAME:
Sarianna Savolainen

ABSTRACT TITLE:
Physiotherapeutical approach to management of bladder and bowel symptoms after incomplete SCI.

AUTHOR(S):
Savolainen, Viikeväinen, Juntto, Purhonen

ABSTRACT TEXT:
Background: Bladder and bowel management among patients with incomplete spinal cord injury (SCI) is implemented mostly with same methods than with complete injury even though there is recovery of bladder, bowel and pelvic floor functions. To re-establish bladder and bowel management multidisciplinary team (physician, urotherapist, nurse, physiotherapist) approach is needed.
Aim: To improve bladder and bowel management after incomplete SCI.
Methods: First three month after injury and beside urodynamic evaluation the patients with ASIA C and D were evaluated by measuring pelvic floor muscle (PFM) EMG to consider bladder and bowel management options. From the physiotherapeutical point of view this involved re-learning of the motor control and training of PFM, learning the coping strategies to control urinary leakage and finding the optimal muscle activity on toilet seat for urination and defecation. With some patients therapy was optimized by biofeedback and electrical stimulation. With some patient defecation were facilitated with abdominal wall electrical stimulation and bladder overactivity by tibial nerve stimulation or sacral stimulation. The PFM therapy need long rehabilitation period and some patients continued as out-patient or independently with own EMG- biofeedback or electrical stimulation equipments. The therapy for management of bladder, bowel and PFM requires active participation of a motivated patient and it usually takes some time and persistence to reach the maximum benefit. Based on clinical experience the results were promising but more research is needed.

NoSCoS 2009
Friday 5 June 2009

12.30-12.45

NAME:
Karin Pettersson Hammerstad

ABSTRACT TITLE:
Risks of bacteriuria and urinary tract infection associated with neurogenic bladder dysfunction.

AUTHOR(S):
K. P. Hammerstad, O. Jonsson, B. Kaijer, Y. Logadottir, A. K. Karlsson

ABSTRACT TEXT:
There are risks of bacteriuria and urinary tract infection associated with neurogenic bladder dysfunction. The ability to empty by CIC differs between men and women due to anatomical reasons. Is this also reflected in different incidence of bacteriuria and UTI.

Methods: A retrospective chart review was performed in 138 patients using CIC. The urine was cultured twice weekly. Some of the patients performed CIC independently, some needed assistance. All women had to be lying during CIC.

Results: Bacteriuria was found in 31.8% of the cultures in both groups. In the female group 45.1% were treated by antibiotics, compared to 36.7% in the male group. 1.9% in the female group had intravenous treatment compared to 12.0% in the male group. This was most likely due to infection by Klebsiella species in the male group. 27 of the 408 cultures showing Klebsiella were treated intravenously compared to 0 out of 47 in the female group.

Conclusion: There is no gender difference incidence of bacteriuria. The higher proportion of treatment in the female group might be due to difficulty in treating urinary leakage in women. The higher incidence of serious infections in the male group is remarkable.

NoSCoS 2009

28
Friday 5 June 2009

12.45-13.00

NAME:
Erland J. Erlandsen

ABSTRACT TITLE:
Serum Cystatin C: An improved estimator of glomerular filtration rate in patients with spinal cord injury.

AUTHOR(S):
E. J. Erlandsen, J. Abrahamsen, E. Randers, I. L. Johannesen

ABSTRACT TEXT:
Background: To investigate the relationship between serum cystatin C, serum creatinine, creatinine clearance and estimated glomerular filtration rate based on creatinine (MDRD) compared to 51Cr-EDTA-clearance in patients with spinal cord injury.

Methods: Seventy men and 33 women aged 17.9 to 81.6 years with motoric complete, and motoric incomplete spinal cord injury were included. Serum cystatin C was measured by an automated particle-enhanced nephelometric immunoassay (Dade Behring), and serum and urine creatinine by an enzymatic method, and 51Cr-EDTA-clearance by a multiple plasma sample method.

Results: A linear relationship was found between 51Cr-EDTA-clearance and 1/cystatin C, (r=0,70) and 1/creatinine (r=0,41), n=103, and between 51Cr-EDTA-clearance and creatinine clearance (r=0,64) and estimated GFR (MDRD) (r=0,54) (n=86). Comparison of the area under the curves (AUC) in the non-parametric receiver operating characteristics (ROC) plots for serum cystatin C AUC = 0.890, and for serum creatinine AUC = 0.68 (n=103) revealed significant differences (p=0,002). Comparison of ROC plots for serum cystatin C (AUC=0.889), serum creatinine (AUC=0.690), creatinine clearance (AUC=0.873) and estimated GFR (AUC=0,781) (n=86).

Conclusion: In patients with spinal cord injury serum cystatin C is a better estimator of glomerular filtration rate in patients with spinal cord injury compared to serum creatinine and estimated GFR based on serum creatinine.

NoSCoS 2009
State of Art Lecture.

Neurogenic bowel dysfunction - symptoms, pathophysiology and treatment.

Klaus Krogh, MD

ABSTRACT TEXT:
The aim of this presentation is to review clinically relevant aspects of bowel dysfunction in individuals with spinal cord injury (SCI).
The majority of SCI patients have bowel symptoms. Accordingly, 80% lack normal need for defecation, 66% use digital stimulation, 75% have episodes of faecal incontinence and 39% report that bowel symptoms have some or major influence on their quality of life. The severity of symptoms depend on the completeness of SCI and constipation becomes more severe with time since injury. Supraconal lesions usually result in hypercontractility and increased colorectal tone whereas conal or cauda equina lesions result in reduced contractility and tone. In individuals with supraconal lesions transit time is often prolonged through the whole colon while those with conal/cauda equina lesions may have severely prolonged transit time of the rectosigmoid.

In SCI patients with colorectal problems resistant to basic treatment including oral laxatives, digital stimulation, suppositories or mini enema the following treatment modalities are available: transanal irrigation, the Malone appendicostomy, or colostomy. Promising new treatments are peripheral nerve rerouting, peripheral nerve stimulation and, perhaps, sacral nerve stimulation.
Friday 5 June 2009

14.45-15.00

NAME:
Pia Faaborg

ABSTRACT TITLE:
Long term outcome and safety of transanal irrigation for neurogenic bowel dysfunction.

AUTHOR(S):
P. Faaborg, P. Christensen, K. Krogh, B. Kvitza, S. Buntzen, S. Laurberg

ABSTRACT TEXT:

Introduction: In a recent randomized controlled trial transanal colonic irrigation (TAI) was superior to conservative bowel management in spinal cord injured (SCI) patients. However, long-term results need to be described.

Methods: Between 1994 and 2007, 173 (93 female) SCI patients (age: 7-80 years (median 45)) were introduced to TAI. Data were obtained from hospital records and a mailed questionnaire. Treatment was considered successful in patients still using TAI, patients who had used TAI until they died, and patients whose symptoms had resolved while using TAI.

Results: Successful out-come was achieved in 84 (49 %) SCI patients after a mean follow-up of 14 months (range 1-120 months). A Kaplan-Maier plot showed a drop-out of 20 % in the first three months followed by a graduate drop-out rate. One I five have used TAI for more than 6 years and continue to do so. A regression analysis showed male gender (OR 2.1), mixed symptoms (OR 2.9) and prolonged colorectal transit time (OR 2.4) to be significantly associated to successful out-come.

NoSCoS 2009
Mean time spend irrigating was 29 minutes (1-120) and mean volume of water used was 1119 ml (250-4000 ml). One non-lethal bowel perforation occurred in approximately 50,000 irrigations (0.002 %), while minor side-effects were observed in 48 %.

**Conclusion:** After mean 14 months of follow-up, 49 % of SCI patients were successfully treated by TAI. 20 % become long-term users. TAI is safe and can be introduced to most SCI patients suffering from neurogenic bowel dysfunction.

P Faaborg, P Christensen, K Krogh, Kvitza B, S Buntzen, S Laurberg

NoSCoS 2009
Friday 5 June 2009

15.00-15.15

NAME:
Peter Christensen

ABSTRACT TITLE:
Sacral nerve stimulation for neurogenic bowel dysfunction - a care report.

AUTHOR(S):
P. Christensen, S. Buntzen, L. Lundby, S. Laurberg, K. Krogh

ABSTRACT TEXT:
Surgical Research Unit, Department of Surgery P and 2Neurogastroenterology Unit, Department of Hepatology and Gastroenterology V, Aarhus University Hospital, Denmark

Sacral nerve stimulation offers a minimal surgical alternative to the major surgical procedures for idiopathic faecal incontinence with success rates of approximately 80%. The indications for sacral nerve stimulation are broadening, and pilot studies suggest the use also in incomplete spinal cord injury patients with neurogenic bowel dysfunction. For sacral nerve stimulation an electrode is implanted through one of the posterior foramina of the sacral bone. Permanent implantation is usually preceded by a three weeks test period using a percutaneous needle electrode – the percutaneous nerve evaluation. This test improves patient selection for permanent implantation of the electrode and pacemaker. A case report with a patient with incomplete spinal cord injury and neurogenic bowel dysfunction successfully treated with sacral nerve stimulation is presented
State of the Art Lecture.

Epidemiology of traumatic SCI.

Ellen Merete Hagen

ABSTRACT TEXT:
The incidence of SCI varies widely among countries from 10.4 to 83 per million inhabitants per year. The average incidence in Northern America is 51 per million, in Europe 19.4, and in Australia 16.8. Hence the differences of prevalence: 755 per million in Northern America, 280 in Finland, and 681 in Australia.

All studies find a male preponderance in SCI, but the male/female ratio varies from 1.6-4.3 in Europe to 4.0-8.1 in Africa.

The most recent studies show a significantly increased mean age at injury over the last decades, especially an increasing number of people >60 years of age at injury. In the National Spinal Cord Injury System (NSCIS) database the mean age at injury was 28.7 in the 1970’s, and 37.6 after 2000. The percentages of people >60 year at injury increased from 4.7 to 10.9 in the same period.

The causes of SCI vary due to differences in geography and culture. In the NSCIS database motor vehicle-accidents accounts for 35.9% of injuries, followed by violence in 29.5%, falls in 20.3%, and sports-related injuries in 7.3%. The incidence of violent SCI’s in USA increased from 13.3% in the 1970s to 29.5% in the 1990s. A study from Norway found falls (45 %) and motor vehicle-accidents (35%) to be the main causes, while violence accounted for only 4%.

Cervical injuries are more frequent than thoracic and lumbar injuries. Recent data from the NSCIS database shows that incomplete tetraplegia is most frequent (34.5%); followed by complete paraplegia (23.1%), complete tetraplegia (18.4%), and incomplete paraplegia (17.5%).

NoSCoS 2009
Patients with SCI have increased mortality compared to the general population. Most studies report a higher mortality in men than in women. However, studies from Denmark and Norway have found that the mortality is highest in women. In the last five decades, the causes of late mortality have changed significantly. In the past, urosepsis was the leading cause of death, but now the leading causes are respiratory problems, heart disease and suicide. Pneumonia is the leading cause of death among patients with cervical SCI and patients over 55 years of age, while unintentional injury and suicide are frequent causes of death among patients with thoracic, lumbar or sacral injuries.

Non-traumatic SCI are caused by different conditions such as spinal stenosis, neoplastic compression, infections, paraneoplastic syndrome, vascular ischemia, multiple sclerosis, etc. These patients are more likely to be older and of female gender than patients with traumatic SCI.
NAME: Sigrún Knútsdóttir.


AUTHOR(S): S. Knútsdóttir, H. Thórisdóttir

ABSTRACT TEXT:
Introduction: The epidemiology of all traumatic Spinal Cord Injuries (SCI) in Iceland has been registered at the Rehabilitation Department at Landspítali, University Hospital, Iceland since 1973. Prevention strategies have mainly focused on Road traffic accidents (RTA).

Purpose: To explore if there have been changes in the incidence, causes, age, gender and severity of injury in Iceland from 1973-2008.

Subjects and methods: Data was collected from the SCI register of the Rehabilitation Department and analysed. Total number of subjects was 191.

Results: The average incidence of SCI was 5.3/year (appr. 18/million) during the whole period but increased to 7.6 (appr. 24/million) in 2001-2008. Men were 73%, women 27%. In 2001-2008, women increased to 33%. Mean age was 37. Fifty percent had ASIA ABC classification, whereof 35,5% in 2001-2008. Forty four percent of injuries was due to RTA, whereof 21,4% occurred in 2001-2008, falls where 31% and increased slightly in 2001 – 2008, sport/leisure activities were 21 % whereof 50 % occurred in 2001-2008, horse riding accidents being the main single cause.

Conclusion: The results showed an increase in the incidence of SCI and in sport/leisure activities during 2001-2008. Prevention strategies need to focus more on sport/leisure with special emphasis on horse riding accidents.
NAME:
Eija Ahoniemi

ABSTRACT TITLE:
Mortality and causes of death after traumatic spinal cord injury (TSCI) in Finland.

AUTHOR(S):
E. Ahoniemi, T. Pohjola, H. Kautiainen

ABSTRACT TEXT:
Aim: To study the mortality and causes of death among patients with TSCI over 25 years period.

Patients and methods:
During the period 1976 - 2005, a total of 1647 patients with TSCI were admitted to Käpylä Rehabilitation Centre, Helsinki. Demographic and clinical data of patients were collected from registers of Rehabilitation Centre. Using Statistics Finland’s official cause-of-death statistics assessed cause-specific mortality. Standardised mortality ratio (SMR), survival rates and the causes of death were studied. Cox proportional hazards regression model was used to explore risk indicators for death.

Results:
During the observation period (1976-2007) a total of 419 of all patients died. The main causes of death were cardiovascular disease followed by suicide/poisoning, cancer and respiratory disease. The average age at death was 55.5 (15.8) years for men and 58.2 (14.8) years for women. SMR was 2.65 (95% CI: 2.40 to 2.92) for the whole population, 3.56 (95% CI: 2.71 to 4.60) for women and 2.54 (95% CI: 2.29 to 2.82) for men. Ten-year survival was 97.9 (95% CI: 96.7 to 98.5). Mortality was significantly affected by age at onset of injury, completeness of traumatic spinal cord injury and severity of neurological level.

Conclusions: Beside the general causes suicide and poisoning are common causes of death of patients with TSCI. The results support the need of regular follow-up, especially greater attention must be paid on psychosocial rehabilitation and follow-up services.

NoSCoS 2009
NAME: Rikke M. Hansen

ABSTRACT TITLE: Spinal cord injury in West Denmark.

AUTHOR(S): R. M. Hansen, N. B. Finnerup, I. L. Johannesen

ABSTRACT TEXT:
Methods: The medical records of all persons admitted to the Department of Spinal Cord Injury in Viborg, Denmark in the period 2004 to 2008 were analysed. Data were compared with data collected in 1980-1984, 1991-1995 and 1996-2000. Data on incidence age, gender, level of injury and causes of injury were collected.
Results: 323 persons with a new SCI were admitted from 2004-2008. During this 28 year period the incidence of SCI has increased from 10.4/mill/year to 21.5/mill/year. There was a tendency towards a higher percentage of women, but not statistically significantly. The mean age for both women and men has increased, for women it was 41.5 in 1991-1995 compared with 52.8 in 2004-2008, and for men 33.0 vs. 46.0 years. The percentage of non-traumatic causes of SCI had increased from 28.4% in 1980-1984 to 51.7% in 2004-2008. The percentage of incomplete injuries had increased from 61.0% in 1991-1995 to 69.3% in 2004-2008
Conclusion: The study demonstrated an increase in incidence, mean age, non-traumatic causes to SCI and percentage of incomplete SCI. The results must be taken in account in dimensioning the health care system to ensure adequate resources to patients with SCI.

NoSCoS 2009

38
State of the Art Lecture.

Data Sets.

Fin Biering-Sørensen, Professor, MD

ABSTRACT TEXT:
The International SCI Data Sets should be collected on individuals with SCI to facilitate comparisons regarding injuries, treatments, and outcomes. The Core Data Set standardizes the collection and reporting of a minimal amount of information from initial post injury inpatient period.
A Basic Question is a question, which with an affirmative answer implies that it is possible to go on to one or more specific data set(s) with more detailed information on the particular topic.
A Basic SCI Data Set is the minimal number of data elements, including the possible Basic Question, which together should be collected in daily clinical practice for a particular topic. This mean that the various Basic SCI Data Sets in the future may be the basis for a structured record in centres worldwide caring for persons with SCI. An Extended SCI Data Set is a more detailed data set, which may be used as optional for a topic, but may be recommended for specific research studies within the particular area.
Data set presentation: As soon as a new International SCI Data Set is developed they will be disseminated at meetings, and published in international journals and through the web sites of ISCoS (www.iscos.org.uk), and ASIA (www.asia-spinalinjury.org).
Saturday 6 June 2009

09.45-10.00

NAME:
Dorothy Barthélemy.

ABSTRACT TITLE:
Walking Disabilities following lesion of the corticospinal tract in persons with incomplete spinal cord lesion.

AUTHOR(S):

ABSTRACT TEXT:
Hypothesis: Lesion of the corticospinal tract (CST) is correlated with dropfoot and impaired Tibialis Anterior (TA) motor unit coupling.
Methods: Experiments were done on 24 participants with incomplete spinal cord lesion (SCL) (AIS C and D) above the lumbar segments and 13 healthy controls (HC). Dropfoot was analysed by kinematic software, transmission in corticospinal tract was tested by Transcranial magnetic stimulation (TMS) and motor unit coupling was evaluated by multi-site EMG recordings of TA.
Results: During treadmill walking, HC showed two peaks of EMG activity in TA: early and late swing. In SCL participants, 3 major patterns were observed: 1-similar to controls, 2-lack of second peak, 3-absence or reduction of both peaks.
In pattern1 participants, TA motor evoked potentials had similar latency and amplitude as controls. Pattern2-3 participants had significantly longer latencies and smaller amplitudes.
In all HC and pattern1 participants coherence was seen in the 15-35 Hz band accompanied by short-lasting central peaks of synchronization in the time domain. This evidence of descending drive to TA motor units was only seen in few pattern2 participants but none of the pattern3 participants.
Conclusion: These data suggest that impaired corticospinal drive monitored by TMS and coherence is correlated to dropfoot in SCL individuals.
CIHR, Elsass Foundation, Danish National Research Foundation

NoSCoS 2009
Saturday 6 June 2009

10.00-10.15

NAME:
Hanne Gregersen

ABSTRACT TITLE:
Satisfaction with upper-limb surgery in persons with tetraplegia.

AUTHOR(S):
H. Gregersen, M. Lybæk, I. L. Johannesen, P. Leicht, F. Biering-Sørensen

ABSTRACT TEXT:
Purpose
To measure the satisfaction with the upper-limb reconstructive surgery in tetraplegics.

Method
A survey with 21 questions was sent to 42 Danish tetraplegics, who have had reconstructive surgery from 1973 to 2008. They underwent 71 operations, including 96 procedures.
The surgical interventions were: 19 triceps activations, 7 wristextensions, 42 stabilizations of the thumb - both active and passive, 13 fingerflexors, 7 Zancolli, 8 miscellaneous, among these 2 FreeHand operations.
In the whole period 49 tetraplegics had surgery, but 7 have died.

Results
39 surveys (93 %) were returned.
85 % were generally satisfied with the results of the surgery. 77 % were satisfied with the information they received before the surgery.
80 % reported improvement in activities of daily living (ADL), and 85 % felt that the surgery had a positive impact on their lives. 59 % reported they needed less personal assistance.

Conclusion
The survey shows that the tetraplegics benefit from the upper-limb surgery and it contributes to a higher degree of independence. They are satisfied with the outcome.

NoSCoS 2009
Comment
In Denmark all tetraplegics are offered an evaluation for potential hand surgery before final discharge from the SCI units.
ABSTRACT TITLE:
Repeatability of clinical examination according to standard neurological classification of spinal cord injury.

AUTHOR(S):
P. Tederko, J. Czech, I. L. Johannesen, M. Krasuski

ABSTRACT TEXT:
Background:
Standard neurological classification of spinal cord injury (SCI) is a widely used specific diagnostic tool. Subjective character of motor and sensory function estimations raise question of clinical test validity. A test designed for patient’s monitoring, should be characterized by good repeatability between observers with different clinical experience.
Aim: To evaluate the repeatability of clinical examination according to standard neurological classification of spinal cord injury.
Material: 100 consecutive SCI patients admitted to rehabilitation department examined by independent observers.
Method: Analysis of interrater repeatability. Comparison of blinded results of ASIA examinations performed by trained residents and a specialist in rehabilitation medicine.
Measurements: correlation coefficient (CC), R-squared statistic (R2), standard error of estimate (SE).
Setting: Viborg Hospital, Marian Weiss Rehabilitation Center, Konstancin
Main results: Estimation of completeness showed between-observer consistence in 92 cases including 40 persons with complete and 52 persons with incomplete neural deficit. Estimation of motor level of injury was more accurate than sensory level. Estimation of zone of partial preservation was more reproducible in motor level compared to sensory level.
Conclusions: Neurological examination according to standard neurological classification of spinal cord injury is characterized by high and clinically useful interrater reliability although results are less reproducible in patients with incomplete neural deficit.

NoSCoS 2009
Saturday 6 June 2009

09.45-10.07

NAME:
Viggo Rasmussen

ABSTRACT TITLE:
RYK - Rygmarvsskadede I Danmark - A consumer organization committed to research and the development of rehabilitation for people with a spinal cord injury (SCI).

AUTHOR(S):
V. Rasmussen, J. Horsewell, B. Ovesen, M. Bundgaard

ABSTRACT TEXT:
It is central to the work of RYK to follow the progress in the development of the treatment and rehabilitation of people with SCI, and in research related to this field. We do not simply act as spectators; we actually attempt to influence this development by cooperating with specialists in the field.

When new research appears, we are dependent on a close cooperation with the professional experts to enable us to fully understand the impact and potential of the newly-gained knowledge. This active collaboration also allows us to disseminate the information properly to our members.

In this presentation, we will outline our view of recent developments and the areas of research that are interesting from point of view of RYKs members. Through our research group (known as Go-Johnny) we encourage researchers and practitioners to let us know if we can assist them by cooperating in their projects and we support, by whatever means we have at our disposal, all research that we feel will contribute to an improvement in the quality of life of people with SCI.

NoSCoS 2009
Saturday 6 June 2009

10.07-10.30

NAME:
Leif Arild Fjellheim

ABSTRACT TITLE:
NORR. Proclamation for a Nordic Spinal Cord Injury day.

AUTHOR(S):

ABSTRACT TEXT:
NORR, which is a cooperative council of the Nordic spinal cord injury organizations, has made a proclamation for a Nordic Spinal Cord Injury Day to highlight key messages about spinal cord injuries and what can be done about it.

We want to

- give attention to the social challenges spinal cord injured people has,
- promote research in improving the general health care and treatment for sci people,
- prevent spinal cord injuries by making the public and health professionals aware by targeted campaigns.

The Nordic Spinal Cord Injury Day will be a foundation to give these topics special focus. It will be up to the single spinal cord injury organization in each country to decide how to mark the day. The day will be held annually the last Friday in April.

NoSCoS 2009
NAME: Tom Tørhaug

ABSTRACT TITLE: Does arm crank and wheelchair ergonomtry produce similar VO2

AUTHOR(S): T. Tørhaug, B. Brurok, J. Hoff, J. Helgerud, G. Leivseth.

ABSTRACT TEXT: Study design: Experimental cross sectional crossover parallel group design Objective: Wheelchair ergometry (WCE) and arm crank ergometry (ACE) are two modes commonly used for training and testing SCI individuals. There is however lack of knowledge to whether the physiological responses of these two modes differs during sub-maximal and peak aerobic work. Thus, this study aimed to compare VO2peak and sub-maximal VO2 values during ACE and WCE. Setting: St Olav's Hospital, Trondheim, Norway. Department of Spinal Cord Injuries. Outpatient basis. Methods: 12 paraplegic subjects performed separate tests on an electrically braked arm crank ergometer and a specially designed wheelchair ergometer. The test protocol for both ACE and WCE consisted of a sub-maximal bout at 30 watt followed by a peak aerobic test where resistance was increased in one minute increments until exhaustion or volitional fatigue. Results: No significant differences in VO2peak during ACE vs. WCE were observed. A significantly higher sub-maximal VO2 during 30 Watt for ACE compared to WCE was obtained as well as a significantly higher peak watt during ACE compared to WCE. Conclusions: These results show that peak testing during wheelchair ergometry and arm crank ergometry show similar VO2peak. Thus for clinical determination of VO2peak with paraplegic subjects either work modality may be used. The differences in sub-maximal VO2 between ACE and WCE are most likely due to different methods for calculating work output between the two ergometers. Keywords: arm crank, wheelchair, ergometry, paraplegia, spinal cord injury, exercise testing.
NAME:
Waleesamarn Chokrathin

ABSTRACT TITLE:
Attitudes of health professionals towards patients with substance abuse problems.

AUTHOR(S):
W. Chokrathin

ABSTRACT TEXT:
Design: Anonymous mail survey.
Setting: Spinal cord lesions and multitrauma inpatient rehabilitation unit at Sunnaas Hospital HF
Background: Health professionals have been shown to often have negative attitudes towards patients with substance abuse problems. There is a growing body of literature which supports that attitudes are an important factor in healthcare settings and may affect patient care.
Participants: 125 active health professionals of an inpatient rehabilitation unit.
Method: A questionnaire was developed. 43 beliefs were translated from The Substance Abuse Attitude Survey (SAAS) to measure five dimensions towards patients with substance abuse problems; Permissiveness, Treatment intervention, Non-stereotyping, Treatment optimism and Non-moralism.
Results: Eighty-eight (71.4 %) of the 125 sampled health professionals returned usable questionnaires. The survey results show that all five dimensions had lower mean scores than a referential score of 50. There were significant differences (the one-way ANOVA) between professional groups in Treatment intervention and Treatment optimism dimensions. Post-hoc analysis showed the attitudes of nursing professionals had significantly higher scores than those of physiotherapists and ergotherapists in the Treatment intervention and Treatment optimism dimensions. On the other hand, nursing professionals were more stereotypical and moralistic, although these differences were not statistically significant.
There were also significant differences (the one-way ANOVA) between educational levels in Treatment intervention and Non-stereotype dimensions. Post-hoc analysis showed the attitudes of participants with trade school educations had significantly higher scores than those of other groups in Treatment intervention. However, the scores were significantly lower than those of other groups in the Non-stereotype dimension. Trade school professionals showed greater Treatment intervention and Treatment optimism, while participants with university degrees were less stereotypical and less moralistic in their approach. Length of service at Sunnaas Hospital HF (SunHF) had a positive effect on participants' Treatment optimism. This relation was statistically significant. Experience with the substance abuse patient group at SunHF correlated positively with Non stereotyping and Non moralism. In addition, participants with such patient group experience also scored positively on other dimensions than those without, however these differences were not statistically significant. Those who had taken a substance abuse course showed significantly higher levels of Treatment optimism. On the other hand, the course didn't seem to have a positive effect either on the Permissiveness, Non stereotype or Non moralism dimensions.

Conclusion: The results suggest that there are elements of demographic factors that play roles in predicting attitudes and contribute differently to these five attitude dimensions when working with patients with substance abuse problems. Lengths of service, taking a substance abuse course, and experience with this patient group, were factors which had a positive impact on attitudes.
Saturday 6 June 2009

11.30-11.45

NAME:
Vaida Lankauskiene

ABSTRACT TITLE:
The influence of verticalization on ortostatic reactions of the patients with cervical part spinal cord injuries.

AUTHOR(S):
V. Lankauskiene. J. Daraiene, V. Valioniene.

ABSTRACT TEXT:
Keywords: spinal cord injury, blood pressure, verticalization, orthostatic hypotension, physiotherapy.

Study subject: orthostatic reactions of the patients with cervical part spinal cord injuries.

Orthostatic reactions for patients with cervical part spinal cord injuries is one of the most biggest problems, which disturbs to seek the aims of rehabilitation. Patients often suffer from dizziness, nausea and even might to lose consciousness at the beginning of the rehabilitation. All these symptoms has a negative impact to patients, so it must be reduced as soon as possible.

Study aim: to determine which tilt-table- simple or Erigo-has the bigger effect for patient's, after cervical part spinal cord injuries, orthostatic reactions.

Study goals: 1. To evaluate the blood pressure changes of the patients during verticalization with different tilt-table; 2. To evaluate the heart rate changes of the patients during verticalization with different tilt-table; 3. To evaluate the state of the patients health after verticalization with different tilt-table; 4. To determine the tolerated duration of the virtualization procedure with different tilt-table.

Hypothesis: Erigo - a tilt-table with passive legs movements – is more effective in reducing orthostatic reactions of the patients with cervical part spinal cord injuries.

Study methods: The study included 24 patients with cervical part spinal cord injuries which had treatment at Palanga Hospital of Rehabilitation on 2007-2008 year period. Patients were divided in to two equal groups (12 patients in each group). All patients had the same rehabilitation and physiotherapy program, but we were using different tilt-table: for 1-st group patients a simple tilt-table, and for the 2-nd group an Erigo- a tilt-table with passive legs movements.

NoSCoS 2009
The blood pressure and heart rate of the patients were measured before and after verticalization procedure and during verticalization at different angles (30, 45, 60 and 80 degree) every 3 minutes. We also followed the procedure of verticalization and subjective symptoms of the patients before and after procedure.

Outcomes: 1. Patient's blood pressure felled statistically reliably much slower \((p < 0.001)\) during verticalization procedure with Erigo than with tilt-table; 2. Patient's heart rate increased more during verticalization with simple tilt-table \((p < 0.001)\) than with Erigo; 3. Patients who was verticalized with Erigo less complained of blurry vision, dizziness, nausea, fatigue or sweating \((p < 0.001)\) than after verticalization with simple tilt-table; 4. The tolerated duration of verticalization procedure was statistically reliably longer \((p < 0.001)\) with Erigo than with simple tilt-table. There were more statistically reliably successfully finished verticalization procedures with Erigo than with tilt-table; 5. Erigo - a tilt-table with passive legs movements – is more effective in reducing orthostatic reactions of the patients with cervical part spinal cord injuries.
# INDEX

<table>
<thead>
<tr>
<th>POSTER PRESENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDEX</strong></td>
</tr>
<tr>
<td><strong>Poster 1:</strong></td>
</tr>
<tr>
<td>Ojaniemi, Mariella</td>
</tr>
<tr>
<td>Tectile Stimulation</td>
</tr>
<tr>
<td><strong>Poster 2:</strong></td>
</tr>
<tr>
<td>Bing, Jette</td>
</tr>
<tr>
<td>Levetiracetam in spinal cord injury pain: A randomized controlled trial.</td>
</tr>
<tr>
<td><strong>Poster 3:</strong></td>
</tr>
<tr>
<td>Mærsk-Møller, Camilla</td>
</tr>
<tr>
<td>Neuropathic pain behavior in rats after experimental SCI: A histological characterization.</td>
</tr>
<tr>
<td><strong>Poster 4:</strong></td>
</tr>
<tr>
<td>Skyggebjerg, J. S.</td>
</tr>
<tr>
<td>Women with spinal cord injury and the need for sexologic interventions during initial rehabilitation.</td>
</tr>
<tr>
<td><strong>Poster 5:</strong></td>
</tr>
<tr>
<td>Leppänen, P.</td>
</tr>
<tr>
<td>Respiratory management with SCI patents in Käpylä Rehabilitation Centre.</td>
</tr>
<tr>
<td><strong>Poster 6:</strong></td>
</tr>
<tr>
<td>Darantiene, J.</td>
</tr>
<tr>
<td>Organisation of SCI rehabilitation in Palanga.</td>
</tr>
</tbody>
</table>

NoSCoS 2009
Poster 7:
Rutberg, L
The role of the spinal cord neurologist in the reconstruction handsurgery team.

Poster 8:
Tuvnes, K
Scanned and catheterized volume measurements - a comparison between stationary and portable bladder scanners.

Poster 9:
Winther, R
Investigating the potential of stem cells to repair injuries in the spinal cord.

Poster 10:
Karlsson, A. K.
Spasticity following spinal cord injury.

Poster 11:
Darantiene, J.
Prognosis changes in rehabilitation time.

Poster 12:
Rusu, L
Method for monitoring the rehabilitation program in spinal cord injury.

Poster 13:
Palmquist, Zita
Working relationship with relatives.

Poster 14:
Christensen, Peter
Cost-effectiveness of transanal irrigation versus conservative bowel management for spinal cord injury patients.

NoSCoS 2009
Poster 15:
**Worsøe, J.**
Long-term results of MACE in neurologic disabled patients.

Poster 16:
**Brandsborg, M. B.**
Traumatic spinal cord injury-epidemiologic evolution through 15 years in the west of Denmark.

Poster 17:
**Tederko, P.**

Poster 18:
**Bragmo, A.**
Assessing sensibility tests.

Poster 19:
**Baer, G. A.**
From opinions to significant findings. Electroventilation (ev) vs. Mechanical ventilation (mv) for functionel C2-tetraplegic patients.

Poster 20:
**Jørgensen, V.**
Assessment of sitting balance in patients with spinal cord injury.

Poster 21:
**Svankjær, E.**
An information folder.

Poster 22:
**Pakkala-Österholm, S.**
Peer counseling for SCI - in between professionality and voluntary action.

NoSCoS 2009
ABSTRACT TEXT:
Tactile Stimulation is a method developed in Sweden by Gunilla Birkestad, a teacher of social welfare. It is used, for example, with clients who have cancer, traumatic brain injury, hemiplegia or spinal cord injury (SCI). The purpose of this method is to increase the body’s oxytocin levels through conscious and structured light touching which activates the sensory receptors of the skin. Treatment can be given to the whole body or only to the problem areas, such as upper limbs with sensory dysfunction. Time of treatment varies from 30 to 60 minutes depending on the area that is treated.

Oxytocin hormone is an endogenous anti-stress hormone that has a positive effect on pain and spasticity (Uvnäs-Moberg 2000). SCI clients often indicate these symptoms, which are difficult to manage and decrease their quality of life. Tactile Stimulation treatment aims to decrease these symptoms.

This method has been used with SCI clients at the Käpylä Rehabilitation Centre since spring 2008. Fourteen clients received Tactile Stimulation treatments more frequently during their rehabilitation period. Most of them had tetraplegia. In addition to managing pain and spasticity, clients have also reported positive effects on quality of sleep, relaxation and bowel management. The therapists measured pain and spasticity with the VAS-scale. Preliminary results have been very encouraging, but more studies need to be conducted to evaluate the effects of Tactile Stimulation.
ABSTRACT TITLE:
Levetiracetam in spinal cord injury pain: A randomized controlled trial.

AUTHOR(S):
N. B. Finnerup, J. Grydehøj, J. Bing, I. L. Johannesen, F. Biering-Sørensen, S. H. Sindrup, T. S. Jensen

ABSTRACT TEXT:
The objective of this randomized, double-blind, placebo-controlled, crossover, multi-center trial was to evaluate the efficacy of the anticonvulsant levetiracetam in patients with spinal cord injury pain and secondarily to evaluate the effect on spasm severity. A one-week baseline period was followed by two treatment periods of five weeks duration with levetiracetam increased from 500 mg BID to a maximum of 1500 mg BID separated by a one-week washout period. The primary outcome measure was the change in median daily pain score (on a 0-10 point numeric rating scale) from one-week baseline period to the last week of each treatment period. Secondary outcome measures included pain relief of at- and below-level pain, allodynia, spasms, and spasticity. Thirty-six SCI patients with at- and or below-level pain were enrolled. Twenty-four patients completed the trial. We found no effect of levetiracetam on the primary (p=0.46) or any of the secondary outcome measures. Only two patients continued levetiracetam treatment following the trial, and one patient was still in levetiracetam treatment at the 6-month follow-up. Levetiracetam was generally well-tolerated with no serious adverse events. In conclusion, levetiracetam did not relieve neuropathic pain or spasm severity following spinal cord injury.

NoSCoS 2009
NAME: Camilla Mærsk-Møller

TOPIC: Pain


AUTHOR(S): C. Maersk-Moeller, N. B. Finnerup, J. R. Nyengaard, C. Baastrup, T. S. Jensen

ABSTRACT TEXT: The purpose of this study was to correlate pain behavior in spinal cord injured (SCI) rats with the volume and localization of the lesion. Rats were injured with the MASCIS weight drop impactor at the T9-T10 vertebral level and monitored weekly for behavioral recovery, spontaneous pain behavior (over-grooming) and the development of at- and below-level evoked mechanical and cold alldynia. Using Cavalieri's principle and 2D nucleator, cross-sectional areas were estimated in sections spanning 16 mm rostral and 8 mm caudal from the lesion epicenter. Cell counts were estimated with an optical fractionator with varying sampling fractions using uniform random sampling. We found no difference in spared gray matter in rats with below-level overgrooming behavior and no difference between the groups with and without at-level evoked pain behavior. There were significantly fewer neurons in the first segment rostral to the epicenter in SCI rats with below-level overgrooming behavior than in SCI rats without (p=0.036, T-test), but we found no difference in total and glial cell counts. In conclusion, the extent and location of the lesion was not a predictor of evoked at-level pain or overgrooming below-level. However, this study suggested that at-level neuronal cell death may be related to below-level overgrooming.

NoSCoS 2009
NAME:  
Jette S. Skyggebjerg 

TOPIC:  
Sexuality - women. 

ABSTRACT TITLE:  
Women with spinal cord injury (SCI) and the need for sexologic interventions during initial rehabilitation. 

AUTHOR(S):  
J. S. Skyggebjerg 

ABSTRACT TEXT:  
Objective: To identify what women with Spinal Cord Injury (sci) believe would be helpful in their post-injury sexual adjustment. 

Design: A qualitative study of two women with sci. 

Setting: Clinic for Spinal Cord Injury, Rigshospitalet Hornbæk, Denmark. 

Results and Conclusions: 
1. The Counselor in Sexology should first establish a good relationship with the patient. 

2. When the patient is ready, she should be informed by the Counselor of the impact of sci on sexuality and sexual life. This information should be discussed individually with the patient and in layman’s language with the focus on the question, "Is sex possible and can it be better?". 

3. The patient’s partner should be informed about the impact of sci on sexuality and sexual life by the Counselor. 

4. Each patient should receive individual counseling by the Counselor. The counseling should focus on psychological factors such as regaining self-worth, positive body image with specific reference to a sense of being sexually attractive, allowing the need for a dynamic process of mourning and coping, and a holistic approach to sexual rehabilitation taking into account physical, psychological and interpersonal circumstances. 

NoSCoS 2009
ch patient also need the support from a psychologist in the process of mourning the losses imposed by the injury.

6. Other professional personnel must be able to talk about sexuality and be able to inform patients about the impact on sexuality.

7. The already existing peer support evenings are considered very helpful.

8. Peer support groups and women’s groups are considered very helpful and should be available during and after initial rehabilitation.
NAME:
Paula Leppänen

TOPIC:
Free paper

ABSTRACT TITLE:
Respiratory Management with Spinal Cord Injured Patients in Käpylä Rehabilitation Centre.

ARTHUR(S):
P. Leppänen, A. Tolmala, E. Ahoniemi

ABSTRACT TEXT:
Reduced respiratory function is associated with tetraplegia and can lead to increased risk of complications such as pneumonia, atelectasis and excessive mucus. Therefore, Käpylä Rehabilitation centre has evaluated current clinical practise in respiratory management. A new treatment protocol has been developed and integrated during patients’ rehabilitation periods.

The patient’s respiratory management program is based on the individual’s measurements of lung function. If the vital capacity (VC) is measured at under 1.5 litre, an intensive respiratory training programme is commenced. This includes several strength and endurance training techniques for the respiratory muscles, methods for secretion clearance and chest and thorax mobility training. In addition, endurance training is carried out by ‘Spiro Tiger’. A bag valve mask is used to assist and to achieve deeper lung ventilation, and to improve secretion clearance and coughing.

To achieve the best outcome requires interdisciplinary collaboration. The training programme is carried out during physiotherapy sessions and at a ward. Furthermore, the patient takes part in a Respiratory Training Group led by a physiotherapist and a speech and language therapist. The patient’s progress is monitored and documented throughout this active respiratory management programme.

This new systematic respiratory management approach with patients and rehabilitation professionals gives an opportunity for further objective evaluation, research and evidence-based practise.
NAME:
Judita Daratiene

TOPIC:
Free Papers.

ABSTRACT TITLE:
Organization of SCI rehabilitation in Palanga.

AUTHOR(S):
J. Darantiene, R. Mikelskas, V. Biskys, R. Aleknaviene

ABSTRACT TEXT:
The purpose is to evaluate the key advantages and drawbacks of reform of the medical rehabilitation system of SCI patients, to establish its influencing factors and, based on the date of analysis and the opinion of the experts participating in the development of rehabilitation system, to develop suggestions how to improve the quality of rehabilitation services patients after SCI in Palanga rehabilitation hospital (PRH). The practical part analysis the changes in the rehabilitation system in the period from 1992 to 2007.

Having reached the set objectives it has been established that the changes in the rehabilitation system in PRH in period from 1992 to 2007 were essential. Individual legal acts directly influenced the changes in the structure of rehabilitation services in the course of development of the priority directions of rehabilitation SCI patients by improving the quality and accessibility of the services. Three main periods are considered in the development: the first period – employment of some procedures of physical and electrical therapy, the second – development of multiprofile rehabilitation, and third – development of comprehensive rehabilitation system. The financing methods of the rehabilitation service from the State patient territorial Fund directly influenced the removal of the uneven distribution of the territorial accessibility.

The analysis showed that the system is developing in the right direction. The structure of the rehabilitation services from 1992 to 2007 changed significantly. The strategic goal to change from the sanatorium, treatment of light patients to the medical

Rehabilitation of heavy cases was implemented.

NoSCoS 2009
NAME: Ann-Katrin Karlsson

TOPIC: Free papers.

ABSTRACT TITLE: The role of the spinal cord neurologist in the reconstructive handsurgery team.

AUTHOR(S): L. Rutberg, A. K. Karlsson, J. Fridén

ABSTRACT TEXT: Reconstructive upper limb surgery is an option for spinal cord injured with a level of lesion between C5-C8. The surgery improves independence in daily living. However, the result of the surgery is not dependent solely on the mechanical improvement of the grip, but the whole situation of the patient. Before reconstruction the patient is evaluated by the team consisting of hand-surgeon, neurologist, physical therapist and occupational therapist.

Method: to evaluate the role of the neurologist in the team by retrospective chart review.

Results: Besides the evaluation of the muscle strength in the upper extremity the individual evaluation of each patient now also includes bladder and bowel function, spasticity, pain assessment, ongoing infections and the risk of autonomic dysreflexia. The treatment of spasticity might involve Botox injections or per oral medication. The wish and need to be independent in bladder and bowel treatment is incorporated in the evaluation by the neurologist. Furthermore the risk of reactivating the psychological reaction to the accident is evaluated.

The result of the surgery is improved by the involvement of the neurologist in the hand team.

NoSCoS 2009
NAME:  
Kristin Tuvnes and Marit Berg Fallmyr

TOPIC:  
Bladder

ABSTRACT TITLE:  
Scanned and catheterized volume measurements, a comparison between stationary and portable bladder scanners.

AUTHOR(S):  
K. Tuvnes, M. B. Fallmyr, G. Leivseth

ABSTRACT TEXT:  
Background  
Bladder scanners is used for measuring volume of urine and may be a useful assistive technology for patients with SCI, MS and men with benign prostatic hypertrophy who have urine retention and residual urine. However, the equipment commonly used is expensive and not suitable for home use. Thus there is a need to develop a scanner which is inexpensive and easy for home use.  
Method  
A new portable prototype bladder scanner from Vitacon (VBM- one dimensional) for home use were tested and compared with DxU’s three dimensional bladder scanner (BVI 3000). 15 SCI patients were recruited for testing. A total of 10 scans were performed with the two different scanners. The subjects went through 5 scans with both devices. Additionally the subjects performed 5 individual scans. Subsequently the subjects performed intermittent catheterization, and the urine volume was measured.  
The scanned volumes of urine obtained by both scanners, i.e. VBM and DxU, were compared to the catheterized volumes of urine. The accuracy of the measurements is defined by the difference between scanned and catheterized urine volumes.  
Statistics  
Bland Altman Plot was used for testing the accuracy between the two bladder scanners.  
Results  
No significant differences between the mean values for scanned and catheterized urine volumes between the two bladder scanners were found. 13 of the 15 subjects were able to use the portable VBM scanner.  
Conclusion  
The VBM and the DxU bladder scanners may be used interchangeably. However the VBM has a lower cost and is more suitable for home use.

NoSCoS 2009
ABSTRACT TITLE:
Investigating the potential of stem cells to repair injuries in the spinal cord.

AUTHOR(S):
R. Winther, J. Z. Rasmussen, F. Biering-Sørensen

ABSTRACT TEXT:
To establish organotypic slice cultures from postnatal rat spinal cord with characterization of the cellular content and architecture of the slices. Conduction of traumatic injuries on spinal cord slice cultures followed by analysis of the damage by cell death measurements and immunohistochemical stainings for neurons and glia. Next, transplanting neural stem cells and progenitor cells isolated from early postnatal spinal cord of rats and mice to repair injury in the lesion model.

Slice cultures from postnatal rat spinal cord was established and analyzed by immunocytochemical staining for different neuronal and glial markers. A lesion model was established where connections between two slices were lesioned. Spinal cord stem cells were transplanted to the lesion site. The cells survived at least two weeks after the transplantation and showed neuronal and astroglia morphology.

Studies of connections between slice cultures were conducted with the co-culture model, which could also be used to study lesion and transplantation. Neural stem cells were transplanted to the lesion site where these survived and differentiated into neurons, oligodendrocytes and astrocytes.
NAME:  
Ann-Katrin Karlsson

TOPIC:  
Free papers

ABSTRACT TITLE:  
Spasticity following spinal cord injury.

AUTHOR(S):  
A. K. Karlsson, L. Rutberg, B. Skoog

ABSTRACT TEXT:  
Spasticity following spinal cord injury has for long time been treated by intrathecal delivery of Baclofen (ITB). We have 20 years experience of the treatment. We performed a retrospective chart review of 12 of the 27 patient treated by ITB. Results: Group characteristics: 1/11 male/female, mean age 53 years, level of lesion C1-T4 ASIA A-C, 1/11 nontraumatic/traumatic injury. Total length of treatment was 114 years (range 1-20 years). The mean dose varied from 6.4-36.7 mikrogram/hour and the maximum dose varied between 6.4-85.4 mikrogram/hour. Two patients had to have their pump replaced due to infection. 5 patients underwent revision of the system due to lack of effect. The complications were preceded by increase in dose in 3 of the patients. The ASIA C patients had a mean dose of 17.5 mikrogram/h compared to 12.7 in the ASIA A group (p<0.01). Discussion: ITB have a good effect on spasticity. The inter- as well as intraindividual doses varies and the incomplete group needs a higher dose than the complete. An increase in dose might be a sign of ongoing complications in the system and should thus be investigated. However the complication rate is rather low and the treatment is thus safe.
NAME:  
Judita Darantiene

TOPIC:  
Free papers

ABSTRACT TITLE:  
Prognosis changes in rehabilitation time after spinal cord injury.

AUTHOR(S):  
J. Darantiene, V. Biskys, B. Spakauskas

ABSTRACT TEXT:  
Although it is widely believed that after spinal injury an early decompression of the spinal cord improves the chances for regeneration, however, decompression at a later stage can also give positive results. We would like to present two cases which we had observed during the rehabilitation process.

Case number one: A sixteen-year-old man suffered spinal injury while diving into water. He was diagnosed with fractured, but not dislocated, VC5. Conservative treatment was prescribed at a neurosurgical department of the hospital. Some 20 days after the trauma the patient was brought to the rehabilitation clinic. The injury was assessed as tetraplegia ASIA B. Rehabilitation did not bring about positive dynamics of any considerable degree. The patient suffered pain in his shoulders. Following the rehabilitation period of 25 days, the patient was referred to the Kaunas Medical University hospital for neurological consultation. At this stage a decision was made to carry out an operation. After the operation the patient was sent back for further rehabilitation. This time the patient's condition improved significantly during the rehabilitation. The syndrome of Braun-Seker became evident. The left side of the body regained strength up to 4 to 5 points, the right side up to 3 to 4 points. The activity of pelvic organs regained their natural functioning.

Case number two: A man aged 57 suffered spinal injury in an accident at home. The patient had been suffering from rheumatoid polyarthritis for a long time. He was diagnosed with the fracture of KT C3 spinal procesus spinosus and free vertebral channel; signs of spondylarthrosis were also detected. He was subjected to conservative treatment at a neurosurgical department. The patient arrived to the rehabilitation hospital after 23 days since the injury. The injury was assessed as tetraplegia ASIA C. The condition was not improving during the rehabilitation; symptoms of breathing problems started appearing and the paralysis was deepening. After a period of 48 days of rehabilitation he was referred to a neurosurgeon for consultations. It was established that there was instability on C3-C4 level. He was operated on; spondylodesis of C3-IC4 was carried out.

NoSCoS 2009
The rehabilitation continued however the condition was rapidly worsening up to ASIA D. Discussion: Patient's condition after spinal cord injury seems to remain changeable for a long time and it is difficult to say realistic prognosis in acute time after trauma. Sometimes early treatment type after SCI during rehabilitation time has to be reconsidered.
NAME: Ligia Rusu

TOPIC: Free papers

ABSTRACT TITLE: Method for monitoring the rehabilitation program in spinal cord injury.

AUTHOR(S): L. Rusu. P. F. Rusu, E. Paun, M. Dragomir

ABSTRACT TEXT: Propose of study -monitoring of rehabilitation programm in paraparesis. We present a protocol for neuromuscular assessment in paraparesis using tensiomiography(TMG) and stabilogram. We obtain informations about muscle force and balance. Method: 20 patients with paraparesis. Assessment: clinical, pain assessment scale, functional assessment using scales like: FIM, ADL, Ashworth scale. TMG and stabilogram assessment. TMG assess delay time(Td), contraction time(Tc), sustain time(Ts), displacement(D), relax time(Tr) after electrostimulation, at both lower limb. Stabilogram assess balance body and posture with and without visual afference. Results: we observe that TC is high, TD decrease , Ts increase, D increase and Tr decrease. Mean values are: Tc 33ms, D 6mm, Td 26,8ms, Ts 185,1ms, Tr 96,7ms. Stabilogram shows a balance deviation during 10seconds, to anterior and extern quadran. Conclusions: Analyze the dates shows a corelation between value of spasticity and increase of Tc, Ts, D and decrease of Tr. That means that we can speak about aberant way of nervous conductivity that maybe appear during paraparesis. Also exists, probably, different values of TMG parameters depends on side of this development way, left or right. If we see stabilogram results we can observe a deviation on the the side where is possible to exist this new way. We can say that a complet rehabilitation and assessment protocol can modulate this programm and let us to associate physical exercises and electrostimulation.
NAME:  
Zita Palmquist

TOPIC:  
Working relationship with relatives.

ABSTRACT TITLE:  
Working relationship with relatives.

AUTHOR(S):  
Z. Palmquist, L. Laier, D. Kristensen

ABSTRACT TEXT:  
Scientific studies and our experience show the importance for relatives to have the opportunity to be involved in the rehabilitation process.

At the Spinal Cord Unit - Paraplegifunktionen - this working relationship includes
• Information leaflet for relatives
• Invitation to the relatives to take part in the patient’s everyday activities at the unit
• Days for Relatives

During the past 12 years, we have successfully held Days for Relatives. After each session, the relatives have evaluated its form and content.

These evaluations have proven useful in our efforts to improve the concept continually, and it now includes:

• Education by a medical doctor, a nurse and a psychologist
• Opportunity to ask questions and express thoughts, feelings and attitudes
• Conversation with relatives of current and former patients
• Conversation with former patients

The poster shows the information leaflet for relatives, the contents of the Days for Relatives as well as examples of evaluation answers from the participants.
NAME:
Peter Christensen

TOPIC:
Bowel function.

ABSTRACT TITLE:
Cost-effectiveness of transanal irrigation versus conservative bowel management for spinal cord injury patients.

AUTHOR(S):
P. Christensen, J. Andreasen. L. Ehlers

ABSTRACT TEXT:
Objectives: To estimate the cost-effectiveness of transanal irrigation compared to conservative bowel management for spinal cord injury patients. Material and methods: Efficacy outcomes were drawn from a randomised controlled trial conducted in 2003–2005, where 82 adult spinal cord injured patients with neurogenic bowel dysfunction were randomised to 10 weeks with either transanal irrigation using Peristeen Anal Irrigation or to conservative bowel management. Costs were calculated based on results from the clinical trial, on 24 interviews, from official unit cost, and from product list prices. The analysis follows international guidelines for cost-effectiveness analyses. Results: When comparing outcome measures at termination, transanal irrigation significantly reduced symptoms of neurogenic bowel dysfunction. Using a 2 day period, product-related costs were higher for transanal irrigation (€16 vs. €4); however, labour costs due to bowel management were lower (€6 vs. €9). For transanal irrigation, costs associated with urinary tract infections (€1 vs. €3) and patient time spent (€15 vs. €23) were reduced. Thus, the total cost to society is lower when patients use transanal irrigation (€38 vs. €39). Conclusion: Transanal irrigation reduces symptoms of neurogenic bowel dysfunction and results in a lower total cost to society than conservative bowel management.
ABSTRACT TITLE: Long-term follow-up of MACE in neurological disabled patients.

AUTHOR(S): J. Worsøe, P. Christensen, K. Krogh, S. Buntzen, S. Laurberg

ABSTRACT TEXT: 
Background: Antegrade continence enema performed through an appendicostomy can treat both constipation and incontinence. We report long-term follow-up.
Method: Retrospective chart review identifying 28 patients (20 females, mean age 50) treated between 1993 and 2006. Primary diagnosis: SCI 15, sequelae from disc prolapse 5, spina bifida 5, syringomyelia 2, cerebral palsy 1. Twenty-one appendico-/neoappendicostomies and 7 combined appendico-/neoappendicostomy and a colostomy were made. Patients answered a questionnaire considering bowel regime, complications, bowel function, social function and quality of life. Success was achieved if patients still used ACE or did not need it anymore. Results: Twenty-five patients were available for follow-up (mean 70 months). Eighteen were still using ACE and 2 did not need it any longer. Accordingly treatment was successful in 80%. Mean time for ACE procedure was 47 min performed daily or every other day. Seventy-eight percent did the procedure without any help. Fifty percent reported minor side-effects with the procedure like pain at catheter placement, nausea, abdominal pain or chills. Evaluation of bowel function, social function and quality of life on arbitrary scales 0-100 (100 best) before and after the procedure all showed significant improvement (P<0.001). Conclusion: ACE can benefit the neurological disabled patients suffering from incontinence or constipation that cannot be managed conservatively. NoSCoS 2009
NAME:
Marie Behrndtz Brandsborg

TOPIC:
Epidemiology

ABSTRACT TITLE:
Traumatic spinal cord injury - epidemiologic evolution through 15 years in the west of Denmark.

AUTHOR(S):
M.B. Brandsborg, D. Clemmensen, J.C. Sorensen

ABSTRACT TEXT:
Aim: An epidemiologic description of patients with traumatic spinal cord injury (T-SCI), since the treatment of these patients was centralized.
Results: There were 175 patients in the first group compared to 142 patients in the other. Mean age respectively 36 and 44 years, male/female ratio 3,7:1 resp. 4,5:1. Mean hospitalization 20 resp. 22 days. Traffic accidents accounted for half of the injuries; other aetiology changed over time. Overall the traumas caused 55% paraplegics in the first period against 70% tetraplegics in the latter. Distributed primarily as cervical lesions with an increase from 45% to 73%, the share of thoracic and lumbar lesions decreased significantly. Mortality was 8% resp. 6%, in both cases > 70% males with mean age 61 years and > 75% cervical lesions.
Conclusion: In 2003-07 patients were older and more often males, more frequently with cervical lesions – these parameters also associated to mortality. Lower incidence of T-SCI could reflect results of preventive campaigns, means of prehospital treatment or changes in aetiology.

NoSCoS 2009
NAME:  
Piotr Tederko

TOPIC:  
Free papers.

ABSTRACT TITLE:  
Evaluation of health awareness in persons after Spinal Cord Injury (preliminary report)

AUTHOR(S):  
P. Tederko, J. Czech, I. L. Johannesen, M. Krasuski, H. Limanowska

ABSTRACT TEXT:  
Purpose: Evaluation of health awareness of persons with SCI who accomplished hospital phase of rehabilitation.  
Material: 133 consecutive traumatic SCI persons 0.5-31 years after injury.  
Method: Health Awareness Test (SCI-HAT) - questionnaire consisting of 150 detailed questions concerning recognition, significance, prophylaxis and management of typical health SCI consequences.  
Main results: SCI-HAT scores did not depend on gender. SCI-HAT scores decrease with age, particularly in females, unemployed and persons unable to perform activities of daily living. SCI-HAT scores raised with the time elapsing from injury with distinct increments between 0.5-1 year and above 10 years after event. Significantly higher SCI-HAT scores were noted in persons with university or secondary education. Persons unable to walk but able for independent wheelchair locomotion gave significantly better responses compared to wheelchair-bound persons unable to drive wheelchair and walkers. Better results were achieved by inhabitants of cities above 100.000, employed, members of SCI association, respondents independent in self-service. There was reversed correlation between SCI-HAT scores and Beck’s depression test.  
Conclusions: Predictors of better health awareness in SCI persons include young age, at least secondary education, more than 10 years elapsing from injury, participation, employment, walking inability, effective self-service, absence of depression. Interaction with persons with disability is main source of health related knowledge in SCI persons.

NoSCoS 2009
ABSTRACT TITLE:
Assessing sensibility tests

AUTHOR(S):
A. Bragmo, K. Bartschick, S. Gald

ABSTRACT TEXT:
Background:
A literature review of Semmes Weinstein Monofilaments led to an investigation of different types of sensibility tests used at rehabilitation hospitals in Norway. The aim of this project was to re-assess and up-date the sensibility tests being used among occupational therapists (OT) at Sunnaas Rehabilitation Hospital.

Methods:
OT's at recognized hospitals in Norway were contacted by phone and email to list the most common used sensibility tests. A literature review was further conducted with emphasis on sensibility and sensibility tests.

Results:
The information gathered led to a further investigation of the Moberg Pick-up test, Semmes Weinstein Mini-Kit, 2-point discrimination (Moberg) and the STI-test, which are commonly used sensibility tests. The literature review indicated that these different sensibility tests all have dissimilar purposes assessing different qualities of senses. It is therefore necessary to use a variety of appropriate tests to thoroughly evaluate the sensibility of the hand.

The use of a detailed description of how to perform the test, are important to ensure correct use of the test and the way it is carried out.

Semmes Weinstein monofilaments and the STI-test have available detailed descriptions for performance and test protocols. However, we did not find a standardized test technique and test protocol for the Moberg Pick-up test and 2-point-discrimination (Moberg).

Conclusion:
Due to the results of this project, equipment used has been up-dated by purchasing the STI-test and Semmes Weinstein Mini-Kit. A combination of standardized sensibility tests of the hand, that evaluate all qualities of senses, and use of test protocols are necessary to ensure correct assessment of the hands sensibility.
NAME:
Gerhard A. Baer.

TOPIC:
Rehabilitation technology.

ABSTRACT TITLE:
From opinions to significant findings: Electroventilation (ev) vs. Mechanical ventilation (mv) for functional C2-tetraplegic patients.

AUTHOR(S):
G. A. Baer.

ABSTRACT TEXT:
A review is given on publications evaluating EV and MV for treatment of respiratory device-dependent patients with spinal cord injury. Medline was appropriately searched. Of 79 hits published between 1980 and 2008 23 papers dealt with our patients, including only two studies comparing differently treated groups. An additional three groups-comparing papers and two reviews were known to the author. Opinions favouring EV over MV were given in 18 papers. In three comparing papers trends were obvious favouring EV for quality of life (QOL), life span, mobility, and nursing. Only one recent study (1) showed a significant reduction of airway infections, use of single use airway equipment, a significantly improved quality of speech, and positive trends with EV appeared for QOL, mortality, and life span. Obviously until recently the imperturbable belief in superiority of EV over MV of those who use EV for their patients prevented them from performing clinically necessary comparing studies.
NAME:  
Vivien Jørgensen

TOPIC:  
Free papers.

ABSTRACT TITLE:  
Assessment of sitting balance in patients with spinal cord injury.

AUTHOR(S):  
V. Jørgensen, A. I. Opheim, N. Hagstrøm, B. Elfing.

ABSTRACT TEXT:  
Introduction:  
Sitting balance is affected following spinal cord injury (SCI) depending on the level and extent of the lesion. It is of great importance to use reliable and valid measurement tools both in patient reports, for evaluating effects of training and in research. There is, however, no easy, valid and reliable tool available to describe and evaluate sitting balance in SCI patients.

Objective:  
To modify two instruments developed for stroke patients to patients with SCI and to assess the validity and inter-rater reliability of the instruments.

Method:  
The Motor Assessment Scale(1), test 3 and the Sitting Balance Score (2) will be modified and used to assess sitting balance. About 50 wheelchair dependent patients with SCI, ASIA A-D, will be tested consecutively by 2 physiotherapists and 1 physiotherapy student. To assess validity the balance tests will be correlated to two instruments assessing function: The Functional Independence Measure (FIM) 3, test 9 and 10, and the Five Additional Mobility and Locomotor Items(4).

Results:  
The study will be carried out in winter 2009, and preliminary results will be presented at the conference.

References:  
2. Sandin, KJ & Smith,B: The measure of balance in sitting in stroke rehabilitation prognosis. Stroke 1990; 21(1), s. 82-86

NoSCoS 2009

NAME:
Ella Svankjær

TOPIC:
Free papers

ABSTRACT TITLE:
An information folder for the newly hospitalized.

AUTHOR(S):
E. Svankjær, B. Christensen

ABSTRACT TEXT:
Background:
In 2002, the Spinal Cord Unit - Paraplegifunktionen began distributing an information folder to the newly hospitalized patients on a trial basis. The staff had identified a need to gather information and papers in one place in order to make those easily accessible to the patient and his/her relatives.
The first-year-evaluation concluded that the distribution of the information folder had been a success and was to be made permanent. Since then, the folder has seen several improvements and is reviewed annually by a primarily responsible committee.
The information folder is intended as each patient’s personal reference book about the Spinal Cord Unit - Paraplegifunktionen, as well as a collection folder for the papers given to the patient during his/her stay at the Spinal Cord Unit - Paraplegifunktionen. Materials included are applications, training instructions and written information about issues to acknowledge and be especially aware of as a spinal cord injured patient.
New material must be processed by the committee and approved by the leadership of the Spinal Cord Unit - Paraplegifunktionen.
The poster demonstrates the contents of the information folder and how the folder is distributed. An example of the information folder will be presented with the poster.

NoSCoS 2009

74
NAME:
Sari Pakkala-Österholm

TOPIC:
Free papers

ABSTRACT TITLE:
Peer counseling for sci - in between professionality and voluntary action.

ARTHUR(S):
S. Pakkala-Österholm, J. Parviainen

ABSTRACT TEXT:
The poster is based on a master’s thesis at Helsinki University, faculty of political sciences, department of social psychology. The thesis is accepted to belong in the branch of social work. The poster presents also peer counseling activities generally in Käpylä Rehabilitation Centre.

The aim of the study was to clarify the place of peer counseling at the Käpylä Rehabilitation Centre in the field of peer support and voluntary action, to describe how peer support works in rehabilitation, and to study how professional aspects, and on the other hand, layman and voluntary aspects, can be combined in peer counseling action.

The study is based on qualitative research interviews with four peer counselors and four patients in the Käpylä Rehabilitation Centre. The data is analyzed by content analysis methods.

An important result was, based on the theory of social comparison, that all patients who were interviewed compared themselves upwards. The peer counselors who were interviewed did not compare themselves directly to patients. A conclusion was made that peer counselors did not have a need to get support to themselves through comparing.

The result of the study show that peer counselors still strongly see themselves like peers to patients, even if there are many features of professionalism in their action, such as reward.

NoSCoS 2009
## WORKSHOPS

### INDEX

<table>
<thead>
<tr>
<th>WORKSHOP</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>WORKSHOP 1</td>
<td>76</td>
</tr>
<tr>
<td>Pressure ulcers in patients with spinal cord injury: A multidisciplinary approach to prevention and treatment - an E-learning course.</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 2</td>
<td>77</td>
</tr>
<tr>
<td>Sponsored by Medtronic</td>
<td></td>
</tr>
<tr>
<td>Intrathecal Baclofen (ITB)</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 3</td>
<td>78</td>
</tr>
<tr>
<td>Obesity project at the Spinal Cord Unit, Viborg.</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 4</td>
<td>79</td>
</tr>
<tr>
<td>Introduction to spinal cord independence measure (SCIM III) instrument.</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 5</td>
<td>81</td>
</tr>
<tr>
<td>Dressing technique.</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 6</td>
<td>82</td>
</tr>
<tr>
<td>Pain.</td>
<td></td>
</tr>
<tr>
<td>WORKSHOP 7</td>
<td>86</td>
</tr>
<tr>
<td>Sponsored by Spiropharm</td>
<td></td>
</tr>
<tr>
<td>Pulmonary Rehabilitation - Non-invasive Cough Augmentation with Mechanical Insufflation-exsufflation techniques.</td>
<td></td>
</tr>
</tbody>
</table>

NoSCoS 2009
WORKSHOP 8
Sponsored by Handicare

Pressure mapping - ways to use it.

WORKSHOP 9

Working with relatives.
Workshop 1 - Wednesday 3 June 2009

14.00-15.00


CHAIR: V. Jørgensen

AUTHOR(S): V. Jørgensen, S. Gald, I.L. Syversen

ABSTRACT TEXT:
This course has been developed as part of a pilot project on the implementation of e-learning as an educational tool at Sunnaas Rehabilitation Hospital. The main objective of this particular course is to provide a flexible means of education in order to repeat and update the multidisciplinary staff of the spinal unit and to ensure that everyone has necessary knowledge relevant in this field. The course is part of the compulsory introduction programme for new employees on the rehabilitation of spinal cord injured patients.

The course has an interactive approach and takes approximately 1 hour to complete. It covers the following topics:
• the physiology of the skin
• pressure ulcer definition
• the development of pressure ulcers
• risk factors
• prevention

NoSCoS 2009
Workshop 2 - Wednesday 3 June 2009
Sponsored by Medtronic

14.00-16.00

TITLE:
ITB treatment algorithm.

CHAIR:
Anand Nene

AUTHOR(S):
Medtronic

ABSTRACT TEXT:
Introduction
Pathophysiology
European treatment algorithm
Assessment and selection of patients for ITB, including low and high function patients
ITB for different indications
Clinical evidence
Cost-effectiveness
General discussion

NoSCoS 2009

77
Workshop 3 - Wednesday 3 June 2009

15.00-16.00

TITLE:
Obesity project at the Spinal Cord Unit, Viborg.

CHAIR:
Randi Eilenberger

AUTHOR(S):
R. S. Eilenberger, Stine Bonne, B. Riis, M. Fjelstad, M. Jensen, Anne Christensen, L. L. Johannesen

ABSTRACT TEXT:
Background: Data from the spinal cord unit Paraplegifunktionen Viborg, indicate that obesity is a growing problem with our primary patients. Research suggests that a multidisciplinary approach to prevention and treatment of lifestyle diseases could be effective. Few studies on obesity among SCI - patients exist, however, and none has measured the efficacy of an interdisciplinary effort during primary hospitalisation.
The purpose of this project is:
- To investigate the efficacy of multi-disciplinary and targeted action to positively influence spinal cord injury patients diet and exercise habits by creating knowledge and understanding of the importance of diet and exercise.
- To articulate and discuss the opportunities and barriers that people with paraplegia or tetraplegia experience effecting relation to potential behavioural changes.

Method: This is a collaborative project between dieticians, psychologists, physiotherapists, occupational therapists, doctors, and nurses. Health promoting initiatives with a focus on food and nutrition, education, training and motivating conversation will be launched. There will in the project be collected hard data, filling out questionnaires, focus group interviews and depth interview to examine the impact of these interventions.
The results will be compared with a control group.

Each profession present its role and mission of the project.
Workshop 4 - Wednesday 3 June 2009

16.30-17.30

TITLE:
Introduction to spinal cord independence measure (SCIM III) instrument.

CHAIR:
H. Vest Hansen, H. Gregersen

AUTHOR(S):
H. Vest Hansen, H. Gregersen

ABSTRACT TEXT:
Purpose
The workshop issue. The SCIM instrument will be introduced, and the participants will get the possibility to test it themselves in the workshop.

Introduction to the SCIM
The SCIM instrument is a reliable and validated outcome measure to assess independence after a spinal cord lesion.

SCIM III has been tested in a multi center study at thirteen centers, across six countries. Clinic of Spinal Cord Injuries at Rigshospitalet participated in this study. The conclusion of this study was that the scores of each sub scales in SCIM are reliable and useful quantitative representation of at specific construct of independence after spinal cord lesion. Therefore it was decided to translate and implement this assessment tool in our clinic.

Methodology and participants in the testing and translating process
Clinic of Spinal Cord Injuries, H. Vest Hansen, V. Laursen, H. Rask, physio- and occupational therapists and doctors, Jane Horsewell, The Danish SCI consumerorganisation RYK, M. Lybæk and I. Lauge, Viborg, Denmark participated in the translating process. The process will be presented at the workshop.

References

NoSCoS 2009
Workshop 5 - Thursday 4 June 2009

11.45-12.30

TITLE:
Dressing techniques for patients with tetraplegia.

CHAIR:
Å. Hove

AUTHOR(S):
Å. Hove, G. Stubbings, L. Sørensen

ABSTRACT TEXT:
Background:
Being independent in dressing is important to be able to manage ones everyday life. ADL-training is one of occupational therapist's most important domains within rehabilitation. Currently there are limited material demonstrating dressing techniques for patients and health-care professionals. Funding was provided from the college of Oslo to develop a DVD showing dressing techniques for individuals with complete tetraplegia.
The aim of this project was to develop instruction material for students and health-care professionals working with dressing patients with tetraplegia.

Methods:
Participants: The target population was patients with a complete SCI, level C6/C7. Basic ADL skills can thus be a challenge. Two participants, injured for one and eighteen years ago, participated in the project. The dressing techniques demonstrated in the project were chosen based on information gathered from health-care professionals and patients, as well as literature review.

Results:
The project will be used as educational material for the college of Oslo during the fall 2009. It will further serve as a guide for health-care professionals working with SCI rehabilitation.

Discussion/conclusion:
This project will enable best possible practice when providing dressing techniques for patients with SCI.

NoSCoS 2009
WORKSHOP 6 - THURSDAY 4 JUNE 2009

16.30-17.30

TITLE:
CHRONIC PAIN FOLLOWING SCI: PATIENTS’ PERSPECTIVES AND TREATMENT

CHAIR:
N.B. Finnerup

ABSTRACT TEXT:
This workshop will consist of four short presentations followed by discussion.

Pain from a patient’s perspective

Cecilia Norrbrink, RPT PhD

Pain is a very common consequence of a spinal cord injury and interferes with rehabilitation, daily activities, and quality of life amongst other things. Especially neuropathic pain is difficult to relieve and therefore has a great impact on patients’ life. Studies have reported that patients with spinal cord injuries and pain consider their pain to be the greatest problem. Few treatments have been successfully evaluated in clinical trials within this patient group and many of the recommended drugs are associated with adverse events influencing compliance. Treatment algorithms most often recommend anti-convulsant drugs such as gabapentin and pregabalin, and tricyclic anti-depressants, or serotonin and norepinephrine reuptake inhibitors for treating neuropathic pain. Results from surveys within patients with spinal cord injuries have however reported patient preference for other types of drugs, such as opioids. Studies on non-pharmacological treatments, often associated with less adverse events, are lacking. Management of pain, medication failure, and coping with pain has been identified as important themes in qualitative analyses in patients with spinal cord injury and pain. Patients have also expressed requests on getting information on pain as well as a better dialogue with the researchers.

Evidence-based treatment of neuropathic pain

Nanna Brix Finnerup

Danish Pain Research Center, University of Aarhus and the Spinal Cord Unit, Viborg Hospital.

NoSCoS 2009
In this part of the workshop, evidence-based treatments of SCI neuropathic pain will be discussed. These include mainly gabapentin and pregabalin as well as antidepressants for neuropathic pain. Other treatments are used for which there is less evidence and include motor cortex stimulation, mirror visual feedback, and cognitive behavioral therapy. Evidence for treatment of other neuropathic pain states will also be discussed in relation to SCI pain.

Management of neuropathic pain following spinal cord injury; Our experience
J. Kriz
Authors: J. Kriz, V. Hysperska
Spinal Cord Unit, University Hospital Motol, Prague, Czech Republic
Objective
Presentation of 4-year experience in treatment of spinal cord injured (SCI) patients with neuropathic pain.
Methods
The Spinal Cord Unit in Prague provides care for SCI patients from 2 weeks to 3 months after injury. Patients with neuropathic pain continue their follow-up in our outpatient clinic and are re-hospitalized if necessary.
Treatment scheme:
1. Start with gabapentin in increasing doses
2. Pregabalin if gabapentin fails (or as first choice in severe spasticity)
3. Combination of one of the above with amitriptylin if no other antidepressives
4. Combination of one of the above with clonazepam if amitriptylin contraindicated or severe spasticity
5. 1st generation anticonvulsants (i.e. carbamazepin) in small doses
6. If no improvement, the patient is referred to Pain Centre for treatment with opiates or surgery.
Results
75 SCI patients with neuropathic pain: 35% at-level and 65% below-level of injury.
Etiology: 81% traumatic lesions, 19% non-traumatic.
Age: 13% under 30 years, 21% between 31 and 40, 26% between 41 and 50, 20% between 51 and 60, 20% over 60 years.
Gender: 55% men, 45% women
ASIA: level: 41% cervical, 48% thoracic, 11% lumbar
ASIA: AIS A 39%, AIS B 11%, AIS C 23%, AIS D 27%.
Time since injury: 64% under 1 year, 20% between 2 and 5 years, 16% over 5 years.

NoSCoS 2009
Treatment: 41% gabapentin, 27% pregabalin, 13% combination with amitriptylin, 5% combination with clonazepam, 8% changed from gabapentin to pregabalin, 8% referred to Pain Centre, 3% discontinued treatment, 3% missed control examination.

Conclusions
1. Neuropathic pain is independent from age or level of injury.
2. Pain appears mostly at subacute stage during first hospitalization.
3. Gabapentin is most efficient in neuropathic pain
4. 90% of our patients respond favorably to medication

**Pain in spinal cord injury: Cause and management**
G. Fizotti
*Spinal Unit Fondazione Salvatore Maugeri Pavia. Italia

The onset of the pain in the patients with spinal cord injuries is a frequent clinical complication.
Epidemiological researches prove that 75% of the patients with spinal cord injury have chronic pain and that in 25% of these patients the pain is severe (Bonica, 1991; Finnerup 2001; Siddal 2002). A sequence of anatomic, chemical and inflammatory events follows a spinal cord injury and causes a spontaneous activity in spinal cord segment injured and in the more rostral segments. (Falci, 2002). These physiologic chances are the basis of caused and spontaneous pain. The conventional classification of the pain in the patients with spinal cord injury is based on the seat of the pain compared with the seat of the injury.
Pain above level is related to the rostral metamers compared with spinal cord injury. Pain at level is related to the same metamers of spinal cord injury.
Pain below level is related to an area where motor and sensitive changes are present. In this case is very important to define if the pain is spontaneous or evoked.
Spontaneous pain that disappear in sleep is frequently a pain that arise from central nervous system in spino thalamic tract. (Lenz, 1994).
The therapies chance according to the quality and the seat of the reported pain. The use of hygienic measures and adequate ortesi can help to reduce some type of pain; the operations can give results to reduce the pains in the joints, in the tendons and the entrapment of peripheral nerves. The drugs that modulate the sodium and calcium channels can control the neuronal excitability (lidocaine, carbamazepine, oxcarbazepine and gabapintin). The same drugs are indicated to control the pain below the injury.

**Bibliography**


NoSCoS 2009
WORKSHOP 7 - Thursday 4 June 2009
Sponsored by Spiropharma

16.30-17.30

TITLE:
Pulmonary rehabilitation - Non-invasive Cough Augmentation with Mechanical Insufflation-Exsufflation techniques.

CHAIR:
Monique Hom

AUTHOR(S):
M. Hom

ABSTRACT TEXT:
Abstract:
Cough augmentation with mechanical insufflation-exsufflation produces significant increase in peak cough flow and facilitates airway secretion clearance in neuromuscular disorders. CoughAssist® creates the explosive force of a natural cough and prevents complications in patients with an ineffective cough.
WORKSHOP 8 - FRIDAY 5 JUNE 2009
SPONSORED BY HANICARE

11.00-11.45

TITLE:
Pressure mapping - ways to use it.

CHAIR:
Dorte Læsø.

AUTHOR(S):
D. Læsø.

ABSTRACT TEXT:
Only a few hours of pressure, is all that is needed, before people with reduced sensibility, bad nutrition, reduced cardiovascular system and limited mobility, can risk damage of the tissue. Pressure wounds will cause many month of reduced activity, pain and lack of life quality. It is also a considerable charging of the hospital expenses.
Pressure mapping can help therapists, wheelchair users and other people involved in preventing pressure damages.
Pressure mapping can be one way to illustrate, what is happening in the seating area, which the person with a spinal cord injury no longer feels. The wheelchair user can obtain knowledge and understanding about the need for new seating's and positioning. The user will easily understand and accept the need for changing of position, choice of cushion and need for relieve during the day.
Pressure mapping is often used as part of a seating assessment, as it gives a clear and objective measure to document a rotated or asymmetric pelvis or an unlike weight distribution.
However, it is important to be aware of, what kind of information the mapping will give us and how to use it.
I would never suggest that pressure mapping should stand alone, but as an educational tool, it will help both caretakers and wheelchair users to understand the important issues of seating and positioning.

The presentation will change between theory and case stories.

Presentation by product specialist Dorte Læsø, Handicare.

NoSCoS 2009

87
Workshop 9 - Saturday 6 June 2009

12.00-13.00

TITLE:
Working relationship with relatives - why and how

CHAIR:
Zita Palmquist

AUTHOR(S):
Z. Palmquist, B. M. Christensen, L. Laier, D. Kristensen

ABSTRACT TEXT:
Scientific studies and our experience show the importance for relatives to have the opportunity to be involved in the rehabilitation process.

At the Spinal Cord Unit - Paraplegifunktionen - this working relationship includes
• Information leaflet for relatives
• Invitation to the relatives to take part in the patient's everyday activities at the unit
• Days for Relatives
• Sessions by a psychologist

This workshop will show:
• generally: why the working relationship with relatives is so important and
• especially: how we hold Days for Relatives - a successfull concept at Spinal Cord Unit - Paraplegifunktionen, Viborg.

We look forward to telling you about our concept and share experiences of the working relationship with relatives

NoSCoS 2009

88