This annual report provides an overview of the clinical and research activities that took place at The Danish Headache Center and the affiliated Glostrup Research Park in 2011.

The Danish Headache Center celebrated its 10 years anniversary in September 2011. Since its inauguration the Center has greatly expanded in terms of number of patients treated. At the same time the armamentarium of treatments offered to our patients has been considerably expanded, and we are continuously aiming at increasing also the quality of the treatments. The number of staff members has also increased considerably through the years, and we are grateful that we have a highly committed and highly qualified multidisciplinary staff, which do their utmost to take care of our severely affected patients. However, the word is out on the treatment possibilities in the Center. This has resulted in a steadily increasing number of patients referred to the Center through the years and thereby to increasing waiting lists. Various initiatives have been put in action to try to solve this unacceptable situation.

The Founder of The Danish Headache Center Jes Olsen celebrated his 70 years birthday in September 2011. Jes Olsen was honoured at several symposia in Denmark, and at the annual meeting of the European Federation of Neurological Societies in Budapest a symposium with the title “Brain disorders in Europe: Future directions” was dedicated to Jes Olsen in recognition of his outstanding contribution to the fields of neurology and the development of the EFNS and the European Brain Council. Congratulations to Jes.

The research at The Danish Headache Center and the affiliated basic research at Glostrup Research Park continue to be very active with a high number of publications and a large impact factor. In 2011, Anne Hauge defended her PhD thesis entitled “Migraine with aura: Triggers and treatment.”. Congratulations to Anne. Additional information can be found at our homepage: www.danishheadachecenter.dk

Glostrup, March 2012.

Lars Bendtsen
Rigmor Jensen
Jes Olsen
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1.1 ORGANIZATION
Danish Headache Center has a vigorous research group including 8 senior researchers, 4 post docs and 19 Ph.D. students. The organization of research is shown in Figure 1.

1.2 RESEARCH STAFF
Senior scientists:
- Jes Olesen
- Rigmor Jensen
- Per Thoft-Hansen
- Inger Jansen Olesen
- Messoud Ashina
- Saurabh Gupta
- Lars Bendtsen
- Aydin Gozalov

Post docs:
- Christina Kruuse
- Henrik Winther Schytz
- Jakob Müller Hansen
- Lars Schack Kruse

Technologists:
- Hanne Andresen
- Lene Elkjær
- Winnie Gronning

Administrative assistants:
- Kirsten Hjelmin
- Karin Aagaard

Ph.D. students:
- Sohail Asghar
- Anne Werner Hauge
- Michael Baun
- Han Le
- Signe Bruun Munksgaard
- Maja Myren
- Dipak Vasantrao Anrutkar
- Deepak Kumar Bhattacharyya
- Roshni Ramachandran
- Julie Caroe Kristensen
- Anne-Louise Eserholt
- Anders Hougard
- Faisal Amin
- Maria Antonova
- Mads Barløse
- Hanne Yri
- Dorte Kirkdgaard Nielsen
- Sara Hougard Pedersen
- Karin deLinde Troelsen

Other researchers:
- Sait Ashina
- Asif Munir Shah
- Bjarne Kjeldgaard Madsen
- Lotte Skytte Knoll
1.3 RESEARCH AREAS

Human migraine models

Members
Mesoud Ashina, Sohail Aghar, Jakob Müller Hansen, Henrik Schytz, Troels Wienecke, Anders Hougaard, Faisal Amin, Maria Antonova, Jes Olsen.

Background
Fast tracking of new drugs for migraine have faced the major challenge of poorly-predictive preclinical models. Indeed, novel, migraine-specific preventive drugs have not been developed in decades. Further-more, the acute therapy armamentarium remains suboptimal, with no new chemical entities since the triptans. On the other hand, human experimental studies are surfacing as a powerful tool in targeted migraine therapy. To this end, human studies have identified three novel targets: inhibitors of cortical spreading depression, antagonists of calcitonin gene-related receptors, and chemicals that prevent the production of nitric oxide. Two of these novel mechanisms are in phase 3 clinical development and one is in phase 2. These encouraging observations, however, are based on 30 years of research in human provocation studies and which are based on 30 years of research in human.

Current projects
- Preclinical models. Which combines human provocation studies and which are based on 30 years of research in human
- Mechanisms are in phase 3 clinical development and one is in phase 2. These encouraging observations, which are based on 30 years of research in human provocation studies and which are based on 30 years of research in human.

Collaboration
Henrik Larsson and Adam Espe Hansen (Department of Clinical Physiology and Functional and Diagnostic MR Unit), Vibeke Andre Larsen (Department of Radiology), David Borsok and Lino Bercera, PAIN Group, Mcllean Hospital, Harvard University Boston USA; David A Raus, Optical Imaging Core & Lab at Martinus Center Department of Radiology, Boston USA; Professor van der Geest, Leiden University Medical Center, Holland; Professor Michael Hoffmann, Head of Visual Processing Laboratory, Universitätsaugenklinik, Otto-von-Guericke-Universität, Magdeburg; Prof Till Sprenger, Department of Neurology and Division of Neuroradiology, University Hospital Basel, Switzerland.

Figure
Region of interest for visual stimulation as defined by conjunction of all individual’s activation areas in the first scan. Aghar et al., J Magn Reson Imaging, 2011 Oct;34(4):921-7.

Tension-type headache

Members
Lars Bendtsen, Lotte Skytte Krøll, Bjarne Kjeldgaard Madsen, Sait Ashina, Rigmor Jensen.

Background
Increased understanding of the role of peripheral factors (mainly muscular) and central factors (mainly central pain processing) in the pathophysiology of tension-type headache are crucial for the development of more effective treatment options for this disorder. Experimental models studying muscular factors, e.g. muscle pain sensitivity, and central factors, e.g. degree of wind-up, and the interaction between these factors are needed to explore the cause/effect relationship between the various peripheral and central abnormalities reported in tension-type headache. Previous studies of our group have, e.g., demonstrated abnormal tenderness and pain perception indicating central sensitization.

Current projects
- Epidemiology of neck pain and headache, processing and modulation of peripheral nociceptive input in the central nervous system and the role of neck pain in tension-type headache.

Collaboration
Professor Jens Ebeling, Center for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark. Professor Tim Steiner, Division of Neuroscience and Mental Health, Imperial College London, London W6 8RF, UK.

Epidemiology

Members
Rigmor Jensen, Sait Ashina, Asif Munir Shah.

Background
Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations. The Glostrup County population study from 1989 was the first prevalence study of specific headache entities in a representative general population, based on a structured interview and examination by a physician. This study demonstrated the huge impact headache has on individuals and society. A follow-up study showed an increase in frequency and health care utilisation and thereby indicated a higher impact of headache over a 12-year period. Risk factors for migraine were young age, female gender, familial disposition, no vocational education, high work load and frequent tension-type headache. For tension-type headache risk factors were young age, female gender, poor self-rated health, inability to relax after work, and sleeping fewer hours per night. In general migraine and tension-type headache had a favourable prognosis with increasing age and only a minority of subjects had increased headache frequency. Prognostic factors were identified.

Current projects
A very large health survey study on more than 100.000 individuals was conducted in 2010 and headache related questions are under evaluation. Supplementary data analysis with specific focus on chronicisation, medication overuse and socioeconomic impact are ongoing. A large clinical study of patients treated at the Danish Headache Center has already been conducted with main focus on medication overuse headache. It has been demonstrated that detoxification have a very positive outcome, especially in migraineurs and that these patients becomes reactive to migraine prophylactics again. Several new projects focusing on specific treatment results and neurobiological mechanisms underlying medication overuse headache are ongoing. Data from the epidemiological studies are related to newer population studies and predictors for chronicisation are searched.

Genetics and environment

Members
Anne Hauge, Han Le, Ann-Louise Esserling, Anne Francke Christensen, Jes Olsen.

Background
Family studies and twin studies show that the risk of migraine is 50% inheritance and 50% environment. The identification of genes involved in migraine may give clues to underlying pathophysiological
mechanisms. It is equally important to identify the environmental factors, which so far are largely unknown.

Current projects
One aim of our studies is to identify the genes involved in migraine with aura, familial hemiplegic migraine, and migraine without aura. To date we have collected blood from more than 1400 migraine patients and the molecular genetics analyses have been initiated. In twin studies we try to identify the most important environmental risk factors for migraine. We also study the influence of co-morbidity and secular trends.

Intracellular transduction mechanisms in migraine

Members
Christina Kruse, Lars Schack Kruse, Julie Caroe Kristensen.

Background
Pain signalling in humans involves second messenger signalling through second messengers; cyclic adenosine monophosphate (cAMP) and cyclic guanosine monophosphate (cGMP). Studies in humans show that specific modulation of such cyclic nucleotide signalling induce headache, though the tissues in which the processes take place and the possible interaction between signalling pathways is not fully understood. We aim to localize and investigate the role of cyclic nucleotide signalling in tissue and cells relevant for the pain process. In collaboration with Department of Clinical Biochemistry Glostrup, Department of Neuroscience and Pharmacology and Functional Imaging Unit Dept Clinical Physiology and Nuclear medicine we have found unique localisation and function of molecules, phosphodiesterases (PDE), responsible for modulation of cGMP and cAMP signalling in cerebral arteries and the brain.

Current projects
- Co-localisation of PDEs with other relevant pain cellular signalling molecules in vascular and neuronal cell systems
- Investigating potential new targets for treatment in the pain mechanism of headache and migraine related to cyclic nucleotide signalling
- Localisation and role of PDE in the choroid plexus, interaction with natriuretic peptides and regulation of cerebrospinal fluid production in relation to idiopathic intracranial hypertension.

Collaboration
Rigmor Jensen (Danish Headache Center), Mari-anne Juhler (Dept. Neurosurgery, Rigshospitalet), Henrik Larsson and Adam Egpe Hansen (Functional Imaging Unit, Department of Clinical Physiology), Morten Mulder (Department of Neurology and Pharmacology, Panum Institute); Joe Beavo and Sergei Rybakulin (Dept Pharmacology, University of Washington, Seattle); Lars Edvinsson (Department of Experimental Clinical Research, Gastro-Hospitalet; Steen Gammeltoft (Dept. Clinical Biochemistry, Glostrup).

Idiopathic intracranial hypertension

Members
Rigmor Jensen, Maren Skau, Hanne Yri.

Background
Idiopathic intracranial hypertension (IIH) is an intriguing, clinical condition of increased intracranial pressure without pathological, laboratory or radiological evidence of intracranial pathology in young, obese individuals. The clinical symptoms are severe headache, pulsatile tinnitus, transitory visual obscurations and diplopia. Demographic studies report a rapidly increasing incidence of IIH in obese young females and with the global epidemic increase of obesity a significant increase in the number of IIH patients in Denmark can be predicted. Severe obesity is closely related to a number of neuroendocrinological changes which has still not been evaluated in IIH. Untreated IIH may lead to severe visual loss and blindness resulting from damage to the optic nerve. The mechanism whereby IIH leads to optic nerve dysfunction is poorly understood but it seems to be closely linked to oedema of the optic nerve head and the associated elevation of hydrostatic pressure inside the optic nerve.

A PhD study from this group described the diagnostic value of new and attraumatic OCT-examinations and a new biomarker was identified. A new multidisciplinary study of IIH comprising neurobiological and ophthalmological aspects is a unique study of still unsolved aspects in IIH.

Collaboration
Dai Mílea, Department of Ophthalmology, Gastro-Hospitalet, Denmark. Jens Peter Gotze and Jens Rehfeld, Department of Clinical Biochemistry, National Hospital, Copenhagen, Denmark. Marianne Juhler, Department of Neurosurgery, National Hospital, Denmark.

Medication-overuse headache

Members
Signe Bruun Munksgaard, Rigmor Jensen, Lars Bendtsen.

Background
Medication-overuse headache (MOH) is a daily or almost-daily type of headache that usually results from the chronicification of primary forms, such as migraine or tension-type headache, as a consequence of the progressive increase in the intake of symptomatic drugs. MOH affects a percentage of 1.4-3% of the general population. Limited amount of data exists on the burden of MOH, even in developed countries, but there is general agreement that the disease represents one of the most disabling disorders, which markedly deteriorates the quality of life of patients, exposing them to the risks of side-effects and co-morbid conditions.

Our knowledge on the mechanisms leading to MOH is limited, and there are virtually no data on how these severely patients are treated optimally. Thus, there is an urgent need for studies investigating the pathophysiology and treatment possibilities of MOH.

Current projects
- A prospective study comparing two different treatment options for MOH ( abrupt drug withdrawal and a 2 month drug free period compared with restricted intake of analgesics combined with prophylactic headache treatment).
- A prospective study investigating pain modulation (peripheral and central pain sensitivity) before and after drug withdrawal.
- An EU-founded multi-Center study (COMO-ESTAS) investigating the benefit of electronic headache diaries during detoxification of MOH was finalized and data analysis is ongoing.

Collaboration
Cluster headache

Background
Cluster headache is one of the most severe and disabling type of headaches. The pathophysiology of this disorder is largely unknown and it may be very difficult to treat, in particular the chronic form of cluster headache.

Current projects
Neurostimulation has been used in selected cases of chronic neuropathic pain but there is only very limited evidence of neurostimulation in headache disorders. As chronic cluster headache is one of the most disabling pain disorders known by mankind there is a constant search for new and better strategies, especially for those patients that are refractory to medical treatment strategies. At present, the Danish Headache Center is participating in an international multicenter study of the effect of neurostimulation of the sphenopalatine ganglion in 10 patients with chronic cluster headache. Further neuromodulation studies are emerging and in case of positive outcome this principle can contribute to a significant therapeutic breakthrough for these patients. Likewise, important information on modulation of the pain signaling during cluster headache periods can be provided. Furthermore, large scale studies on the clinical and the genetic relation between cluster headache and sleep is under planning.

Collaboration
Søren Hillerup, professor, DDS, and Jørgen Rostgaard, CMT surgeon, DDS, Department of Oromaxillofacial Surgery, National Hospital, Copenhagen, Denmark.

Anthony Carparso, Principal Clinical Scientist, Autonomic Technologies, Inc., CA, USA.

Clinical trials

Members
Messoud Ashina, Rigmor Jensen and Jes Olesen and Peer Tfelt Hansen

Background
The Center participates in number of clinical trials designed to test new therapies, or new ways of using known treatments to improve the treatment of headache disorders.

Current trials
• Study MR-0974-065: A multicenter, double-blind, placebo-controlled, parallel group study to compare the efficacy and safety of oral MR-0974 with placebo for the preventive treatment of menstrual migraine
• Sphenopalatine Ganglion Stimulation for the Acute Treatment of Cluster Headache

Trigeminal neuralgia

Members
Aydin Gozalov, Lars Bendtsen, Rigmor Jensen and Jes Olesen.

Background
Trigeminal neuralgia is an extremely painful disease, which may be difficult to treat. Management consists of prophylactic pharmacotherapy and surgery in selected cases. There is a huge lack of high quality research in this field and essential aspects such as epidemiology, pathophysiology, diagnosis and optimal treatment are far from understood.

Current projects
A PhD project is planned, where the main aims will be to clinically characterize patients with trigeminal neuralgia and to investigate whether findings from imaging, e.g. the presence or absence of neurovascular contact on high resolution MR-scans, is correlated to clinical findings and to efficacy of pharmacological treatment and neurosurgery.

1.4 SPONSORS

Major sponsors:
• Lundbeck Foundation as part of the Lundbeck Foundation Center for Neurovascular Signalling
• Lundbeck Foundation (independent grant for genetics)
• Candy’s Foundation
• Capital Region Foundation
• Faculty of health, University of Copenhagen
• Danish Research Council
• European Commission
• IMK Foundation
• Danish Headache Society
• Augustinus Foundation
• Foundation of Largevindenskabens Fremme
• Kong Christian IX og Dronning Louises Jubilæumslegat
• The Foundation for Neurological Research
• The Illum Foundation
• Novo Nordisk Foundation
• Torben og Alice Frimodts Foundation
• Ulla and Mogens Følmer Andersens Foundation
• Grocer Sven Hansen and wife Ina Hansens Foundation
• Aase og Ejnar Danielsens Foundation

Figure 2.
Jes Olesen was honoured at the annual meeting of the European Federation of Neurological Societies in Budapest with a symposium with the title "Brain disorders in Europe: Future directions" in recognition of his outstanding contribution to the fields of neurology and the development of the EFNS and the European Brain Council.
2. COLLABORATIONS

Departments within Glostrup Hospital
- Department of Ophthalmology
- Department of Clinical Experimental Research
- Department of Clinical Physiology
- Department of Clinical Biochemistry
- Department of Paediatrics
- Department of Radiology
- Department of Gynaecology
- Department of Anaesthesiology
- Department of Oral and Maxillo-Facial Surgery
- Department of Clinical Neurophysiology
- Functional Imaging Unit, Dept Clinical Physiology and Nuclear medicine
- Stroke Unit, Department of Neurology
- Pain Group, Mole Hospital, Harvard University
- Optical Imaging Core & Lab at Martins Center
- Department of Radiology, Boston USA
- Leiden University Medical Center, Holland
- Visual Processing Laboratory, Universitätsaugenklinik, Otto-von-Guericke-Universität, Magdeburg
- Department of Neurology and Division of Neuroradiology, University Hospital Basel, Switzerland
- Center for Sensory-Motor Interaction, University of Ålborg, Denmark
- Professor Elena Lebedeva, University of Ural Region, Jekaterinburg, Russia
- Mondino Institute of Neurology Foundation, Pavia, Italy
- Department of Physical Therapy, Department of Health Sciences, University of Lund, Sweden
- Department of Neurology, Semmelweis University, Budapest, Hungary
- PAIN Group, Mole Hospital, Harvard University
- Department of Neurology and Division of Neuroradiology, University Hospital Basel, Switzerland
- Center for Sensory-Motor Interaction, University of Ålborg, Denmark
- Professor Elena Lebedeva, University of Ural Region, Jekaterinburg, Russia
- Danish twin registry, University of Odense, Denmark
- Department of Neurology, Hillerød Hospital, Denmark
- Professor John-Anker Zwart, Department of Neurology, Umeå University Hospital, University of Oslo, Oslo, Norway
- Professor Knut Hagen, Department of Neuroscience, Faculty of medicine, Norwegian University of Science and Technology, Trondheim, Norway
- Professor Timothy Steiner, Department of Neuroscience, Faculty of medicine, Norwegian University of Science and Technology, Trondheim, Norway
- Professor Hartmut Goebel, The Headache Clinic, Kiel University, Germany
- Kiel University, Germany
- Department of Anaesthesiology
- Department of Gynaecology
- Department of Radiology
- Department of Clinical Neurophysiology
- Functional Imaging Unit, Dept Clinical Physiology and Nuclear medicine
- Stroke Unit, Department of Neurology
- External collaborators
- Clinical research
  - Center for Health and Preventive Medicine, Copenhagen County, Denmark
  - Department of Neurosurgery, National Hospital, Copenhagen, Denmark
  - Danish twin registry, University of Odense, Denmark
  - Department of Neurology, Hillerød Hospital, Denmark
  - Professor John-Anker Zwart, Department of Neurology, Umeå University Hospital, University of Oslo, Oslo, Norway
  - Professor Knut Hagen, Department of Neuroscience, Faculty of medicine, Norwegian University of Science and Technology, Trondheim, Norway
  - Professor Timothy Steiner, Department of Neuroscience, Faculty of medicine, Norwegian University of Science and Technology, Trondheim, Norway
  - Professor Hartmut Goebel, The Headache Clinic, Kiel University, Germany
- Basic Pain Mechanisms
  - Professor Jens Eriich, Center for Sensory-Motor Interactions, Department of Health Science and Technology, Aalborg University, Denmark
  - Department of Pharmacology, University of Washington, Seattle, USA
  - Department of Medical Physiology, Faculty of Life Sciences, Copenhagen University, Denmark
  - Institute of Pharmacology, Faculty of Pharmaceutical Sciences, Copenhagen University, Denmark
  - Institute of Experimental Research, University of Lund, Sweden
  - Professor Karl Meslinger, Institute of Physiology and Experimental Pathophysiology, University of Erlangen-Nürnberg, D-91054 Erlangen, Germany
  - Institute of Anatomy, Panum Institute, University of Copenhagen, Denmark
- Genetics and environment
  - DeCode, Reykjavík, Iceland
  - Danish twin registry
- Headache Epidemiology
  - Professor Michael Baum Russell, University of Oslo, Akershus Hospital, Norway
  - Professor Lars-Jacob Stovner, Kompetencecenter for epidemiology, University of Trondheim, Norway
- Genetics and environment
- DeCode, Reykjavík, Iceland
- Danish twin registry
- Medication-overuse headache
  - Dr. C. Tassorelli, Fondazione Istituto Neurologico Casimiro Mondino, Italy
  - Dr. M. Lamir, Fundación de la Comunidad Valenciana para la Investigación Biomédica del Hospital Clínico Universitario De Valencia, Spain
  - Dr. Z. Katsarava, Universitätsklinikum Essen, Germany
  - Dr. R. Fadic, Pontificia Universidad Catolica de Chile, Santiago, Chile
  - Dr. A. Stoppini, Fundacion para la Lucha contra las Enfermedades Neurologicas de la Infancia, Buenos Aires, Argentina
  - Dr Csaba Ertsay, Department of Neurology, Semmelweis University, Budapest, Hungary
  - Professor Tim Steiner, University of Trondheim and London
  - Ass. Professor Cristina Tassorelli, Istituto Mondino, University of Pavia, Italy

Guest lectures and visitors
- Professor Tim Steiner, University of Trondheim and London
- Asst. Professor Cristina Tassorelli, Istituto Mondino, University of Pavia, Italy
- As well as numerous Danish colleagues.
We have a dedicated and very stable staff who most of whom have had little success in other places. We have successfully treated thousands of patients mode of action extremely complicated. Nevertheless, our hospital and this makes our multidisciplinary Center is housed in seven different locations in Glou-

trading has been constant ranging around 25 full time of headache patients. Small further additions to the organized. The second big expansion came when Center became an immediate success. Huge numbers many were part time employed because there was psychologists. When I use plural it is only because sated by enthusiasm among the few participating what we lacked in terms of versatility and vibrating. At the threshold to our whole thing took off. What we lacked in terms of resources and infrastructure was more than compensated by enthusiasm among the few participating doctors, nurses, secretaries, physiotherapists and psychologists. When I use plural it is only because many were part time employed because there was actually only one of each except for two doctors. The Center became an immediate success. Huge numbers of patients from all over Denmark came to us and in just a couple of years the capacity had to be increased. We got more people, more rooms, more organized. The second big expansion came when we were allocated six beds specifically for the care of headache patients. Small further additions to the staff have been made but for the last few years staffing has been constant ranging around 25 full time equivalents. The Center has been located in three different places, largely in the former psychiatric area but infrastructure presents a problem. Currently the Center is housed in seven different places in Glou-

Another developmental project is to make the Center more international. Before we can do that, we must however cope with our long waiting list. Our productivity has been stable and has always lived up to the budgeted expectations. This year we have even surpassed our target by one thousand visits without any extra resources. However referrals have been steadily increasing year by year and currently we receive seven hundred referrals more than we can possibly cope with. We have tackled the problems by a strict visitation refusing all patients who have not previously seen a neurologist. We also refuse certain patient groups such as whiplash related headaches. However, three to four hundred referrals per year remain who would definitely benefit from care at the Danish Headache Center. We hope that the Capital Region of Copenhagen will cope with this problem either by expanding capacity in other parts of the region or by increasing capacity at the Danish Headache Center.

We intend to move forward with our plans for treat-

ment of patients from other countries in parallel with plans for the waiting list. We shall eventually name the Center Danish International Headache Center and we intend to offer a range of services to patients from other countries. Key to this whole project is the recently created project for trigemi-

nal neuralgia. A very close collaboration has been established with the neurosurgical department at Rigshospitalet. All patients suspected of trigeminal neuralgia are referred to Danish Headache Center. Here they receive an accelerated course of medical treatment and within just a few weeks or months eligible candidates receive a neurosurgical interven-

tion. Postoperatively they are followed in the Danish Headache Center. Such an integrated course has not been developed in any other Center in the world and it is just a question of time and effort before it can be created for headache patients.

A further developmental area for Danish Headache Center is to look at the social conditions for headache patients. No social worker in Denmark has ever been specialized in the social problems that bother headache patients. There is a huge need for access to expertise amongst social workers throughout Denmark. They are trying to help sufferers of severe headache disorders but need to know how such patients can best be assisted. Unfortunately, there are today many patients who feel that they bang on a closed door when they ask social authorities for help. Also such patients should receive help and the best way is to create a fulltime position for a social worker at the Danish Headache Center.
4. TEACHING AND PUBLIC ACTIVITIES

Teaching activities

Medical students, Faculty of Health Sciences, University of Copenhagen.

Neurology trainees, Faculty of Health Sciences, University of Copenhagen.

Trainees from General Practise, an essential part of their educational programme.

PhD students, Faculty of Health Sciences, University of Copenhagen.

In addition, numerous teaching activities at international and national congresses.

Public activities
In November the Danish Headache Center organized a public meeting at Glostrup Hospital for patients, relatives and other with an interest in headache and facial pain. The subject was new treatment possibilities in cluster headache and trigeminal neuralgia. The meeting was well attended with approximately 100 attendants.

Staff from the Danish Headache Center has been interviewed on national television and radio more than 10 times in 2011. The staff has contributed to numerous articles in Danish newspapers during the year.
PhD Thesis
1. Hauge AW. Migraine with aura: Triggers and treatment. 2011:1-64. Faculty of Health Sciences, University of Copenhagen, Glostrup Hospital.

Papers in peer-reviewed scientific journals


Hansen JM, Hauge AW, Ashina M, Olesen J. Characteriza-


Ho TW, Olesen J, Dodick DW, Kost J, Lines C, Ferrari MD. Antiinflammatory efficacy of Tel-


Myren M, Olesen J, Gupta S. Pharmacological and expression profile of the prostaglandin F2\alpha receptor in the craniovascular system. Vascu-

Olesen J, Ashina M. Emerging migraine treatment and drug targets. Trends in Pharmaco-


Olesen J, Ashina M. Emerging migraine treatment and drug targets. Trends in Pharmaco-


(48) Tfelt-Hansen PC. Koehler PJ. One hundred years of migraine research: major clinical and scientific observations from 1910 to 2010. Headache 2011 May;51(5):752-78.


7) ORGANIZATION AND STAFF

Management
Rigmor Jensen - Professor, MD, DrMedSci. Director of The Danish Headache Center.
Jes Olesen - Professor, MD, DrMedSci. Founder and co-director of The Danish Headache Center.
Lars Bendtsen - MD, Ph.D., DrMedSci, associate professor. Co-director of The Danish Headache Center.

Staff Neurologists

Medical secretaries
Karoline Aagaard
Katrine Kristensen
Tina Würgler Kærgaard
Thue Hjøtter Nielsen – MD, senior consultant.

Pain medicine
Messoud Ashina - MD, Ph.D., DrMedSci, associate professor. Co-director of The Danish Headache Center.

Psychologists
Dorthe Kjeldgaard Nielsen
Bruno Vinther
Trine Zimmer

Nurses
Annette Vangaa Rasmussen
Annette Feldbøg Jonassen
Hjerdis Rasmussen (assistant)

Psychiatrist
Marianne Nilsson and Andreas Tang Varnild-Jørgensen, Center of Psychiatry, Glostrup Hospital

Gynaecologist
Birgit Hansen, Department of Gynaecology, Herlev Hospital

Dental expertise
Professor, dr. odont Peter Svensson
Department of Oral Physiology, Institute of Odontol- ogy, University of Aarhus

Anaesthesiologist
Jonna Fomsgaard, Department of Anaesthesiology, Glostrup Hospital

Physiotherapists
Bjarne Kjeldgaard Madsen
Niina Caspersen
Bjarne Kjeldgaard Madsen

Figure 4.
The annual summer party at the Danish Headache Center.
The clinical activities in DHC consist of a multidisciplinary out-patient service and an in-patient service. At the end of 2011 the staff consisted of 3 psychologists (1 PhD student), 3 physical therapists, 3 nurses, 1 team leader, 1 laboratory technician, 8 secretaries, 8 neurologists specialized in headache (all part time), 1 psychiatrist (one day per week), 1 dentist (one day per month) and a variable number of younger physicians (all part time). In addition, nurses at the Department of Neurology N 38 take care of the in-patients.

The out-patient activities continued to increase in 2011 compared with previous years. A total of 2,655 patients were treated in the Center during 2011. However, the demand for treatment is increasing more leading to longer waiting lists by the end of the year. Approximately 120 patients have been treated at the in-patient department N 38. A total of 68% of patients were referred from The Capital Region, while the rest of patients were referred from other parts of Denmark and Scandinavia.

![Bar chart showing numbers of patients by gender and age in 2011 (n=2,655). The female/male ratio was 2.3 and the mean age of our patients was 42 years with a range from 13 to 94 years.](image)

We aim to continue the high research productivity, and facilitate scientific documentation and development of the treatment strategies in the Danish Headache Center. It is of utmost importance to improve the quality of the services offered to our patients, and increasingly try to combine basic experimental research with clinical experience on a daily basis in order to develop new therapeutic avenues. We aim to expand the pain rehabilitation programme for our severely affected patients and continue to develop the Danish Headache Center in order to achieve our goal to be in among the leading international Centers for headache and neurological pain. Our significant expansion within clinical and research activities request additional space and facilities and a geographical implementation in close relation to the other clinical activities within the hospital plan.

![Pie chart showing relative frequencies of major diagnostic categories in 2011. Migraine, medication-overuse headache, tension-type headache and combinations thereof are the most common types of headache seen in the Center.](image)