SURVEY OF SLEEP WAKE RESEARCH IN THE NETHERLANDS ANNO 2007

Gé S.F. Ruigt

NV Organon, Oss

This is the 2007 survey of Sleep-Wake Research in The Netherlands. Research institutes and centres engaged in sleep-wake research are mentioned in alphabetical order including the scientists, who are working at the various institutes with the principal investigator / contact person being underlined.

AMERSFOORT: MEANDER MC, SLEEP AND DIALYSIS

The Department of Neurology and Clinical Neurophysiology is the location of the Centre for sleep and wake disorders in Amersfoort. Clinical whole night sleep studies, and 'multi sleep latency tests' form the main basis for diagnosis and treatment of sleep apnoea syndrome, restless legs syndrome and periodic leg movement disorder, narcolepsy, insomnia and other disturbances of night time sleep and excessive daytime sleepiness. In a multidisciplinary setting called the Morpheus study group difficult clinical problems are discussed and tried to be solved. In the Morpheus group a neurologist, lung specialist, ENT specialist and a oral surgeon are presented. Additionally in 2004 a multidisciplinary study started on the sleep disturbances of dialysis patients. Emphases of this study are the role of nocturnal dialysis and exogenous melatonin and sleep problems in this population. The Dutch Kidney Foundation sponsors this research project.

Researchers: JBS Boringa, neurologist, JE Nagtegaal, hospital pharmacist and BCP Koch, resident pharmacist and principal investigator.

AMSTERDAM: AMSTERDAM CENTER FOR SLEEP-WAKE DISORDERS, SLOTERVAARTZIEKENHUIS

www.slaapkliniek.nl

The centre for sleep and wake disorders of the Slotervaart general hospital in Amsterdam is located at the Department of Neurology and Clinical Neurophysiology. The multidisciplinary team consists of sleep technicians, a neurologist and a psychologist, pulmonologists, ear nose and throat specialists, and a dentist of the Academic Centre for Dentistry Amsterdam (ACTA). Clinical whole night sleep studies, and 'multi sleep latency tests' form the main basis for treatment of 'obstructive sleep apnoea syndrome', 'upper airway resistance syndrome', 'restless legs syndrome', narcolepsy and other disturbances of night time sleep and excessive daytime sleepiness. Also Insomnia patients are diagnosed and if possible treated. Research is focussed on simple ambulant diagnostics in OSA and RLS, the treatment of bruxism, the relationship between bruxism and 'periodic leg movement syndrome' and the use of
'mandibular advancement device' in sleep breathing problems. Also drug studies in Insomnia and RLS are performed.

Researchers: Dr. H. Hamburger, mr. L. Harten, Prof.dr. F. Lobbezoo, mrs G.Arab, mr J.vd Zaag.

AMSTERDAM: NETHERLANDS INSTITUTE FOR NEUROSCIENCE

Sleep wake research in the Netherlands Institute for Neuroscience (NIN) is concentrated on (1) hypothalamic mechanisms and (2) sleep and cognition. A main research line addresses the role of the suprachiasmatic nucleus in the regulation of circadian rhythms. Sleep and circadian rhythm disturbances in ageing and neuro-degenerative disorders (Alzheimer and Parkinson) are major topics of interest. The institute has expertise in actigraphic assessment and analyses of circadian rhythms and tremor. The institute has led a multi-centre clinical trial on the long term effects of daily melatonin gifts and bright light exposure on the development of disturbed sleep, circadian rhythms, behaviour, emotion and cognition in demented elderly people, which is now followed up by a two-year follow-up study in early dementia. Moreover, the relation between temperature regulation and sleep is a main issue and studied in healthy young and old subjects, insomnia, Alzheimer's disease and narcolepsy (in cooperation with the LUMC). Consequences of age-related disturbances in sleep and circadian rhythms for cognitive performance have become a major topic. fMRI has been used to investigate to what extent age-related sleep disturbances contribute to age-related decrements in executive functioning and memory consolidation. The relation between EEG-synchronization patterns and cognitive processing is a recent interest.


AMSTERDAM: UNIVERSITY OF AMSTERDAM

The Department of Education is involved in research concerning the relation of sleep duration, sleep quality, and chronic sleep reduction with school performance and behaviour problems of children and adolescents. Both cross-sectional and longitudinal studies are undertaken to study these relationships. Another project is focussed on the relation of infants’ sleep, parenting, parental insomnia, and marital relationship over time. This study is done with first-time parents.
In addition, a comparative study funded in part by NIH (US) is aiming to replicate findings based on animal studies regarding the development of diurnal rhythms (i.e. sleep-wake cycles and HPA-activity) as it is related to the biological clock.

Researchers: dr. Blom, M.J.M., dr. Meijer, A.M. (A.M.Meijer@uva.nl) and dr. Wittenboer, G.L.H. van den
AMSTERDAM: UNIVERSITY OF AMSTERDAM

The Department of Psychology is involved in research on sleep and circadian rhythm. One project is focussing on biological, social and environmental markers of the shift-work maladaptation syndrome. Measurements are done before the start of a job involving shift-work and during 2 consecutive years after the actual start of the shift-work. Another project involves chronic insomnia. Epidemiological studies are done on insomnia in relation with comorbidities. Also the effect of cognitive behavioural therapy on chronic insomnia is studied. A project on the effect of chronic sleep loss in adolescents focuses on changes in sleep/wake patterns in adolescents living in a multicultural society.

Researchers: dr. W. Hofman, drs. H. van der Holst, prof. Dr. G. Kerkhof

AMSTERDAM: UNIVERSITY HOSPITAL 'VRIJE UNIVERSITEIT'

The centre for sleep disorders located at the Department of Clinical Neurophysiology consists of a multidisciplinary team. It has an outpatient clinic and facilities for ambulatory and clinical sleep registration. Important interests are the influence of sleep on cognition in sleep apnoea syndrome and in insomnia, narcolepsy and the validation of new techniques for signal analysis.


AMSTERDAM: PERSONAL HEALTH INSTITUTE INTERNATIONAL

The research of Personal Health Institute international (PHII) evolves around inter-twined boundaries of technology, physiology and behaviour. The ongoing research on knowledge based modeling of diagnosis and therapy has led to a computational model of a therapist providing Cognitive Behavior Therapy of insomnia. In an international consortium, under construction, this model will be tested for fine tuning of pharmacotherapy and application to teenagers. A research project in Germany has already started. The diagnostic models and tools to advance sleep medicine is another area of activity. The members of the institute have already obtained a patent for modeling respiratory instability during sleep. PHII is developing a consortium NEBULA CRUISER that will allow researchers and clinicians to share tools and models of signal and image processing. The membership to this NEBULA CRUISER consortium is open to all who like to focus on their work on signal processing without programming and who like to share ideas and expertise with their colleagues.

PHII also develops wearable, wireless medical monitoring devices. A prototype of such a device, called CLOCKWATCHER, a wearable and ubiquitous monitor for measuring intrinsic physiological rhythms in humans, is in the validation and testing phase. Development and testing is done in conjunction with the EUCLOCK consortium of the European Union. Another wearable medical device GALAXY will soon be validated and tested in Stockholm for long-term monitoring in real-life situation of children with Prader-Willy Syndrome.
PHII also undertakes contract research and provides services as CRO. Recently, PHII worked on the evaluation of a pharmaceutical agent for OSAS and validation of bruxism therapy.

Researchers: Wendy van Ecke, Winni Hofman, Anand Kumar (a.kumar@phi-i.com), Cees Lijzenga, two vacancies (Ph.D. candidate and Post-Doc) and openings for graduate students

BREDA / OOSTERHOUT: AMPHIA HOSPITAL, CENTER FOR SLEEP-WAKE DISORDERS

Our center is located in the Amphia hospital on the Pasteurlaan in Oosterhout, region West-Brabant The multidisciplinary team consists of clinical neurophysiology personnel, a specialised nurse, neurologist, pneumologist, ENT physician, neuropsychologist and psychiatrist. There are possibilities for clinical and ambulatory sleep research (polygraphy/polysomnography, actigraphy, sleep endoscopy) for diagnosis and treatment of sleep related breathing disorders, RLS/PLMS, circadian rhythm disturbances, sleep and epilepsy and ADHD.

Researchers: A.H.Temmink (neurologist), J.Asin (pneumologist) and E.Janssen (Otolaryngologist).

EDE: CENTRE FOR SLEEP-WAKE DISORDERS AND CHRONOBIOLOGY OF THE GELDERSE VALLEI HOSPITAL

This sleep centre, situated in the midst of the Netherlands, has extensive possibilities to study disorders in out patients as well as in hospitalised patients. Treatments are recommended that can be supervised by the patients' general practitioner. Special interests are circadian rhythm disorders and sleep disorders in blind people, autistic patients and in patients with ADHD, chronic whiplash syndrome, chronic fatigue syndrome and intellectual disability. There is a collaboration with the Expertise centre for sleep disturbances in individuals with intellectual disabilities (Maastricht University - Gouverneur Kremers Centre). Effects of melatonin treatment on circadian rhythm disorders are presently evaluated. Patients are asked to complete the "zelftest slaapstoornissen" at www.slaapstoornissen.nl


ENSCHERDE: SLEEP CENTRE OF THE HOSPITAL 'MEDISCH SPECTRUM TWENTE'

This sleep centre located in the east part of The Netherlands is an example of symbiosis between the Clinical Department of Respiratory Medicine and the Department of Clinical Neurophysiology. It fulfils a supra-regional function in the diagnosis of sleep disorders and nightly respiratory disturbances. Currently the research topic is prevalence of sleep disorders in patients with chronic toxic encephalopathy.

GRONINGEN: UNIVERSITY OF GRONINGEN

The Research Group CBN-Chronobiology has a long history of research in the field of causation, function and timing of behaviour in animals and humans. Theoretical work on the temporal organisation of sleep-wake behaviour in humans goes hand in hand with experimental work in the available 4-subject temporal isolation facility. This facility is used to study the regulation of sleep and performance in humans in relation to environmental light. Non-human research focuses on the generation and function of circadian rhythms and sleep in nocturnal and diurnal rodents, in worms, fungi, and yeast. There is a long-standing tradition of collaboration with various members of the Department of Biological Psychiatry of the Groningen University, which, in collaboration with the Institute of Pharmacology in Zürich, has led to the two-process model of sleep regulation.


GRONINGEN: UNIVERSITY OF GRONINGEN

Research at the Department of Molecular Neurobiology includes studies on sleep and circadian rhythmicity. Animal models are used to study the function of sleep as well as the consequences of sleep loss, particularly, the role of sleep in neuronal plasticity and cognitive function, the relationship between stress and sleep, and the effects of disrupted or restricted sleep on brain function, stress sensitivity and emotionality. Studies on circadian rhythmicity include regulation of protein expression in the suprachiasmatic nucleus and the role of this biological clock in modulation of cognitive processes.


GRONINGEN, UNIVERSITY MEDICAL CENTER: CENTRE FOR SLEEP/WAKE DISORDERS

The Centre for Sleep/Wake Disorders of the UMCG is a multidisciplinary sleep centre for the study, diagnosis and treatment of sleep/wake disorders. Situated within the framework of an Academic Hospital, it is characterized by the close cooperation between all involved disciplines. In its diagnostic activities, the center focuses on ambulatory and clinical long-term recording techniques.

Research focuses on the themes: therapy of OSAS, PLMS, sleep disturbances in cardiac and renal failure, and driving capability in patients with EDS.

Clinicians/researchers: Prof. Dr. L.G.M. de Bont, Prof. Dr. W.H. Brouwer, M.H.J. Doff, Dr. J.W. Elting, M.G. Gremmer, Dr. D.J.. Heersema, Drs. A. Hoekema; Dr. J.H. van der Hoeven
(external contacts) , Drs. A.G.W. .Korsten-Meijer; Dr. G.J. Luijckx;; Drs. J.A. Nieuwenhuis, Dr. P.J. Wijkstra

HEEZE: CENTRE FOR SLEEP- AND WAKE DISORDERS 'KEMPENHAEGHE'

The Centre for Sleep- and Wake Disoders 'Kempenhaeghe' situated in the southern part of the Netherlands near the city of Eindhoven, is a clinical sleep centre for diagnosis and treatment of disorders of sleep and wakefulness and of related complaints. The centre is specialised in neurological sleep disorders, including sleep epilepsy, in sleep-related breathing disorders and in non-pharmacological treatment of insomnia. The centre is located at, and affiliated with, the epilepsy centre 'Kempenhaeghe'.


HENGELO, STREEKZIEKENHUIS MIDDEN-TWENTE: CENTRE FOR SLEEP/WAKE DISORDERS.

The centre for sleep/wake disorders of the Ziekenhuisgroep Twente in Hengelo is located at the Department of Neurology and Clinical Neurophysiology. The multidisciplinary team consists of sleep technicians, a neurologist / neurophysiologist, psychiatrists, socialpsychiatric nurses, pulmonologists, orthodontists, EN&T-specialists and pediatricians. Ambulatory sleepstudies, clinical whole night sleep studies, and multi sleep latency tests form the main basis for diagnostics and treatment of respiratory disturbances in the sleep, restless legs syndrome, narcolepsy and other disturbances of nighttime sleep and excessive daytime sleepiness. At this moment research is focussed on chronic primary insomnia (contract research; clinical pharmocotherapeutical study).

Principal researcher / coordinator "Sleep Team": T.J. Tacke, neurologist / clinical neurophysiologist.

LEEUWARDEN: MCL CENTRE FOR SLEEP AND WAKE DISORDERS

Since 2000 the Medical Centre Leeuwarden (MCL) has had a fully equipped Centre for Sleep and Wake Disorders for diagnosis of insomnia, parasomnias and the several forms of sleep apnoea syndrome. The emphasis is on clinical oriented investigation. Most of the studies are out-patient studies. Hospital studies are mainly used for unsolved problems and for adjustment of patients to CPAP. The centre has a regional function for the province of Fryslân.

LEIDEN: UNIVERSITY MEDICAL CENTER

The Department of Public Health and Primary Care investigating sleep disorders and the prevalence of sleep apnoea in general practice. The Dutch standard for general practitioners 'Insomnia and Hypnotics' is being evaluated. Furthermore, aspects of sleep disturbances in patients with chronic fatigue syndrome are evaluated. Moreover, the department is involved in research projects concerning the treatment of patients with chronic use of benzodiazepines.

Researchers: dr. A. Graffelman, dr. A. Knuistingh Neven

LEIDEN UNIVERSITY MEDICAL CENTRE

The Department of Pulmonology is involved in the care for patients with sleep disordered breathing, mainly sleep apnea and obesity hypoventilation syndrome. Sleep disordered breathing is a small part of the curriculum for medical students. Physicians in training for pulmonologist participate in clinical care for sleep apnea patients. The research activities concern sleep disordered breathing in patients with pulmonary hypertension and the role of disturbed sleep in endocrine dysfunction such as hypophyseal, hypothalamic tumors and paragangliomas. Collaboration is being intensified with the department of Endocrinology, Neurology and Vascular Medicine.

Researchers: dr. K.W. van Kralingen

LEIDEN: UNIVERSITY MEDICAL CENTER

Our research group in the Laboratory for Neurophysiology at the Department of Molecular Cell Biology is involved in fundamental research on sleep regulation with emphasis on the interaction between the circadian clock and sleep regulatory mechanisms. Research is mainly approached in rats and mice applying long-term recordings of the electroencephalogram and neuronal activity on the multi-unit and single-unit level together with behavioral techniques to record daily rest-activity patterns.

http://www.lumc.nl/1050/research/Neurophysiology3_research.html

LEIDEN: UNIVERSITY MEDICAL CENTER

The department of Neurology hosts an outpatient clinic for patients suffering from narcolepsy and related disorders. Research topics include pathophysiological and clinical aspects of narcolepsy and cataplexy. The department also serves as European reference centre for the measurement of hypocretin-1.

MAASTRICHT: EXPERTISE CENTRE FOR SLEEP DISTURBANCES IN INDIVIDUALS WITH INTELLECTUAL DISABILITY, MAASTRICHT UNIVERSITY (GOVERNEUR KREMERS CENTRE)

This expertise centre is an initiative of the Gouverneur Kremers Centre (Maastricht University) in collaboration with the department of Special Education (Radboud University Nijmegen), the department of Neurology (Gelderse Vallei Hospital), the Koraal Groep and ‘s Heeren Loo Zuid-Veluwe. Research is focused on sleep problems in individuals with intellectual disabilities (ID) and individuals with syndromes associated with ID (for example Angelman syndrome, Cri du Chat syndrome, Jacobsen syndrome and Prader-Willi syndrome). Research topics are, amongst others, prevalence of sleep problems in specific syndromes, behavioral treatment of sleep problems and melatonin treatment of circadian rhythm disorders. Also clinical data of the Sleep clinics for individuals with intellectual disability are evaluated. Methods of research include materials such as (sleep) questionnaires, sleep diaries, actigraphy, ambulatory polysomnography, measurement of melatonin levels in saliva and designs such as double-blind placebo controlled trials and single case studies.


MAASTRICHT: SLEEP CLINICS FOR INDIVIDUALS WITH INTELLECTUAL DISABILITY, MAASTRICHT UNIVERSITY (GOVERNEUR KREMERS CENTRE)

On the initiative of the Gouverneur Kremers Centre (Maastricht University) two outpatient sleep clinics are functioning at this moment. One is located at the Koraal Groep and the other at ‘s Heeren Loo Zuid-Veluwe (Wekerom). Each clinic is specialized in diagnosis and treatment of sleep problems in children and adults with intellectual disability. Treatment is based on results obtained from sleep questionnaires, sleep diaries, measurement of melatonin levels in saliva and if considered necessary ambulatory polysomnography and actigraphy. Treatment is multidisciplinary: medical treatment (for example melatonin treatment for circadian rhythm disorders) and/or behavioral treatment (for example gradual distancing for co-sleeping). Treatment is performed in the patient’s home setting, if possible. All clinical data are stored in the database of the Gouverneur Kremers Centre which guarantees scientific evaluation.


www.slaapstoornissen.nl (button: Verstandelijk Gehandicapten)
(0318) 59 35 65 (Monday, Wednesday or Thursday between 8:00 and 12:00)
MAASTRICHT: MAASTRICHT UNIVERSITY

The Department of Respiratory Medicine studies, in collaboration with the Sarcoidosis Management Center, the Department of Neurology, the Nutrition and Toxicology Research Institute Maastricht (NUTRIM) and the Department of Pulmonary Medicine University of Antwerp (Belgium), the association between disturbed sleep and sarcoidosis. Patient care is also focussed on hypoventilation, sleep apnea and indications for non-invasive ventilation.

Researchers: Dr. C. van der Grinten, Dr. N. Cobben, Prof. Dr. M. Drent, Prof. Dr. J. Verbraecken and Prof. Dr. E. Wouters.

MAASTRICHT: MAASTRICHT UNIVERSITY

The Experimental Psychopharmacology Unit of the Department of Psychology is involved in research on the effects of drugs and nutritional manipulations on sleep quality and daytime functioning. One project aims to assess the effects of drug and user characteristics on the next day residual effects of hypnotics. Performance effects of GABA-A agonists with different mechanisms of action will be assessed, using various psychomotor, cognitive and attention tasks and a standardized highway driving test in actual traffic. The effects will be assessed in males and females, young and elderly, and healthy volunteers and patients complaining of insomnia to determine how these residual effects may change depending on age, gender and health status of the user. A second project investigates the involvement of the brain serotonin (5HT) system in sleep and sleep related cognitive and emotional decline by means of dietary brain manipulation methods.

Researchers: dr. A. Vermeeren (contactpersoon), dr. R. Markus, drs. T. Leufkens, prof. dr. W. Riedel

NIJMEGEN: RADBOUD UNIVERSITY NIJMEGEN

At the Department of Biological Psychology of the Radboud University Nijmegen, the neurophysiology and neuropsychology of sleep, including REM sleep, is the central topic. Using the concept of 'sensory gating', information processing during the various sleep-wake states is investigated. This is partly done in co-operation with Johnson and Johnson, Pharmaceutical Research and Development, in Beerse, Belgium. Also effects of various psychoactive drugs on sleep-wake states are determined. Research is mainly approached in rats, using EEG and ERP recordings and behavioural techniques. The cognitive capacities of the brain in several states of vigilance and alertness are studied both in rats and humans. Neuronal activities underlying components in the human ERP and effects of vigilance and attention on these components are studied.

Researchers: prof. dr. A. Coenen (contact: a.coenen@nici.ru.nl), dr. W. Drinkenburg, dr. P. Eling, dr. E. van Luijtelaar
NIJMEGEN: NISPA

Nijmegen Institute of Scientist-Practitioners in Addiction is a knowledge centre for addiction and addiction care. NISPA is a part of the Academic Centre for Social Sciences at the Radboud University Nijmegen and consists of 4 addiction care institutions in the southern and eastern part of the Netherlands. Participating institutions are: Novadic-Kentron, TACTUS, Iris-zorg and the GGZ Noord en Midden-Limburg. One of the NISPA research groups aims to study quality and quantity of sleep during detoxification of drugs and alcohol in an inpatient population. The main issues are sleep quality (subjective and observed) and sleep problems in detoxified patients in addiction care and the the use of non-farmalogical treatment in this population.

Researchers: Cor A.J. De Jong, M.D., Ph.D., Associate professor of Clinical Psychology, prof. dr. A. Coenen (contact: a.coenen@nici.ru.nl), Dr. C, Klaassen, psychiatrist GGZ Noord-en Midden-Limburg, Drs. Ellis H. B. Magnée, PhD student and researcher in addiction care in the GGZ Noord-en Midden-Limburg.,

NIJMEGEN: UNIVERSITY MEDICAL CENTRE NIJMEGEN

The Department of Pulmonary Diseases 'Dekkerswald' of the University Medical Centre Nijmegen (UMC) is specialised in sleep disordered breathing in patients with chronic obstructive pulmonary disease, chest wall deformations, respiratory muscle failure, problems with control of breathing, chronic heart failure and obstructive sleep apnoea syndrome. Research and patient care are performed on administration of nocturnal oxygen, respiratory muscle training, respiratory stimulants, NIPPV and CPAP treatment, OSAS and diastolic heart failure.


NIJMEGEN: RADBOUD UNIVERSITY NIJMEGEN MEDICAL CENTRE

At the Department of Neurology, sleep disturbances in neurodegenerative disorders are evaluated, with an emphasis on extrapyramidal syndromes. Within this line, REM Sleep Behavior Disorder receives special attention, both in clinical care and basis research. Finally, the pathophysiology of cataplexy is studied using a range of neurophysiological methods. This research is performed in close collaboration with the group of dr. G.J. Lammers in Leiden.


OSS: NV ORGANON

The effects of newly developed as well as established psychotropic drugs are studied on rat sleep and waking behaviour in the research facilities in Schotland at Newhouse. Special emphasis is given to the study of drug effects on electroencephalographic parameters during waking and sleeping. In phase I clinical trials sleep and electroencephalographic changes
during sleep are often taken along as a sensitive biomarker for the CNS effects of drugs in first human exposure studies. Occasionally sleep is studied in depressed patients for the study of putative antidepressant compounds, as it is well-known that antidepressants can reverse the typical sleep disturbances of depression. Apart from the use of sleep as a biomarker for the CNS effects of psychotropic drugs, Organon is currently developing novel pharmacotherapeutic interventions for insomnia.


ROTTERDAM: ERASMUS MC
At the Department of Epidemiology and Biostatistics, insomnia and its determinants are studied in more than 1,000 elderly inhabitants of Ommoord, a suburb of Rotterdam, representative of a normal population aged 55 and over. Actigraphy, sleep diaries and questionnaires are used to assess sleep patterns and the presence of insomnia. This research is carried out within the Rotterdam Study, an ongoing population-based cohort study. Its overall aim is to investigate the incidence of, and risk factors for, chronic disabling diseases.


At the Department of Psychiatry, ambulatory recording methods (based on accelerometer sensors) are used to study daily functioning in relation to psychomotor disturbances, clinical symptoms and efficacy of treatment in depression, ADHD, and Tourette's syndrome. In addition, we use wrist-actigraphy to quantify disturbances in sleep-wake pattern and behavioural recovery in post-operative delirium; as such, 24-hr motor activity parameters are quantified and explored for their usefulness to contribute to an improvement of prognosis of delirium by early treatment, and relevance for the development and evaluation of treatment strategies.


RIJSWIJK TNO DEFENSIE EN VEILIGHEID
Sleep-Wake Research at the Department of Diagnosis and Therapy of TNO is focussed on applied fundamental research on sleep and alertness management. Research is performed with non-human primates applied with telemetric transmitters for electroencephalogram and electromyogram. Besides effects on various sleep-wake states of the sleep architecture, behavioral techniques like activity, motor functions and cognition are theme of the expertise to measure effects of hypnotics, alertness enhancers or effects of sleep deprivation. Recently the research of the relation between neurodegeneration or stress on the sleep pattern has started in human-like models for stress and for Parkinson's disease.

Researchers: Ingrid Philippens, Raymond Vanwersch
SOESTERBERG: TNO HUMAN FACTORS
Since 1988, TNO Human Factors-Aerospace Medicine Group (until 2002 known as Netherlands Aeromedical Institute) has extensively used objective and subjective methods in large studies on sleep, sleepiness, fatigue, and performance in commercial and military aircrew and operators engaged in safety-sensitive jobs. Our expertise is centered on the evaluation of sleep, alertness, and performance under operational conditions (e.g. aircrew, professional drivers, sea transport, railroad, military crew) and in clinical trials on hypnotics, stimulants, and side-effects of drugs. The results of the studies incorporated in our Sleep and Alertness Management Program have provided reliable and practical assessment tools for investigating humans in real life settings. Our research and consultations are commissioned by the Ministries of Transport and Defense, Joint Aviation Authority (Europe), International Civil Aviation Authority (ICAO), NATO, airlines and patient organizations. In collaboration with our international partners (German Centre of Aviation Medicine, Karolinska Instutet, Université René Descartes, Qinetiq Centre for Human Sciences, NASA), a database has been established, which enables interpretation of results in terms of practical relevance for impact on daily life, performance of operator tasks, etc.


THE HAGUE: 'PARNASSIA' PSYCHO MEDICAL CENTRE
The aim of this centre is to evaluate the subjective and objective aspects of sleep, mental status and circadian rhythms in the research program 'chronobiology and psychiatry'. The links between chronobiological disturbances and psychiatric disorders are examined in a clinical setting. Emphasis is laid on the treatment with melatonin and bright light therapy in depression, sleep disturbances, chronic fatigue syndrome, dementia, post-partum depression and schizophrenia. Moreover the role of melatonin in the human reproductive system is studied. Other topics of interest are premenstrual syndrome, perinatal depression, the role of light therapy on the reproductive cycle is studied and polymorphisms in seasonal affective disorders and bipolar disorders.

Researcher: dr. P.M.J. Haffmans, Drs. L. den Hoed, Drs. A. Spijker, Prof Dr E Hoencamp.

THE HAGUE: CENTER FOR SLEEP/WAKE DISORDERS
The Center for Sleep/Wake Disorders, a department of the Medical Center Haaglanden, location Westeinde, a large regional hospital in The Hague, is a general sleep center for the study, diagnosis and treatment of sleep/wake disorders. Situated within the framework of a general hospital, the center is characterized by a broad, multidisciplinary approach as evidenced by the close cooperation between neurologists and psychologists, physicists, IT-specialists, ENT-specialists, and others. In its diagnostic activities, the center focuses on the application of sophisticated ambulatory recording techniques (e.g. multi-channel 24h recordings, long-term actigraphy) and extensive in-depth psychological assessment. The center offers all available state-of-the-art treatment facilities, which are continuously updated on the basis of careful monitoring of treatment outcome measures.
Both applied and fundamental research of the center focuses on the following main themes: chronic insomnia, parasomnia, circadian rhythm disorders and automatic sleep analysis. Most research is carried out in close cooperation with both the University of Amsterdam and the University of Leiden.


UTRECHT: UTRECHT UNIVERSITY

The research of the Department of Clinical Psychology focuses on nightmares; in particular on the assessment, associated features, and cognitive-behavioral treatment of nightmares. This applies to both posttraumatic and idiopathic nightmares. Questionnaires measuring other sleep disorders are evaluated as well.

Researchers: dr. V.I. Spoormaker, drs. J. Lancee, prof. dr. J. van den Bout

ZWOLLE, SLEEPCENTER SEIN ZWOLLE (SSZ)

The Sleepcenter is closely connected to the SEIN Epilepsycenter in Zwolle. Diagnostic and therapeutic facilities are available for all kinds of sleep disorders. Special fields of interest are sleep in children and teenagers, restless legs syndrome and the interrelation between sleep and epilepsy. Contract research is done on a regular basis.

Researchers: Dr. Al de Weerd, Dr. Hanna van Hemert-van der Poel, Drs. Mireille Bourez-Swart, neurologists; Drs. Marina Folkers, Drs. Monique Thijssen, psychologists; Ir. Rens Wientjes.