INSELSPITAL
UNIVERSITÄTSSPITAL BERN
BERN UNIVERSITY HOSPITAL

Bern University Hospital
Department of Neurology

UNIVERSITY OF BERN

1958–2023
Department of Neurology

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1958–2023
Department of Neurology

Doctors in the corridor
of Haus 12, 1970

Foreword by Prof. Dr. med. Claudio L. A. Bassetti

Head of Department until 2024 and Dean

Neurological diseases are the leading cause of premature disability and the second leading cause of death worldwide. Fortunately, neurology has evolved from a primarily diagnostic to a therapeutic discipline in recent decades. More and more efficient and increasingly causal (precise) therapies have improved life expectancy and quality of life for those affected. There has been a successful campaign to prevent and rehabilitate neurological diseases and promote brain health.

The transformation of neurology into a highly dynamic and increasingly therapeutic field in a rapidly changing medical and social environment has also shaped our clinic.

Over the past 12 years, for example, emergency neurology has been strengthened to provide integrated and graduated care, the Bern Stroke Unit has been opened, Neuroimmunology, Neurorehabilitation (at the Inselspital and Riggisberg sites) and the Centre for Parkinson's Disease and Movement Disorders have been significantly expanded, the epilepsy and sleep centres have been made bigger and merged together, and Psychosomatics/Neuropsychosomatics have been integrated into our clinic. This year, the first dementia professorship was established at a Swiss university hospital of neurology.

In terms of teaching, we were able to expand our neurological training by introducing 14 fellowship programmes and two postgraduate international master's degree programmes on sleep and strokes, as well as the world's first CAS in brain health.

In research, translational-experimental approaches were newly established and the completion of clinical trials has been professionalised. Biotechnological and neurotechnological approaches (foundation of NeuroTec), health care research (foundation of Swiss Sleep House Bern) and the prevention of neurological diseases were strengthened. Our academic vibrancy has been shaped by 62 habilitations/professorships over the past 12 years.

Young talent, diversity, interprofessionality, sustainability and networking have always been important to me and allow us to look to the future with optimism.

I would like to express my sincere thanks to the employees and the institutions who have supported us with their trust over all these years, enabling us to provide first-class patient care.

I dedicate this brochure to my esteemed teachers and mentors Marco Mumenthaler and Christian W. Hess.

Claudio L. A. Bassetti

Welcome
65 years of pioneering spirit
Prof. Dr. med. Urs Fischer, Head of Department since 2024 and Chief Physician

Dear Readers,
On behalf of the Management of the Department of Neurology, it is a great pleasure and honour for me to write the foreword to this anniversary brochure to mark the 65th anniversary of the Department of Neurology at Inselspital Bern. In addition to clinical care, teaching and research, Bern has been carrying out pioneering work for more than 65 years, which has contributed to the national and international profile of our department. The list of pioneers and pioneering work is a long one. We would like to use this opportunity to pick out a few of our many achievements.

The textbook ‚Läsionen peripherer Nerven und radikuläre Syndrome' [Lesions involving peripheral nerves and radicular syndromes] by Prof. Marco Mumenthaler remains the standard work for peripheral nerve lesions today, and his other textbooks have also shaped generations of neurologists in Switzerland and abroad. Academic teaching has constantly evolved in the meantime, and today we offer international courses on sleep, strokes and brain health.

With the introduction of transcranial magnetic stimulation and the sleep laboratory by Prof. Christian Hess, the central motor system and sleep medicine became new focuses of scientific interest. Under the leadership of Prof. Claudio Bassetti, Bern became one of the leading centres in sleep medicine, in both clinical and academic terms, and his work on hypocretin deficiency in narcolepsy has contributed significantly to the recognition of narcolepsy as an autoimmune disease.

The world's first Doppler device for measuring intracranial flow velocities was developed by Rune Aaslid in Bern and heralded a whole series of pioneering achievements in vascular research: In 1992, for example, the first intra-arterial stroke treatment in Switzerland was carried out by Professors Heinrich Mattle and Gerhard Schroth. In 2008, they were able to show that endovascular treatment for stroke patients suffering occlusion of a large cerebral vessel leads to much more favourable outcomes than for intravenous treatment. This work anticipated the results of randomised studies on endovascular stroke treatment, one of the most efficient treatments in the history of medicine. Today, Stroke Center Bern is one of the world's leading centres from a clinical and academic perspective.

Many other achievements could be added to this list, and the pioneering work is the result of the dedication of countless individuals, who have worked tirelessly for the advancement of neurology. I hope this pioneering spirit, in clinical, research and teaching work, will continue to be embraced by future generations. At the same time, our aim should always be to improve the treatment of our patients and to ensure high-quality education, development and training.

Urs Fischer

Head Nurse Anna Lüthi, Haus 12

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The birth of neurology in Bern

In Switzerland, even before the founding of the Swiss Neurological Society (SNG) in 1908 and before the emergence of neurological university hospitals, several academics made significant contributions to clinics, teaching and research. In Bern, the experimental work of the Bernese universal genius Albrecht von Haller (1708–1777) and the Wrocław native Gabriel Gustav Valentin (1810–1883), among others, are worth mentioning.

Follow us on a journey through the history of neurology, with the help of the most formative figures:

Gottlieb Burckhardt
(1836–1907)

- In **1863,** he qualified as a professor at the University of Basel as Switzerland's first lecturer in neurology.
- From **1873–1882**, he was a senior physician at the Waldau psychiatric hospital in Bern and also gave lectures in psychiatry and neurology.
- In **1888**, he became the first person in the world to introduce lobotomy and is thus considered the founder of psychosurgery.

Ludwig Lichtheim
(1845–1928)

- In **1878**, he was appointed Full Professor of Internal Medicine in Bern.
- His research included nuclear ophthalmoplegia, apoplectic bulbar paralysis and aphasia and apraxia.
- In **1887**, he became known for writing the first description of funicular myelosis, which was named "Lichtheim's disease".

Heinrich Irenaeus Quincke
(1842–1922)

- Was a Full Professor of Internal Medicine in Bern from **1873–1878**.
- Introduced lumbar puncture in Kiel in **1891**.

Paul Dubois
(1848–1918)

- In **1902**, he was appointed Extraordinary Professor ad personam in "Neuropathology" in Bern.
- His main field was psychoneurosis and psychotherapy.
- He is considered the founder of psychosomatic medicine.
- From **1910–1916** he served as the second president of the Swiss Neurological Society, founded in **1908**.

Fritz Lotmar
(1878–1964)

- In **1912** he qualified as a Professor of Internal Medicine in Bern with his thesis on meningitis.
- From **1920** onwards, he worked as a clinical neurologist, lecturer and researcher in Bern and provided neurological consultations at the Inselspital's surgical clinic until **1949**.
- He was the family doctor and a long-time friend of Paul Klee.

Georg-Robert Isenschmid
(1882–1964)

- He was Professor ad personam of Internal Medicine in Bern from **1930** and ran a practice as a neurologist until **1958**.
- From **1930** until his retirement in **1952**, he ran a neurological examination course for medical students, which took place once or twice a week.

Ernst Frauchiger
(1903–1975)

- Qualified as a professor in **1934** at the Faculty of Veterinary Medicine Bern for Comparative Neurology and Animal Psychology.
- In **1944**, he was appointed Extraordinary Professor of Comparative Neurology in Bern.
- He ran a neurological practice in Bern from **1948–1974**.
- He was the 16th president of the Swiss Neurological Society **(1953–1956)**.

Werner Bärtschi-Rochaix
(1911–1994)

- In **1948**, he was one of the first in Switzerland to use the EEG.
- In 1949, he qualified as a professor in the field of cervical migraines.
- Together with Prof. Frauchiger, he was a strong advocate of neurological training for practising doctors in Bern and of the Swiss MS Society.

Rudolf Stähli
(1904–1994)

- Worked as a neurological consultant at the Medical University Hospital until around **1965**, so during the time of Rolf Magun and Marco Mumenthaler.

Sandro Bürgi
(1904–1974)

- Qualified as a Professor of "Internal Medicine, specialising in Neurology" in Bern in **1947**.
- As Isenschmid's successor, he gave what was then the only compulsory neurological lecture, "Neurological Examination Course for Beginners" from **1952–1958**.
- He was appointed Honorary Professor in **1957** and worked until **1971.**

The history of neurology at Inselspital

Rolf Magun
(1916–1960)

Department Director 1958–1960

- In 1958, the first official neurological department was established as part of the Medical Clinic. Prof. Magun was appointed Department Director and Associate Professor of Neurology.
  His research focused on the peripheral nervous system. In terms of methodology, he introduced electroneuromyography in Bern.
- When it was founded in 1958, the department was located on the first floor of Haus 12 and had 12 beds and 10 employees. In 1960, assistants and a senior physician, Dr. Eichenberger, worked in the department. The latter led the department on an interim basis after the unexpected sudden death of Prof. Magun.

History of the Department for Neurology

Marco Mumenthaler
(1925–2016)

Department Director 1962–1965
Head of Department 1966–1990

- Prof. Marco Mumenthaler was appointed his successor and Associate Professor. His research focused on lesions of the peripheral nervous system. He established a neuromorphological research laboratory (with electron microscopy). Prof. Mumenthaler was strongly committed to neurological teaching and his neurological textbook has been translated into 14 languages.
- The first joint neurological-neurosurgical polyclinic in Europe was founded in 1964. In 1966, the department became an independent department of neurology and the associate professorship became a full professorship of neurology. The move to the new high-rise hospital building took place in 1970.
- In 1990, the hospital had 31 beds.
- Prof. Mumenthaler was the 21st president of the Swiss Neurological Society (1969–1971) and Rector of the University of Bern (1989–1991).

Christian W. Hess
(1946–2024)

Head of Department 1990–2012

- In 1990, Prof. Hess was appointed as his successor and Full Professor of Neurology. His research focuses were clinical neurophysiology and the pathophysiology of peripheral and central motor functions. From a methodology perspective, he introduced motor evoked potentials.
- In the 1990s, Neurorehabilitation was integrated into the clinic and the sleep laboratory (with pulmonology), the EEG telemetry laboratory and the neurovascular laboratory (both with neurosurgery) were founded. In 2003, the interdisciplinary Competence Centre for Movement Disorders with Neurosurgery was established, thus expanding the treatment with deep brain stimulation. The University Neuro Centre was founded in 2009.
- In 2012, the hospital had 52 beds and 157 employees.
- Prof. Hess was the 38th president of the Swiss Neurological Society (2003–2007).

Claudio L.A. Bassetti
(1958–)

Head of Department 2012–2024

- Prof. Bassetti began his work as the successor and Full Professor of Neurology in 2012. Claudio Bassetti's research focuses on the relationship between sleep and the brain in physiological and pathological states.
  He established an animal experimentation laboratory (ZEN) and a neurotechnological laboratory (NeuroTec).
- Bern's first Stroke Unit was opened in 2013 in the high-rise hospital building. In 2014, the EEG and sleep laboratory was expanded and merged into the SWEC (Sleep-Wake-Epilepsy Centre). The new interdisciplinary outpatient clinic was opened in 2015 as the Outpatient Neuro Centre (ANZ). In 2016, the second neurorehabilitation location was opened in Riggisberg and psychosomatic medicine was integrated into the clinic.
- In 2023, the hospital had 140 beds and 463 employees. The ward and stroke unit have moved to the new Anna-Seiler-Haus.
- Prof. Bassetti was the 40th president of the Swiss Neurological Society (2009–2013) and was also president of the European Academy of Neurology (2019–2022).

Full and associate professorships at the Faculty of Medicine at the University of Bern

Paul Dubois
Extraordinary professorship/
associate professor ad personam
1902

Rolf Magun
Extraordinary professorship/
associate professor
1958

Marco Mumenthaler
Extraordinary professorship/
associate professor
1962
Full professorship/professor
with chair
1966

Albert Bischoff
Extraordinary professorship/
associate professor
1972

Kazimierz Karbowski
Extraordinary professorship/
associate professor
1972

Hans-Peter Ludin
Extraordinary professorship/
associate professor
1986

Christian Hess
Full professorship/
professor with chair
1990

Claudio Bassetti
Full professorship/
professor with chair
2012

Urs Fischer
Extraordinary professorship/
associate professor
2015
Full professorship/
professor with chair
2024

Antoine Adamantidis
Assistant professorship
with tenure track
2014
Extraordinary professorship/
associate professor
2017

Andrew Chan
Extraordinary professorship/
associate professor
2019

Athina Tzovara*
Assistant professorship
with tenure track
2022
Extraordinary professorship/
associate professor
2024

Bogdan Draganski
Extraordinary professorship/
associate professor
2024

*Double affiliation with the Faculty of Science

A complete list of the 118 habilitations and professorships in neurology from 1958 to 2023 can be found under Teaching and Research on pages 48/49.

About us

The Department of Neurology offers an integrated range of medical services and, since the 1960s, has developed into one of the world's leading hospitals in teaching and research.

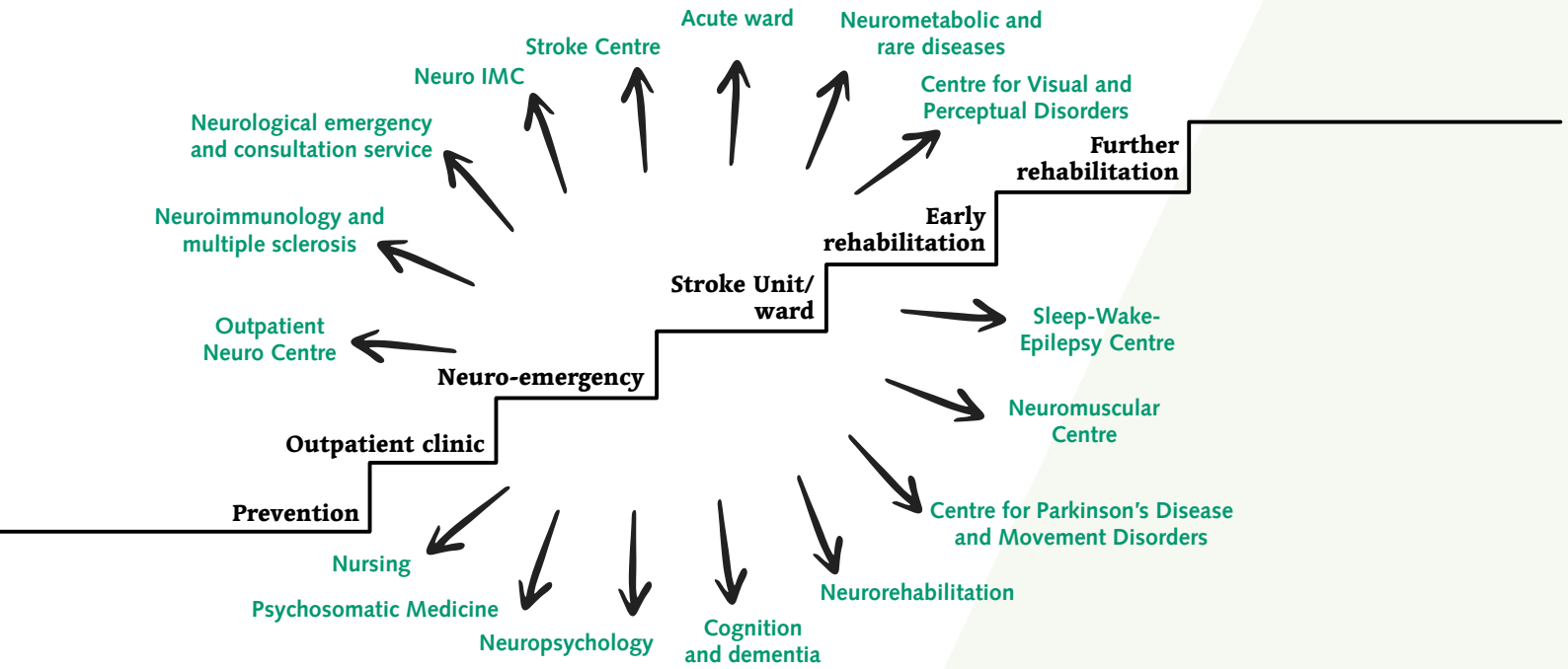
Our specialist teams diagnose and treat people with diseases of the central and peripheral nervous system, neuromuscular transmission and muscular system. The department offers high-quality treatment ranging from basic neurological care to highly specialised medicine.

Integrated care is part of our everyday operations. We support our patients throughout the entire treatment chain, from admission to the A&E department to long-term rehabilitation.

The expertise of the Department of Neurology is strengthened by the close collaboration within the University Neuro Centre, a strategic cornerstone of the Insel Group and the Faculty of Medicine at the University of Bern.

We support the high-quality treatment of our patients with pioneering research and training. The department focuses on translational, clinical and technological research and is Switzerland's largest training centre for obtaining the title of "Specialist in Neurology".

In collaboration with our colleagues in neurosurgery, neuroradiology, and neuropediatrics, we were successful in securing the mandate in all fields of highly-specialised medicine (HSM): complex neurology, neurosurgery and neuroradiology, functional neurosurgery. Hereby, we could further strengthen our leading role in the fields of stroke, epilepsy surgery and deep brain stimulation.



Graduated care model at the Department of Neurology Bern

Department Management 2023

Prof. Dr. med. Claudio L.A. Bassetti
Chief Physician,
Head of Department

Prof. Dr. med. Andrew Chan
Chief Physician, Deputy Department Director, Medical Director MB Neuro, Head of Outpatient Neuro Centre

Prof. Dr. med. Marcel Arnold
Chief Physician, Head of the Stroke Centre and Neurovascular Centre

Prof. Dr. med. Adrian Guggisberg
Chief Physician, Head of University Neurorehabilitation

Prof. Dr. med. Paul Krack
Chief Physician, Head of the Centre for Parkinson's Disease and Movement Disorders

Prof. Dr. med. Dr. sc. nat. Kaspar Schindler
Deputy Chief Physician, Head of the Sleep-Wake-Epilepsy Centre, Head of NeuroTec

Dr. med. Nina Bischoff
Senior Attending Physician I,
Head of Psychosomatic Medicine

Aferdita Aliji-Saiti
Department Head of Nursing, Neurorehabilitation and Psychosomatic Medicine

Manuela Steinauer
Department Manager Neurology

Key figures: 65 years of development

	1959*	1972	1990	2011	2023
Patients discharged	272	634	904	1347	3114
Number of beds	12	24	31	52	140
Outpatient consultations	116	7445	5847	11147	50963
Employees (no. of people)	**10**	**–**	**73**	**157**	**463**
Management	1	–	9	25	76
Assistants	1	–	15	28	72
Nursing staff	4	–	28	47	132
External revenue (in CHF million)	**–**	**–**	**7**	**49**	**120**

*First figures are available from 1959, as Prof. Magun only took up his position as Director of the Department of Neurology in November 1958.

Transport of neurological patients in Haus 12 in the 1960s. You can see Dr. Philippe Grandjean and Sr. Anni Lüthi in the front.

Key figures 2023

Department of Neurology	2023
Patients discharged	3 114
Number of beds	140
Outpatient consultations	50 963

These figures are made up from the following departments:

Acute Neurology	
Patients discharged	2 751
Outpatient consultations	36 912

Neurorehabilitation	
Patients discharged from early rehabilitation	71
Patients discharged from Neurorehabilitation	588
Outpatient consultations	3 362

Psychosomatic Medicine	
Patients discharged	292
Outpatient consultations	10 666

Employees (in full-time equivalents)	363
Medical staff	112
Nursing staff	101
Academic staff	58
Medical technical and therapeutic staff	46
Administrative staff	46

140
Beds

3 114
inpatients

50 963
outpatient consultations

463
employees

Our **services**

University Outpatient Neuro Centre (ANZ)

The neurology polyclinic is used for the outpatient assessment and care of medical and a patients with disorders of the central or peripheral nervous system. It offers high-quality treatment in both basic neurological care and highly specialised medicine.

An interdisciplinary neurological-neurosurgical outpatient clinic (the fourth in Switzerland) was founded in 1964. The ANZ opened in 2015. With numerous clinics, the interdisciplinary diagnostic and treatment facilities at the ANZ cover the entire neurological spectrum. The following clinics and institutes are united under the umbrella of the Neuro Centre:

- Department of Neurology
- Department of Neurosurgery
- Neuropaediatrics Ward of the Department of Paediatrics
- University Psychiatric Services Bern (UPD)
- Department of Diagnostic and Interventional Neuroradiology

Depending on the issue and condition, prior to the first consultation, the patient is triaged in a special clinic, where different issues and rare diseases are treated to a standard befitting a university hospital. There are lively exchanges between the specialist departments for the purpose of joint patient care. Other departments are involved for special issues, such as pain therapy, infectious diseases and haematology.

Headache Consultation

Headaches affect more than 20% of people and, in Switzerland, are the brain disorder with the most severe impact, resulting in reduced quality of life and absences from work. There are more than 200 different kinds of headache. These may occur either as primary headaches, for which there are no other organic causes, or as secondary headaches, which are signs of another underlying disease.

Together with cooperation partners such as the Pain Centre, the headache clinic offers comprehensive interdisciplinary treatment with state-of-the-art drug-based, non-drug-based and invasive procedures.

The university-affiliated headache clinic also conducts its own studies into headaches and visual disorders. As well as this, the team participates in national and international studies. This enables selected patients to be given access to new treatments as early as possible.

Head of ANZ:
Prof. Dr. med. Andrew Chan
Deputy: PD Dr. med. Robert Hoepner

Head of Consultation:
Prof. Christoph Schankin
Deputy: Prof. Dr. Franz Riederer

Dizziness Consultation

Dizziness is one of the most common neurological symptoms in practice: 20 to 30% of people can be affected, with symptoms increasing with age. In the case of dizziness, an assessment by your GP is usually advisable in the first instance. If it is not possible to clearly classify the symptoms from the issues described or if severe symptoms persist, an additional assessment by a special outpatient clinic is advisable.

In cooperation with the Department of Ear, Nose and Throat Diseases, Head and Neck Surgery, the interdisciplinary Vertigo Centre facilitates comprehensive diagnosis and treatment of various dizziness complaints. Patients can also be quickly assessed together with colleagues from the Ophthalmology/Orthoptics, Psychosomatics and Physiotherapy departments in the event of relevant symptoms.

Consultation for gait analysis and fall prevention

This clinic is aimed at people of all age who need help due to balance problems or the risk of falling.

During the clinic, the specialist team works closely with nurses and physiotherapists to carry out a comprehensive analysis of gait problems. Modern diagnostic devices are used to carry out precise examinations of gait, vestibular function and eye movements. Extensive investigations make it possible to determine the causes of balance disorders and falls. Thanks to the interprofessional assessment methods used, individual recommendations can then be made for improving mobility and preventing falls.

Head of Consultations: Dr. med. Hassen Kerkeni
Deputy: PD Dr. med. Tatiana Brémovà-Ertl, PhD

Entrance to the Neuro Centre

Neuroimmunology and multiple sclerosis

One clinical focus of the Outpatient Neuro Centre (ANZ) and the Neuro Day Clinic is the care of patients suffering from multiple sclerosis (MS). Diagnosis and treatment of the entire spectrum of autoimmune diseases of the nervous system complement the range of services offered.

The aim of neuroimmunology is the comprehensive care of patients in various stages of the disease as well as special issues (e.g. affective and cognitive comorbidity, pregnancy, MS in adolescence). For many issues, in addition to the core Neuroimmunology team, other departments are involved in the assessment on an interdisciplinary basis, such as Neurosurgery, Ophthalmology, Rheumatology, University Psychiatric Services (UPD) and the Competence Centre for Psychosomatic Medicine. There is also close cooperation with other departments to ensure the best possible patient care, for example in the field of haematology or neuroradiology.

Neuro Day Clinic

At the Neuro Day Clinic, complex and potentially risky therapies for immune-mediated or other neurological diseases are carried out under the continuous supervision of experienced nurses and the medical team. Diagnostic measures that are difficult to carry out out of hospital are also offered.

Clinical research focuses on the multidimensional phenotyping of different diseases. The aim is to identify characteristic features of the progression of the disease in order to create risk profiles and thereby improve certain therapies. The experimental neuroimmunology laboratory provides support with this through neurobiological plausibility checks.

Analysis of brain scans

Head of Consultation: PD Dr. med. Robert Hoepner
Head of the Neuro Day Clinic: Dr. med. Helly Hammer

Neurology emergency department

Neurological emergency department and consultation service

Working in shifts, the 14-strong team of the neurological emergency department guarantees optimal, around-the-clock care for all patients suffering with urgent neurological issues.

Neurological emergencies are common and are estimated to account for up to 20% of all emergency consultations. At Inselspital, more than 7,000 people are treated every year by the emergency service or consultation service.

As the only A&E department in the canton of Bern and the neighbouring cantons, the interdisciplinary A&E department at Inselspital has a continuous presence of neurologists. Thanks to an interdisciplinary and interprofessional approach, the team is able to offer all the necessary diagnostic steps at a high level and in one place and initiate acute measures.

The team's extensive experience and practice in the field of neurology enables it to readily meet the daily challenges of emergency operations and offer patients the best possible care.

Director: Prof. Dr. med. Simon Jung
Deputy: Dr. med. Ulrike Prange


Anna-Seiler-Haus

Glimpse of the Neuro IMC

Neuro IMC

On the Neuro IMC (Neuro-Intermediate-Care) observation ward, patients who are in a neurologically or medically unstable condition are monitored. The ward is operated by the Departments of Neurology, Neurosurgery and Intensive Care Medicine in close collaboration.

Neuro IMC cares for people whose condition can change rapidly and requires close monitoring, extensive treatment and intensive care. This mainly refers to patients who have suffered a stroke, bleeding in the brain or subarachnoid space, epilepsy, a traumatic brain injury, meningitis or encephalitis, brain tumours and patients who have undergone endovascular surgery or brain surgery.

Specialised clinical and instrument-based monitoring of the neurological condition as well as circulation and respiration is carried out for this purpose.

The Neuro IMC has 14 beds and an interdisciplinary and interprofessional team of experts. Around 1,900 patients are treated there each year.

Director: Prof. Dr. med. Werner Z'Graggen
Deputy Co-Directors: Prof. Dr. med. Simon Jung and Dr. med. Philipp Bücke, MSc

Stroke Centre

Bern's Stroke Centre is the largest certified centre for stroke care in Switzerland and supports patients from the acute phase through to follow-up treatment and prevention.

There has been a stroke team in Bern ever since the 1990s. The Stroke Unit was opened in 2013. The Stroke Centre was the first university centre to be certified in the field of highly specialised medicine. Twelve beds have been available in the specialised Stroke Unit for stroke patients since 2015. The Stroke Unit investigates the causes of strokes and monitors vital parameters.

The interdisciplinary team consists of specialists in neurology, neuroradiology, neurosurgery, anaesthesia, intensive care, cardiology, vascular surgery and neuropsychology. Neuroradiology is responsible for diagnosing and treating clots, while neurosurgery treats any complications. The Stroke Centre works closely with the intensive care unit, the neuro monitoring ward (IMC) and the Sleep-Wake-Epilepsy Centre and is a world leader in neurovascular research. Specialist nurses and a team of physiotherapists, occupational therapists and speech therapists ensure targeted treatment.

In the neurovascular clinic and neurovascular laboratory, more than 3,000 outpatient consultations are carried out each year. All state-of-the-art diagnostic imaging procedures (ultrasound as well as CT, MRI and angiography in neuroradiology) are available. One of the focus areas is providing individual, holistic advice on prevention. Patients with complex issues can be registered for a case discussion on the weekly interdisciplinary neurovascular board by both internal and external referring physicians.

Director: Prof. Dr. med. Marcel Arnold
Deputy Co-Directors: Prof. Dr. med. Mirjam Heldner and Prof. Dr. med. David Seiffge

Interventional stroke treatment

Acute ward

More than 2,000 patients are treated every year in Switzerland's largest acute-care neurology ward. The whole spectrum of disorders of the brain, spinal cord, nerves and muscles are examined and treated here.

A highly skilled team of specialist physicians, nurses, therapists and secretarial staff ensures high-quality care. Assessments are carried out using state-of-the-art diagnostic methods in close collaboration with the highly specialised neurological subdisciplines. The latest research findings are incorporated directly into patient treatment.

More than half of hospitalised patients are admitted via the emergency department. The capacity is 47 beds. Stroke patients are also cared for together with the Stroke Centre and the Neurorehabilitation team. In addition to the Neuro Day Clinic, brief assessments on a semi-inpatient basis are also offered.

Below are some examples of the specialised assessments and therapies offered in collaboration with the neurological sub-disciplines and within the medical division neuro:

- Epilepsy surgical assessments
- Deep brain stimulation in patients with Parkinson's disease/mobility disorders
- Treatment of complex inflammatory diseases of the central and peripheral nervous system

Co-Directors: Dr. med. Lara Chilver-Stainer and Dr. med. univ. Thomas Horvath

Patient rooms in the new Anna-Seiler-Haus

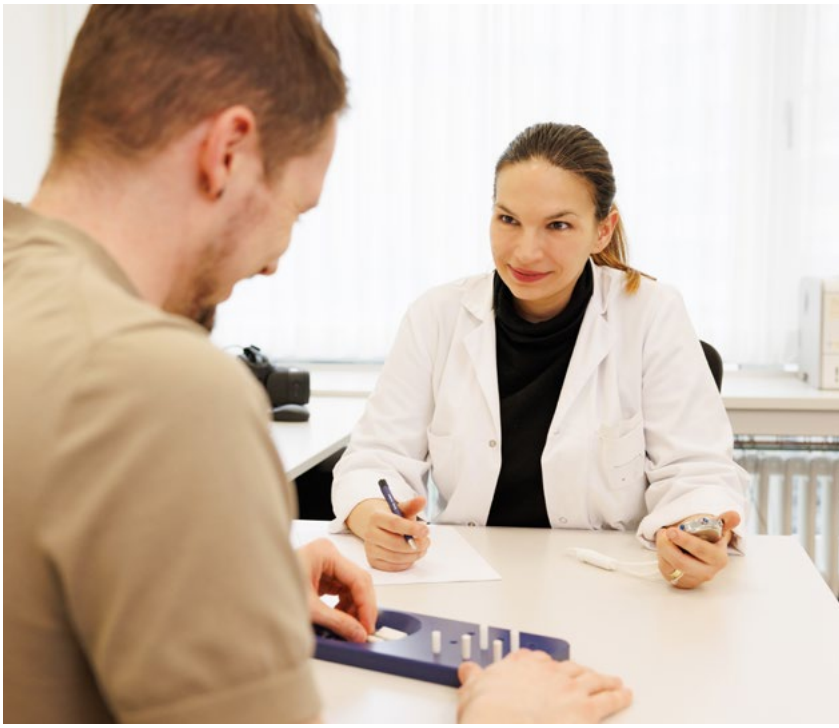
Neurometabolic and rare neurological diseases

In Europe, a disease is defined as rare if it affects fewer than 2 in 10,000 people. At present, more than 6,000 rare diseases have been recorded worldwide. A good half a million people in Switzerland are affected, many of whom suffer from a neurological disease. The clinic works closely with the Centre for Rare Diseases established at Inselspital and has applied for recognition as a kosek reference centre.

Neurological symptoms often present with a wide range of symptoms. Rare diseases can occur at any age, but most often occur in childhood. In this clinic, patients with neurometabolic diagnoses receive care. Due to the diversity of symptoms, the focus of the clinic is on complex neurological problems and psychosocial consequences. It provides a seamless transition from paediatric to adult neurology. Patients benefit from multimodal and multidisciplinary management in close collaboration with the Centre for Laboratory Medicine, the Department of Paediatrics and various patient organisations. The latest research findings are incorporated directly into treatment. With the aim of improving the management of patients with rare neurological diseases, the Department of Neurology coordinates the Swiss Network for Rare Neurological Diseases of the CNS (Swiss RND CNS) and is applying for recognition as a reference centre for these diseases. The recognition procedure is carried out by kosek (National Coordination of Rare Diseases).

The clinic is closely linked to the Centre for Rare Diseases at Inselspital, which received recognition from kosek in June 2020, meaning the centre can also care for patients without a diagnosis. Due to the rarity factor, there are often years of delays in diagnosis as well as incorrect treatment, which the Centre for Rare Diseases tries to counteract. There is close collaboration with the ProRaris umbrella organisation for rare disease patient organisations.

Head of Consultation:
PD Dr. med. Tatiana Brémovà-Ertl, PhD



Examination of fine motor skills using a 9-hole peg test

Centre for Visual and Perceptual Disorders

The interdisciplinary Centre for Visual and Perceptual Disorders, established in 2003, provides comprehensive care to more than 400 patients every year. Specialists in neurology and ophthalmology as well as orthoptists focus on treating patients with impaired vision, eye movements and visual perception.

The successful diagnosis and treatment of complex visual disturbances require a collaborative approach from different medical disciplines. The close collaboration between these departments and the continuous development of research are crucial in order to be able to ensure optimal care even for highly complex disorders. In addition to our patient care, our centre is active in research and contributes significantly to the continuous improvement of therapy methods through innovative findings.

State-of-the-art analysis methods for eye movements and visual function are used as part of targeted examinations. Depending on the individual cause, a variety of therapeutic approaches are used, including medication, occlusion therapy, the use of prism glasses and, in some cases, surgical interventions.

Director: Dr. med. Hassen Kerkeni
Deputy: PD Dr. med. Tatiana Brémovà-Ertl, PhD

Eye movement examination

Sleep-Wake-Epilepsy Centre (SWEZ)

The interdisciplinary team cares for patients with sleep, alertness or consciousness disorders as well as people affected by epilepsy.

At the University Sleep-Wake-Epilepsy Centre (SWEZ), which was established in 2014 from the merger of the EEG laboratory founded in the 1950s and the sleep laboratory founded in the 1980s, sleep, alertness and consciousness disorders are diagnosed, treated and researched. Close collaboration between specialists in neurology, pulmonology and psychiatry enables the precise and personalised diagnosis and treatment of complex issues. Thanks to close cooperation between clinical care and clinical research, new findings can be incorporated into assessment and treatment processes.

The SWEZ offers specialised and interdisciplinary clinics:

- In the **hypersomnia clinic**, patients with daytime sleepiness are assessed. Causes may include a lack of sleep or narcolepsy.
- In the **parasomnia clinic**, symptoms that may be caused by **non-REM sleep parasomnia** or **nocturnal epilepsy** are assessed. Typical forms of non-REM parasomnia include sleepwalking, talking during sleep and night terrors. This clinic also focuses on **restless leg** issues and the assessment of other possible causes of restless legs.
- Multidisciplinary clinics include the **neuro-psychiatric clinic,** which is attended by patients with complex neurological-psychiatric diagnoses and symptoms and key sleep-related symptoms.
- The **neuro-pulmonology clinic** sees patients with internal medical-pulmonological issues. Typical symptoms are sleep apnoea syndrome.
- The **epilepsy clinic** treats patients who suffer from seizure-like disorders or for whom epilepsy is suspected. A wide range of possible treatments are available for diagnosed epilepsy. These range from drug treatment to highly specialised epilepsy surgery and the necessary diagnostic assessments. As part of the epilepsy clinic, the patient's fitness to drive can also be checked or special consultations, such as on epilepsy and pregnancy, can be attended.

Swiss Sleep House Bern

The Swiss Sleep House Bern opened its doors in November 2022. Around one third of the population suffers from difficulty falling asleep or staying asleep, sleep apnoea or other sleep-related illnesses. Thanks to its innovative walk-in concept, the interdisciplinary team made up of specialists from the fields of psychology, biology, psychiatry and neurology is the first point of contact for the rapid triage of sleep disorders, including the use of innovative telemedical diagnostics.

In addition to the treatment of private individuals, organisations are also advised on the topics of shift work and occupational health management.

Director: Prof. Dr. med. Dr sc. nat. Kaspar Schindler
Deputy Co-Directors of Epilepsy: Prof. Dr. med. Dr sc. nat. Maxime Olivier Baud and Dr. med. Andrea Seiler
Deputy Director of Sleep: PD Dr. med. Markus Schmidt, PhD

Measuring
electrode positions

Sleep Bern:
“all under one roof”

Interdisciplinary Sleep-Wake-Epilepsy-Center (SWEZ)

Specialized, tertiary sleep medicine

NeuroTec
Translational sleep technology

Public sleep health

Experimental Neurology Center (ZEN)

Basic sleep science

Paper on the Swiss Sleep House
Bern, 2024

Paper on NeuroTec Sitem-Insel
Bern, 2021

Neuromuscular Centre

The Neuromuscular Centre provides interdisciplinary assessments, treatment and care for patients with neuromuscular disorders. Since 2021, it has formed part of Inselspital's Reference Centre for Neuromuscular Diseases, which is recognised by the National Coordination for Rare Diseases (Kosek).

Neuromuscular diseases include diseases of the motor neurons, the peripheral nerves, neuromuscular transmission and the muscles themselves. Compression neuropathy, rare diseases and hereditary muscular dystrophy are some of the common syndromes. The Neuromuscular Centre was established in 2013 and offers the integrative assessment of neuromuscular diseases using various instrument-based methods, such as neurophysiology, muscle/nerve/skin biopsies and imaging. In addition to specific therapy (e.g. enzyme replacement therapies, genetic therapies, immunotherapies), the centre also provides long-term care for affected patients and their relatives in a sociomedical and palliative context.

Patient care is provided on an interdisciplinary basis and in collaboration with the relevant specialised physiotherapists and nurses. Patients and their relatives are supported in all areas of everyday life, including the provision of aids, making contact with authorities and social institutions and developing emergency medical and nursing plans. Working closely with the Neuropaediatrics department ensures a seamless transition over the course of the illness.

In order to guarantee highly specialised care, the centre has links with various national and international networks. Research in the field of neuromuscular diseases includes translational and biomedical aspects as well as clinical studies. In this regard, there is close cooperation with Swiss and foreign research institutions such as the Institut de Myologie in Paris.

Director: PD Dr. med. Olivier Scheidegger
Deputy: Dr. med. Marisa Blanquet

ENMG screening

Centre for Parkinson's Disease and Movement Disorders

The Centre for Parkinson's Disease and Movement Disorders offers a comprehensive range of services: from the assessment stage through to the therapeutic support of our patients.

The Centre for Parkinson's Disease and Movement Disorders was founded in the 1990s. The range of interdisciplinary services offered covers the entire and multifaceted spectrum of movement disorders. This includes the diagnostic assessment, treatment and long-term care of patients with Parkinson's disease, dystonia, tremor disease, tick disorders as well as chorea and rare movement disorders.

The treatment of Parkinson's at all stages of the disease represents a clinical focus. Intensified treatment options are offered for advanced Parkinson's disease. The centre's work is distinguished by the continuous integration of new scientific findings. With the support of Parkinson Switzerland, a "Parkinson Professorship" was established in Bern as part of a national competitive procedure.

In the case of movement disorders with various causes, the centre works on an interdisciplinary basis with the departments of Human Genetics, Ear, Nose and Throat Diseases (ENT), Metabolic Disorders, Neuro-Psychosomatic Medicine, Neuropaediatrics and University Psychiatric Services (UPD). Deep brain stimulation is offered in close collaboration with the Neurosurgery team. An interprofessional team ensures the best possible care, from preoperative planning through to outpatient follow-up care. Treatment is also carried out in collaboration with UPD for rare indications such as depression, Tourette's syndrome and obsessive-compulsive disorder.

One of Switzerland's largest botulinum toxin outpatient clinics, the centre offers injections for treatment indications such as dystonia, hemifacial spasms and spasticity. For patients with severe spasticity, an interprofessional consultation is also offered, with the option of undergoing individually optimised treatment.

Director: Prof. Dr. med. Paul Krack
Deputy Co-Directors: Dr. med. Ines Debove and Dr. med. Lenard Lachenmayer

Advice on DBS (deep brain stimulation)

Neurorehabilitation

University Neurorehabilitation treats patients with neurological disorders and injuries at the Inselspital and Spital Riggisberg sites. From early rehabilitation to outpatient follow-up care, the range of services provided covers the entire rehabilitation care chain.

Neurorehabilitation at Bern was integrated into Neurology in the 1990s. A wide range of services is offered for targeted rehabilitation after acute brain damage, for example as a result of a craniocerebral trauma, a stroke or a cerebral haemorrhage. Seriously affected patients are treated at Inselspital. Rehabilitation can also be continued at Riggisberg as part of the next steps. A team made up of specialists in rehabilitation care, neuropsychology, speech therapy, social counselling, physiotherapy and occupational therapy along with physicians works closely together to ensure optimal treatment.

Since the opening of the neurological-neurosurgical early rehabilitation department in January 2017, it has been possible to accept patients directly from the Intensive Care Unit or the neurological-neurosurgical monitoring ward (Neuro IMC). Such patients are sometimes confused and medical problems are still a major concern for them. In these cases, specially developed treatment concepts provide patients with optimal support based on their individual needs.

Outpatient interdisciplinary rehabilitation supports patients as they return to everyday life and, if applicable, to work. The Research department uses modern imaging methods to investigate the mechanisms that allow patients to regain lost capabilities, at least partially. These neural processes are then directly and specifically stimulated using new therapeutic approaches.

The advanced Neurorehabilitation department at Spital Riggisberg opened in September 2016 and expanded from 35 to 45 beds in July 2022. Patients who have already made progress during acute neurorehabilitation at Inselspital or those who are fundamentally less severely affected can receive specific, individually tailored rehabilitation here.

In the Memory Clinic, patients with progressive neurodegenerative diseases are treated in cooperation with the Gerontopsychiatry department.

Director: Prof. Dr. med. Adrian Guggisberg
Deputy: Dr. med. Julian Lippert

Top: Neurorehabilitation at Riggisberg
Bottom: Willhelm-Fabry-Haus

Cognition and dementia

The Professorship of Dementia and Neurodegenerative Diseases, created in 2023, will strengthen and expand the comprehensive interdisciplinary assessment of patients with cognitive disorders and dementia and modern and effective therapeutic approaches.

Early diagnosis of cognitive issues is essential to prevent irreversible changes in mental performance and to advise and support patients and their relatives. What is important here is objectifying the symptoms, conducting a clinical examination and classifying the findings. Depending on the classification, further therapeutic steps may be taken and a prognosis may be made.

As part of the clinic, patients receive comprehensive advice and care based on the latest research findings. The broad expertise and experience in the care of multimorbid patients with other neurological diseases play an important role.

There are signs that new drugs are becoming available for patients with neurodegenerative diseases such as Alzheimer's disease or Lewy body dementia/Parkinson's disease, which could significantly change the course of the disease and slow down the progression of cognitive disorders. With the existing infrastructure in place in the Department of Neurology, these new treatments can be delivered safely and in keeping with an evidence-based approach, while any side effects can be treated.

The following assessment and therapy services are offered:

- Test psychological and behavioural neurological objectification of mental performance and comparison with the information provided by patients and/or carers
- Completion of a comprehensive clinical investigation
- Organisation of additional diagnostics, e.g. cerebral MRI, cerebrospinal fluid examination incl. determination of dementia biomarkers
- Notification of the diagnosis and prognosis
- Guidance and application of therapeutic measures

Specialists work on an interdisciplinary basis with Neuropsychology, Outpatient Neurorehabilitation, Memory Clinic Bern, the Stroke Unit, the Centre for Parkinson's Disease and Movement Disorders and the Sleep-Wake-Epilepsy Centre.

Since August 2023, a brain health clinic has been offered, which focuses on holistic aspects of brain health.

With support from the WHO, EAN and SFCNS, a Certificate of Advanced Studies (CAS) on brain health will be offered from 2024.

Prof. Bogdan Draganski will be appointed to the new dementia professorship (full professorship) at the Department of Neurology from June 2024.

Head of Consultation: PD Dr. Roza Umarova

Neuropsychology

Injuries or diseases of the brain can lead to cognitive and emotional-affective changes. Memory, attention and concentration, motivation and/or personality disorders are common. Neuropsychology focuses on the diagnosis and treatment of these cognitive and emotional disorders.

Neuropsychological specialists work at Inselspital Bern and the Riggisberg Rehabilitation Clinic to diagnose and treat patients. Neuropsychological diagnostics include a broad assessment of cognitive subfunctions using standardised test procedures and self-assessment tools in the form of questionnaires. In addition to emotional-affective symptoms, such questionnaires also include aspects like quality of life, stress, self-efficacy and fatigue. Following detailed diagnostics, the necessary individual therapeutic measures are determined, which in particular also include integration into the professional and social spheres.

Treatment is individual and focused on everyday life, including discussions about how to deal with the disease, how to adapt to changes in lifestyles and how to build resilience. Psychotherapeutic advice and counselling are also offered for those affected and their relatives, e.g. shortly after a diagnosis.

In addition to clinical work, scientific studies are carried out to investigate the efficacy of new therapy concepts and test procedures and to develop new questionnaires. The insights gained are soon incorporated into day-to-day clinical practice in order to provide patients with rapid access to the latest diagnostic and therapeutic concepts.

Director: Prof. Dr. Iris-Katharina Penner

Neuropsychology Consultation

Psychosomatic Medicine

Psychosomatic Medicine at Inselspital Bern is the only university hospital department in Switzerland with an outpatient clinic, inpatient ward, day clinic and consultation and liaison service. For over 40 years, the department has made solid contributions to research, clinical practice and teaching in psychosocial and psychosomatic medicine.

The global founder of psychosomatics was Prof. Dubois, who became the first Full Professor of Neurology in Bern in 1902. Psychosomatic Medicine plays a leading role in the treatment of the entire spectrum of psychosomatic and functional bodily symptoms and has expertise in diagnosing and treating severe eating disorders. It was integrated into the Department of Neurology in 2016 and also offers a specialised clinic for patients with functional neurological disorders, the only one of its kind in Switzerland.

Functional psychosomatic bodily symptoms are commonplace. Stress-associated diarrhoea before an exam or trembling all over the body during a stage performance are well known, for example. Body perception and body regulation can change as a result of neurobiological processes, resulting in clinically manifest disorders. Comorbid symptoms of anxiety and depression are also prevalent. The functional symptoms often occur without a necessary correlation at the structural level and can affect all organ systems. A combination with organ-structure-related complaints is common.

An interdisciplinary and multiprofessional team of highly qualified and experienced specialists works closely together, focusing on patients and their individual needs and conditions and treating patients in accordance with the latest scientific findings, using both conventional medical and integrative forms of therapy.

The services provided in the outpatient clinic, inpatient ward and day clinic are open to people of all insurance categories from Switzerland and abroad, relatives and referring physicians.

Director: Dr. med. Nina Bischoff

Psychological-psychotherapeutic discussion on the terrace of the C. L. Lory-Haus

Anna-Seiler-Haus

Nursing

Nursing services are an indispensable part of the interdisciplinary treatment and support process for patients. The nursing staff aim to provide patients and their relatives with individual, competent, safe, ongoing and partnership-based support with experiencing and coping with their illness.

As neurological diseases can lead to drastic changes in life situations, patients and their relatives are under strain and often find themselves in a state of crisis. Nurses offer assistance with activities of daily living, take measures to alleviate pain and help to release blockages in the case of sensation, expression and movement disorders. Various and changing complaints and restrictions shape the expectations that patients have of nursing. This also includes fears and uncertainty about the future and development of the disease.

A constant and meticulous exchange of information with physicians, specialists from different therapeutic areas, social counsellors and other professional groups involved is vital.

Nursing staff can acquire specific specialist knowledge within neurology, e.g. in acute neurology. The Neuro Day Clinic, the Stroke Unit, Acute and Early Rehabilitation, Psychosomatic Medicine, the Outpatient Neuro Centre – with the Centre for Parkinson's Disease and Movement Disorders – and various special clinics are available for training and further education.

Director: Aferdita Aliji-Saiti (Neurorehabilitation and Psychosomatic Medicine)

Acute ward nursing

Head of Nursing 1958–2023

Ruth Gfeller,
Head Nurse
approx. 1958–1960

Therese Meier,
Head Nurse
approx. 1960–1964

Anni Lüthi,
Head Nurse
approx. 1964–1974

Susi Spycher,
Head Nurse
1975–1991

Babette Stuber,
Head Nurse
1992–2009

Rosmarie Wyss,
Head of Nursing
2009–2021

Martina Siffert
Nursing Department Head
2021–2023

Aferdita Aliji-Saiti
Nursing Department Head
Since 2022

Teaching & **research**

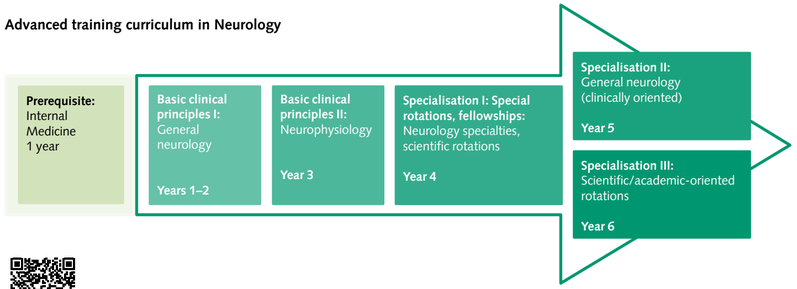
Teaching

Teaching is of great importance and has a long tradition at the Department of Neurology, both in terms of academic studies and further and advanced training. As Switzerland's largest neurological training centre, the clinic offers a wide range of fellowships, three international postgraduate specialised master's programmes and an innovative and unique online further education and training opportunity in the form of the interactive learning platform NeuroNews.

Education

Since the establishment of the Department of Neurology, the transfer of clinical knowledge has been of great importance. By completing an internship in their elective year, students can gain their first experience in the field of neurology. For one or more months, students work under the close supervision of the senior physicians and junior doctors on the Acute Ward, the Stroke Unit or the Neurological Emergency Department. Practical relevance and intensive bedside teaching are important in this respect and have gained us national and international recognition.

Advanced training curriculum in Neurology



Further training

The further training concept is based on the belief that patient-oriented, broad-based clinical further training is the backbone of a future neurologist. Since its founding, the Department of Neurology has been known for its excellent teaching of clinical skills and robust further training in general neurology. The department offers a five-year neurological training course, culminating in students being qualified as specialists in neurology by the Swiss Medical Association (FMH). The complexity of neurology is constantly increasing with the advancement of neuroscience and technology. The 13 fellowships are therefore an innovative addition to the continuing education programme. The university centre offers students the opportunity to consolidate their individual interests, which serves as a springboard for a specialist medical career. We not only offer fellowships for the specialist disciplines, but also one that prepares students in training to become a general neurologist with broad clinical expertise.

- For doctors who are at the end of their training, the fellowships are intended to facilitate the transition to the position of senior physician/specialist. The fellowships promote personal responsibility, independence, academic interest and specialised mentoring and supervision.
- Fellowships allow advanced junior doctors and medical specialists to gain an additional qualification in a specialised area.

Together with the scientific rotations, the programme is designed to foster a focus on academic careers.

Fellowships

- Fellowship I: Acute inpatient neurology
- Fellowship II: Acute and intensive care neurology
- Fellowship III: Stroke Unit
- Fellowship IV: Neurovascular outpatient care
- Fellowship V: Cognitive neurology/neurorehabilitation
- Fellowship VI: Neuroimmunology
- Fellowship IX: Dizziness and headaches
- Fellowship X: Neuromuscular Centre
- Fellowship VIII: Functional neurological disorders / neuropsychosomatic medicine
- Fellowship XI: EEG and telemetry
- Fellowship XII: Sleep
- In-house rotation I: Fellowship in intensive care
- In-house rotation II: Fellowship in neuroradiology

Fellowship in general neurology

In addition to subject-specific fellowships, the Department of Neurology also offers advanced training in general neurology. These doctors receive broad clinical training covering the entire patient pathway (emergency/consultation service, acute ward, rehabilitation, outpatient follow-up care). The core competence lies in the assessment of complex clinical pictures based on in-depth knowledge of the entire field of neurology. Specialists in general neurology maintain close contact with the respective expert teams. At the same time, in addition to teaching, certain topics in medicine that are relevant to the future such as digitalisation, patient-based assessment algorithms and the development of outcome-based treatment methods are taught as part of the curriculum and integrated into everyday clinical practice.

Advanced training

The clinic is known for its wide range of symposia and grand rounds for neurologists, general practitioners and specialists from other disciplines. Interdisciplinary training courses such as the Sleep-Wake-Epilepsy Days, the Brain and Heart Symposium and the Stroke Symposium attract broad interest.

In order to meet the demands of today's digital world, we have developed the innovative interactive learning platform **NeuroNews**, which not only broadcasts training courses live and makes them available on demand, but also meets all the requirements of a modern learning and communication platform.

Postgraduate International Master's in Sleep Medicine

The International Master's in Sleep Medicine is a postgraduate programme offered in collaboration with the University of Bern, the Università della Svizzera italiana and 13 international partner universities under the patronage of the SGSSC, ESRS, EAN and ESF. It offers medical and scientific insights into sleep physiology, chronobiology and sleep medicine. The programme promotes the training of a new generation of sleep researchers and clinicians and provides participants with expertise in scientific and clinical aspects of sleep medicine.

Postgraduate Master's in Stroke Medicine

The European Stroke Master is a programme developed in close collaboration between the Stroke Centre in Bern and the European Stroke Organisation. The aim is to train the next generation of clinicians and researchers in stroke care. A specially developed interactive, state-of-the-art learning platform offers participants attractive and individual e-learning opportunities. With this innovative approach, the European Stroke Master ensures that prospective specialists remain at the cutting edge of science and are optimally prepared for their future duties.

Certificate of Advanced Studies in Brain Health

With the support of the Swiss Federation of Clinical Neurosocieties (SFCNS) and the European Academy of Neurology and in collaboration with the WHO, the University of Bern offers the world's first postgraduate training programme on the subject of brain health.

The most internationally renowned specialists provide in-depth teaching on the most important aspects of brain health. The extra-occupational CAS lasts two semesters and is aimed at all interested professionals, such as physicians, neuropsychologists, nurses and policymakers on healthcare. A state-of-the-art online learning platform set up for this purpose completes the offering.

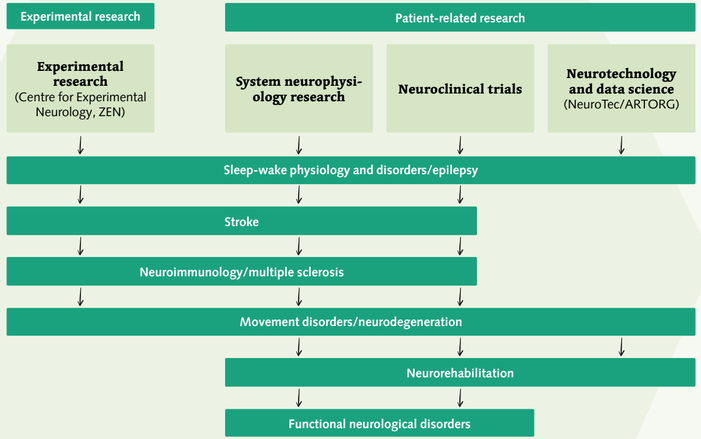
Research

Modern clinical and translational research forms the basis for innovation and future development in medicine.

The Department of Neurology has a long tradition of conducting patient-oriented and systems physiology research. In the last 10 years, animal experimental research (foundation of ZEN), the performance of clinical trials (foundation of Neuro CTU) and technological research using large digital data sets and artificial intelligence (foundation of NeuroTec) have also been established.

From a methodology perspective, the clinic now offers all modern research approaches and state-of-the-art laboratories for integrated, patient-oriented and translational research under one roof. Our internationally recognised research focuses on sleep epilepsy, strokes and neuroimmunology. The wide scope of the research in terms of topics covered and methodology is ensured at our clinic by 34 professors and assistant professors. In recent years, efforts have also been made to strengthen interprofessionality in research. The opening of the Swiss Sleep House Bern ultimately reflects the clinic's commitment to care and health promotion research.

Research Profile Neurology



The following information documents the development of research at our clinic from 2012 to 2023:

73 SNF grants (2012–2023), of which **51** as "main applicants"

2 ERC consolidator grants

Faculty ranking:
2018 **no. 2**, 2019 **no. 5**, 2020 **no. 1**, 2021 **no. 6**, 2022 **no. 15**

1636 original papers (2012–2023)

Our commitment to research sees the promotion of early career researchers as well as equality and integration as one of its most important strategic priorities. Every year, internal research grants totalling approx. CHF 360,000 are awarded to this end. Our clinic systematically supports the combination of clinic and research through 50/50 (clinic/research) workloads and by enrolling our residents in the Clinical Sciences PhD programme offered by the Faculty of Medicine at the University of Bern.

Our work has been published in the following top journals:

Science (4x)
Nature (2x)
New England Journal of Medicine (8x)
Lancet (6x)
Lancet Neurology (16x)

Professors of Neurology

- Paul Dubois (1902)
- Ernst Frauchiger (1944)
- Sandro Bürgi (1958)
- Rolf Magun (1958)
- Marco Mumenthaler (1962)
- Albert Bischoff (1971)
- Kazimierz Karbowski (1972)
- Hans-Peter Ludin (1977)
- Claus Meier (1987)
- Christian Hess (1990)
- Jürg Kesselring (1996)
- Heinrich Mattle (1996)
- Jean-Marc Burgunder (2000)
- Mathias Sturzenegger (2001)
- Kai Rösler (2004)
- René Müri (2005)
- Johannes Mathis (2008)
- Jean-Marc Burgunder (2009)
- Bruno Weder (2009)
- Marcel Arnold (2010)
- Krassen Nedeltchev (2011)
- Claudio Bassetti (2012)
- Alain Kaelin (2012)
- Kaspar Schindler (2013)
- Werner Z'Graggen (2013)
- Stephan Bohlhalter (2014)
- Urs Fischer (2014)
- Arto Nirkko (2014)
- Thomas Nyffeler (2014)
- Andrew Chan (2016)
- Mauro Manconi (2016)
- Antoine Adamantidis (2017)
- Ramin Khatami (2017)
- Roger Kalla (2018)
- Einar Wilder-Smith (2018)
- Simon Jung (2019)
- Paul Krack (2019)
- Selma Aybek Rusca (2020)
- Hakan Sarikaya (2020)
- Christoph Schankin (2020)
- Christian Kamm (2021)
- Maxime Baud (2022)
- Adrian Guggisberg (2022)
- Mirjam Heldner (2022)
- Vincent Pernet (2022)
- David Seiffge (2022)
- Athina Tzovara (2022)
- Iris-Katharina Penner (2023)

Habilitations (Privatdozenturen) in Neurology

- Fritz Lotmar (1912)
- Ernst Frauchiger (1934)
- Sandro Bürgi (1947)
- Werner Bärtschi-Rochaix (1949)
- Marco Mumenthaler (1960)
- Albert Bischoff (1963)
- Kazimierz Karbowski (1970)
- Hans Spiess (1971)
- Hans-Peter Ludin (1973)
- Claus Meier (1977)
- Hess Christian Walter (1987)
- Jürgen Mertin (1989)
- Jürgen Kesselring (1990)
- Heinrich Mattle (1990)
- Jean-Marc Burgunder (1994)
- Mathias Sturzenegger (1995)
- Kai Rösler (1996)
- Armin Schnider (1996)
- René Müri (1997)
- Ralph Baumgartner (1997)
- Claudio Bassetti (1998)
- Johannes Mathis (1998)
- Bruno Weder (2002)
- Alain Kaelin (2004)
- Arto Nirkko (2006)
- Marcel Arnold (2007)
- Krassen Nedeltchev (2007)
- Thomas Nyffeler (2009)
- Stephan Bohlhalter (2010)
- Kaspar Schindler (2010)
- Werner Z'Graggen (2010)
- Stefan Begré (2011)
- Urs Fischer (2011)
- Andrea Humm (2011)
- Simon Jung (2014)
- Michael Schüpbach (2014)
- Martinus Hauf (2015)
- Marie-Luise Mono (2015)
- Andrew Chan (2016)
- Christian Kamm (2016)
- Heinz Krestel (2016)
- Mauro Manconi (2016)
- Roger Kalla (2017)
- Ramin Khatami (2017)
- Christoph Schankin (2017)
- Heidemarie Gast (2018)
- Georg Kägi (2018)
- Einar Wilder-Smith (2018)
- Mirjam Heldner (2019)
- Paul Krack (2019)
- Roza Umarova (2019)
- Frédéric Zubler (2019)
- Selma Aybek Rusca (2020)
- Robert Hoepner (2020)
- Anke Salmen (2020)
- Hakan Sarikaya (2020)
- Olivier Scheidegger (2020)
- Carolina Gutierrez Herrera (2021)
- Maxime Baud (2022)
- Tatiana Brémovà-Ertl (2022)
- Anelia Dietmann (2022)
- Adrian Guggisberg (2022)
- Vincent Pernet (2022)
- David Seiffge (2022)
- Lukas Heydrich (2023)
- Thomas Meinel (2023)
- Markus Schmidt (2023)
- Gerd Tinkhauser (2023)

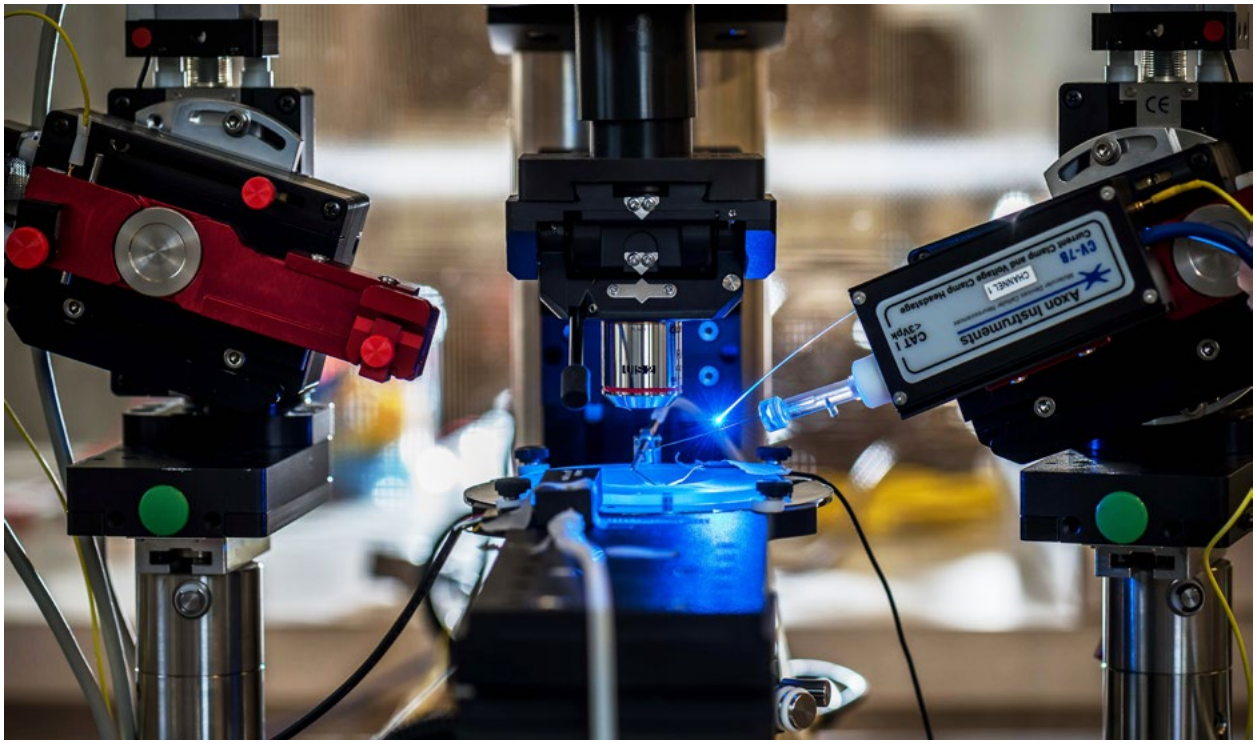
Centre for Experimental Neurology (ZEN)

The Centre for Experimental Neurology (ZEN) offers a creative and interactive research environment based on synergies and interdisciplinary approaches between theoretical, experimental and clinical neuroscience.

The ZEN was founded in 2013 in the Department of Neurology at Inselspital Bern and offers a unique research environment which is home to basic, clinical and neurotechnical laboratories. Using state-of-the-art techniques and data set analyses, ZEN researchers are striving to advance the scientific understanding of the brain, the development of neurodevices and biomedical applications. It benefits from its location on the Insel campus and from various partnerships, such as with sitem-insel, the University of Bern, the DBMR and NeuroTec, providing a unique opportunity to train young scientists, engineers and clinicians and to promote scientific, clinical and educational activities.

The vision is conduct excellent academic research to broaden knowledge in brain research and promote health and clinical care, while the mission is to advance biomedical research in neurology and bridge the gap between experimental neuroscience and clinical care.

Director: Prof. Dr. Antoine Adamantidis, PhD



Fluorescence imaging and optogenetics make it possible to track and visually manipulate the activity of neurons in the brains of free-moving mice over a longer period of time. These technologies were used in ZEN to monitor the activity of neurons during REM sleep and to manipulate cellular circuits involved in controlling sleep, wakefulness and seizures.

Current research projects

Investigation of the neuronal circuits that control sleep:
This project is investigating the contribution hypothalamic and thalamo-cortical circuits make towards controlling sleep states, sleep oscillations and sleep-related brain plasticity, particularly REM sleep (dreaming), in mice. This involves a combination of electrophysiology, imaging and computer-aided methods.

Auditory processing and predictions in sleep, coma, and wakefulness:
This project is investigating the neuronal foundations that support the processing of auditory information in a waking state and in reduced consciousness (in a coma or during sleep). To assist, EEG images of the scalp and intracranial EEG images from individuals are used in combination with modelling and deep learning algorithms.

Unravelling the complex landscape of sleep-wake disorders through data-driven phenotyping:
Diagnosing sleep-wake disorders (SWD) is difficult because few accurate biomarkers exist and multiple SWDs and/or comorbidities often occur concurrently. Unsupervised machine learning is applied to a large cohort of clinical variables recorded over 16 years at Inselspital Bern in well-characterised patients to support a data-driven characterisation of SWDs.

CNS administration of therapeutic antibodies to promote neuronal recovery in diseases:
The blood-brain barrier (BBB) is a major barrier to the supply of antibodies that promote neuronal recovery in the central nervous system (CNS). In order to bypass the BBB and thus improve neurological recovery in CNS disorders, the Pernet/Chan laboratory aims to deliver antibodies intranasally into the CNS and develop antibodies that can overcome the BBB. These new strategies are being tested in animal models for multiple sclerosis and Alzheimer's disease.

Chronobiology of epilepsy:
The aim of this project is to characterise the circadian mechanisms that influence the timing of seizures in a mouse model of temporal lobe epilepsy. For this purpose, long-term recordings are made over several weeks in mice exposed to different light-dark environments.

NeuroTec

A new interdisciplinary platform for researching and developing flexible and cost-effective technologies for the prevention, diagnosis, monitoring and treatment of neurological diseases

Most neurological diseases such as epilepsy, Parkinson's disease, sleep-wake disorders, multiple sclerosis, Alzheimer's disease and strokes are chronic. Current hospital and appointment-based patient care often focuses on snapshots of a patient's health status at relatively long intervals. Therefore, at present it is hardly possible to adequately record the dynamics of chronic neurological diseases over a longer period of time, for example, or to react promptly to the effects of therapeutic interventions.

At NeuroTec, an interdisciplinary research and development platform at the Swiss Institute of Translational and Entrepreneurial Medicine (sitem-insel), operated by the Department of Neurology in close collaboration with the ARTORG Centre, an interdisciplinary team of doctors, engineers and data scientists is striving to fill the information gaps in today's healthcare system. NeuroTec consists of an instrumented apartment, the NeuroTec Loft, in which patients can live for several days under conditions similar to everyday life. It includes laboratories for recording electrical brain activity (EEG), conducting sleep tests and monitoring circadian activity under the control of external influences (light/sound), as well as rooms used by the research groups involved to evaluate the experiments.

In addition to drug studies, new devices and methods are being tested that make it possible to record digital biomarkers in patients' everyday out-of-hospital lives. The aim is to better monitor the course of the individual disease and thus improve the personalised prevention, diagnosis and treatment of neurological diseases.

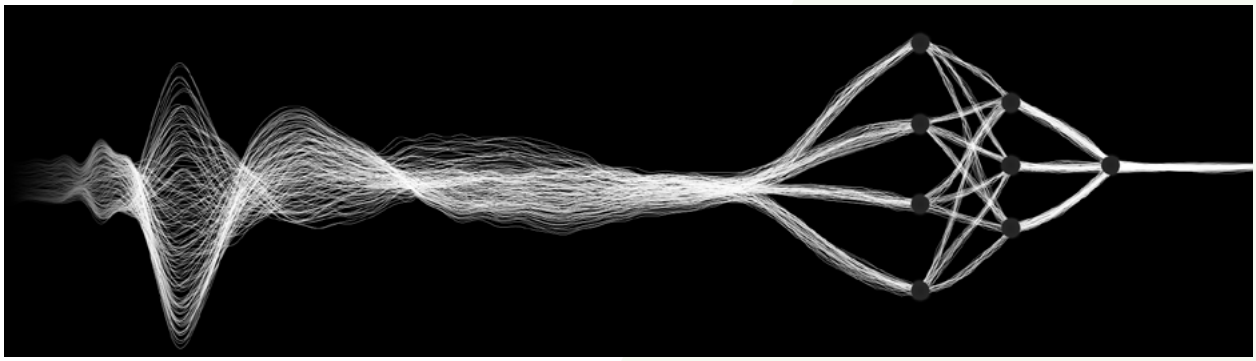
Director: Prof. Dr. med. Dr. sc. nat. Kaspar Schindler
Deputy: Prof. Dr. Tobias Nef

The NeuroTec apartment

New algorithms for neurology

The amount of data collected in the Neurology department is constantly increasing. Precise measurements of neuronal activity are needed to better diagnose diseased brains. In conjunction with the increase in the quantity and precision of the data collected, there is an urgent need for new methods of analysing such data. Artificial intelligence has powerful tools that can be used to extract patterns from large and complex amounts of data. However, existing techniques are usually geared towards specific applications such as the analysis of images or texts. Applying these to neurological data is not always easy.

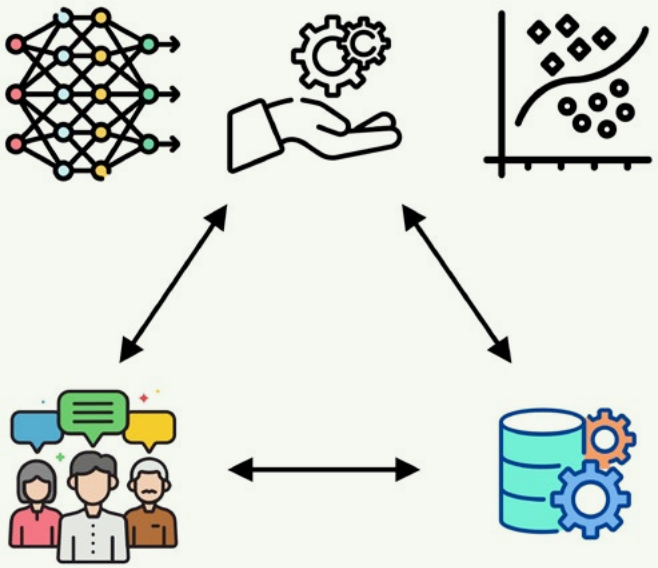
NeuroTec develops powerful algorithms to analyse brain activity signals, such as those recorded by electroencephalography (EEG). The aim is to gain new insights into the functions and dysfunctions of the brain. These algorithms must also be interpretable so that people can understand their decisions.



Mix of EEG signals and deep neural networks

Paper on disentangling the complex landscape of sleep-wake disorders with data-driven phenotyping, 2023

Paper on NeuroTec Sitem-Insel Bern, 2021



Artificial intelligence (AI) is revolutionizing medical research. In particular, the exchange of ideas and expertise across different disciplines is indispensable. The interdisciplinary nature of the team is a strength, as the experiences of clinicians contribute to the further development of models, enhancing their robustness and reliability. These models are applied to carefully curated and collected datasets. The high quality of these datasets is another crucial piece in strengthening the models used. This demonstrates how AI-based technologies can not only advance research but also directly contribute to the improvement of patient care.

images: Flaticon.com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