

University Department of Ear, Nose, Throat,  
Head and Neck Surgery

## Annual Report 2011

 **INSELSPITAL**

UNIVERSITÄTSSPITAL BERN  
HOPITAL UNIVERSITAIRE DE BERNE  
BERN UNIVERSITY HOSPITAL



# Dear colleagues and friends,

The University ENT Department is an internationally recognised centre of competence for diagnosis, treatment and research in diseases of the head and neck. It collaborates closely with the Institute for Surgical Technology and Biomechanics and the ARTORG Center of the University of Bern.

The research priorities are computer-supported surgery and the highly specialised field of cochlea implantation (CI) in cases of severe hearing difficulties. Bern's CI robotics project was awarded a prize by the

Commission for Technology and Innovation (CTI). The «direct acoustic cochlear stimulation» implantable hearing device, initially developed in Bern, has been further developed and used in international studies.

Despite extensive building alterations made to the ENT operating theatres, patients received top quality care at all times. In addition to the new theatres, a multimedia operating room was fitted out for use for training and for minimally invasive endoscopy and microscopy surgery.

The autumn saw the launch of the «singing voice» interdisciplinary course leading to a Certificate of Advanced Studies (CAS) in cooperation with the Music Department of the Bern University of the Arts. The aim of the CAS – which is unique in German-speaking Europe – is to provide the best possible support for professional singers from the point of view of teaching, therapy and medical treatment. The interdisciplinary project to assess the family–dynamic aspects of stuttering was completed; this succeeded in placing the fluency disorder «stuttering» in the context of a communication disorder within the family.

Alongside numerous scientific publications, the publication of a book on bone-anchored hearing aids was a highlight of 2011.

I hope this brochure will give you an interesting insight into our clinic and the fascinating subject of ENT medicine. My warmest thanks to the entire ENT team.

Best wishes,



Prof. M. Caversaccio  
Clinic director



# Staff

## *Clinic Management*

**Prof. M. Caversaccio**

**Director and Chairman**

Prof. P. Zbären

Co-Chairman

Prof. M. Kompis

Head of Audiology

Prof. E. Seifert

Head of Phoniatics

Ms R. Sollberger

Head of Nursing

Mr B. Werle

Head of Theatre Nursing



### *Senior Registrars*

Prof D. Vibert	Head of Otoneurology
Dr A. Arnold	
Dr U. Borner	as of 01.10.2011
Dr P. Dubach	
Dr M. Hagemann	until 31.03.2011
Dr S. Heimgartner	until 30.09.2011
Dr B. Landis	
Dr G. Mantokoudis	until 30.09.2011
Dr P. Schmid	until 31.12.2011
Dr J. Schüpbach	until 31.12.2011
Dr P. Senn	
Dr K. Strub	Deputy Consultant Audiology

### *Consultants*

Dr F. Schönenberger	Manual Medicine
Dr M. Vischer	Cochlea Implantation

### *ARTORG-Professur*

Prof C. Stieger	Artificial Hearing
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# Departments and Units

## *Organisational units*

Audiology	Head: Prof M. Kompis
In-patient ward	Head: Ms R. Sollberger
CI service	Head: Dr P. Senn
ENT surgical ward	Head: Mr B. Werle
Otoneurology	Head: Prof D. Vibert
Phoniatrie	Head: Prof E. Seifert
Out-patients	Head: Dr S. Heimgartner to 30.04.2011 Dr P. Dubach as of 01.05.2011
Tumour surgery	Head: Prof P. Zbären

## *Consultations*

Manual medicine	Prof E. Seifert, Dr F. Schönenberger
Disorders of smell and taste	Dr B. Landis, Dr P. Dubach, Prof M. Caversaccio
Otology	Dr P. Senn, Prof M. Caversaccio
Otoneurology	Prof D. Vibert
Paediatric audiology	Dr K. Strub
Rhinology	Dr B. Landis, Dr P. Dubach, Prof M. Caversaccio
Sleep and snoring	Dr P. Schmid
Tinnitus	Dr G. Mantokoudis until 31.09.2011 Dr A. Arnold from 01.10.2011
Tumours	Prof P. Zbären, Dr A. Arnold
Tumour board	Prof P. Zbären, Dr A. Arnold

# Patient statistics 2011

## Out-patient consultations

ENT outpatient department	12 722
Audiology & CI service	4 725
Phoniatics & logopaedics	4 246
Otoneurology	466
<b>Total</b>	<b>22 159</b>

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## ENT in-patients

<b>Total ENT in-patients and day care</b>	<b>1 412</b>
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## Patient operations

Elective Patients: Children	183
Elective Patients: Adults	1 146
Out-patients with premedication	33
Out-patients without premedication	152
Emergencies: Children	72
Emergencies: Adults	253
<b>Total patient operations</b>	<b>1 839</b>

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# Research: Publications 2011

In 2011 numerous scientific studies conducted at the University ENT department at the Inselsspital appeared in leading scientific journals or were presented at international and national congresses. Below is a selection; the complete list is available on the internet at [www.hno.insel.ch/Jahresbericht.html](http://www.hno.insel.ch/Jahresbericht.html)

## *50 scientific publications*

Including:

- Dubach P, Caversaccio M. Images in Clinical Medicine: Amalgam Tattoo. N Engl J Med 2011;15:364
- Senn P, Häusler R, Panosetti E, Caversaccio M. Petrous bone cholesteatoma removal with hearing preservation. Otol Neurotol 2011
- Pfiffner F, Kompis M, Flynn M, Asnes K, Arnold A, Stieger C. Benefits of low-frequency attenuation of baha® in single-sided sensorineural deafness. Ear Hear 2011; 32(1) : 40-45

Plus another 47 publications (see [www.hno.insel.ch/Jahresbericht.html](http://www.hno.insel.ch/Jahresbericht.html)).

## *1 book*

- Kompis M, Caversaccio M (Eds.): «Implantable bone conduction hearing aids» Advances in Oto-Rhino-Laryngology, Vol 71, Karger, Basel, ISBN 978-3-8055-9699-2

## *3 patents*

- Schütz D, Guenat JM, Stieger C et al: «Methode for Implanting an Access Port», US61/411018, Priority date 08.11.2011
- Schütz D, Guenat JM, Stieger C et al: «Implanted Access Port», 2010, WOEP057860, Priority date: 04.06.2011
- Schütz D, Guenat JM, Stieger C et al.: «Implantable vascular Access», EP2286849, Date of publication: 23.02.2011

## *152 lectures and poster presentations*

Funded by third parties 2011

Project name, <i>Leader</i>	Funding source	CHF
<b>High precision robots for implantable hearing devices</b> <i>Caversaccio, Stieger Weber et al.</i>	CTI	330 553
<b>CO-ME Otorhinolaryngology</b> <i>Caversaccio et al.</i>	SNSF	217 500
<b>Novel Body Access</b> <i>Stieger, Frey et al.</i>	CTI	196 698
HNO/Nephro		
<b>Otolith Function</b> <i>Vibert</i>	Carigest	120 000
<b>Innovative Operating Theatre</b> <i>Caversaccio</i>	SNSF	50 000
<b>Cochlear Microendoscopy</b> <i>Huth</i>	SNSF	37 000
<b>Future Vertigo Assessment</b> <i>Mantokoudis</i>	SNSF	10 000
<b>BAHA</b> <i>Kompis</i>	Cochlear AG	18 600
<b>Ear stem cells</b> Senn	Medel GmbH	20 000
	Stiftung für Hörgeschädigte	10 000
<b>VoIP Internet Telephony</b> <i>Mantokoudis, Senn et al.</i>	Cochlear AG	20 000
<b>Intraoperative Test System</b> <i>Stieger et al.</i>	Cochlear AG	14 600
<b>Miscellaneous Contributions</b>	Various	3 900
<b>Total</b>		<b>1 048 851</b>



## Prizes and other distinctions

- Caversaccio MD, Stieger C, Bell B, Arnold A, Salzmann J, Gerber N, Roder S, Gavaghan K, Williamson T, Paci F, Nauer C, Hamacher V, Weber S  
Best Poster Award, CTI Medtech Event 2011, Bern 23.08.2011 for the poster: High-Precision Robot for Implantable Hearing Systems
- Stieger C: CTI Medtech Award 2nd rank, nominated out of 50 projects, «Novel Body Access», Bern 23.08.2011

## Scientific collaborations

- ARTORG Center of the University of Bern and University Hospital (Inselspital) ([www.artorg.unibe.ch](http://www.artorg.unibe.ch))
- Computer-aided and image-guided medical interventions ([www.co-me.ch](http://www.co-me.ch)), National Center of Competence in Research of the Swiss National Science Foundation
- University clinic for nephrology and hypertonia, Inselspital Bern
- Bern University of Applied Sciences, Engineering and Information Technology, Burgdorf, Department of Electrical Engineering
- Bern University of the Arts, Music Department

Universität Bern  
University of Bern  
Fakultät für Informatik  
Institute for Robotics and Intelligent Systems

Inselspital  
University Hospital  
Fakultät für Medizin  
Department of Otorhinolaryngology

CTI Medtech Event 2011

### High-Precision Robot for Implantable Hearing Systems

**RTI Project:** 802

**Industrial partner:** Phonak Acoustic Implants SA

**Project goal:** Clinical feasibility of a robotic system for minimally invasive access to the middle ear

**Key findings:** Clinical accuracy of the robotic system assessed through a cadaver study

**Authors:** C. Stieger, W. Bell, A. Arnold, J. Salzmann, N. Gerber, S. Roder, K. Gavaghan, T. Williamson, F. Paci, C. Nauer, V. Hamacher, S. Weber

**Main applicant:** Prof. Dr. B. Caversaccio/University of Bern

**Start:** June 1st, 2009 (2 years duration)

**Project start:** June 1st, 2009 (2 years duration)

**Project summary**  
The treatment of profound hearing impairment is often very invasive through a mastoidectomy of hearing devices which is associated closely with the surgical and acoustic treatment of hearing. One major drawback of these devices however, is that a mastoidectomy (removal of tissue in the region just behind the ear) must be performed during mastoidectomy to provide safe and effective surgical access to the middle ear. The aim of the CTI Project is to reduce the frequency of device implantation through the development of a high precision robot and supporting systems which will allow the surgeon to access the middle ear cavity with a minimally invasive approach.

**Commercial Aspects**  
Myriad Products

**Experimental Validation and Results**  
The overall clinical accuracy of the robotic system, including mapping and planning phase, was tested in a cadaver study using cadaveric whole head specimens as shown in the following images.

Estimation	Target	Target	Time (sec)
Max	0.87	1.236	7.500
Avg	0.821	0.826	13.000
Min	0.45	0.56	0.66
SD	0.21	0.41	0.42

**System Description**  

- High resolution movements (1 um)
- Robotic hand motion (flexion, extension)
- High accuracy imaging, planning and tracking
- 6DOF navigation
- Lightweight construction (2.5 kg)
- Hapticless optimized for DR use
- Limited cables for easy clean setup

**Quality**

- Mapping by DR table reduces possibility of air bubbles
- Reducible position measurements (force and contact)
- Full safe braking system

**Economic Impact**  

- Reduced direct monetary cost of care due to the possibility of alternative planning the way the procedure is performed. It thereby reduces the efficiency in the DR unit (reimbursement for the health insurance system)
- Low cost robot
- Smaller installation
- Shorter installation procedure
- Higher surgeon confidence
- More comfortable and precise
- Easy integration into existing CT

Phonak  
Acoustic Implants SA

Universität Bern  
University of Bern  
Fakultät für Informatik  
Institute for Robotics and Intelligent Systems

Inselspital  
University Hospital  
Fakultät für Medizin  
Department of Otorhinolaryngology

Winner CTI Swiss Medtech Best Poster Award 2011

CHF 5,000 - Available to the winner for the purchase of a CTI product developed for the event.

# Teaching

## Lectures and courses at the University of Bern

- Introductory course, Masters in Human Medicine, ENT lectures, 4th year medicine (Prof M. Caversaccio with other lecturers)
- Final course 1, ENT lecture and clinical training, 5th year, (Prof M. Caversaccio with other lecturers)
- Lecture on biomedical acoustics (Prof M. Kompis, Prof C. Stieger)
- Clinical skills, physical examinations, 3rd year (Dr P. Schär, Dr S. Negri, Dr J. Jermini, Dr B. Greusing)
- ENT lectures for students of dentistry (Prof M. Caversaccio with other lecturers)
- Elective internships for 1st and 2nd year students: (Sonography, Prof E. Seifert; Otoacoustic emissions, Prof M. Kompis; Brainstem audiometry, Dr M. Vischer)
- Lectures for Masters course in biomedical engineering (Prof M. Caversaccio with other lecturers)
- Station designers and expert examiners for university and federal ENT OSCE examinations HNO (Prof E. Seifert with other lecturers)



## Lectures and courses at other universities

- University of Fribourg, Faculty of Arts and Humanities, Institute of Special Education: Audiology for speech therapy students (Prof M. Kompis)
- University of Fribourg, Faculty of Arts and Humanities, Institute of Special Education: Phoniatics I for speech therapy students (Prof E. Seifert)
- University of Fribourg, Faculty of Arts and Humanities, Institute of Special Education, Fluency disorders for speech therapy students (A. Zimmermann)
- University of Fribourg, Faculty of Arts and Humanities, Institute of Special Education: Voice disorders and disorders in voice quality, for speech therapy students (Speech therapy team)
- Lucerne University of Applied Sciences and Arts: Music department: The voice phenomenon – physiology and development (Prof E. Seifert)
- Bern University of Teacher Education (PH): Vox adolescentis: Physiology and development of the voice (Prof E. Seifert)
- University of Neuchâtel, Faculty of Arts and Humanities; Speech-Language Pathology Teaching and Research Unit: Audiology I: Anatomy, Physiology, Embryology, Phylogenetics, Acoustics (Prof D. Vibert)
- University of Fribourg, Physiology Unit: APP seminar «Sleep apnoea», 3 lessons for 2nd year students of human medicine (Dr M. Vischer)
- Bern University of Applied Sciences, MedInf Medtec Masters course: Implantable hearing devices (Prof C. Stieger, Dr P. Senn)
- Advanced course at the for teachers of singing and voice therapists at the Music Department of the Bern University of the Arts in cooperation with the Inselspital, Bern: Singing voice CAS – recognising, alleviating, avoiding dysfunctions. (Prof E. Seifert with other lecturers)
- Thurgau University of Applied Sciences, Kreuzlingen; Lecture for state qualified speech therapists: The stuttering child at school (A. Zimmermann)

## Advanced training events

- 29.01.2011 Infections and complications in the ENT area in children: Update 2011, University Departments of ENT and Paediatrics, Inselspital Bern
- 24.02.2011 Audiometry course, Module 1 (Prof M. Kompis)
- 31.03.2011 Otology update
- 16.04.2011 «Pop-Belcanto», «Stimmwelten», (World Voice Day) (Prof E. Seifert)
- 02.05.2011 Cochlear research meeting – University of Bern: «DACs activities at the University of Bern» (Prof C. Stieger)
- 16.05.2011 «CAS Course» for future engineers at the Master's course of the University of Bern with ARTORG and BrainLAB (Organiser and course leader: Dr P. Dubach)
- 20.05.2011 - Stuttering in Children: the Bern model  
21.05.2011 (phoniatics)
- 26.05.2011 3rd Baha Specialist Roundtable, ARTORG Center Bern
- 29.08.2011 - Otological microsurgery course with emphasis on minimally  
31.08.2011 invasive techniques (Organiser: Prof M. Caversaccio)
- 02.09.2011 - Advanced training for speech therapists, teachers of singing  
03.09.2011 and other voice-connected professions:  
AAP (Phonation adapted to the breathing rhythm)  
Lecturer: Uwe Schürmann, Inselspital Bern (I. Schaller Gilg)
- 08.09.2011 - Endoscopic Course for Paranasal Sinus and Skull Base Surgery  
10.09.2011 (Organiser: Prof M. Caversaccio)
- 16.09.2011 Visit by Swiss Association of Science Journalism:  
«Implantable Hearing Devices» (Prof C. Stieger)
- 08.12.2011 «The olfactory cleft and its pathologies – A rising star in  
rhinology» (Dr B. Landis)
- 16.12.2011 Farewell symposium in honor of Prof P. Zbären
- 22.12.2011 Visit to the ENT clinic by the Bernese cantonal government
- Monthly meeting on mortality and morbidity of the University of Bern  
ENT Department (Dr A. Arnold)

# Nursing care in in-patient wards and the out-patient setting

2011 was a year of preparation both for new systems and for short training courses. Easy-learn courses to introduce i-pdos (electronic patient data gathering) and tacs (to record nursing activities) started in autumn. Easy-learn was also used to train nursing staff about the new system of DRG (diagnosis related groups) flat rates per case.

Back-up research on DRG was conducted here as well. We introduced nursing rounds in the clinics, which demonstrably boosted cooperation both within and between professions.

The patients also greatly appreciate the rounds. In cooperation with the Quality department we introduced identification armbands to improve patient security. To avoid postoperative nausea and vomiting, we have started using acupressure armbands.

Ms R. Sollberger



# Operating Team

2011 was to a considerable extent dominated by the planning and implementation of building alterations to the Ear Nose and Throat operating theatres.

Our operating rooms were completely refurbished between the end of May and the middle of September. The alterations were completed within the planned time frame. The operating team faced a huge logistics challenge. At times we were operating at up to 5 different locations at once.

Thanks to careful planning we were able to relocate most of our operations to the gynaecology department, the hand surgery operating theatres and the paediatrics department. On occasion we also used the operating areas in the neurosurgery department and in the ophthalmic clinic.

Great demands were placed on us to have all the necessary instruments ready at the right time in the right place. This repeatedly pushed our team to its limits. Here we would like to express our heartfelt thanks to all of those who gave us their energetic support at this time. We must thank especially the operating teams of the other departments of the Inselspital and the central sterilisation department. Thanks to their great dedication it was even possible to operate on significantly more patients than originally planned during the rebuilding period.

ENT/CMR theatre team

Mr B. Werle

Mr T. Hofmann



# Smell and Taste Outpatient Clinic

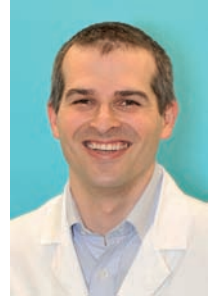
Dr B. Landis, Dr P. Dubach, Dr H. Friedrich

Smell and taste disorders are widespread, with approximately 5 % of the population thought to be sufferers.

Unfortunately in most patients the disorders remain untreated because there is a lack of comprehensive and easily available information about them.

The goal of our smell and taste outpatient clinic is to provide a comprehensive assessment of patients suffering from smell or taste disorders. In addition to a thorough ENT examination we perform extensive olfactory and gustatory examinations and tests. We not only establish a diagnosis, but we provide follow-up and treatment for patients with olfactory and gustatory disorders.

A second important activity of our smell and taste outpatient clinic is research. Alongside clinical studies on how to cure olfactory and gustatory disorders, our laboratory also focuses on research into the use of electrophysiology to provide objective measurements of olfactory and gustatory disorders. The aim is to be able to better locate the disorders through evoked responses and electroencephalography.



Patients contact: ENT outpatients (no referral needed)





# Contact

## Administration of the University Department of ENT

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Director and Chairman

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