Department of Dermatology, University Hospital Inselspital, University of Berne, Switzerland

Background
- The Department of Dermatology is part of the University Hospital Inselspital in Berne. The Inselspital belongs to a private foundation, die Insel Stiftung, which has an agreement with the State of Berne to provide a tertiary health care center and University teaching Hospital to the population of the State of Berne.
- The Department of Dermatology serves as tertiary referral center and University Hospital for skin and sexually-transmitted diseases. Patients come non-only from the State of Berne, but also from all neighbouring states and the rest of Switzerland. More than 20% of the treated patients comes from outside the State of Berne

Structural organization, medical staff and nurse team
- Our Department consists of an in-patient sector with 25 beds, an out-patient sector with several specialized clinics, a day-hospital for complex cases, a phototherapy unit, a surgical unit, a laser platform, and, finally, a dermatopathology unit.
- The medical staff consists of 9 senior physicians and 9 junior physicians. There are currently three professors and two senior lecturers. Furthermore, there are 8 part-time board-certified consultants.
- There is a tight collaboration with a specialized out-patient and in-patient nursing team. The latter takes particular care in ensuring the best education and practice quality in nursing. The nursing activity for in-patients ward has earned an ISO accreditation attesting at the quality of the standards of the provided nursing practice.

Patients and technical statistics
- The number of patients hospitalized is approximately 500 per year. There are per year up to 20’000 ambulatory patients, 3’500 patients followed in the day-hospital, up to 5’500 phototherapy treatments and 2’000 surgical procedures. The dermatohistopathology unit processes and analyses approximately 20’000 skin biopsy specimens per year and is the largest dermato-pathology unit in Switzerland.

Objectives
The main goals are
1. to provide high level medical care and service by offering a number of specialized ambulatory consultations as well as appropriate evaluation and management of patients
requiring hospitalization. Respect of patients’ dignity and ethical issues are a constant preoccupation in patients’ treatment.

2. carry out translational clinical and basic research. The ultimate objective is to ensure better patient care, state of the art therapy and to have a better understanding of disease mechanisms.

3. pre-graduate and postgraduate teaching of medical students, physicians and specialists in dermatology and venereology.

Overall, the Department would be very enthusiastic and highly motivated to share with other Partners experience in both clinical evaluation, management and treatment of patients with skin diseases as well as to develop in collaboration clinically-oriented or basic investigative research projects.

Our interest is currently focused on the evaluation and management of:

1. **Skin cancers**, with clinical evaluation, management and systematic follow up with video-microscopy and digital imaging of melanoma and non-melanoma skin cancer patients;
2. **Dermatosurgery** with development of the **Mohs micrographic surgery**;
3. **Chronic wounds** in elderly and in children (with tissue-engineered skin equivalents and novel wound dressings);
4. **Pigmentation disorders** (Excimer laser therapy and development of melanocyte transplantation approaches);
5. **Inflammatory (psoriasis and atopic dermatitis) and autoimmune skin blistering disorders** (use of novel biological treatments);
6. Skin **vascular lesions and malformations** (Cynergy vascular laser);
7. **Chronic venous disorders and nail diseases** (with both conservative and surgical treatments).

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*The following part summarizes our specialized ambulatory consultations offered in our Department and highlights some areas of clinical and research interests*

**Melanocytic skin cancer consultation (PD Dr. Dr. R. Hunger)**

- The incidence of malignant melanoma is rapidly growing. The current incidence rate in Switzerland is 20 new cases per 100’000 inhabitant leading to over 200 melanoma
related deaths each year. While early stages are treated by surgical excision, late stages have a poor prognosis. To best follow up patients with malignant melanoma and to recognize these tumors at early stages we have two specialized consultations:

1. melanoma and melanocytic skin tumors clinic

2. Our patients with atypical moles and malignant melanoma are clinically regularly followed up. This is important to exclude disease progression as early as possible. Since patients with melanoma have a relatively high risk to develop a second melanoma, regular examination of the whole skin is essential.

3. dermoscopy/videomicroscopy clinic

4. Patients with multiple dysplastic nevi or other patients at risk for melanoma are regularly evaluated using a digital dermatoscopic system (Fotofinder). The latter allows to detect even slightest changes in the pigment pattern of the lesions, increasing the sensitivity and specificity of diagnosis.


Non-melanoma skin cancer (NMSC) consultation (PD Dr. Dr. R. Hunger, Dr. Dr. L. Parmentier)

The importance of Non-Melanoma Skin Cancers (NMSC) such as basal cell carcinoma and squamous cell carcinoma and thus of dermatosurgery is steadily increasing. This is related first to the increase of skin cancers (4 – 8 % in Europe per year) due to the life style (sun exposure) and the aging of the population. Second, there is a growing demand of skin surgery techniques ensuring good aesthetic results. Switzerland has the highest incidence of NMSC. Since the Inselspital is one of the Swiss reference sites for organ transplantation, we are also strongly implicated in managing skin tumors in this high-risk organ-recipient population. Our clinic is thus committed toward the management of skin tumors of peculiar complexity.

To deal with this challenge, specific platforms are developed:

- multidisciplinary skin tumor consultations
- dermatologic surgery, with particular focus on MOHS micrographic surgery (see below)
- alternate therapeutic approaches, like photodynamic therapy (PDT), cryosurgery, non-invasive topical immunomodulatory therapies such as Imiquimod or 5-fluorouracil.
**Dermato-surgery clinic: Micrographic surgery (Mohs surgery) (Dr. A. Skaria, Dr. L. Parmentier)**

- Micrographic surgery is a technique, which combines the surgical act with an immediate intraoperative histopathological examination of the excised tumour. It allows to diminish recurrence rates of epidermal tumours from 10 – 20% with classical surgery to 1 to 4 % in Mohs Surgery. The major part of treated tumours are mostly epidermal tumours but a modified technique called slow Mohs surgery also allows to treat certain forms of skin sarcomas and malignant melanomas. These techniques are a golden standard in the USA.

- Our department is one of the only centers in Switzerland, which provides Mohs Surgery. This approach has been developed by dr. A.M. Skaria, who is currently the acting director of the dermatosurgery committee of the Swiss Society of Dermatology.


° Skaria AM. Rotation flap reconstruction for nasal tip defect after mohs surgery. Dermatology. 2006;213:118-22

° Skaria AM. The modified chondrocutaneous advancement flap for the reconstruction of helical defects of the ear. Dermatol Surg. 2008 ;34:806-10

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**Psoriasis consultation (Prof. N. Yawalkar)**

Psoriasis is a common inflammatory skin disease of variable severity with profound psychosocial implications and morbidity. Evidence exists indicating that psoriasis may also be associated with serious comorbidities such as metabolic syndrome and cardiovascular diseases. The underlying pathomechanism is still not fully understood and probably involves a complex dysregulation of the innate and acquired immunity. Recent insights into the immunopathogenesis of psoriasis provide new therapeutic opportunities, e.g. with biologic treatments.

In our specialized clinic we offer the following:

- Topical and systemic treatments including phototherapy, traditional systemic agents and tumor necrosis factors inhibitors (etanercepts, infliximab, adalimumab) are routinely used.
- Interdisciplinary (dermatologist, psychologist, nutritionists) medical education courses for affected patients, a unique offer in Switzerland.
- Clinical research studies with testing of novel biologic treatments, and participation in phase 3 trials.
- Basic investigative studies aimed at the characterization of the cellular infiltrate in psoriasis lesions (see research below)
Autoimmune skin blistering consultation (Prof. L. Borradori, Prof. T. Hunziker)
- Our Department has a specific interest and expertise in the evaluation, diagnosis and management of patients with severe and potentially devastating autoimmune blistering diseases, such as bullous pemphigoid, cicatricial pemphigoid, epidermolysis bullosa, pemphigus and paraneoplastic pemphigus, which is unique in Switzerland.
- Our Clinic is involved as tertiary referral center for patients from all over the Country. Besides clinical management, we are directly involved 1) in clinical multicenter European studies aimed to characterize the clinical course, severity and prognostic markers in affected patients; 2) in the development of diagnostic tools such as ELISA for improved diagnosis and better follow up; 3) in basic investigative studies to assess the immunological humoral and cellular response in affected patients (see research part).
- For correct evaluation and classification of patients, we are able to provide in our or in associated laboratories all standard procedures, such as direct immunofluorescence microscopy studies, indirect immunofluorescence microscopy studies (with all kind of substrates), as well as immunoblot and immunoprecipitation studies using recombinant proteins. Finally, we have contributed to the development of several different novel diagnostic ELISAs.

Dermato-pediatric consultation
- Our Department has a tight collaboration with the University Children's Hospital in Berne. Dr K. Kernland Lang, consultant in dermatopediatrics, is involved in the evaluation of
children with genetic, infectious, metabolic and endocrine diseases and skin manifestations.

- There are two major areas of interest and expertise:
  - **vascular malformations** evaluated in the context of an interdisciplinary hemangioma board (together with Pediatricians, Angiologists and Pediatric Surgeons). The board takes advantage of the fact that the Department of Pediatric Surgery (prof. Z. Zachariou) is the reference center in Switzerland for large hemangiomas and interstitial laser therapy. Vascular lesions involving the skin are however managed in collaboration with our laser team;
  - management of chronic wounds in patients with inherited skin blistering disorders such as **epidermolysis bullosa**. We offer a specialized interdisciplinary evaluation of affected patients involving pediatricians, gastroenterologists, dentists, plastic surgeons, and dietitians/nutritionists as well as a diagnostic genetic workup in collaboration with various leading European molecular-genetic laboratories. We have a specialized team ensuring appropriate wound dressing care and physiotherapy of affected patients. Finally, we also provide information to people living with these disorders as well as their family members and friends.

**Laser Clinic (Dr. M. Adatto, Dr. K. Fritz, Dr. U. Büttiker)**

- The Laser Clinic treats both in- and out-patients and tightly cooperates with two experienced specialists to provide high standard clinical care taking advantage of their extensive database with more than 95,000 patients. Our two consultants are internationally highly respected specialists, who are directly involved in new developments of cutting edge technology with various American and European laser companies.
- Our laser center is equipped with most of the state of the art laser devices (e.g. Cynergy Lasers). Cooperation with specialists of other Departments (Angiology, Pediatrics, Pediatric surgery) allows interdisciplinary clinical management and research.
- Efforts are made to improve therapy algorithms by the use of lasers for a number of skin disorders, such vascular malformations, pigmentary disorders (vitrigo), psoriasis, eczema, allergies, acne, skin cancers and sun damage. Furthermore, we are also dealing with the study of the impact of laser wavelengths on tissue reaction including safety aspects, as well as aesthetic issues.
- With regard to **clinical research**, we are currently assessing the effect of distinct lasers on pigmentation disorders (Excimer, IPL), rosacea, psoriasis (Excimer and pulsed dye
laser). atopic eczema (light vaccination, multicenter trial with optomed), actinic keratoses (laser PDT) and acne (blue and red light laser sources).

The clinical staff consists of Dr K. Fritz, specialist in laser dermatology and vice-president of the European Society of Laser Dermatology (ESLD), Dr. M. Adatto, president of the European Society of Laser Dermatology and director of Skinpulse Geneva, and Dr U. Büttiker, one of the founding members of the Swiss group of esthetic dermatology and skin care.

- Fournier N, Fritz K, Mordon S. Use of nonthermal blue (405- to 420-nm) and near-infrared light (850- to 900-nm) dual-wavelength system in combination with glycolic acid peels and topical vitamin C for skin photorejuvenation. Dermatol Surg. 2006;32:1140-6

**Eczema and atopic dermatitis consultation (PD Dr. med. D. Simon)**

- Eczematous skin diseases are very common and concern over 20% of dermatologic patients. For instance, atopic dermatitis affects approximately 12% of children at the age of 6-7. Irritant and allergic contact dermatitis are common in adults often as occupational eczema. Eczematous skin diseases are characterized by an acute and/or chronic inflammation of the skin and intense pruritus Therefore, they have an enormous impact on the quality of life and are of medical as well as socioeconomic importance.

- We here provide all diagnostic and therapy facilities for patients with eczematous skin diseases. Diagnostic tests comprise blood and skin tests (patch test, skin prick test, atopy patch test, provocation tests) to identify exogenous and endogenous pathogenic factors. The treatment includes an adequate anti-inflammatory therapy including systemic therapy, skin care, skin protection, psychological advices, and pathogenic trigger avoidance strategies, including changes in occupational life. Furthermore, we offer medical education courses for atopic dermatitis patients.

Trichology consultation (Dr. P. de Viragh, Dr. N. Pelivani)
- We provide a specialized evaluation and care of patients with complex diseases of the scalp and hair. Expert evaluation and individualized therapy are mandatory when hair loss, hair structure alteration or scalp inflammation are treatment-resistant or when scarring occurs.
- To analyse in detail the features of the disease, a number of exams are carried out:
  - Microscopical analysis of hair samples (trichogram) to assess structural abnormalities, establish the rate of hair loss, or identify genetic influences.
  - Scanning electron microscopy is rarely also used to establish a definitive diagnosis of hereditary hair abnormalities.
  - Stereotactic photography and computer-assisted digital imaging (trichoscan) is used to evaluate treatment efficacy objectively.
  - Dermoscopic scalp evaluation.
  - Scalp biopsies for examination by light microscopy and immunohistochemistry.
- The scientific interest and experience in physiology and diseases of the pilosebaceous follicle is best attested by the numerous conferences and publications from the involved staff, as much as in ongoing research activities (e.g. treatment protocols for alopecia areata, chemotherapy induced hair loss).

° Ackerman AB, De Viragh PA, Chongchitnant, N. Neoplasms With Follicular Differentiation Lea & Febiger, Hagerstown, Maryland, U.S.A. 1993
° Trüeb RM, de Viragh PA; Schweizerische Arbeitsgruppe fur Trichologie. Status of scalp hair and therapy of alopecia in men in Switzerland Praxis. 2001;90:241-8

Nail clinic (Prof. E. Haneke)
- In a dermatological practice, 10 to 15% of the patients present because of nail disorders. Little is known about the management of nail patients since until recently little could be done for many nail diseases. Specifically, onychomycoses that affect up to a third of the elderly are still a problem with a complete cure rate remaining below 50%. Furthermore, treatment of nail psoriasis is still unrewarding. Despite the availability of effective systemic biological treatments, topical nail psoriasis therapy is unsatisfactory and does not meet our demands. The diagnosis of nail diseases is further hampered by the fact that very few dermatopathologists and pathologists are experienced with nail biopsies, since most physicians are afraid or hesitant to biopsy a nail organ. Finally, some nail
diseases require a specific surgical approach for treatment, but only few experts are able to perform skilled nail surgery.

- Evaluation with both conservative and surgical management is offered for inflammatory, infectious, tumoral and congenital nail diseases.


**Phlebology Clinic (Dr. A.A. Ramelet, Dr. U. Büttiker, Prof. T. Hunziker)**

- More than 50% of the adult population in Western countries are suffering from chronic venous disorders (CVD). Besides varicose veins, the most severe form of CVD, chronic venous insufficiency, occurs in 10% of the population, leading to dermatitis, pigmentation problems, dermatoliposclerosis, and leg ulcers, with high morbidity and health costs.

- Our department is specialized in the clinical evaluation, clinical investigation (plethysmography, cw-Doppler and colour duplex) as well as in both the conservative (compression, vеноactive drugs, physiotherapy) and surgical (sclerotherapy, echo-guided sclerotherapy, surgery) treatment of CVD. There is a tight collaboration with the Department of Angiology in Bern (Prof. I. Baumgartner, Dr. T. Willenberg), which is of fundamental importance for a throughout and multidisciplinary evaluation of patients.

- Management of chronic wounds is another speciality in our department with several specialized nurses for wound care. Lymphatic disorders (e.g. lymphoedema) are also treated.


**Chronic wounds clinic (tissue-engineered skin equivalents) (Prof. T. Hunziker)**

- Our Department has a large out-patient Clinic specifically dealing with evaluation and management of recalcitrant skin wounds with specialized nurses, providing the entire
offer of conservative (with all kind of the novel wound dressings) and surgical treatments (such as conventional skin grafting, complex grafting).

- The clinic is in the leading front in the development of biotechnologically developed treatments, including tissue-engineered skin equivalents. Specifically, our clinic has been directly implicated in the development of autologous epidermal skin equivalent derived from hair taken directly from affected patients (see research). The latter approach has been shown to be useful and cost-effective for the management of distinct chronic venous and mixed venous-arterial wounds. Its costs for patient's management are now covered by the health insurance system in Switzerland.


Dermatopathology Unit (Dr. I. Hegyi, Dr. R. Anex, Dr. L. Nievergelt)

- The Dermatopathology Unit is implicated in the histopathological examination and evaluation of 18'000 to 20'000 tissue samples per year (with 50'000 slides). Biopsy specimens are obtained from our and others Departments within the University Hospital and from dermatologists from all over the country.

- This sector provides the entire diagnostic spectrum for inflammatory, autoimmune and neoplastic skin diseases using conventional histological investigation, immunohistochemistry and molecular technologies (collaboration with the Institute of Pathology). One of our interest is the diagnosis of malignant melanoma (approximately 400 new cases per year), dysplastic melanocytic naevi, as well as cutaneous lymphomas. One of the greatest challenges in this area is the wide spectrum of existing inflammatory skin diseases and skin tumors, the number of which has been estimated to be approximately 1500.

The Dermatopathology sector is actively implicated in the pre- and post-graduate teaching courses. Furthermore, it ensures clinical-pathological correlation courses and meetings,