



**Karolinska University Hospital**

## **Burn Centre** **Department of** **Reconstructive Plastic Surgery**



**For additional information, or to schedule a study visit at the unit, please contact the Burn Centre or visit our website via the Karolinska University Hospital homepage.**

**[www.karolinska.se](http://www.karolinska.se)**

## **Modern Burn Care with the Highest Level of Patient Safety**

The Burn Centre at the Department of Reconstructive Plastic Surgery has been located at Karolinska University Hospital in Solna since 1962. Today our centre is the largest and most modern, specialized facility for advanced burn care in Sweden. In May 2004, the Burn Centre moved into new, state-of-the-art facilities designed to comply with high international standards for burn care.

The Burn Centre is in a class of its own, since our facilities include an outpatient clinic, two operating theatres, and seven beds equipped for advanced intensive care. Patients can be isolated, and temperature can be individually controlled as needed. The Burn Centre includes a room for family members with the possibility to stay over night.

Each patient room is equipped with special air control and ventilation, monitoring module, and anteroom to minimize the risk of spreading infection among infection-prone patients. Ventilation in patient rooms is specially designed to minimize airborne bacterial infections.

### **Surgical Team Comes to the Patient**

Severely burned patients may need surgery daily for an extended period. Operations for all of our patients take place at the Burn Centre. The heating and ventilation systems in the operating theatres are specifically designed to meet the individual needs of burn patients for higher room temperatures. Since the full range of services is available “on site”, we have eliminated the risks associated with transporting intensive care patients to surgical units at other locations.

The Karolinska University Hospital treats most burn patients (both adults and children) in Sweden, giving the Burn Centre a unique level of expertise.

## Mission: Burn Care

**The vision of the Burn Centre** is to be the leading Burn Centre in Scandinavia, providing advanced burn care of the highest international standard, guided by science and care for the patient.

**The goals of the Burn Centre** are to provide acute care for patients with burn injuries to the skin and underlying soft tissues, to treat and prevent organ failure, and to rehabilitate patients so they achieve a good quality of life.

### Who Are Our Patients?

Burn injuries can be caused by fire, hot water, hot gas, hot objects, electricity, and corrosive substances. Many minor burns can be treated at other departments and do not require specialized expertise. Major burns that require specialized care should be treated at special units that, according to international norms, should have a volume of around 100 patients per year.

The highly specialized Burn Centre at Karolinska University Hospital is available to treat burn patients needing specialized services. The centre also is a resource for patients with major soft-tissue injuries caused by trauma, advanced wounds resulting from impaired blood circulation, major soft-tissue infections, and life-threatening allergic conditions that break down the skin and cause damage similar to major burns.

Adult patients comprise the primary target group for the Burn Centre. The nature of our services requires a high level of around-the-clock readiness to deliver advanced care without delay.

Since the centre is located in Stockholm – representing the largest population centre and the largest number of burns and other major accidents in Sweden – most of our services are delivered to local patients. Close proximity to health care and family during the care episode are important quality aspects. The Burn Centre cares for approximately 100 adult patients annually, whereof 70% have



*Members of the Burn Team.*

*Photo: Harald Marx, Medicinsk Bild*

moderate to very severe burns according to the classification scale of the National Board of Health and Welfare (PM 1988:33). The average length of stay is approximately 14 days. During the past five years, the occupancy of the unit's four staffed beds has been just over 90%, which basically means full occupancy. The Burn Centre provides advanced intensive care, anaesthesiology, surgery, and intermediate care (more staff-intensive care than at a normal unit).

**Paediatric burns:** Our paediatric surgeons and plastic surgeons work in close collaboration to deliver care in the best way to children with burns. Around 300 children per year are treated for burns at the Astrid Lindgren Childrens Hospital, and they make 1200 visits to Burn Centre's outpatient clinic. Anaesthesia is delivered over 200 times per year. Around 50 children need to be anaesthetized, and just over 20 of these children require surgery for skin grafting. A few children require intensive care at the paediatric intensive care unit. They are treated at the Astrid Lindgren Childrens Hospital, which is one of the few facilities in Sweden with this expertise. Many children will also need surgery for their burn scars later in life. Hence, contact with the team is often maintained well into adulthood.

## The Burn Team – A Multidisciplinary Group of Experts

Burn patients require multiple specialists to achieve the best outcome. Burn teams include plastic surgeons, intensive care physicians, anaesthesiologists, nurses with special training in intensive care and anaesthesiology, and assistant nurses with special skills in advanced burn care. Along with other specialists, e.g. infectious disease specialists, occupational therapists, physiotherapists, dieticians, and social workers, the team provides the expertise that burn patients need. Burn care presents special challenges that require staff to be well-qualified, engaged, and compassionate. Many of the staff have extensive experience, and have been involved in designing the special methods that optimize care and increase the patient's chances for survival and a meaningful life.

The attending physician for a burn patient is always a plastic surgeon, but intensive care specialists are responsible for all intensive care patients. An agreement between the Department of Reconstructive Plastic Surgery and the Department of Anaesthesiology defines the distribution of responsibility in a unique way to assure the greatest possible security for patients, around-the-clock. The agreement complies with the safety standards for modern intensive care, and assures continuous development of expertise by the staff in collaboration with the main Intensive Care Department at Karolinska University Hospital.



*Operating theatre*

## Rehabilitation for a Good Life

Rehabilitation is started as soon as possible during the hospital stay and continues as needed at special rehabilitation facilities.

Patients are monitored during the rehabilitation phase, especially, their lung function, muscle strength, mobility, and sensation. Good rehabilitation helps the patient return to work and regain their normal lifestyle.

Some patients have residual problems such as scarring, pain, heat and cold intolerance, severe irritation, functional impairment, or activity limitations. To achieve maximum progress, some patients need several corrective operations over an extended period after sustaining a burn injury.

With support from the National Board of Health and Welfare, a centre for rehabilitation of burn patients has been developed in collaboration with the Institute of Rehabilitation Medicine at Karolinska Institute, where teams from the Burn Centre provide continuity in following up burn patients. Part of this follow-up involves measuring the patient's health-related quality of life.



*Paediatric burn clinic*

## Unique Treatment Options for the Most Severely Injured

The Karolinska University Hospital is currently the only hospital in Sweden to offer certain combinations of highly specialized burn care.

**The HBO unit** in Solna opened in April 2006. This new, state-of-the-art unit, often referred to as the pressure chamber is the largest of its kind in the world. To avoid brain injury, burn patients suffering from severe smoke inhalation and carbon monoxide poisoning may require hyperbaric oxygen (HBO) therapy. We are the only facility in the Nordic countries to offer HBO therapy in combination with burn care.

**The ECMO centre** at the Astrid Lindgren Children's Hospital is unique in Europe. Extra Corporeal Membrane Oxygenation (ECMO) is a treatment method for patients with respiratory and/or circulatory failure, and where traditional intensive care is insufficient. In severely burned patients with lung damage, the addition of ECMO therapy can be life saving.



*The HBO Unit (Pressure chamber) at the Karolinska University Hospital*

## Always Prepared – Special Expertise when Disaster Strikes

Since Karolinska University Hospital is Stockholm's largest trauma centre, we must be prepared to deal with disaster recovery around-the-clock, throughout the year. Burn care is a necessary element in this context. When disaster strikes, it is not unusual for many people to be affected at the same time and present with different combinations of injuries. These patients often need care in isolated rooms, which many intensive care units cannot offer. The outbreak of infectious disease may also require the type of care environment available at the Burn Centre.

The special services of the centre are also available to patients outside of the Stockholm region, e.g. we treated victims returning from the Tsunami disaster.

## Quality Improvement for the Patient's Benefit

Since 1993, all Burn Centre patients have been recorded in a local registry that now includes over 1200 patients. The registry collects data on diagnosis, anamnesis, length of stay, operations, pain at rest, infections, and antibiotic treatment during the inpatient stay. An annual report with feedback information from the registry is available to staff, payers, and other interested parties. Some of the data have been used in research and presented internationally.

Since June 2005, the department has used a structured quality improvement process aimed at assessing the possibility to certify the department in accordance with an international quality system, which have not been done previously. This effort requires the evaluation of every work element, establishment of clinical protocols, and systematic monitoring of patients. Data from the local burn registry serve as a basis for this work.



# Research, Development, and Education – A Continuous Quest for Excellence

## Research

The Burn Centre focuses on patient-oriented research aimed to benefit patients in the near future. Our research profile covers patient care during the acute phase, management of pain, and the patient's experience of pain. Other topics include the prevalence and prevention of infections, and stress reduction in intensive care patients, e.g. by adapting care to provide undisturbed time and the opportunity to recover between stressful treatments.

## Development

*Tissue engineering* is an exciting new field, which aims at cultivating various tissues and organs in laboratory environments. Our department has a strong tradition in skin and tissue cultivation – important aspects of advanced care for extensive burns. A small section of the patient's healthy skin is used to cultivate new skin that can be transplanted to the injured surface. Facilities for cultivating skin are located near the hospital and easily accessible.

## Education

During every academic term since year 2000, the Burn Centre has arranged courses in advanced burn life support (ABLS). The American College of Surgeons (ACS) and the American Burn Association (ABA) accredit these courses. They include guidelines for evaluating burn patients and their care for the first 24 hours following injury. Course instructors are from the Department of Reconstructive Plastic Surgery and have been trained in the USA. The courses mainly target physicians and nurses, and are also open to participants from all over Scandinavia.

Advising burn patients, ambulance staff, and staff from other healthcare facilities is an important educational role of the Burn Centre.



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