Sterile hydrogel dressings for application in plastic surgery and aesthetic medicine
HYDROGELS AS UNIQUE BIOMATERIALS

• Hydrogels are defined as two- or multicomponent systems consisting of a three-dimensional network of polymer chains and water that fills the space between macromolecules.

• HydroAid is chemical (true, permanent) hydrogel with covalent bonds linking the chains.

• One of the important properties of hydrogels is the ability to absorb aqueous solutions without loosing shape and mechanical strength, are commonly met in many natural constituents of a human body, like muscles, tendons, cartilage etc. Besides that, hydrogels usually exhibit good biocompatibility in the contact with blood, body fluids and tissues.

• Sufficient mechanical durability
INNOVATIVE TECHNOLOGY

- developed on Technical University of Lodz, in Poland

- aqueous composition natural and of synthetic polymers: povidone, polyethylene glycol and agar

- the polymerization and the radiation sterilization

- radiation engineering – due to absorption of ionizing energy are created long lasting chemical bonds between polymer chains.

- It is possible to start crosslinking reaction without other chemical components – technology is pure and safety and non toxic
New aids to cure old ills

Research and development to use radiation to synthesize and bond various materials has been going on since the 1970s. Some of these so-called "biomaterials" are now widely used medically, mostly to treat burns and other wounds, and already in hospital doorsteps are derivative devices that can be implanted in patients’ bodies to treat a variety of ailments and conditions. Radiation has opened the way to producing such materials. It is able to synthesize, mold, fabricate and sterilize them in a single operation, at any temperature and pressure, in viscous, solid and heterogeneous forms, and in complex phases at various doses. The Institute of Applied Radiation Chemistry at Poland’s Technical University in Lodz is one of several centres particularly active in recent years in developing a variety of new biomaterials, generally called hydrogels. Many products are in advanced stages of development and trials. A few have passed all the clinical tests and been approved by a number of national authorities, including the U.S. Food and Drug Administration (FDA).

The "Rosiai-method" for hydrogel dressings was developed by the Lodz group led by Prof. Janusz Rosiak. It won the gold medal in 1993 at the Brussels Eureka World Exhibition of Invention, Research and Industrial Innovation. Two Lodz hydrogels, one for dressing bedsores, burns and other wounds and skin grafts; the other for internal controlled release of prostaglandins to treat ulcers — are on the market in the Czech Republic, Germany, Hungary, and Slovakia. "Though we patented technology only in developed countries like Germany, the UK and the USA, it has been transferred within the framework of IAEA export missions and projects to developing countries like Brazil, China, Indonesia and Malaysia", says Rosiak who collaborates closely with the Agency. Hydrogel dressings prevent bacterial invasion from outside, while being permeable to drugs such as antimicrobials and allowing gases and water vapour to escape from the wound site. The material adheres well to the wounds and normal skin but, unlike stitches, can be removed painlessly. Lodz has other products at an advanced stage, including an artificial pancreas (the gland which produces insulin), grafts for blood and other vascular vessels, eye inserts to slowly release the alkaloid pilocarpine against glaucoma, and materials for dental surgery.
The technology of production of hydrogel dressing was awarded on International Exhibition of Innovation EUREKA in 1993 in Brussels.
In 1995 the technology of obtaining of hydrogel dressing was awarded in Nuernberg on International Exhibition IENA - Germany.
In 1996 the technology was awarded again on Technical Exhibition GENIUS, in Budapest.
• HydroAid is a modern dressing in the form of a homogenous, transparent, mechanically resistant pad of hydrogel based on a special net of three polymers, including over 90% of water, 3.0 mm thick.
• Thanks to this unique structure HydroAid dressing has many exceptional properties.
• HydroAid is a sterile, transparent, cooling hydrogel pad to be used after palstic surgery procedures, after aesthetic procedures like face injections or face lifts, peelings and dermabrasions. HydroAid can easily be cooled and recooled. It cools the skin, soothes the patient and absorbs exudate.

• It is useful as a standoff for ultrasound applications in cases of breached dermis or open wounds, or when a sterile and transparent hydrogel pad is necessary to improve visibility of examined tissue.
• HydroAid may be used during non-ablative laser procedures, as an elastic and transparent contact layer which cools and protects the epidermis from thermal injuries, thus improving the quality of the procedure and the patient's level of comfort.

• HydroAid may be used as a cooling hydrogel pad during procedures using lasers of various types (Q-switched, pulsation, half-conductive, KTP) with continuous-wave emission or with intense pulsed light-generating devices (IPL) with wavelengths of 500-1100 nm.
Non ablative laser procedures: laser epilation, tattoos removing
• Most of all HydroAid is used during non-ablative laser therapies such as: laser hair removal, tattoos, naevi, hyperpigmentation removal, flat vascular lesion and vascular spider pattern removal.

• The use of hydrogel during surgical laser procedures eliminates excess steam and smoke from coagulated tissues.

• During laser hair removal through hydrogel dressing, the laser head touches only the sterile hydrogel layers, thanks to which it is kept clean what has a positive influence on the procedure's hygiene, quality and safety.
Even before injection, Hydropad helps by cooling. It soothes the patient and lowers the threshold of pain considerably.
During injection, the pad can easily be recooled using a cold pack for a few seconds. After injection, it is again used on the forehead to recool and soothe the skin.
Hydrogel dressings have great skin cooling properties

Water vaporization is responsible for the cooling effect of the hydrogel products.

The effect is rapid, cooling occurs immediately.

The effect is long-lasting, as long as there is water within the polymer-structure, the cooling continues unabated.

Unaided, this works for about 10 to 15 hours. A few drops of water refill the hydrogel and let the process continue for a longer time.
Short term skin temperature graph

Blue – pre-cooled hydrogel at 8°C
Grey – hydrogel at room temperature
• HydroAid is a sterile, transparent, cooling hydrogel in form of an eye mask.

• It can easily be cooled and recooled. It assists the wound healing process and addresses swellings after surgical procedures (blepharoplasty) and around the eyes (after fraxal wrinkles removal).

• The mask is transparent to allow inspection of the wound and flexible and light-weight to fit closely to the wound.

• It supports the healing of injured tissue as well.
HydroAid® Eye Mask

Pack with 3 single-blister hydrogel masks

1 mask to be used directly after surgery (room temp. or 4° C)
   Wake-up phase
   Exudate and blood can be absorbed while cooling

2 masks to take home, cooling for the next 24-36 hours (room temp.)
   1 mask for the rest of the day of surgery
   1 mask for the next day

Alternatively:
   2 masks to be used alternatingly (4° C), while one mask is on the face, the other one is being re-cooled in refrigerator or with ice-pack.
The cooling effect

Water vaporization is responsible for the cooling effect of the hydrogel products.

The effect is rapid, cooling occurs within 15 to 30 seconds.

The effect is long-lasting, as long as there is water within the polymer structure, the cooling continues unabated.

Unaided, this works for about 10 to 15 hours.

A few drops of water refill the hydrogel and let the process continue for a longer time.
Drying

The mask dries out gradually (evaporation of water being the mechanism of action).

Under typical conditions, the drying starts after about 7-10 hours (depending on temperatures and humidity), it is completely dry after about 15-18 hours.

It is important that patients do not leave the mask on their face unnoticed for this time span (e.g., during night sleep).

If under any circumstances, the hydrogel should dry on the skin, one can re-moisturize it by applying large amounts of water and rubbing the water into the mask.
Only hydrogel dressing can keep moisture balance depending on the wound stage.

In case of dry wounds hydrogel gives the moisture into the wound.

When the wound exudate the hydrogel absorbs moisture into its structure.
HydroAid could be used as a standoff by USG procedures when the sterile pad is necessary, e.g. by a Doppler evaluation of veins through an ulceration.
Medical device class II b

- The content of one blister package is intended for single use
- Resterilization is not possible
- Any remaining materials should be discarded
- Shelf life: 2 years
- Store at temperatures between 4 – 25 °C
- Do not freeze
- Do not use the product, if the sterile packaging has been damaged
More than 20 years of experience in production of hydrogels