



The decisive step in
the use of freezing
technology

The unique method with a constant penetrating temperature

The unique method with direct contact between the liquid and the skin allowing a constant penetrating temperature of -89 °C

General advantages

- Low treatment costs
- Simple and secure handling
- Extremely precise application, with a constant penetrating temperature of -89 °C
- Fits in the hand like a pen
- Suitable for almost all skin-changes
- Accessories for special applications in gynaecology, proctology, urology, plastic surgery, dentistry, veterinary medicine, podiatry and aesthetics

The advantages of cryosurgery

- No destruction of biological function or structures
- Excellent cosmetic effects
- Almost no scar formation
- Non bleeding treatment, no anaesthesia required
- Practically painless, therefore suitable for children and sensitive patients
- The majority of symptoms disappear after just one treatment



Cryosurgery with «LIQUIDFREEZING» the liquid phase of nitrous oxide

- Very high refrigerating capacity
- Recommended application times
- Handy like a pen
- Simple and virtually painless treatment
- Effective treatment of all types of skin lesions

Fields of application

The top unit with different tips for specialities such as dermatology gynaecology, urology, surgery, dentistry, veterinary medicine and podiatry

More security, more efficiency and short treatment times

The following table shows just a part of the big number of possible skin lesions. The recommended application times are based on several tests and the experience of many users.



Indications	recommended application time in sec.
Acne	4-6
Age pigments	1-2
Basiloma	8-9
Cavernous angioma	4-6
Condyloma	8-12
Granuloma anulare	5-6
Hemangiolympangioma	6-8
Juvenile warts	3-4
Keloids	4-6
Keratosis actinica	5-7
Lentigo maligna	4-5
Lentigo senile	2-3
Nevus pigmentosus	8
Plantar warts	15-20
Seborrhoeic warts	6-8
Senile keratoma	7-8
Soft fibroma	4-5
Solar keratosis	4-5
Verruca vulgaris	8-10

It is possible that a longer application time or more than one treatment is necessary. It depends on the type of skin lesion, on the thickness of the skin and other factors. The application time is entirely up to the user and the personal experience.

Techniques

Techniques to generate low working temperatures

In dermatological cryosurgery, depending on the type of indication, working temperatures between -70°C and -196°C are most commonly used. There are different techniques to generate cold, for instance thermoelectric cooling, the release of compressed gas like CO_2 ($-78,5^{\circ}\text{C}$) and N_2O (-89°C) and different liquid gas mixtures. With the exception of N_2 , CO_2 and N_2O cold performance is between approx. -30°C to approx. -55°C .

Therefore, the operational area of these methods is strictly limited and not sufficient for many applications - especially tumours but also other lesions. The liquid phase of N_2O (with a constant temperature of -89°C) is extremely effective.

Technique of the cryosurgical treatment using the liquid phase of the Cryosuccess system

The Cryosuccess unit function is based on cold expansion, whereby liquid N_2O (nitrous oxide) is brought directly through a micro capillary to the area to be treated, under a remaining constant temperature of -89°C (184,4 K). Freezing of the tissue to a depth of 3 mm, by a diameter of 10 mm is reached after an application time of 12 seconds. Patients feel a light «tickle», similar to a mosquito bite. In the following days, normally a necrosis forms, peeling after approx. 10 to 14 days. Usually pigmentation comes back after a few weeks. However, the re-pigmentation could also take longer depending on the type of skin. Pain is usually not felt but of course, the sensitivity for pain is quite individual. Therefore, a higher sensitivity is possible when removing bigger lesions.

How is cryosurgery affecting tissue?

The formation of extra- and intracellular ice crystals in treated tissue is of great importance because this creates cell destruction with secondary consequences. In rapid freezing almost simultaneously extra- and intracellular ice crystals are created, (so called a homogenous nucleation), whilst slow freezing first creates only extra-cellular and only after a delay intracellular ice crystals, (so called a heterogenous nucleation).

In this context one speaks about three different phases, the physical, the vascular phase and the immunological. The direct destruction of tissue and cells by ice crystal formation (as well as secondary structure changes in thawing) during one or several successive freezing-thawing cycles is terminated in thawing.

Irritations of the micro-circulation in the frozen area for up to 48 hours leads to secondary tissue anoxie and more destruction especially in the fringe. Antigen characteristics in the physical phase of changed and released tissue particles could lead to secondary effects, outside of the treated area. Furthermore, modified factors, different tissue sensitivity, typical secondary effects and contra indications are added. Important factors are speed of the temperature decrease, lowest

reached temperature, duration of freezing, volume of the frozen tissue and lapse of time of thawing. The most effective way is quick freezing, followed by slow thawing. Thereby, 99 % of the cells per treatment are destroyed in vitro. In cryosurgery, cells are destroyed, but in a selective way and thus the connective tissue structures are preserved. This is of importance in comparison to other methods as the risk of scar deformation is much lower. Side effects can result. In dark or high tanned skin, cryosurgery treated areas could become depigmented (by a loss of cell-pigmentation). Re-pigmentation could take several years and solar radiation could cause stronger pigmented fringes to be evident. A great deal of information regarding the technique and the mechanism in the tissue can be found in the many published studies, abstracts and guidelines for cryosurgery. For detailed information the country specific medical association should be contacted.

The treatment

As with most treatments careful preparation is necessary.

The following points are important:

- Anamnesis
- Clinical aspects
- Pathological examinations
- Explanation to the patient
- Choice of the procedure
- Precautions
- Indications
- Execution of the treatment
- After-treatment check up

Prior to treatment the user should have a good knowledge of the method, the organs and the medical condition to be treated. User and patient should be aware of the possible success, and also the potential risks involved.





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LIQUIDFREEZING

The good choice!

Other than nitrogen, only the liquid phase (liquidfreezing) of nitrous oxide, which the Cryosuccess system uses, can reach a temperature of more than -80°C . Therefore, the system is perfectly suited for all cryosurgery interventions.

The refrigerating capacity and the very fast freezing time are rather impressive. Thousands of users all over the world are already familiar with «LIQUIDFREEZING» and would not like to miss such an easy to handle and successful tool.

Studies of the different methods of cryosurgery and also of the «LIQUIDFREEZING» can be found worldwide in large numbers.

«LIQUIDFREEZING» is a registered trade mark of UMP. Cryosuccess is fully produced and assembled in Switzerland by NMT, the partner company of UMP.

