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## Chronic wounds: Do they heal better with vacuum therapy?



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Most wounds will heal well within days or weeks, particularly in younger people, either on their own or with the help of stitches, plasters or bandages. But some wounds, for example open leg wounds and bed or pressure sores, can take months to heal. In the case of large wounds such as burns it is often necessary to take skin from another part of the body and transplant it onto the affected area so that it can heal.

A wound is considered to be chronic if it does not heal properly or keeps recurring. This might happen because of poor blood flow to the wound, for example in people with diabetes or as a result of constant pressure on one part of the body due to lying in the same position for a long time. You can read more about chronic wounds in our fact sheet (URL:

<http://www.informedhealthonline.org/index.235.en.html>).

## How vacuum therapy works

One option for the treatment of chronic wounds is vacuum-assisted closure therapy, which has been available since 1995. VAC is the trade name of one commonly used product. It is believed to work by exposing the wound to negative pressure, which aims to promote healing. Vacuum systems are used in some hospitals to treat chronic or large open wounds, for example following skin grafts. But people who have slow-healing wounds can also learn how to use the equipment themselves at home. The system can either be used around the clock or at regular time intervals. There are several systems, some of which are portable and operated by rechargeable battery.

As with any treatment for chronic wounds, the wound is first cleaned by removing dead tissue and secretions and then cleansing the area. Special sterile foam then goes on the wound and is held in place by an airtight film covering the area around the wound. The foam is used on the whole surface area of the wound, even in deep wounds. It is usually replaced every second day, or more often if the wound is infected. The foam has a tube in it. The tube is attached to a canister or small container, and that is attached to a small pump. The pump sucks blood and other fluids out of the wound, which creates an even negative pressure across the area of the wound. The vacuum aims to

increase the flow of blood to the wound. Keeping the wound moist is a further effect which is believed to be helpful.

People are unable to move around freely when using the machine and it makes a noise. Some patients find this annoying. Changing the foam and tube can cause pain and a small amount of bleeding. If the pressure goes too low it can be painful too. The machines have a built-in warning system to make sure that the pressure is kept at a normal level.

## How good is vacuum therapy?

In order to find out what the advantages and disadvantage of vacuum therapy are, researchers from the German Institute for Quality and Efficiency in Health Care (IQWiG), together with the Institute for Research in Operative Medicine (FOM) at the University of Cologne, evaluated the most relevant research in this area. They found 28 studies involving around 1100 patients.

Due to the poor quality of the research, however, it is not yet possible to reach clear conclusions about whether vacuum therapy is better than conventional wound therapy in certain types of patients or wounds. The studies were very different to one another, comparing vacuum therapy with a number of different types of treatment and in different types of wounds. A variety of dressing materials were used and, in some cases, additional procedures such as surgically removing dead tissue and foreign matter ("debridement") were applied. Most people who took part in the studies were treated in hospitals, so no conclusions can be drawn about the use of vacuum therapy at home.

Some of the studies suggested that vacuum therapy could reduce the size of wounds more quickly. This would mean that vacuum therapy has a small benefit compared to conventional therapy. Yet the studies did not provide enough information to reliably say whether vacuum therapy truly speeds up the healing process, causes fewer complications or less pain. It is also not possible to determine whether vacuum therapy is associated with adverse effects and, if so, what kind. The studies did not look at quality of life during and after treatment, patients' preferences, scars or cosmetic outcomes.

The IQWiG researchers came to the conclusion that vacuum therapy might have benefits for patients with some types of wounds, but there is not enough evidence

to determine whether vacuum therapy is generally better than other types of therapy in the treatment of chronic wounds. Larger trials looking at the possible advantages and disadvantages of vacuum therapy are needed.

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**Note**

This health information is a summary of a scientific report published by IQWiG. It is not an assessment of the right to have health care services reimbursed by statutory health insurance funds in Germany. By law, decisions about the reimbursement of diagnostic and therapeutic procedures can only be made by the German Federal Joint Committee (G-BA). The Federal Joint Committee takes IQWiG reports into consideration in its decision-making process. You can find information about the decisions of the German Federal Joint Committee on its English-language website, [www.english.g-ba.de](http://www.english.g-ba.de) (URL: <http://www.english.g-ba.de/>) .

## Glossary

### evidence

Evidence is what we call scientific proof from well-conducted, good-quality scientific trials that have been carefully designed to answer specific questions. Depending on the types of questions, different scientific research methods (types of study) are most appropriate to find reliable answers to these questions. Randomized controlled trials (RCTs), for example, are the best way to get reliable evidence on the effectiveness of medical treatments (interventions). This type of study, however, is not the best form of evidence for all possible questions, and does not provide the best answers to all kinds of questions, either. Epidemiological studies, for example, are very suitable for establishing well-founded proof for the spreading of a disease in the population.

### debridement

The word debridement comes from the French word "débrider", which means to remove extra fluid. In medicine, debridement is the cleaning or scraping away of dead cells and contaminated tissue out of a wound. This can be done with a scalpel, spoon or other instrument, and is called surgical debridement. It can also be done with a chemical made of particular proteins (enzymes), or it can be done "mechanically". "Mechanical" or physical debridement can be done with a special dressing. Excess wound fluid, cells, and germs stick to the dressing and are removed whenever the dressing is changed. Mechanical cleaning of a wound can also be done under the shower: the flow of water can remove germs and dead cells. Using wound-cleaning substances like hydrogen peroxide or moist dressings is another form of mechanical debridement. An old type of debridement that is coming more into use again is "biological" debridement, done with sterile maggots. The term debridement is also used for the surgical removal of stitches after a wound has healed.

### vacuum therapy

In vacuum therapy for wounds (also called vacuum-assisted wound closure or negative pressure wound therapy), negative pressure is applied to the wound. As with every chronic wound, first the surface and the edges of the wound are cleaned. After that dead tissue and wound fluid are removed. Then the wound is covered with a sterile foam, which itself is covered by an airtight foil attached to the surrounding skin. A tube connects the foam to a

vacuum pump with a container for fluid. This system keeps the wound in a constantly moist state, without letting it get too wet.

## Sources

German Institute for Quality and Efficiency in Health Care (IQWiG). *Negative pressure wound therapy. Final report N04-03. Version 1.0*. Cologne: IQWiG. March 2006. [Full text (URL: [http://www.iqwig.de/download/N04-03\\_Final\\_report\\_Negative\\_pressure\\_wound\\_therapy.html](http://www.iqwig.de/download/N04-03_Final_report_Negative_pressure_wound_therapy.html)) ]

German Institute for Quality and Efficiency in Health Care (IQWiG). *Negative pressure wound therapy - Rapid report. Final report N06-02. Version 1.0*. Cologne: IQWiG. January 2007. [Executive summary (URL: [http://www.informedhealthonline.org/http://www.iqwig.de/download/N06-02\\_Executive\\_summary\\_Rapid\\_report\\_Negative\\_pressure\\_wound\\_therapy.html](http://www.informedhealthonline.org/http://www.iqwig.de/download/N06-02_Executive_summary_Rapid_report_Negative_pressure_wound_therapy.html)) ] [Full text (URL: [http://www.iqwig.de/download/N06-02\\_Rapid\\_Report\\_Vakuumversiegelungstherapie\\_von\\_Wunden..html](http://www.iqwig.de/download/N06-02_Rapid_Report_Vakuumversiegelungstherapie_von_Wunden..html)) - in German]

**The German Institute for Quality and Efficiency in Health Care (IQWiG)**

The German Institute for Quality and Efficiency in Health Care (IQWiG) was established by legislation to provide evaluations of the effectiveness, quality and efficiency of healthcare services. This includes the assessment of medicines as well as the publication of health information for consumers and patients.

**Evidence basis of our health information**

Our information is based primarily on systematic reviews of the effects of health care. Systematic reviews are necessary to gain an objective picture of health care. In order to do this, a clear question is formulated. Researchers then find all the relevant studies that could answer this question. They then evaluate those studies.

You can find a list of the evidence and other scientific literature on which this information is based at **[www.informedhealthonline.org](http://www.informedhealthonline.org)**

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