Cochrane Wounds Group Reviews and Review Updates

EDITOR:

Gill Rizzello, Managing editor Cochrane Wounds, School of Nursing, Midwifery and Social Work, University of Manchester

Correspondence: gill.rizzello@manchester.ac.uk · More information: www.wounds.cochrane.org

Conflict of interest: None

REVIEW: Publication in The Cochrane Library, 2022, Issue 2

Pressure redistributing static chairs for preventing pressure ulcers

Melanie Stephens, Carol Bartley, Jo C Dumville

Citation: Stephens M, Bartley C, Dumville JC. Pressure redistributing static chairs for preventing pressure ulcers

Cochrane Database of Systematic Reviews 2022, Issue 2. Art. No.: CD013644.

DOI: 10.1002/14651858.CD013644.pub2.

ABSTRACT

Background

Sitting can be viewed as a therapeutic intervention and an important part of a person's recovery process; but the risk of ulceration must be mitigated. Interventions for ulcer prevention in those at risk from prolonged sitting include the use of specialist cushions and surfaces, especially for wheelchair users. Whilst there is interest in the effects of different pressure redistributing cushions for wheelchairs, the benefits of pressure redistributing static chairs, compared with standard chairs, for pressure ulcer development in at-risk people are not clear.

Objectives

To assess the effects of pressure redistributing static chairs on the prevention of pressure ulcers in health, rehabilitation and social care settings, and places of residence in which people may spend their day.

Search methods

In June 2021 we searched the following electronic databases to identify reports of relevant randomised clinical trials: the Cochrane Wounds Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL), Ovid MEDLINE, Ovid Embase and EBSCO CINAHL Plus (Cumulative Index to Nursing and Allied Health Literature). We also searched clinical trials registers for ongoing and unpublished studies, and reference lists of relevant systematic reviews, meta-analyses and health technology reports. There were no restrictions by language, date of publication or study setting.

Selection criteria

We sought to include published or unpublished randomised controlled trials that assessed pressure redistributing static chairs in the prevention or management of pressure ulcers.

Data collection and analysis

Two review authors independently performed study selection. We planned that two review authors would also assess the risk of bias, extract study data and assess the certainty of evidence according to GRADE methodology.

Main results

We did not identify any studies that met the review eligibility criteria, nor any registered studies investigating the role of pressure redistributing static chairs in the prevention or management of pressure ulcers.

Authors' conclusions

Currently, there is no randomised evidence that supports or refutes the role of pressure redistributing static chairs in the prevention or management of pressure ulcers. This is a priority area and there is a need to explore this intervention with rigorous and robust research.

Plain language summary

Do pressure redistributing static chairs help to prevent pressure ulcers?

Key messages

Despite a comprehensive search, we did not find any studies that looked at whether pressure redistributing static chairs help to prevent or manage pressure ulcers. This is an important topic area and high quality research is needed to determine whether or not such chairs bene-

fit people at risk of developing pressure ulcers.

What are pressure ulcers?

Pressure ulcers are injuries to the skin and underlying tissue that can be caused by prolonged pressure. Sitting can be an important part of a person's recovery process, but sitting for long periods can increase the risk of developing pressure ulcers.

How are pressure ulcers managed?

Specialist cushions and surfaces aim to redistribute pressure on the skin when people have to stay sitting for long periods of time. There has been more research into the effects of using pressure redistributing cushions in wheelchairs than in standard chairs.

We do not currently know how effective pressure redistributing static chairs are, compared with standard chairs, for preventing or managing pressure ulcers in at-risk people.

Pressure redistributing static chairs range from standard hospital chairs and chairs used in residential settings with no cushion or manual/dynamic function, to those with integrated pressure redistributing surfaces and recline, rise or tilt function when the person is sitting in it. These can be produced to a standard design or a bespoke design tailored to the needs of the person.

What did we want to find out?

We wanted to find out how effective pressure redistributing static chairs are for preventing or managing pressure ulcers in health, rehabilitation and social care settings, and residential places where people may spend their day.

What did we do?

We searched for published and unpublished studies that assessed pressure redistributing static chairs for preventing or managing pressure ulcers. There were no restrictions on language, date of publication or study setting.

What did we find?

We did not find any eligible completed or registered studies investigating the effects of pressure redistributing static chairs for preventing or managing pressure ulcers.

There is no current high-quality evidence that supports or refutes the role of pressure redistributing static chairs for preventing or managing pressure ulcers.

This is a priority area and there is a need to explore this intervention with rigorous and robust research.

How up to date is this evidence?

This evidence in this Cochrane Review is up to date to June 2021.

REVIEW UPDATE: publication in The Cochrane Library, 2022, Issue 4

Negative pressure wound therapy for surgical wounds healing by primary closure

Gill Norman, Chunhu Shi, En Lin Goh, Elizabeth MA Murphy, Adam Reid, Laura Chiverton, Monica Stankiewicz, Jo C Dumville

Citation: Norman G, Shi C, Goh EL, Murphy EMA, Reid A, Chiverton L, Stankiewicz M, Dumville JC. Negative pressure wound therapy for surgical wounds healing by primary closure

Cochrane Database of Systematic Reviews 2022, Issue 4. Art. No.: CD009261.

DOI: 10.1002/14651858.CD009261.pub7

ABSTRACT

Background

Indications for the use of negative pressure wound therapy (NPWT) are broad and include prophylaxis for surgical site infections (SSIs). Existing evidence for the effectiveness of NPWT on postoperative wounds healing by primary closure remains uncertain.

Objectives

To assess the effects of NPWT for preventing SSI in wounds healing through primary closure, and to assess the costÐeffectiveness of NPWT in wounds healing through primary closure.

Search methods

In January 2021, we searched the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); Ovid MEDLINE (including In-Process & Other Non-Indexed Citations); Ovid Embase and EBSCO CINAHL Plus. We also searched clinical trials registries and references of included studies, systematic reviews and health technology reports. There were no restrictions on language, publication date or study setting.

Selection criteria

We included trials if they allocated participants to treatment randomly and compared NPWT with any other type of wound dressing, or compared one type of NPWT with another.

Data collection and analysis

At least two review authors independently assessed trials using predetermined inclusion criteria. We carried out data extraction, assessment using the Cochrane risk of

bias tool, and quality assessment according to Grading of Recommendations, Assessment, Development and Evaluations methodology. Our primary outcomes were SSI, mortality, and wound dehiscence.

Main results

In this fourth update, we added 18 new randomised controlled trials (RCTs) and one new economic study, resulting in a total of 62 RCTs (13,340 included participants) and six economic studies. Studies evaluated NPWT in a wide range of surgeries, including orthopaedic, obstetric, vascular and general procedures. All studies compared NPWT with standard dressings. Most studies had unclear or high risk of bias for at least one key domain.

Primary outcomes

Eleven studies (6384 participants) which reported mortality were pooled. There is low-certainty evidence showing there may be a reduced risk of death after surgery for people treated with NPWT (0.84%) compared with standard dressings (1.17%) but there is uncertainty around this as confidence intervals include risk of benefits and harm; risk ratio (RR) 0.78 (95% CI 0.47 to 1.30; I2 = 0%). Fifty-four studies reported SSI; 44 studies (11,403 participants) were pooled. There is moderate-certainty evidence that NPWT probably results in fewer SSIs (8.7% of participants) than treatment with standard dressings (11.75%) after surgery; RR 0.73 (95% CI 0.63 to 0.85; I2 = 29%). Thirty studies reported wound dehiscence; 23 studies (8724 participants) were pooled. There is moderate-certainty evidence that there is probably little or no difference in dehiscence between people treated with NPWT (6.62%) and those treated with standard dressing (6.97%), although there is imprecision around the estimate that includes risk of benefit and harms; RR 0.97 (95% CI 0.82 to 1.16; I2 = 4%). Evidence was downgraded for imprecision, risk of bias, or a combination of these.

Secondary outcomes

There is lowÐcertainty evidence for the outcomes of reoperation and seroma; in each case, confidence intervals included both benefit and harm. There may be a reduced risk of reoperation favouring the standard dressing arm, but this was imprecise: RR 1.13 (95% CI 0.91 to 1.41; I2 = 2%; 18 trials; 6272 participants). There may be a reduced risk of seroma for people treated with NPWT but this is imprecise: the RR was 0.82 (95% CI 0.65 to 1.05; I2 = 0%; 15 trials; 5436 participants). For skin blisters, there is low-certainty evidence that people treated with NPWT may be more likely to develop skin blisters compared with those treated with standard dressing (RR 3.55; 95% CI 1.43 to 8.77; I2 = 74%; 11 trials; 5015 participants). The effect of NPWT on haematoma is uncertain (RR 0.79; 95 % CI 0.48 to 1.30; I2 = 0%; 17 trials; 5909 participants; very lowÐcertainty evidence). There is lowÐcertainty evidence of little to no difference in reported pain between groups. Pain was measured in different ways and most studies could not be pooled; this GRADE assessment is based on all fourteen trials reporting pain; the pooled RR for the proportion of participants who experienced pain was 1.52 (95% CI 0.20, 11.31; I2 = 34%; two studies; 632 participants).

Cost-effectiveness

Six economic studies, based wholly or partially on trials in our review, assessed the costÐeffectiveness of NPWT compared with standard care. They considered NPWT in five indications: caesarean sections in obese women; surgery for lower limb fracture; knee/hip arthroplasty; coronary artery bypass grafts; and vascular surgery with inguinal incisions. They calculated quality-adjusted life-years or an equivalent, and produced estimates of the treatments' relative cost-effectiveness. The reporting quality was good but the evidence certainty varied from moderate to very low. There is moderate-certainty evidence that NPWT in surgery for lower limb fracture was not cost-effective at any threshold of willingness-to-pay and that NPWT is probably cost-effective in obese women undergoing caesarean section. Other studies found low or very low-certainty evidence indicating that NPWT may be cost-effective for the indications assessed.

Authors' conclusions

People with primary closure of their surgical wound and treated prophylactically with NPWT following surgery probably experience fewer SSIs than people treated with standard dressings but there is probably no difference in wound dehiscence (moderate-certainty evidence). There may be a reduced risk of death after surgery for people treated with NPWT compared with standard dressings but there is uncertainty around this as confidence intervals include risk of benefit and harm (low-certainty evidence). People treated with NPWT may experience more instances of skin blistering compared with standard dressing treatment (low-certainty evidence). There are no clear differences in other secondary outcomes where most evidence is low or very low-certainty. Assessments of cost-effectiveness of NPWT produced differing results in different indications. There is a large number of ongoing studies, the results of which may change the findings of this review. Decisions about use of NPWT should take into account surgical indication and setting and consider evidence for all outcomes.

Plain language summary

Dressings that use negative pressure for closed surgical wounds

Key messages

Negative pressure wound therapy (NPWT) probably results in fewer surgical site infections (SSIs) than standard dressings in people with closed wounds after surgery. NPWT probably makes no difference to the proportion of people with wound reopening (dehiscence) after surgery and may make little or no difference to the number

of people who die.

NPWT may increase the number of people with skin blistering after surgery but may make little or no difference to other outcomes.

The cost-effectiveness of NPWT and how certain we are about this depends on the type of surgery.

What are surgical wounds healing by primary closure?

Surgical wounds healing by primary closure are incisions created by surgery where the edges have been brought together, usually by using stitches or staples. Most surgical wounds heal in this way. A potential complication of surgery is SSI, an infection at the site of a surgical wound. The proportion of people who develop an SSI after surgery can be as high as 40%. An SSI can cause pain and discomfort, as well as increasing a person's length of hospital stay and cost of treatment.

What did we want to find out?

NPWT is a sealed wound dressing attached to a vacuum pump which sucks fluid away from the wound. This may assist with wound healing and reduce risk of infection. We wanted to find out whether NPWT was better compared with standard wound dressings (usually gauze and tape) for treating people who had had surgery and had wounds which had been closed. We were interested in complications including SSI; wound reopening (dehiscence) and death for any reason. We also looked at several other outcomes including the need for another operation, the need to be admitted to hospital again, pain, quality of life, as well as some specific types of complications (haematoma (an accumulation of blood under the skin), seroma (an accumulation of clear fluid under the skin), skin blisters).

We also wanted to find out whether NPWT was cost-effective for treating people who had closed surgical wounds.

What did we do?

We searched for randomised controlled trials (clinical studies where the treatment people receive is chosen at random). This type of study design provides the most reliable evidence about the effects of a treatment. We searched for studies that compared any type of NPWT with standard dressings in people who had had surgery and had a wound which had been closed. We compared and summarised their results, and rated our confidence in the evidence.

What did we find?

We found 62 studies which compared NPWT with standard dressings and looked at surgical site complications. A variety of NPWT systems was used. A total of 13,340 people have been included in this review. A wide variety of surgeries was included such as knee and hip operations, caesarean sections, operations for broken bones and abdominal surgeries. There were more women than men included in the review because several large trials included only women having caesarean sections. Most of the people included in the review live in North America, Europe or Australasia.

Eleven studies (6384 people) reported on risk of death and found that there may be a lower risk with NPWT compared with standard dressings but this is not clear. FortyÐfour studies (11,403 people) looking at SSI were combined, and found that NPWT probably reduced the risk of SSI compared with standard dressings. Twenty-three studies (8724 people) found that there is probably little or no difference in wound reopening between NPWT and standard dressings. For most other outcomes, the evidence showed that there may not be clear differences between the treatments, or that we are uncertain about the true effect of the treatments. The exception was skin blistering where NPWT may increase the proportion of people who experience this after surgery.

Six cost-effectiveness studies were included in the review. These studies looked at women who had had caesarean sections, people with lower limb fractures, knee and hip surgeries, vascular surgery and heart surgery. All these studies used clinical information from trials included in this review. NPWT is probably cost-effective for caesarean section wounds in obese women and probably not cost-effective for fracture surgery wounds but we are less sure about its costÐeffectiveness in the other types of surgery.

What limited our confidence in the evidence?

Our confidence in the evidence was limited by different reasons for different outcomes. Given the small number of people who died, the results for death are likely to change with more evidence. For SSI, approximately half the people were in studies using methods likely to introduce errors. For wound reopening and most other outcomes, our confidence was reduced by a combination of these reasons. For skin blistering, our confidence was reduced by differences between the studies as well as study methods.

How up to date is this review?

This review is up to date to January 2021.

REVIEW: publication in The Cochrane Library, 2022, Issue 5

Dressings and topical agents for the management of open wounds after surgical treatment for sacrococcygeal pilonidal sinus

Philip J Herrod, Brett Doleman, Edward J Hardy, Paul Hardy, Trevor Maloney, John P Williams, Jon N Lund

Citation: Herrod PJ, Doleman B, Hardy EJ, Hardy P, Maloney T, Williams JP, Lund JN. Dressings and topical agents for the management of open wounds after surgical treatment for sacrococcygeal pilonidal sinus

Cochrane Database of Systematic Reviews 2022, Issue 5. Art. No.: CD013439.

DOI: 10.1002/14651858.CD013439.pub2.

ABSTRACT

Background

Sacrococcygeal pilonidal sinus disease is a common debilitating condition that predominantly affects young adults, with a profound impact on their activities of daily living. The condition is treated surgically, and in some cases the wound in the natal cleft is left open to heal by itself. Many dressings and topical agents are available to aid healing of these wounds.

Objectives

To assess the effects of dressings and topical agents for the management of open wounds following surgical treatment for sacrococcygeal pilonidal sinus in any care setting.

Search methods

In March 2021, we searched the Cochrane Wounds Specialised Register, CENTRAL, MEDLINE, Embase and EBSCO CINAHL Plus. We also searched clinical trials registries for ongoing and unpublished studies, and we scanned reference lists of included studies, reviews, meta-analyses and health technology reports to identify additional studies. There were no restrictions with respect to language, date of publication or study setting.

Selection criteria

We included parallel-group randomised controlled trials (RCTs) only. We included studies with participants who had undergone any type of sacrococcygeal pilonidal sinus disease surgery and were left with an open wound.

Data collection and analysis

We used the standard methodological procedures expected by Cochrane. We used GRADE to assess the certainty of the evidence for each outcome.

Main results

We included 11 RCTs comprising 932 participants. Two studies compared topical negative pressure wound therapy (TNPWT) with conventional open wound healing, two studies compared platelet‐rich plasma with sterile absorbent gauze, and the other seven studies compared various dressings and topical agents. All studies were at high risk of bias in at least one domain, whilst one study was judged to be at low risk of bias in all but one domain. All studies were conducted in secondary care. Mean participant ages were between 20 and 30 years, and nearly 80% of participants were male. No studies provided data on quality of life, cost-effectiveness, pain at first dressing change or proportion of wounds healed at 6 or 12 months, and very few adverse effects were recorded in any study.

It is unclear whether TNPWT reduces time to wound healing compared with conventional open wound healing (comparison 1), as the certainty of evidence is very low. The two studies provided conflicting results, with one study showing benefit (mean difference (MD) −24.01 days, 95% confidence interval (CI) −35.65 to −12.37; 19 participants), whilst the other reported no difference. It is also unclear whether TNPWT has any effect on the proportion of wounds healed by 30 days (risk ratio (RR) 3.60, 95% CI 0.49 to 26.54; 19 participants, 1 study; very low-certainty evidence). Limited data were available for our secondary outcomes time to return to normal daily activities and recurrence rate; we do not know whether TNPWT has any effect on these outcomes.

Lietofix cream may increase the proportion of wounds that heal by 30 days compared with an iodine dressing (comparison 4; RR 8.06, 95% CI 1.05 to 61.68; 205 participants, 1 study; low-certainty evidence). The study did not provide data on time to wound healing.
We do not know whether hydrogel dressings reduce time to wound healing compared with wound cleaning with 10% povidone iodine (comparison 5; MD −24.54 days, 95% CI −47.72 to −1.36; 31 participants, 1 study; very low-certainty evidence). The study did not provide data on the proportion of wounds healed. It is unclear whether hydrogel dressings have any effect on adverse effects as the certainty of the evidence is very low.

Platelet-rich plasma may reduce time to wound healing compared with sterile absorbent gauze (comparison 6; MD −19.63 days, 95% CI −34.69 to −4.57; 210 participants, 2 studies; low-certainty evidence). No studies provided data on the proportion of wounds healed. Platelet-rich plasma may reduce time to return to normal daily activities (MD −15.49, 95% CI −28.95 to −2.02; 210 participants, 2 studies; low-certainty evidence).

Zinc oxide mesh may make little or no difference to time to wound healing compared with placebo (comparison 2; median 54 days in the zinc oxide mesh group versus 62 days in the placebo mesh group; low-certainty evidence). We do not know whether zinc oxide mesh has an effect on the proportion of wounds healed by 30 days as the certainty of the evidence is very low (RR 2.35, 95% CI 0.49 to 11.23).

It is unclear whether gentamicin-impregnated collagen sponge reduces time to wound healing compared with no dressing (comparison 7; MD −1.40 days, 95% CI

−5.05 to 2.25; 50 participants, 1 study; very low-certainty evidence). The study did not provide data on the proportion of wounds healed.

Dialkylcarbamoyl chloride (DACC)-coated dressings may make little or no difference to time to wound healing compared with alginate dressings (comparison 8; median 69 (95% CI 62 to 72) days in the DACC group versus 71 (95% CI 69 to 85) days in the alginate group; 1 study, 246 participants; low-certainty evidence).

One study compared a polyurethane foam hydrophilic dressing with an alginate dressing (comparison 3) whilst another study compared a hydrocolloid dressing with an iodine dressing (comparison 9). It is unclear whether either intervention has any effect on time to wound healing as the certainty of evidence is very low.

Authors' conclusions

At present, the evidence that any of the dressings or topical agents contained in this review have a benefit on time to wound healing, the proportion of wounds that heal at a specific time point or on any of the secondary outcomes of our review ranges from low certainty to very low certainty. There is low-certainty evidence on the benefit on wound healing of platelet-rich plasma from two studies and of Lietofix cream and hydrogel dressings from single studies. Further studies are required to investigate these interventions further.

Plain language summary

How effective are dressings and topical agents in the management of wounds after surgical treatment for pilonidal sinus of the buttocks?

Key messages

- Platelet-rich plasma (part of the participant's own blood that promotes tissue regeneration) may reduce time to wound healing compared with sterile gauze

- Lietofix skin repair cream may help wounds to heal by 30 days compared with a dressing with iodine (which helps to reduce bacteria in the wound)

- It is not clear whether hydrogel dressings (designed to keep the wound moist) reduce time to wound healing compared with wound cleaning with iodine

What is pilonidal sinus disease of the buttocks?

Pilonidal sinus disease of the buttocks is a common painful condition that mainly affects young adults.

It occurs in the natal cleft (the groove between the buttocks). It begins as infected or inflamed hair follicles. A vacuum effect, created by the motion of the buttocks, may draw more hairs down into the inflamed area. Symptoms can be very painful and sometimes last for a long time.

How is pilonidal sinus of the buttocks treated?

The condition is often treated surgically, by cutting out the inflamed area containing the hair and debris, and in some cases the wounds are not closed by stitches but left open to heal naturally. A lot of dressings and topical agents (creams or lotions) are available to help these wounds heal.

What did we want to find out?

We wanted to see which dressings and topical agents are better for treating open wounds after surgical treatment for pilonidal sinus of the buttocks.
For each intervention we looked at:

- how long it took wounds to heal;

- the number of wounds healed after 30 days, 6 months and 1 year;

- whether the wounds came back;

- how long it took people who had been treated to return to normal daily activities;

- quality of life;

- value for money;

- pain during the first dressing change;

- harmful effects (for example surgical site infection or allergic reaction) after treatment.

What did we do?

We included participants of any age and either sex who had been treated in any care setting. We searched for studies where:

- participants had been treated for pilonidal sinus disease of the buttocks and were left with an open wound;

- different dressings and topical agents were compared to see how effective they were for helping wounds to heal.

What did we find?

We included 11 studies with a combined total of 932 participants. Two studies compared topical negative pressure wound therapy (which applies controlled suction to the surface of the wound) with simple wound dressings. Two studies compared platelet-rich plasma with sterile absorbent gauze. The other seven studies compared various dressings and topical agents. All the studies took place in hospitals.

- No studies provided data on quality of life, value for money or pain at the first dressing change.

- We do not know if topical negative pressure wound therapy helps wounds to heal faster than simple wound dressings.

- Lietofix skin repair cream may help wounds to heal by 30 days.

- We do not know if hydrogel dressings help wounds to heal faster or protect better against surgical site infection compared with wound cleaning with 10% povidone iodine.

- Platelet-rich plasma may reduce the time to wound healing compared with sterile absorbent gauze.

- Compared with placebo mesh, mesh with zinc oxide (which is thought to have healing properties) may have little or no effect on whether wounds heal by 30 days, and it is unclear if it reduces the time to wound healing.

- We do not know if collagen sponge soaked in antibiotic has any effect on the time to wound healing compared with no dressing.

- Dressings coated with dialkylcarbamoyl chloride (a substance that bacteria sticks to) may make little to no difference to wound healing time compared with alginate dressings (derived from seaweed).

What are the limitations of the evidence?

We are not very confident in the evidence because there were only one or two studies in each comparison and most of the studies were very small. It is also possible that people in the studies were aware of what treatment they were getting.

How up to date is this evidence?

The evidence in this review is up to date to March 2021.

REVIEW: publication in The Cochrane Library, 2022, Issue 5

Negative pressure wound therapy for managing the open abdomen in non-trauma patients

Yao Cheng, Ke Wang, Junhua Gong, Zuojin Liu, Jianping Gong, Zhong Zeng, Xiaomei Wang

Citation: Cheng Y, Wang K, Gong J, Liu Z, Gong J, Zeng Z, Wang X. Negative pressure wound therapy for managing the open abdomen in non-trauma patients

Cochrane Database of Systematic Reviews 2022, Issue 5. Art. No.: CD013710.

DOI: 10.1002/14651858.CD013710.pub2.

ABSTRACT

Background

Management of the open abdomen is a considerable burden for patients and healthcare professionals. Various temporary abdominal closure techniques have been suggested for managing the open abdomen. In recent years, negative pressure wound therapy (NPWT) has been used in some centres for the treatment of non-trauma patients with an open abdomen; however, its effectiveness is uncertain.

Objectives

To assess the effects of negative pressure wound therapy (NPWT) on primary fascial closure for managing the open abdomen in nonÐtrauma patients in any care setting.

Search methods

In October 2021 we searched the Cochrane Wounds Specialised Register, CENTRAL, MEDLINE, Embase, and CINAHL EBSCO Plus. To identify additional studies, we also searched clinical trials registries for ongoing and unpublished studies, and scanned reference lists of relevant included studies as well as reviews, metaÐanalyses, and health technology reports. There were no restrictions with respect to language, date of publication, or study setting.

Selection criteria

We included all randomised controlled trials (RCTs) that compared NPWT with any other type of temporary abdominal closure (e.g. Bogota bag, Wittmann patch) in non-trauma patients with open abdomen in any care setting. We also included RCTs that compared different types of NPWT systems for managing the open abdomen in nonÐtrauma patients.

Data collection and analysis

Two review authors independently performed the study selection process, risk of bias assessment, data extraction, and GRADE assessment of the certainty of evidence.

Main results

We included two studies, involving 74 adults with open abdomen associated with various conditions, predominantly severe peritonitis (N = 55). The mean age of the participants was 52.8 years; the mean proportion of women was 39.2%. Both RCTs were carried out in single centres and were at high risk of bias.

Negative pressure wound therapy versus Bogota bag
We included one study (40 participants) comparing NPWT with Bogota bag. We are uncertain whether NPWT reduces time to primary fascial closure of the abdomen (NPWT: 16.9 days versus Bogota bag: 20.5 days (mean difference (MD) -3.60 days, 95% confidence interval (CI) Ð8.16 to 0.96); very low-certainty evi-

dence) or adverse events (fistulae formation, NPWT: 10% versus Bogota: 5% (risk ratio (RR) 2.00, 95% CI 0.20 to 20.33); very low-certainty evidence) compared with the Bogota bag. We are also uncertain whether NPWT reduces allÐcause mortality (NPWT: 25% versus Bogota bag: 35% (RR 0.71, 95% CI 0.27 to 1.88); very low-certainty evidence) or length of hospital stay compared with the Bogota bag (NPWT mean: 28.5 days versus Bogota bag mean: 27.4 days (MD 1.10 days, 95% CI Ð13.39 to 15.59); very low-certainty evidence). The study did not report the proportion of participants with successful primary fascial closure of the abdomen, participant health-related quality of life, reoperation rate, wound infection, or pain.

Negative pressure wound therapy versus any other type of temporary abdominal closure

There were no randomised controlled trials comparing NPWT with any other type of temporary abdominal closure.

Comparison of different negative pressure wound therapy devices

We included one study (34 participants) comparing different types of NPWT systems (Suprasorb CNP system versus ABThera system). We are uncertain whether the Suprasorb CNP system increases the proportion of participants with successful primary fascial closure of the abdomen compared with the ABThera system (Suprasorb CNP system: 88.2% versus ABThera system: 70.6% (RR 0.80, 95% CI 0.56 to 1.14); very lowÐcertainty evidence). We are also uncertain whether the Suprasorb CNP system reduces adverse events (fistulae formation, Suprasorb CNP system: 0% versus ABThera system: 23.5% (RR 0.11, 95% CI 0.01 to 1.92); very lowÐcertainty evidence), allÐcause mortality (Suprasorb CNP system: 5.9% versus ABThera system: 17.6% (RR 0.33, 95% CI 0.04 to 2.89); very lowÐcertainty evidence), or reoperation rate compared with the ABThera system (Suprasorb CNP system: 100% versus ABThera system: 100% (RR 1.00, 95% CI 0.90 to 1.12); very lowÐcertainty evidence). The study did not report the time to primary fascial closure of the abdomen, participant healthÐrelated quality of life, length of hospital stay, wound infection, or pain.

Authors' conclusions

Based on the available trial data, we are uncertain whether NPWT has any benefit in primary fascial closure of the abdomen, adverse events (fistulae formation), all-cause mortality, or length of hospital stay compared with the Bogota bag. We are also uncertain whether the Suprasorb CNP system has any benefit in primary fascial closure of the abdomen, adverse events, all-cause mortality, or reoperation rate compared with the ABThera system. Further research evaluating these outcomes as well as participant health-related quality of life, wound infection, and pain outcomes is required. We will update this review when data from the large studies that are currently ongoing are available.

Plain language summary

What are the benefits and risks of negative pressure wound therapy for managing the open abdomen in people who are not trauma patients?

Key messages

- We do not know if negative pressure wound therapy (NPWT, defined as pressure lower than a given reference pressure, generally causing suction) helps abdominal wounds to heal quicker or reduces potential harmful effects compared with using a Bogota bag (a sterilised fluid bag used for closing abdominal wounds).

- We do not know if a Suprasorb CNP system (a type of NPWT) helps abdominal wounds to heal quicker or reduces potential harmful effects compared with using an ABThera system (another type of NPWT).

- We do not know if NPWT increases the risk of bowel perforation. Future research should explore healing time, potential unwanted or harmful effects, all-cause mortality, length of hospital stay, healthÐrelated quality of life, reoperation rate, wound infection, and pain outcomes.

What is an open abdomen?

Sometimes a person's abdomen needs to be left open while it heals after surgery. However, high death rates are associated with leaving the abdomen open after surgery. Managing the open abdomen is a considerable burden for patients and doctors.

How is this managed?

NPWT uses a sealed dressing connected to a vacuum pump to drain fluid from a wound. However, the safety and effectiveness of NPWT as a treatment for open abdomen is still uncertain.

NPWT has been used in recent years to treat nonÐ trauma patients after abdominal surgery. NonÐtrauma patients are people who need surgery for conditions that are not caused by trauma (e.g. abdominal infection, cancer, ischaemia).

What did we want to find out?

We wanted to find out whether NPWT is effective in treating the open abdomen after surgery in nonÐtrauma patients in any care setting. We wanted to compare NPWT with other treatment methods or other types of NPWT, and we were particularly interested in their effects on the following:

- wound closure (how long it took for wounds to close and how many people had wounds that fully closed);

- if there were any harmful or unwanted effects (e.g.

bowel perforation);

- death rate;

- participant healthÐrelated quality of life or health status;

- length of hospital stay;

- reoperation rate;

- wound infection; and

- pain.

What did we do?

We searched for studies that compared NPWT with any other type of temporary abdominal closure in nonÐ trauma patients with open abdomen. We also included studies that compared different types of NPWT systems for managing the open abdomen in nonÐtrauma patients. We had no restrictions with respect to language, date of publication, or where the study was conducted. We rated our confidence in the evidence, based on factors such as study methods and sizes.

What did we find?

We found one single-centre study conducted in Turkey, which included 40 adults with open abdomen. Participants were randomly allocated to treatment with either NPWT or a Bogota bag. We cannot tell from the results whether when compared to Bogota bag, NPWT reduces:

- the time needed for wounds to completely close;

- harmful or unwanted effects (bowel perforation);

- death rate; or

- length of hospital stay between the groups.

The study did not report the proportion of people with wounds that were successfully closed, participant health-related quality of life, reoperation rate, wound infection, or pain.

We found another single-centre study, which was conducted in Austria and included 34 adults with open abdomen. Participants were randomly allocated to treatment with either a Suprasorb CNP system or an ABThera system. We cannot tell from the results whether when compared to an ABThera system, a Suprasorb CNP system reduces:

- the proportion of people with wounds that were successfully closed;

- harmful or unwanted effects (bowel perforation);
- death rate; or

- reoperation rate between the groups.

The study did not report the time needed for wounds to completely close, participant health-related quality of life, length of hospital stay, wound infection, or pain.

What are the limitations of the evidence?

We only found two relevant studies, so we are uncertain about the benefits or harms of using NPWT compared with using a Bogota bag or different types of NPWT systems. We did not find any studies that compared NPWT with other types of temporary abdominal closure.

How up to date is this evidence?

The evidence is up to date to October 2021.