Surgical wound dehiscence is defined as the separation of the margins of a closed surgical incision that has been made in the skin, with or without exposure or protrusion of underlying tissue, organs or implants (World Union of Wound Healing Societies [WUWHS], 2018). Separation may occur at single or multiple points on the incision, or involve the full length of the incision, and may affect some or all of the tissue layers. There is a relationship between surgical site infections (SSIs) and surgical wound dehiscence, but not all SSIs will go on to dehisce and not all dehisced wounds will display clinical signs and symptoms of infection.

The majority of surgical wounds will heal by primary intention. There will be no tissue loss and the wound edges are able to be brought together usually with sutures or staples (Figure 1). However, some wounds will heal by secondary intention, which is where tissue loss has occurred and the wound edges cannot be brought together, either because the wound has been left open to heal, or has dehisced following primary closure (Figure 2).

Surgical wound dehiscence is a significant issue that affects large numbers of patients, many of whom are managed in the community setting by general practice nurses (GPNs), community nurses and GPs. An understanding of the risk factors, prevention strategies, and effective assessment and treatment of surgical wound dehiscence can improve GPNs’ practice and ultimately result in improved outcomes for patients.

The ‘NHS Plan’ (NHS England, 2019) promises better care closer to home, which will result in earlier discharge from hospital, so that surgical wound dehiscence may not be captured by hospital-based surveillance studies that report SSIs and therefore is increasingly likely to occur in the community following discharge. The management of patients with unhealed surgical wounds is challenging and these patients are at risk of further wound complications such as infection, which may result in hospital readmission, prescription of antibiotics and antimicrobial dressings, and in some cases, further surgical intervention.

One study into the burden that wounds place on healthcare services reported that unhealed surgical wounds accounted for 11%...
of all wounds managed in the NHS in 2012–2013 (Guest et al, 2015), with the annual cost attributable to managing these wounds and associated comorbidities estimated to be £983.9 million (Guest et al, 2017).

Another UK study found that 57% of wounds that develop as a result of surgical wound dehiscence are cared for in the community (Chetter et al, 2017), and that the cost of caring for surgical wounds in the community accounts for 19–22% of total wound care expenditure (Guest et al, 2017).

From the patient’s perspective, the cost of surgical wound dehiscence is significant, with patients experiencing pain, anxiety, a reduction in their quality of life, and loss of earnings if they are unable to return to work postoperatively. Additionally, complications such as infection may negatively affect their quality of life and result in hospital readmission with prolonged healing (McCaughan et al, 2018).

**CAUSES OF SURGICAL WOUND DEHISCENCE**

The causes of surgical wound dehiscence can be categorised into technical issues, mechanical stress, or disrupted healing (Figure 3). Technical issues with the closure of the wound can include unravelling of suture knots or displaced staples. Mechanical stress can result from excessive forced tension during wound closure or swelling of the tissues around the incision due to oedema. It can also be caused by haematoma, seroma (a pocket of serous fluid that can develop following surgery), or an abscess below the surface of the wound. Additional mechanical stress such as coughing, sneezing or vomiting can also cause rupture of the sutures or the healing incision after sutures or clips have been removed or reabsorbed. Disruption to the normal healing process may be due to underlying comorbidities such as diabetes, obesity, malnutrition, smoking, or as a result of SSI. However, not all surgical wound dehiscence is due to infection and not all infected wounds will go on to break down (WUWHS, 2018).

**RISK FACTORS**

There are a number of risk factors for the development of surgical wound dehiscence that GPNs need to consider in terms of identification and modification for patients who are due to undergo surgery. Major risk factors include patients who exhibit some or all of the following factors:

- Presenting with a body mass index (BMI) of greater than/equal to 35kg/m²
- Presenting with diabetes mellitus or a history of smoking
- Being aged over 65 years
- Having undergone extended or emergency surgery involving inadequate surgical closure
- Exhibiting postoperative infection.

An elevated BMI can be a minor or moderate patient-related modifiable risk factor for surgical wound dehiscence and GPNs should consider weight management discussions and actions plans as part of the overall care of these patients. Other minor or moderate risk factors for surgical wound dehiscence are shown in Table 1.

Some types of surgery pose an increased risk of developing surgical wound dehiscence, for example, surgery classified as contaminated or ‘dirty’, such as that involving incision and drainage of pilonidal abscesses. Rates for surgical wound dehiscence vary from 1.1–3.6% in orthopaedic surgery (Kim et al, 2017), to 18.7–21.5% in abdominoplasty (Tambasco et al, 2015) and 6.9–41.8% in primary closure of pilonidal sinus (Kose et al, 2017).

**IDENTIFICATION AND ASSESSMENT OF SURGICAL WOUND DEHISCENCE**

Patients who are discharged into the community postoperatively are likely to attend their general practice for follow-up care, which may include removal of sutures/staples or monitoring of the wound for development of wound-related issues such as delayed healing. Monitoring the healing progression of surgical wounds is necessary to ensure early identification of surgical wound dehiscence. Inflammation of the wound is normal during the inflammatory stage of wound healing.
and the incision may develop a red colour alongside the presence of oedema. If these symptoms do not reduce, or if the patient reports sudden pain or any discharge from the wound, the GPN should arrange for the patient to see them for a wound assessment appointment.

Surgical wound dehiscence commonly starts 4–14 days postoperatively (Sandy-Hodgetts et al, 2017), but can extend for longer in some patients. Surgical wound dehiscence involving the deep layers of an incision is more serious than that involving more superficial layers, as it may result in exposed bone and organs leading to complications such as infection.

Structured holistic assessment of both the patient and wound should be undertaken, including general patient assessment and examination of the incision or wound if present. General assessment of the patient should include:
- Past medical and surgical history
- Nature of the surgical procedure
- Patient’s current health and lifestyle
- Medicine profile
- Pain
- Psychosocial status
- Impact of the wound on their daily activities.

Wound assessment should be structured and systematic and there are a number of tools to support this approach, including the Triangle of Wound Assessment and the T.I.M.E framework (WUWHS, 2016; Dowsett and von Hallern, 2017; Dowsett and Hall, 2019). The T.I.M.E framework includes assessment of:
- Tissue type, for example necrosis, slough, granulation or epithelialisation
- Inflammation/infection, for example local to the wound site or spreading
- Exudate volume, for example low, moderate or high
- Edges of the wound, for example raised or thickened.

More recently, ‘S’, surrounding skin condition, for example macerated or excoriated skin, has been added.

Structured holistic assessment of both the patient and wound should be undertaken, including general patient assessment and examination of the incision or wound if present.

If more than one area of the wound is dehisced, each separate area should be assessed. The dimensions of the wound and the dehisced area should be recorded. The depth of surgical wound dehiscence should be assessed with caution and any probing required should be undertaken gently so as not to cause any further damage. Pain control should be considered as part of the overall assessment and management of the patient.

MANAGEMENT OF SURGICAL WOUND DEHISCENCE

Care of the patient should be based on the identification of person-centred needs, with any consultation including the patient, their family and carers.

Many patients will understandably be anxious that their wound has broken down and will need ongoing support, education and reassurance during their treatment. Patients with grade 1 surgical wound dehiscence should be assessed for their ability to self-care or receive care from a family member. Surgical wound dehiscence of grades 3 and 4 with or without infection may require input from the

Remember...

Not all surgical wound dehiscence is due to infection and not all infected surgical wounds will dehisce. Correct grading of the surgical wound dehiscence based on the grading system outlined in this paper will enable GPNs to select the most appropriate treatment to heal the wound.
multidisciplinary team, including the tissue viability specialist nurse, to ensure that the wound heals in a timely manner. This may involve using advanced wound care dressings and devices, such as negative pressure wound therapy (NPWT).

The aim of any wound dehiscence management plan should be to mitigate risk factors, reassure and educate the patient, address any contributory factors, such as haematoma and comorbidities, manage the patient’s reported pain, and undertake local wound management that includes treating any infection.

Local wound management will be determined by the severity of the dehiscence and if infection is present or absent. If the wound exhibits seroma or haematoma, these will need to be drained and any non-viable tissue debrided using an appropriate method. Examples of debridement techniques include: surgical; sharp (for example using a scalpel); autolytic (where moisture and the body’s own enzymes liquefy necrotic tissue under a dressing); enzymatic (involving the application of a topical agent that liquefies necrotic tissue); larval; and mechanical (for example using a monofilament pad) (Vowden and Vowden, 2011; Wounds UK, 2013).

The choice of debridement method will depend on the patient, wound and expertise of the clinician (Leak, 2012). Successful debridement is often associated with a progressive reduction in wound exudate and odour, and the appearance of a healthy granulating wound bed (Vowden and Vowden, 2011).

Dressings should be selected based on the depth of the wound, volume of exudate and whether infection is present. Grade 2–4 surgical wound dehiscence should be treated with a dressing that fills and/or conforms to the wound bed to avoid ‘dead’ space, the potential for exudate to cause maceration and the development of infection (Dowsett et al, 2018). The ability of the dressing to manage the exudate should be reassessed at each dressing change and the periwound skin should be protected with a skin protector as necessary.

Any local wound infection should be managed with a topical antimicrobial dressing according to best practice guidelines (Wounds UK, 2013) and the local wound care formulary. A wide range of antimicrobial agents are available for use in wounds, including antimicrobial solutions containing silver, iodine and polyhexamethylene biguanide (PHMB) (Wounds UK, 2013). The choice of topical treatments should be based on assessment of the patient and the wound, any patient-reported allergies, and previous dressings used and whether these had successful outcomes and were acceptable to the patient.

Patients with systemic infection will require oral antibiotics specific to the infection in the wound and should have a wound sample taken to ensure appropriate antibiotics are prescribed (IWII, 2016).

Negative pressure wound therapy (NPWT) has a role in the management of surgical wound dehiscence, either in healing by secondary intention or to prepare the wound for delayed primary closure (Bovill et al, 2008). The use of NPWT is recommended to facilitate healing in patients who are exhibiting a large volume of exudate or deep and complex surgical wound dehiscence (Krug et al, 2011; WUWHS, 2018). As exudate volume reduces, patients can be stepped down to a single-use NPWT unit, which is more portable and readily available in the community setting. NPWT is also increasingly recommended to prevent surgical wound dehiscence, particularly in high-risk patients (Strugala and Martin, 2018), and this option should be discussed with the patient and their surgeon as part of a preoperative care plan.

**CONCLUSION**

Surgical wound dehiscence is most likely to occur when the patient has been discharged into the community and therefore will often be treated by GPs and GPNs. It has a significant impact on patients’ quality of life and can result in hospital readmission. Accurate and timely holistic patient and wound assessment is essential to ensure appropriate care is delivered to modify risk factors, treat the cause of the surgical wound dehiscence and optimise wound healing.

Patients with surgical wound dehiscence should be reassessed at each dressing change and if the wound is not reducing in size or progressing to healing, they should

| Grade 1 | Dehiscence of the dermal layer with no visible subcutaneous fat | No infection present |
| Grade 1a | Dehiscence of the dermal layer with no visible subcutaneous fat | Infection present |
| Grade 2 | Dehiscence with subcutaneous layer exposed but fascia is not visible | Infection present |
| Grade 2a | Dehiscence with subcutaneous layer exposed but fascia is not visible | Infection present |
| Grade 3 | Dehiscence with subcutaneous layer exposed but fascia is not visible | No infection present |
| Grade 3a | Dehiscence with subcutaneous layer and fascia exposed | Infection present |
| Grade 4 | Any area of fascial dehiscence with organ space, viscera, implant or bone exposed | No infection present |
| Grade 4a | Any area of fascial dehiscence with organ space, viscera, implant or bone exposed | Infection present |

* Patients with grade 4 surgical wound dehiscence usually require hospital management

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**Table 2: Grading system for surgical wound dehiscence (WUWHS, 2018)**

- **Grade 1**: Dehiscence of the dermal layer with no visible subcutaneous fat. No infection present.
- **Grade 1a**: Dehiscence of the dermal layer with no visible subcutaneous fat. Infection present.
- **Grade 2**: Dehiscence with subcutaneous layer exposed but fascia is not visible. Infection present.
- **Grade 2a**: Dehiscence with subcutaneous layer exposed but fascia is not visible. Infection present.
- **Grade 3**: Dehiscence with subcutaneous layer exposed but fascia is not visible. No infection present.
- **Grade 3a**: Dehiscence with subcutaneous layer and fascia exposed. Infection present.
- **Grade 4**: Any area of fascial dehiscence with organ space, viscera, implant or bone exposed. No infection present.
- **Grade 4a**: Any area of fascial dehiscence with organ space, viscera, implant or bone exposed. Infection present.

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- **Grade 3**: Dehiscence with subcutaneous layer exposed but fascia is not visible. No infection present.
- **Grade 3a**: Dehiscence with subcutaneous layer and fascia exposed. Infection present.
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- **Grade 4a**: Any area of fascial dehiscence with organ space, viscera, implant or bone exposed. Infection present.

* Patients with grade 4 surgical wound dehiscence usually require hospital management.
be referred to a wound care specialist for support and advice. Patients should be involved in their care and the potential for self-management in a supported environment considered.

**REFERENCES**


