

HOLISTIC MANAGEMENT OF PATIENTS WITH POSTOPERATIVE WOUNDS AND POTENTIAL COMPLICATIONS

Surgery is one of the most important treatments offered by today's NHS. As a result, the care delivered to patients in the pre-operative, intra-operative and postoperative stages form one of the cornerstones of nursing care. This article provides an overview of best practice and highlights the fundamental aspects of care delivery and focuses on the knowledge and skills required to successfully manage patients. Particular focus is given to the screening of high risk surgical patients to avoid postoperative wound complications, as well as the management of postoperative wounds.

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Surgery is one of the most important treatments offered by the NHS in the UK. Surgical staff and the resources they need to practice account for a substantial proportion of NHS activity and frontline care for patients. With continuing innovation, an increasing number of medical conditions are being remedied or managed using surgery.

In England alone, there are 4.6 million hospital admissions that lead to surgical care every year. Conservative estimates suggest that related costs in England amount to approximately £4.5 billion — 4.3% of the total NHS budget (The Royal College of Surgeons of England, 2012).

In the majority of cases, surgical intervention results in a break in the protective barrier of the skin. With the ongoing drive for shorter

hospital stays and the increasing pressure to manage patients in a community setting, it is essential that staff managing patients have the knowledge and skills to enable them to do so effectively. This includes preparing patients for theatre in ways that reduce the risk of potential complications, as well as the ability to recognise early warning signs in order to minimise the impact of any complications that do occur. This article provides an overview of the key aspects of knowledge and skills required by clinicians to enable them to successfully manage patients with postoperative wounds.

Key guidelines and audit

A multidisciplinary approach to postoperative care involving the surgical team is required to improve the overall management of surgical wounds. Guidelines have been issued to help clinicians both

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Table 1. Example audit sheet.

Observations					
Care action	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
1	Y	Y	N	Y	Y
2	N	Y	Y	Y	Y
3	Y	Y	Y	Y	N
4	N	N	Y	Y	Y
5	N	N	N	Y	Y
Total number of times an individual action was compliant	2	3	3	5	4

prevent and manage complications (National Institute of Health and Clinical Excellence (NICE), 2008). They highlight the importance of a thorough and structured approach to pre-, intra- and postoperative care.

This led to the development of a High Impact Intervention (HII) care bundle (Department of Health [DH], 2011), which is based on the NICE (2008) guidelines and expert advice. It comprises three phases of clinical actions which, if all elements are performed every time and for every patient, will reduce the risk of infection. However, the risk of infection increases when one or more actions of a care bundle are excluded or not performed (DH, 2011).

The use of this care bundle including regular audit of the actions taken and recording of any omissions in care during peer review should support cycles of continuous improvement. This will

help users to deliver appropriate and high-quality patient care. It is recommended that compliance audits should be carried out regularly and the results recorded at the point of care (Table 1). In turn, results should be used in helping organisations to standardise patient care and support staff to challenge ritualistic and non-evidence based practice. The following section examines the elements of the care-bundle process.

Preoperative phase

Patients at higher risk of postoperative incisional complications may be identified using a comprehensive preoperative assessment. Factors increasing a patient's risk of wound-healing problems, such as wound dehiscence or blistering, include poor nutritional status; obesity; smoking/living with a smoker; and belonging to particular patient groups. These may include those with diabetes, rheumatoid arthritis and those taking steroids or

immunosuppressant therapy. In addition, the type of surgery (e.g. bowel, planned/emergency), and the duration of the procedure, as well as any intraoperative complications encountered can also increase the risk of postoperative wound infection.

High Impact Intervention recommendations

HII recommendations for the preoperative phase are as follows:

- ▶ Screening and decolonisation: Patient has been screened for Methicillin-resistant *Staphylococcus aureus* (MRSA) using local guidelines. If positive, they have been decolonised according to the recommended protocol prior to surgery
- ▶ Preoperative showering: Patient has showered (or bathed/washed if unable to shower) preoperatively using soap
- ▶ Hair removal: If hair removal is required, it is removed using clippers with a disposable head (not by shaving) and timed as close to the operating procedure as possible.

Intraoperative phase

Operating staff are required to use an aseptic technique during surgical procedures and to prepare the skin at the surgical site immediately before incision using an antiseptic preparation. Surgical incisions anticipated to heal by primary intention should be covered by a film membrane, with or without a central absorbent pad (NICE, 2008). This should be left in place for 3–5 days, provided no adverse events occur (e.g. an unexplained increase in wound pain, pyrexia or sudden increase in wound exudate or odour).

High Impact Intervention recommendations

HII recommendations for the intraoperative phase are:

- ▶ Skin preparation: patient's skin

Table 2. Signs of infection of acute/surgical wounds (Cutting and White, 2004).

Primary closed wounds	Wounds healing by secondary intention (left open)
Abscess	Abscess/pus
Cellulitis	Heat
Discharge (serous exudate with inflammation, seropurulent, haemopurulent, pus)	Oedema
Delayed healing	Erythema
Discolouration	Cellulitis
Unexpected pain/tenderness	Discharge (serous exudate with inflammation, seropurulent, haemopurulent, pus)
Bridging of the epithelium or soft tissue	Delayed healing
Abnormal smell	Discolouration
Wound breakdown	Friable granulation tissue which bleeds easily
	Unexpected pain/tenderness
	Bridging of the epithelium or soft tissue
	Pocketing at the base of wound
	Abnormal smell

has been prepared with 2% chlorhexidine gluconate in 70% isopropyl alcohol solution (or povidone-iodine application if the patient has a sensitivity) and allowed to air dry

- ▶ Prophylactic antibiotics: appropriate antibiotics were administered within 60 minutes prior to incision and only repeated if there is excessive blood loss, a prolonged operation or during prosthetic surgery
- ▶ Normothermia: body temperature is maintained above 36°C in the perioperative period

- ▶ Incise drapes: if incise drapes are used, they are impregnated with an antiseptic
- ▶ Supplemented oxygen: Patients' haemoglobin saturation is maintained above 95% (or as high as possible if there is underlying respiratory insufficiency) in the intra and postoperative stages (recovery room)
- ▶ Glucose control: a glucose level of <11 mmol/litre has been maintained in diabetic patients (this tight blood glucose control is not yet considered relevant in non-diabetic patients).

Postoperative phase

During the postoperative phase, there are several steps to follow in relation to the use of Aseptic Non Touch Technique (ANTT), correct hand hygiene and the choice of surgical wound dressings:

- ▶ The wound is covered with an interactive dressing (i.e. one that promotes the wound healing process through the creation and maintenance of a local, warm, moist environment underneath the chosen dressing) at the end of surgery and while the wound is healing. The interactive wound

dressing is left undisturbed for a minimum of 48 hours after surgery unless there is leakage and the need for a dressing change

- ▶ A postoperative dressing should be removed earlier than the recommended 48 hours if there are clear signs of complications:
- Signs of excessive inflammation which may suggest infection
- Specific wound pain or pressure reported by the patient that is difficult to control with analgesia
- Wound dehiscence can be described in two ways depending on the severity and depth of separation. Partial-thickness dehiscence involves the separation of the skin layers only, whereas full-thickness dehiscence involves both the skin and muscle layers, resulting in visualisation of underlying structures (e.g. major organs and/or bone)
- Excessive exudate, strikethrough or leakage
- Evidence of periwound skin stripping or blisters (may be indicated by pain on movement of the affected area (*Table 2*))
- ▶ The principles of ANTT must be used when the wound is redressed
- ▶ Sterile saline must be used for wound cleansing up to 48 hours after surgery
- ▶ Patients should be advised that they can shower safely 48 hours after surgery
- ▶ The use of topical antimicrobial agents is not recommended for surgical wounds that are healing by primary intention
- ▶ Hands must be decontaminated immediately before and after each episode of patient contact using the correct hand-hygiene technique.

Dressing choice

Dressing choice can significantly affect the outcome of postoperative wound healing and dressings should be chosen to optimise healing and minimise complications. Ideally, dressings should maintain a moist

wound environment conducive to optimal healing, while avoiding maceration or blistering of the surrounding skin (Bhattacharyya et al, 2005; Cosker et al, 2005).

The choice of dressing depends on the wound type, position and size/depth. Other points to consider are the range of dressing sizes available, conformability and acceptability to the patient. Film and pad dressings are more conformable and have been reported to reduce blistering in some instances (Bhattacharyya et al, 2005; Cosker et al, 2005). Actilite Protect® (Advancis Medical), meanwhile, contains Activon Manuka Honey® and is an effective antimicrobial treatment that can be used on surgical wounds for preventing infection postoperatively.

Where possible, postoperative dressing choice should be aligned with NICE (2008) guidance or, where applicable, evidence-based guidelines. Low-adherent postoperative dressings or vapour-permeable polyurethane film dressings are usually used for uncomplicated surgical wounds with or without an incorporated, absorptive, central 'island' pad. Vapour-permeable film dressings offer a number of advantages over non-woven dressings (Roberts et al, 2011) in that they:

- ▶ Provide a barrier to extrinsic contamination
- ▶ Allow postoperative inspection of the periwound area (or inspection of the wound itself) without removal of the dressing in the first 48 hours
- ▶ Allow easy removal as a result of low adhesion to the wound
- ▶ Maintain a moist wound environment
- ▶ Enable the patient to shower after 48 hours without removal (i.e. they are waterproof)
- ▶ Can be left in place for up to 7 days
- ▶ Are conformable to body

contours and tend to be more stretchy, allowing for postoperative movement/wearer comfort with reduced incidence of blistering.

When placing a dressing, careful consideration should be given to dressing orientation and tension, as well as how patient movement postoperatively may affect this. This can be a significant problem when dressing wounds are over joints where movement can result in skin damage and blistering as a result of shear (Leal and Kirby, 2008).

The author hypothesises that this occurs as a result of the use of non-stretch fabric dressings or overextension of any dressing material on application. Their post application renders them unable to accommodate the changes in shape and elasticity of the skin that occur as a result of normal postoperative oedema build-up.

In addition, patients are encouraged to mobilise after their operation to reduce the risk of complications, such as DVT, PE and pressure ulceration. If movement is hampered by dressing choice this will alter recovery times as their patient is less likely to move if they experience pain on movement, appropriate dressing choice can help minimise both pain on movement and also reduce the frequency of dressing changes. As a result, rather than allowing for the increase in volume, they remain fixed and when the patient moves, shear force subsequently strips or blisters the skin.

After the postoperative phase

The following recommendations apply to the initial postoperative phase (3-5 days) (DH, 2011):

- ▶ Continued use of ANTT for change and removal of dressings
- ▶ Keep the frequency of dressing

changes to a minimum to avoid disrupting healing tissue

- ▶ Use tap water for wound cleansing after 48 hours if the wound has separated or has been surgically opened to drain pus. Antiseptic agents are considered unnecessary for general wound cleansing but may be of value when irrigating an infected cavity wound
- ▶ Where periwound skin maceration occurs or is considered to be a risk (e.g. if an enteral fistula is present or if there are excessive exudate levels), consider skin barrier products
- ▶ Use an interactive dressing for surgical wounds healing by secondary intention (NICE, 2008). The dressing should be left in place for as long as indicated. Continual assessment ensures dressing changes are kept to a minimum
- ▶ Refer the patient to wound-care specialists if required for advice on dressings and care.

Patient education

Patients, carers and clinicians should be educated on optimal wound care. As a minimum, this should include how to identify a wound that is failing to heal and who to contact when concerned about a possible surgical site infection (SSI) (NICE, 2008). Where possible, this information should be reinforced with written materials.

These may include:

- ▶ A patient information sheet or

leaflet, which helps to reinforce discussions about planned interventions with patients prior to the planned surgery to minimise risks postoperatively (e.g. smoking cessation, weight management)

- ▶ A postoperative patient education on diet/fluids, exercise/rest, medication, pain control, diabetes control, hygiene, etc. to reduce risks of infection and promote healing.

A good leaflet should also suggest when to contact healthcare professionals if concerned about possible infection.

Managing complications

If an SSI is suspected (i.e. cellulitis or a collection of pus with systemic complications such as sepsis), antibiotics may need to be considered (see *Table 2* for signs and symptoms and help with diagnosis). Intervention and release of pus must be a priority. Antibiotic choice should be based on the most likely causative organisms and patient allergy status, with consideration to local antibiotic resistance patterns and, when possible, the results of available microbiological culture and sensitivity tests.

An SSI can range from a spontaneously limited wound discharge, recognised usually within 7–10 days of an operation, to a life-threatening postoperative complication, such as abdominal wound dehiscence or a sternal infection with mediastinitis and dehiscence after open-heart surgery.

An SSI can have a considerable impact on a patient's quality of life, can carry a higher risk of morbidity and mortality, and can lead to a prolonged hospital stay (Coello et al, 2005) or rehospitalisation with greater use of healthcare resources and higher costs. Based on an SSI rate of 5%, NICE (2008) estimated each episode to cost £3500, and the overall cost of SSIs to the NHS to be around £700 million per year.

SSI is the most common postoperative incisional complication, with at least 5% of patients developing an SSI after a surgical procedure (NICE, 2008). Other complications include postoperative blistering and wound dehiscence, which may often be related to SSI and comprise approximately 20% of all healthcare associated infections (HCAIs).

To improve the onward management of complex surgical wounds, NICE (2008) suggests referral to a tissue viability nurse (or another healthcare professional with tissue viability expertise) for advice on appropriate dressings for surgical wounds that break down postoperatively or are electively left open to heal by secondary intention (e.g. pilonidal sinus). Negative pressure wound therapy (NPWT) may also be considered for more complex wounds such as abdominal wound dehiscence (World Union of Wound Healing Societies (WUWHS), 2008).

Most postoperative wounds will usually heal within 7–14 days depending on the type of surgery carried out. Despite best practice, some surgical wounds fail to heal primarily or are deliberately left open to heal by secondary intention. Several tools exist to optimise healing by secondary intention. Wound-bed preparation using the TIME (tissue, infection, moisture, edge) concept (Schultz

Article key points.

- ▶ Increased knowledge and skills are key to optimising patient outcomes
- ▶ Surgical site infection is largely preventable
- ▶ The key to identifying wound infection is to look for subtle signs
- ▶ Clinical indicators of infection require revision as knowledge advances
- ▶ Maximising patients' health pre-operatively where possible will help reduce risks of postoperative complications, including infection.

et al, 2003; Dowsett and Ayello 2004; Leaper et al, 2012), is an example of a practical tool for identifying barriers to healing and implementing a treatment plan to promote wound healing. Effective wound management will expedite and optimise healing.

Conclusion

This article highlights the significance of a multidisciplinary holistic approach to the care of patients undergoing surgical interventions. The importance and use of care bundles has been emphasised in an effort to minimise the impact of surgical wound complications. When complications occur, early recognition of signs and symptoms is essential in order to reduce the adverse effect on a patient's quality of life, as well as associated healthcare costs. Choice of dressing can significantly affect the outcome of healing in patients with postoperative incisions. A postoperative wound dressing should not be arbitrary, nor based solely on the initial cost of the dressing (Cosker et al, 2005). **WE**

References

Bhattacharyya M, Bradley H, Holder S, Gerber B (2005) A prospective clinical audit of patient dressing choice for post-op arthroscopy

wounds. *Wounds UK* 1(1): 30–4

Cosker T, Elsayed S, Gupta S, Mendonca AD, Tayton KJ (2005) Choice of dressing has a major impact on blistering and healing outcomes in orthopaedic patients. *J Wound Care* 14(1): 27–9

Coello R, Charlett A, Wilson J, Ward V, Pearson A, Borriello P (2005) Adverse impact of surgical site infections in English hospitals. *J Hosp Infect* 60(2): 93–103

Cutting KF, White R (2004) Defined and refined: criteria for identifying wound infection revisited. *Br J Community Nurs* 9(3): S6–15

Dowsett C, Ayello E (2004) TIME principles of chronic wound bed preparation and treatment. *Br J Nurs* 13(15): S16–23

Department of Health (2011) High Impact Intervention. Care bundle to prevent surgical site infection. Available at; <http://bit.ly/11kifVJ> (accessed 20.11.2014)

Leal A, Kirby P (2008) Blister formation on primary wound closure sites: a comparison of two dressings. *Wounds UK* 4(2): 31–7

Leaper DJ, Schultz G, Carville

K, Fletcher J, Swanson T, Drake R (2012) Extending the TIME concept: what have we learned in the past 10 years?(*). *Int Wound J* 9(Suppl 2): 1–19

National Institute for Health and Clinical Excellence (2008) Quick reference guide: Surgical site infection. Available at; <http://bit.ly/1xXrFD0> (accessed 20.11.2014)

Roberts N, Sorrell J, Bielby A, Searle A (2011) A survey of post-operative wound dressing practice before and after implementing national guidelines. *Wounds UK* 7(4): 12–21

Schultz GS, Sibbald RG, Falanga V et al (2003) Wound bed preparation: a systematic approach to wound management. *Wound Repair Regen* 11(Suppl 1): S1–28

The Royal College of Surgeons of England (2014) Surgery and the NHS in numbers. Available at; <http://bit.ly/1xXuDHx> (accessed 20.11.2014)

World Union of Wound Healing Societies (2008) Principles of Best Practice. Vacuum assisted closure: recommendations for use. A consensus document. Available at; <http://bit.ly/1BRCr1C> (accessed 20.11.2014)