Chronic pilonidal sinus wounds: regular cleaning and early laser depilation are key interventions to successful healing

Abstract

Pilonidal sinus wounds are notoriously slow to heal and have a high risk of infection due to proximity to the anus, the moist environment of the natal cleft and friction of buttock cheeks. Since the first pilonidal sinus disease (PSD) protocol was issued to the US army in 1955, care for PSD has focused on the principles of wound care following surgical excision with secondary or modified closure, including cleaning of the wound, hair removal and daily dressings. These principles remain valid today, although advances in the choice of dressings and laser therapies for long-term hair management allow patients more independence and less frequent dressings. At present, there are no standard guidelines for wound care following pilonidal sinus (PS) surgery. This article recommends thorough wound cleaning, starting laser depilation early and individualised patient education to accelerate wound healing and reduce recurrence. Collaboration between specialists in a multidisciplinary team is essential.

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Key words

- Laser depilation
- Laser hair removal
- Pilonidal cyst
- Pilonidal sinus
- Wound recurrence

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Pilonidal sinus disease (PSD) is an inflammatory condition, located mainly in the inter-gluteal area. The incidence has increased across the world, and, in Germany, 100 in 100 000 people are affected (Doll et al, 2019). PSD affects mainly young males with increased bodily hair and has a significant impact emotionally, economically and on the quality of life of the patient and their family.

Many patients are too embarrassed to seek medical advice until the condition becomes acute and are often first seen as an emergency, needing urgent incision and drainage of an abscess (Marza, 2019). When the inflammation subsides, excision of the sinus is usually recommended. The resulting midline wound may be left to heal by primary or secondary intention. In more complex surgery, lateral extensions may be present. Healing time depends on the surgical technique, but the principles of wound care remain the same.

Pilonidal sinus (PS) wounds are slow to heal, given the anatomical location. Although these wounds are expected to close within 2–6 months, they may sometimes take 1–2 years or even longer to completely heal (Harris et al, 2016). Delayed wound healing increases the risk of hair penetrating into subcutaneous tissue, which may cause recurrence of the sinus (Doll et al, 2007).

The care of the wound following surgery is performed by a variety of health professionals—and sometimes by family members—often with varying levels of understanding of this complex condition. A qualitative study by McCaughan et al (2018) showed that it is common for patients to have unrealistic expectations of the rate of healing, as well as that this is in conflict with the expectations of the clinicians. Reassurance, consistent information and continuity of care help create a bond of trust between the patient, family and healthcare team, as well as reduce anxiety at a challenging time for the patient.

Although there is no standard guideline for PS wound care, valid principles can still be drawn from the PS protocol issued in the 1950s by the

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US Army Medical Division (1955) for US soldiers stationed in Europe.

These principles are regular cleaning of the wound, removal of hair and use of dressings that are appropriate to the stage of the wound healing. It is the responsibility of the team of health professionals to develop a plan that fits each individual's specific needs and ensure consistent care appropriate to the local setting and availability.

This article describes principles of wound care following PS surgery and recommends regular wound cleaning and early laser depilation of the natal cleft to enhance healing and avoid further complications.

Wound management

The main aim of PS wound management is to ensure the wound closes from the base up and prevent premature closure of the wound entrance (Newton, 2016). PS patients are usually young and physically active, and they often need reassurance that the wound will improve and they will be able to return to their normal lifestyle. Delays in wound healing have a negative impact on patients' confidence and can make them feel isolated among an endless cycle of wound care visits, while living with the constant fear of recurrence of the sinus (McCaughan et al, 2018).

Wound assessment

Wound assessment requires a holistic approach, involving taking the patient's medical history and examining the wound, its edge and the surrounding area. At every visit, the wound must be assessed for size, depth and colour, as well as the presence of discharge, odour, debris and accumulated hair (*Table 1*). The data should be recorded for comparison at future appointments to assess progress. Particular note should be made of bridging, pocketing and early epithelialisation. The size and depth may be measured with a probe or thin catheter and a disposable paper ruler.

Photographs can aid the monitoring of wound progress. Consent must be taken before capturing images of the patient. For optimal visualisation of the perianal area and to reduce tensing of the buttocks, it is recommended that patients lie in the 'jackknife' position. This involves lying prone, with one or two pillows under the pelvis.

Table 1. Assessment of pilonidal sinus wounds

Area	Specifics
Symptoms	Discomfort, discharge, irritation
Wound measurement	Length, width, depth
Wound presentation	Colour, odour, bleeding/discharge, hairs/debris, bridging/pocketing, epithelialisation, hyper granulation
Periwound skin	Colour, fragility, exfoliation, folliculitis
Intergluteal area	Hair density/coarseness, depth

A reduction in wound surface by 20–30% after 3–4 weeks of treatment is a good predictor of timely healing (South West Regional Wound Care Program, 2015). If the wound is not closing as expected, it must be reassessed for presence of infection and/or hairs.

Periwound cleaning

The first step to be carried out is periwound cleaning. This should make use of a cleaning solution suitable for the condition of the wound, taking into account local availability and the patient's allergies and sensitivities. A number of antiseptic solutions for wound cleansing have been proposed, and polyhexamethylene biguanide (PHMB) has been found to be less irritating to the skin than chlorhexidine and povidone iodine and can also be used to reduce bacteria in the wound (Brown, 2017). An inexpensive, easily available alternative antimicrobial cleanser is acetic acid, which is effective and is useful against *Staphylococcus aureus*, MRSA, *Pseudonomas aeruginosa* and other gram-negative bacteria (Mangkorntongsakul, 2019). Care must be taken to remove the antiseptic from the skin and minimise risk of developing contact dermatitis.

Wound irrigation

Following periwound cleaning, wound irrigation by a steady stream of solution across the open wound surface facilitates removal of debris and permits better visual examination of the wound. It should be carried out before each dressing change and at every assessment (Gabriel, 2017). Wounds can be irrigated using normal saline, potable tap water or antiseptic solutions, such as PHMB, in infected wounds (Brown, 2017). Wound irrigation can promote healing from the inside outward and may prevent premature bridging and development of an abscess pocket or infected sinus tract.

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Hairs and debris

Hairs and debris must be removed meticulously. The author uses a magnifying glass and non-toothed fine forceps to remove hairs from the wound and electrical clipper with a disposable head to remove periwound hairs (*Figure 1*). Although electrical clippers do not perform as short a haircut as razors, they are preferable, as they reduce the risk of razor micro-cuts and it is recommended by the surgical site infection guidelines from the National Institute for Health and Care Excellence (2019).

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Figure 1. Fine forceps, wound probe and electrical clipper with a disposable head

Table 2. Indications of infection in deep or superficial wounds

Wound depth	Acronym
Deep wounds	**S:** Size increasing in the base **T:** Temperature on the side of wound is increased **O:** Os (Latin for bone) Bone can be probed **N:** New breakdown areas in the base of wound **E:** Exudate increased **E:** Erythema on the surrounding skin (cellulitis) **S:** Smell indicative of bacteria or anaerobes
Superficial wounds	**N:** Non-healing **E:** Exudate increased **R:** Red bright, friable granulation **D:** Dead yellow slough on the wound surface **S:** Smell indicative of bacteria or anaerobes

Source: Woo and Sibbald (2009)

Wound dressing

The aim of management of a PS wound is to ensure healing from base up, avoiding infection and early epithelialisation. The selection of a suitable dressing depends on the stage of the wound, volume of exudate, comfort for patient and cost (Harris et al, 2016). If the wound is not infected and has a high volume of exudate, an alginate dressing (e.g. Sorbsan, Kaltostat) or Hydrofibers (e.g. Aquacel) may be chosen. Where a sinus wound is contaminated, antimicrobial dressing (silver, iodine or honey) are most often used. Dressings need to be packed lightly, and use of a secondary dressing, such as a non-adherent dressing or absorbent pad, is often required (Newton, 2016).

Some wounds may benefit from vacuum assisted closure (VAC) therapy, although this may be uncomfortable, particularly at change of dressings. The healthcare team must devise a pain management plan for each stage of the wound, taking into account the patient's particular needs.

Delayed wound healing

The healing of PS wounds is often delayed. A Canadian literature review by Harris et al (2012) concluded that there were two main reasons for this delay in wound healing: failure to recognise infection and failure to remove hairs from the wound and the surrounding area.

Failure to recognise infection

Clinical signs that may indicate an infection have been described by Woo and Sibbald (2009) and are known by the mnemonics STONEES for deep wound infections and NERDS for surface infections (*Table 2*). The presence of three or more signs indicate an infection, and a culture swab is recommended to determine the appropriate antimicrobial agent.

Failure to remove hairs from the wound

The periwound skin in the natal cleft often contains bacteria (including Staphylococci), and the wound can trap hairs. These hairs act as a foreign body, causing inflammation and impeding healing (*Figure 2*).

The need to eliminate a source of inflammation/infection cannot be overstated (Harris et al, 2012). In the author's 20 years' experience of dealing with PS delayed wounds, meticulous

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removal of loose hairs from the wound and a series of laser depilation of the periwound hairs have resulted in no further intervention being needed (*Figure 3*).

Hypergranulation

One of the most common complications that can cause a delay in wound healing is hypergranulation, which results from the presence of a foreign body, infection, excess moisture and/or friction (Lloyd Jones, 2014). Hypergranulation grows beyond the top of the wound surface and can have a cauliflower-like appearance (*Figure 4a*) (Johnson, 2007). Numerous treatments are available, although there is no standard guideline on the best approach (*Figure 4b*). Silver nitrate used to be the first choice for small areas, as it has immediate effect; however, silver nitrate has become less favoured, as it may delay healing by reverting the wound to the inflammatory stage of healing (Johnson, 2007). Dressings (e.g. silver or iodine) may be used, but they can prolong the healing time by up to 6 weeks (Johnson, 2007). Meanwhile, topical corticosteroids, such as Trimovate (Ennogen) or Terra-Cortril (Intrapharm) ointment, give quick results, but they are used off licence and must be prescribed by a medical consultant (Cooper, 2007). The use of fludroxycortide tape, sold as Haelan (Packpharm), has become popular (Oldfield, 2009). To reduce the risk of hypergranulation, it is imperative that the wound is carefully assessed for early signs of infection and that hairs are removed from inside the wound and the surrounding surface.

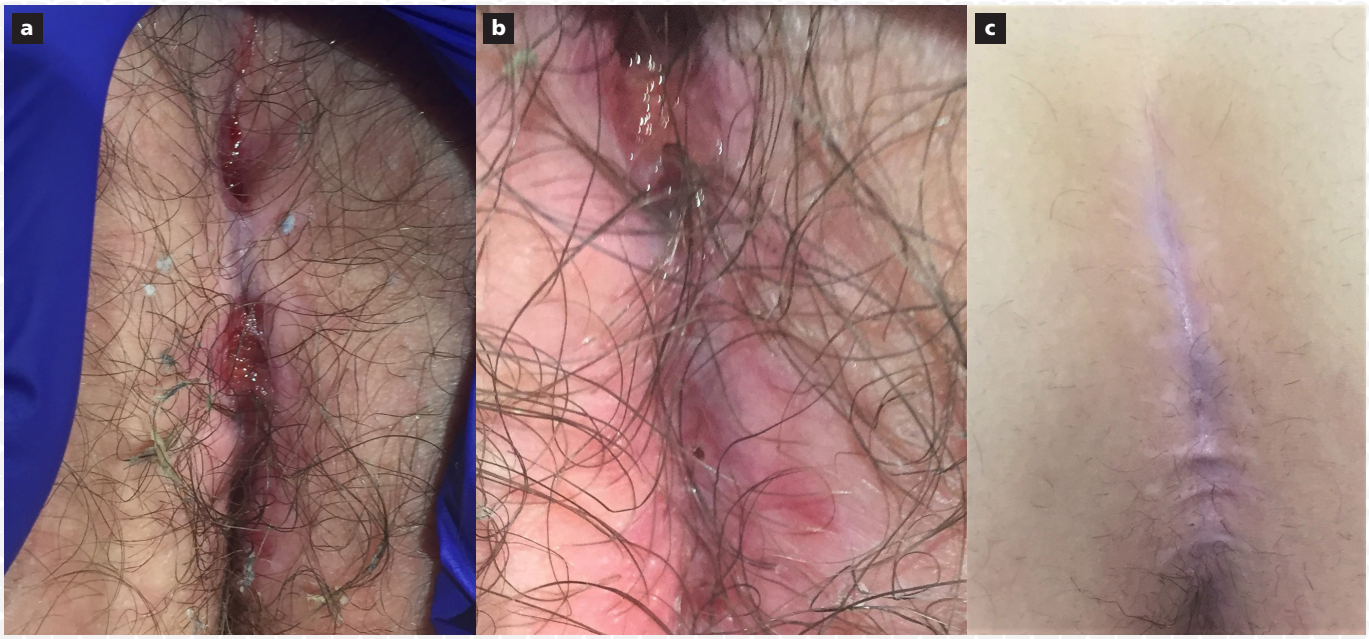
Laser depilation for long-term hair removal

Laser hair depilation has been around for many years. It has been used to treat a number of medical conditions, such as hirsutism, folliculitis, ingrown hairs and hidradenitis suppurativa, as well as PS.



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Figure 2. Non-healing wound with foul odour and discharge 4 months after surgery (a) and wound healed after cleaning and one laser depilation (b)



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Figure 3. Communicating unhealed sinus 4 months after pilonidal sinus excision and before laser depilation (a), coarse hairs entering the sinus and visible pits (b) and wound healed following a series of laser depilations (c)

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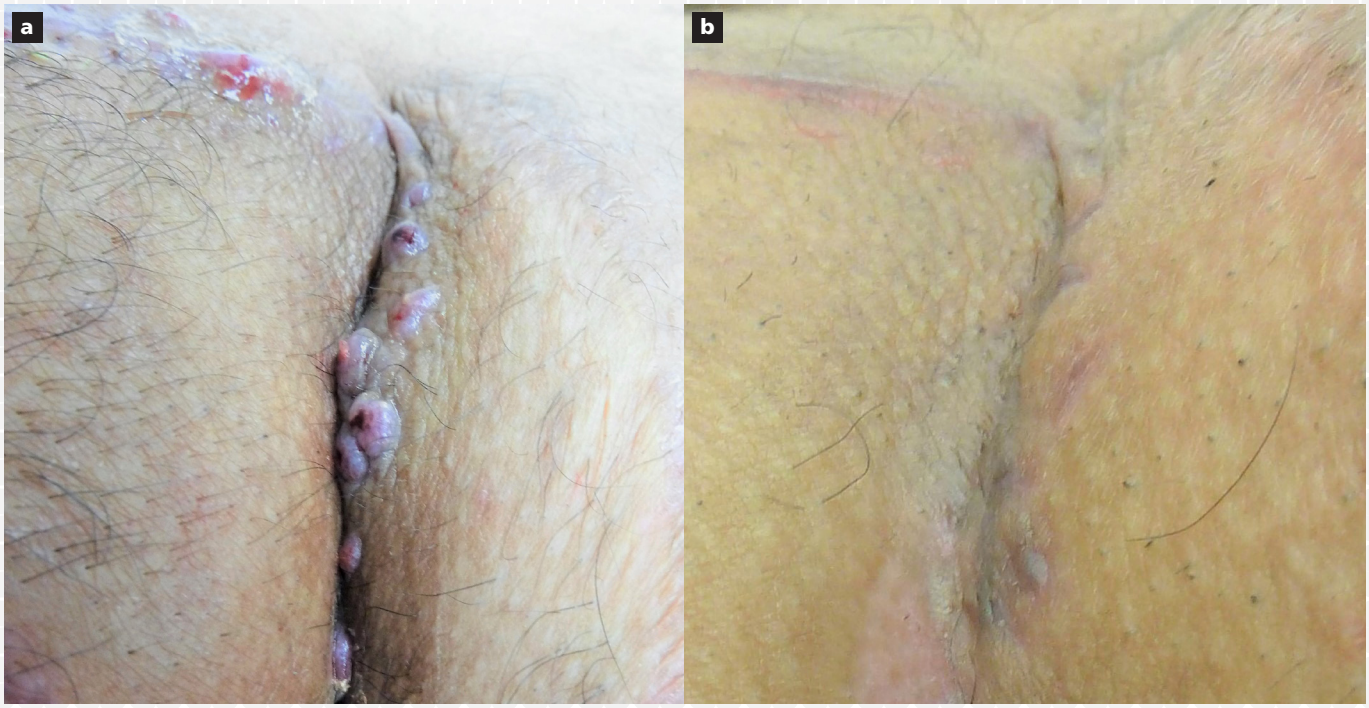


Figure 4. Hypergranulation following complex pilonidal sinus surgery (a) and wound healed following debridement and laser depilation (b)

Benedetto and Lewis (2005) have stated that excess hair growing in and around the gluteal cleft increases the risk of the occurrence of PSD, and the frequency and severity of recurrences are directly related to the density of the hair present on the buttocks. Loose hairs are sucked into the pilonidal sinus by friction and movement of the buttocks and then act as a foreign body, stimulating inflammation and infection (McCallum et al, 2008).

Numerous small-scale reports have shown the benefit of laser hair depilation for PS, leading to repeated calls for larger studies. A group of surgeons, led by Minneci et al (2018), were prompted by the 'very encouraging results' of their initial pilot study to carry out a large, prospective, controlled trial of laser epilation for PS to give a definite answer. Their historical data showed a 20% recurrence rate, but none of the 13 patients involved in the pilot study developed recurrence following laser depilation within 1 year.

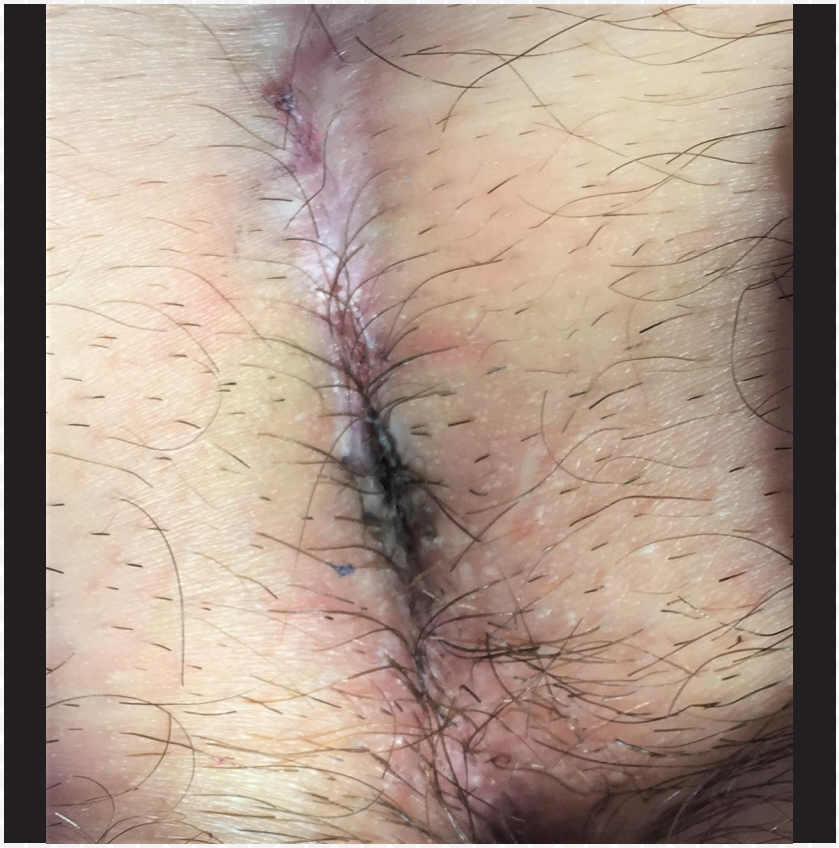
At present, most surgeons recommend hair removal as a preventative measure for recurrence. The advice varies from shaving to using epilation creams to laser depilation. Electrolysis is not suitable for large areas, as it is time-consuming. Shaving and applying depilatory creams in the intergluteal area are inconvenient, require assistance and, in the long-term, lead to poor compliance and consequent recurrence (Hayes Inc, 2014). In addition, new haircuts increase the risk of hairs penetrating in the intergluteal area. Ghnnam and Hafez (2011) recommended that, for every patient with PSD, laser depilation be started before surgery and continued every 6 weeks for between six and eight sessions. A series of treatments are required to transform coarse hairs into fine hairs that do not cause recurrence of the PSD.

All types of light-based technology and laser hair-removal systems are suitable for reduction of hair growth. The choice of the type of laser used should take into consideration the patient's skin type, hair coarseness and pain tolerance (Marza, 2013). Blonde hairs, which lack melanin, do not respond to laser treatment. A series of treatments are well tolerated and are safe in the hands of laser specialists with an interest in this medical condition. Appropriate wound cleaning just before depilation is of paramount importance.

Compared with surgical treatment of recurrences, laser depilation is an efficient and cost-effective method of preventing recurrence and reducing morbidity (Almajid et al, 2017). As a result, a number of NHS clinical commissioning groups are now funding laser depilation of PSD, as are medical insurance companies, recognising the cost-effectiveness of such treatments (Marza, 2019).

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The author has noted a tendency in recent years for more surgeons not to undertake repeat surgery until the periwound area has been laser depilated. The author recommends starting laser depilation early, as soon as the surgeon has reviewed the surgical wound at 4–6 weeks, to avoid hairs becoming embedded in the wound (*Figure 5*). It is advisable to review the patient every year thereafter, to ensure that the wound has stayed healed and the hair burden remains reduced.



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Figure 5. Embedded hairs in the wound and skin breaking 3 years after pilonidal sinus excision, causing pain and irritation every few weeks

Patient education

Patient education plays an important role in ensuring that the wound heals and reducing the risk of recurrence. Particular advice needs to be given according to each patient's individual circumstances and stage of the wound healing. What is practical will depend on the patient's occupation and level of support at home from family and carers. Dressings are very difficult to manage without support, and, the simpler the procedure, the more likely the patient is to adhere to treatment. Patients should be given verbal and written information (*Table 3*), including the rationale for the advice given.

Multidisciplinary collaboration

PSD should ideally be managed by a multidisciplinary team, with an agreed set of protocols and a treatment plan for every individual. Important members of the team include a surgeon with a specialist interest in PSD, a dedicated wound care nurse, a laser specialist and community support from primary care. Ideally, patients should be seen by the team as a whole so that they can understand the long-term plan of treatment and be reassured that the support they require is available. While it may be difficult to assemble such a dedicated team in every centre, the principles of multidisciplinary care should be maintained by effective communication between specialities.

Table 3. Lifestyle activities recommended and to be avoided to reduce recurrence of pilonidal sinus wounds

Area	Encouraged	To be avoided
Activity	Gentle walk, exercise	Squatting, cycling, riding, heavy weightlifting, impact sports; driving or sitting for long period of times
Diet and weight	Balanced, high-fibre foods; weight loss (if overweight)	Increase in weight/obesity; constipation
Clothing	Cotton underwear	Lint-shedding pants, thongs
Hygiene	Showering wound area (or using wet wipes) after opening bowels; leaning forward when washing occipital hair and following haircuts to avoid loose hairs accumulating in gluteal cleft; keeping perianal area dry by light patting +/- hairdryer on low setting	Loose hairs accumulating in the gluteal cleft; sweat and moisture in the inter-gluteal area
Hairs	Long-term intergluteal hair removal and yearly review	Coarse periwound hairs

Conclusions

Poor wound care following surgery increases the risk of PSD recurrence. All hair in the wound should be removed at every assessment, and patients should be educated to wash the intergluteal area carefully, particularly after haircuts, to prevent re-accumulation and to keep the perianal area dry. An appropriate dressing must be chosen for each stage of wound healing. Laser depilation of the periwound area should be started as soon as the surgeon has reviewed the wound. Even one laser depilation can enhance wound healing, although a series of laser treatments is advocated to make the hairs finer

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CPD reflective questions

- List three wound care principles following pilonidal sinus (PS) excision with secondary closure
- What are the two main reasons for delayed healing following PS surgery?
- How does the presence of hair impede PS wound healing?
- What interventions should be carried out at each wound assessment?

and reduce the risk of PS recurrence. It is essential to give the patient consistent information by the multidisciplinary healthcare team to improve the outcome of this troublesome condition and reassure patients that they are receiving the best care. **GN**

Declaration of interest *None. Liliana Marza is an independent laser practitioner in private practice at Skin55 Dermatological Centre, London*

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