CLINICAL MANAGEMENT

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Twelve Common Mistakes in Pilonidal Sinus Care

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This continuing educational activity will expire for physicians on July 31, 2013.

PURPOSE:

To enhance the learner's competence with knowledge of 12 common mistakes in pilonidal sinus care.

TARGET AUDIENCE:

This continuing education activity is intended for physicians and nurses with an interest in skin and wound care.

OBJECTIVES:

After participating in this educational activity, the participant should be better able to:

1. Demonstrate knowledge of pilonidal sinus care and the 12 common mistakes associated with this care.

2. Apply research-based information to educating patients about self-care for pilonidal sinus wounds.

ABSTRACT

Healing of pilonidal sinus wounds (PSWs) by secondary intention requires an average of 2 to 6 months, but delayed healing may require 1 to 2 years or even longer. Characteristically, these midline wounds are in the natal cleft of the buttocks or sacrococcygeal area of the back. These PSWs have costly financial consequences to the healthcare system and negatively affect the quality of life of the individual with the wound. This article contains an evidence-based literature review supplemented by the clinical expert opinion of the authors. Twelve leading mistakes in assessment and treatment have been identified with appropriate solutions to optimize patient outcomes. A case study is included to illustrate the common clinical challenges with strategies to optimize healing.

KEYWORDS: pilonidal sinus wounds, pilonidal cyst, sacrococcygeal fistula

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INTRODUCTION

A pilonidal sinus wound (PSW) (pilonidal cyst, sacrococcygeal fistula) is a cystic structure that contains hair and skin debris and may become secondarily infected.[1] Affected individuals present with pain, pus, and swelling near the natal cleft of the buttocks or in the midline of the sacrococcygeal area of the back. A pilonidal sinus tunnels under the skin often with more than 1 tract or direction.[2] Pilonidal sinus wound is a chronic acquired condition caused by 1 or more factors as listed in Table 1.[3–6]

Pilonidal sinus wounds occur in a ratio of 4 men to 1 woman. The peak onset is at 19 years of age in women and 22 years in men, with new lesions seldom occurring after the age of 40 years.[7,8] Pilonidal sinus disease may be related to the greater production in sex hormones in this age group, causing increased sweat production in the pilosebaceous glands. The differential diagnosis for PSD by the American Society of Colon and Rectal Surgeons includes a furuncle (staphylococcal infection of the deep hair follicle), osteomyelitis, and anal disease.[9] Surgical intervention with incision, drainage, and curettage of an acute abscess is associated with a 40% to 60% recurrence rate.[2,10] A chronic or recurrent sinus will require wide excision and primary or secondary closure.[8] All 3 approaches have risks of recurrence (Table 2).

Table 1.
FACTORS ASSOCIATED WITH PSW

Factor	Comment
Body hairs[3,4]	Hair follicles enter the natal cleft and cause a foreign-body reaction
Body hair tips/debris[5]	Hair tips penetrate the dermis in existing midline pits/dimples or a site of previous excision and cause a foreign body reaction
Hair follicle keratin plugs[4,6]	Inflammation of hair follicles (folliculitis) spreads to adjacent hair follicles causing subcutaneous abscesses, destroying dermal tissue, leading to discrete holes or pits after keratin plugs have been shed

Table 2.
SURGICAL METHOD AND ASSOCIATED RECURRENCE RATES

Method	Recurrence, %
Surgical: incision and drainage, curettage	40–60[2,10]
Natal cleft excision + primary closure	37*
Healing by secondary intention	8–43[8, *]

* Torkington J. In Téot L, Banwell P, Ziegler UE, eds. Pilonidal Sinus Disease. Surgery in Wounds. Berlin and Heidelberg, Germany: Springer-Verlag GmbH & Co. K, 2004: 317-24.

Postoperative PSWs include simple incision and drainage sites, open excisions healing by secondary intention, or primary closures that have opened because of infection and dehiscence. Expected healing rates vary between 8 and 10 weeks or longer. Elements that delay healing include infections and suspected causes such as poor hygiene and wound care choices, physical activity causing increased friction and shearing forces, and obesity.[4,11–15]

A recently published article by Harris and Holloway[16] featured a literature review to identify areas that may contribute to optimal healing conditions or to delay healing in PSW healing by secondary intention. This was followed by a modified Delphi procedure to develop consensus for an evidence-based protocol for treatment.[16,17] The protocol was presented at 4 national wound care conferences and implemented in several healthcare organizations, including those affiliated with the 4 authors. This article will help clinicians to identify 12 common mistakes that the authors believe are key barriers to the success in healing PSW, according to their observations over a 2-year period while using the protocol interventions (Figure 1). Clinicians will also be better able to initiate appropriate treatments to optimize patient outcomes.

TWELVE MISTAKES, OBSERVATIONS, AND INTERVENTIONS

The following review includes the commonly observed ''mistakes,'' rationale for diagnosis and treatment from the literature review, observations, and practical applications of knowledge from the authors to help clinicians optimize PSW healing by secondary intention.

Figure 1.
TWELVE COMMON MISTAKES IN PSW CARE

1. Unrecognized and untreated deep infection in the absence of overt cellulitis (cellulitis/edema)
2. Inadequate/improper hair removal
3. Poor local dressing hygiene
4. Inappropriate local dressing choice (forms and functions)
5. Inappropriate moisture management (exudate and body fluids)
6. Untreated frictional forces (excessive local friction/ activity)
7. Unrecognized and untreated superficial critical colonization
8. Incomplete pain assessment and management
9. Restrictive impact of PSW's on the activities of daily living
10. Unacknowledged psycho-social impact
11. Improper examinationpositioning that prevents visualization and cleansing
12. Inadequate personal skin cleansing to address contamination

1. Unrecognized and untreated deep infection in the absence of overt cellulitis (cellulitis/edema)

Pilonidal sinus wounds infected with hemolytic streptococci and anaerobic bacteria have a statistically significant correlation between pocketing in the base with friable granulation tissue, bridging of the epithelium, and infection ($P = .02$ and $P < .001$).[12] Small pinhole openings in the bluish, newly epithelialized tissue may be present distally and proximally. The openings may probe to the main wound or may be isolated and contain friable granulation tissue. Pockets of infection may form with minor tension, leading to breakdown of the newly epithelialized tissue.[12,13]

The NERDS and STONEES mnemonic first published in the study of Sibbald et al[18] and validated by Woo and Sibbald[19] outlined clinical features that increase the incidence of superficial critical colonization (NERDS) and deep infection (STONES later revised to STONEES). For deep and surrounding infection, consider the wound margin and base as a soup bowl with a continuous compartment between the wound edge and base. Any 3 of the STONEES criteria would be an indication to treat deep infection with systemic (oral or parenteral) antimicrobial agents. The diagnosis of infection should be made with the clinical signs as outlined in the STONEES mnemonic:

• **S**ize is increasing that indicates bacterial damage in the sides or base of the wound.

• **T**emperature increase as defined by touch to the periwound margin with a gloved hand or more exactly with an infrared thermometer. The authors have validated that a 2° F to 4° F increase in temperature compared with a mirror image on the other side of the wound margin/body indicates localized bacterial damage,[20] unequal vascular supply, or deep tissue inflammatory response as might be seen with a Charcot joint.

• **O**s (Latin for bone) is probing to bone or exposed bone.

• **N**ew areas of breakdown with satellite areas developing around the base of the wound indicating localized damage to the intact skin much like pocketing occurs within the wound base

• **E**xudate increased because of the body's response to local injury.

• **E**rythema and/or edema of the surrounding skin otherwise known as cellulitis. Many practitioners look for this sign to diagnose infection and order systemic agents, but any 3 of the other signs will also indicate infection and the need for systemic therapy even in the absence of frank cellulitis

• **S**mell indicates the presence of Gram-negative bacteria, anaerobes, or both agents.

To select the appropriate antimicrobial agent, the clinical diagnosis of infection is made with a bacterial swab to identify the bacterial species and its resistance pattern. Clinicians need to remember that persons with chronic wounds for more than 1 month often have Gram-positive, Gram-negative, and anaerobic organisms playing a role in the bacterial damage. In addition, persistent inflammation with or without infection that may be caused by the hair follicle, hair tip, or foreign-body reaction can delay healing.

Oral antimicrobials with

• *anti-inflammatory* actions include tetracyclines (especially doxycycline), sulfonamides, clindamycins, erythromycins, and metronidazole

• *Gram-positive actions* include cloxacillin, cephalexin, amoxicillin–clavulanic acid, sulfonamides (methicillin-resistant *Staphylococcus aureus* (MRSA), doxycycline (MRSA, *Staphylococcus*, *Streptococcus*)

• *Gram-negative actions* include amoxicillin–clavulanic acid, cotrimoxazole (a sulfa but not effective for *Pseudomonas*), quinolones (ciprofloxacin, moxifloxacin, and related agents)

• *anaerobic activity* include clindamycin and metronidazole

2. Inadequate/improper hair removal

Periwound skin in the natal cleft often contains bacteria, such as staphylococci,[21] and the hairs trap feces that contain bacteria and other debris. Long hair protruding into the PSW contributes to chronic inflammation and increases the risk of infection.[6,8] The Delphi panel recommended shaving the natal cleft at least weekly in a 5-cm-wide strip extending at least 2.5 cm from all edges of the wound, from the anal verge to the presacrum to remove all hair in the area between the distal wound and the anus.[17]

The need to eliminate a nidus of inflammation/infection and provide hair-free wound and periwound skin cannot be overstated. In the authors' experience, razors specifically designed for the bikini area that includes a swivel razor head work most effectively. Anecdotally, the authors have seen improved client outcomes from regularly shaving the periwound area. In open wounds, it is critical to carefully examine the wound

and wound edge at each visit to identify and remove hairs or foreign bodies.

3. Poor local dressing hygiene

Fecal contamination of the dressing and the wound contributes to delayed PSW healing.[17] Patients with PSWs who miss scheduled dressing changes[22] or keep the soiled dressing in situ when bathing or showering are at risk of delayed healing because of fecal contamination associated with poor local hygiene.

Self-management education regarding frequent and regular local hygiene is a key element in improving wound healing rates as well as decreasing recurrences. Patients are taught how to remove dressings, cleanse the area, and redress the wound. Individuals are instructed to

- shower or cleanse area after each bowel movement.
- keep the dressing clean and dry at all times.
- change the dressing immediately if it becomes soiled or damp.
- plan shower time after a bowel movement if possible, to ensure that the patient completes a hygiene routine a minimum of once per day.
- avoid head hair from being trapped in the wound by positioning in the shower: bend slightly forward and to one side.
- use a handheld sprayer to gently flush out the inside of the wound and to direct soap, shampoo, and loose hair away.

Sitz baths or tub bath may be ordered by the physician. It is important that patients know the difference between the two. The patient handout (Figure 2) outlines the correct way to complete a Sitz bath. Although the evidence does not support the use of Sitz baths for wound healing or pain relief, a systematic review[23] identified that they do improve patients' overall satisfaction.

4. Inappropriate local dressing (form and function)

Local wound dressings for PSWs should be flexible and adherent and avoid interface friction and shear. Dressings that form a hard adherent mass (eg, normal saline–soaked gauze or paraffin-impregnated gauze) contribute to friction and inflammation that is not ideal for PSWs. The dressing should

- be cost effective,
- prevent wound bed cooling and disruption,
- minimize patient discomfort, and
- avoid wound contamination and match the contours of the natal cleft, sealed at all edges.[24,17]

Many surgeons continue to pack the wound cavity with saline-soaked gauze that dries out and subsequently associated with pain caused by this suboptimal treatment.[24] Dressings selected need to hold the wound mirror image surfaces apart to prevent superficial bridging or dead spaces forming in the wound base.[25] In the absence of tunneling or deep wounds where the base is not visualized, calcium alginates that are gel-forming or hydrofibers keep the wound moist and the wound edges apart. Cover dressings need to adhere to the anatomical contours so that the dressing does not bunch, roll, or shift with movement.

Hydrogels should be selected for dry or thick-slough areas, keeping in mind that the whole cavity is not to be filled—a small amount in the base of the wound is sufficient to provide needed moisture with the secondary dressing maintaining wound contact.

The secondary dressing choice needs to be based on dressing frequency, and daily dressings need a simple adherent or soft-woven gauze dressings. These dressings are easy for individuals to apply and cost-effective if frequent home dressing changes are required between healthcare provider visits, enabling the client to keep the area dry and reduce friction, and local dressing–induced external pressure.

5. Inappropriate moisture management (exudate and body fluids)

The PSW dressing should prevent ''strike-through'' of exudate that potentiates bacterial contamination, while wicking moisture away from the wound surface. Excess moisture on the wound surface can contribute to hyperproduction of inflammatory metalloproteases, causing the development of friable granulation tissue.[26]

If possible, the goal is to change the dressings 2 to 3 times per week, but this may not be appropriate for all patients or wounds. For this dressing frequency, the more expensive moisture retentive dressings can be considered—for example, adhesive foams, absorbent composite dressings, or semipermeable films with nonwoven soft gauze. The clinician needs to assess how each dressing manages moisture (absorbs, donates), along with its moisture vapor transmission rate. Choosing the right dressing for each patient involves evaluation and reassessment, based on the patient comfort, acceptability, and economic sustainability. In the authors' experience, PSW patients' self-management abilities are facilitated with the use of soft nonwoven gauze as the secondary dressing, changing it as needed throughout the day. Specific to this particular wound type, the soft gauze secondary dressings provide patients with independence while meeting the principles of preventing contamination, contouring, and separation necessary for wound closure.

6. Untreated frictional forces (excessive local friction/activity)

The natal cleft, where most PSWs occur, consists of 2 flat planes separated by a cleft. Simply by walking, a ''rolling'' or drilling effect occurs; the buttocks move against each other, complicated by suction in a deep cleft.[3] These forces cause friction and chronic inflammation, which contribute to exuberant hypergranulation tissue.[26] Sitting for prolonged periods can cause pressure to the wound bed. Engaging in physical sport

Figure 2.

CARING FOR YOUR PILONIDAL SINUS WOUND

Please bring the following to each visit:

- Wear loose pants or bring a pair of boxer shorts to change into following your treatment. If wearing hip-hop jeans, place the belt above the area where your wound is.
- Razor—bikini line razors with a pivotal headare the best.
- Day-time incontinent briefs or panty-liners

Supply Care Kit:

- Dressing supplies will be provided to you along with instructions for use. Please inform the nurse when your suppliesare low.

At home:

- If at all possible, attach a hand-held shower head to your shower stall.
- Purchase liquid soap and use this for cleansing in the shower.
- Keep moistened towelettes near the toilet to use after each bowel movement.

Personal Hygiene

- Your dressing needs to be kept clean AND dry all the time to protect your wound.
- If your dressing gets soiled or wet, it needs to be removed. Clean the wound as instructed, pat the area dry and apply a new clean dressing.
- Shower after each bowel movement (if possible) and at least daily
- Remove soiled dressing before showering or sitz bath.
- Use a hand held sprayer to gently flush out the inside of the wound and direct soap, shampoo and loose hair away from open area.
- Baths are not permitted. If your doctor has recommended a Sitz bath, take one following a bowel movement. A Sitz bath consists of 2–3 inches of warm water in the bath tub. Sit in the tub with knees to chest and stay for no longer than 5 min. or purchase a Sitz Bath Kit. Pat area and wound dry before applying dressing as demonstrated by the nurse.
- Moist towelettes may be used to do some extra clean-up after a BM.

Activities

- Refrain from picking up heavy objects (eg, young child) for at least the first week following surgery.
- Sit for short periods: get up, slowly walk around and stand. It is important to change positions frequently to relieve stress on the area.
- It is recommended NOT to drive a car for the first 5–7 days!
- Gentle yoga will help manage pain as well as support wound healing. NOTE: Gentle yoga only.

Managing your pain:

- Take your pain medication 1 hour before each scheduled dressing change. Pain delays wound healing as well as making it very uncomfortable to receive care. If you need to drive to your care site, speak to the nurse regarding other methods for pain relief.

Eat and drink!!

- Drinking water will help keep stools soft. Constipation increases pain and may pull on incision or wound site.
- Constipation is one of the adverse effects of your pain medication. Eat plenty of fresh vegetables, fruit, and fiber.
- Over-the-counter stool softeners work well to keep the stool soft and will not interfere with your recovery.

activities adds the risk of shearing of the fragile healing tissues, and increased perspiration caused by the activity can also contribute to external contamination of the PSW.[27]

Local wound care management is a critical element in reducing frictional forces. As mentioned, dressing stability is critical. During the initial history and assessment, it is important to know the patient's activities and to fit the dressings to meet the need. Low-profile, bordered adhesive dressings keep the buttocks separate, reduce friction, and eliminate a nidus for pressure. Hydrocolloid paste is beneficial in securing the dressing at the base of the anal verge. Loosely secured dressings roll or bunch and will cause excessive trauma to the wound and periwound area, unless the patient is able to perform self-care as per No. 5 in the authors' presented list.

Another consideration that may contribute to excessive friction activity is the impact of care access, thus the clinic setting versus in-home treatment. As mentioned previously, activities involving sitting, excessive walking, or movement cause further damage and delayed wound healing due to frictional forces. Patients who must travel long distances by car, public transit, or walking may be negatively impacted as compared with those who have in-home care provided. The overall cost of care versus the cost per visit needs to be carefully examined in order to meet patient-centered concerns.

7. Unrecognized and untreated superficial critical colonization

Superficial critical colonization is due to damage caused by bacteria on the surface of the wound that leads to delayed or stalled healing of a PSW. The bacterial damage on the surface of a wound is also known as increased bacterial burden, localized infection, or covert infection. Signs of surface bacterial damage are included in the NERDS mnemonic:

- **N**onhealing—the size of a wound is stalled and not 30% smaller from a previous measurement 4 weeks ago.
- **E**xudate has increased.
- **R**ed friable granulation with lots of blood vessels, an abnormal bright red color and very little mature collagen—look for bleeding points when the dressing is removed or friable granulation with bleeding after compressing or irrigating the wound.
- **D**ebris—dead yellow slough is on the wound surface.
- **S**mell indicates the presence of Gram-negative or anaerobic organisms.

The presence of 3 or more signs is an indication to include topical antimicrobial agents as part of the local wound care. Topical antimicrobials can consist of silver, iodine preparations, polyhexamethylbiguanide (PHMB), honey, or other miscellaneous agents with antimicrobial properties.

Silver has been combined with foams, hydrofibers, alginates, or hydrogels to select the level of silver release and the moisture balance required but is ineffective in a dry environment. Silver also has a local anti-inflammatory action. Iodine has the ability to penetrate biofilms because of its small molecular size, but it may be proinflammatory. It has been combined with a cadexomer absorptive molecule. PHMB foam and gauze may also provide moisture balance for PSWs, with the foam having a longer wear time. Honey is available in alginate, hydrocolloid, and hydrogel formulations with several antimicrobial actions including hyperosmolar properties that may be neutralized when the dressing becomes oversaturated. If the exudate is excessive and not handled with topical dressings changed daily, deep or surrounding skin infection should be suspected, diagnosed, and treated. Many clinicians have had anecdotal success with negative-pressure wound therapy for highly exudative wounds in this region if the cause and secondary infection have been adequately treated.

8. Incomplete pain assessment and management

Pain in PSWs can be a factor in reducing the individual's ability to attend school or continue working, or refusing to have the wound packed.[27] Price et al[28] performed a quality-of-life survey of individuals with acute wounds (n = 80), 62 of which had PSWs. Discomfort from the wound negatively impacted the ability to sleep well for 6 or more nights (49%) and diminished the appetite (20%), at a time when good nutrition is needed for healing.

Many patients are reluctant to take pain medication predressing change because they need to drive to their care site, activities after dressing change are affected if pain medication is taken, or the pain medication is ineffective. Frequently, pain medication causes severe constipation, causing further pain and discomfort. Once this happens, the patient is reluctant to take any medication for fear of adverse effects.

Pain can be managed with gentle wound care and preparation of the patient along with local dressings to minimize pain at dressing change. In general, the systemic approach to pain management involves the World Health Organization pain ladder.[29] If patients have the gnawing, aching, tender, or throbbing pain that is stimulus-dependent, then aspirin, nonsteroidal anti-inflammatory drugs, and narcotic agents may be used. For neuropathic pain (burning, stinging, shooting, stabbing), tricyclic agents (especially nortriptyline, desipramine), gabapentin, pregabalin, and carbamazepine are useful. Oftentimes, wound-associated pain is a combination of both types of pain.

9. Lack of consideration for the restrictive impact of PSWs on the activities of daily living

When clinicians advise individuals with PSWs that they must not sit for long periods or participate in sports activities,

CASE STUDY

A 15-year-old boy had an elective excision of an extensive pilonidal sinus, left to heal by secondary intention. Typically, this procedure is performed as a same-day surgery, with the patient discharged following the procedure. This patient, however, remained in the hospital for 16 days, primarily for the complicated dressing changes. The excision extended down to the anal verge and required at least 2 healthcare team members to ensure a secure seal for the negative-pressure wound therapy that began intraoperatively. The community wound care specialist and visiting nurse came to the hospital prior to discharge to discuss and view the dressing change to ensure the continuity of care.

The hospital healthcare team met throughout the process with the patient and family to create and carry out the plan of care for this young man. Because of the complexity of the wound and dressing, the parents chose to keep the patient out of school for the first part of the year. The patient agreed to limit his activities that would stress the wound and to alter his diet to include foods rich in protein. He also began taking a multivitamin.

Elements of the protocol that were consistently used throughout his healing included weekly periwound shaving, removal of hypergranulation tissue using curette or silver nitrate sticks, and chlorhexidine compresses with each dressing change.

Negative-pressure wound therapy was used for the first 8 weeks at which time the 8-cm cavity was completely filled. Instructions were written as physician orders for conventional dressing using a silver alginate as a contact layer, and adhesive foam as the secondary dressing with hydrocolloid paste to secure the distal dressing edge was applied. The intention was to aid the epithelium to migrate across the wound bed down into the deep fold of the natal cleft, while preventing fecal or other contamination of the wound. The patient reported that the community nurses were quickly covering the wound without ensuring that the dressing material contoured into the natal cleft (Figure 3). The results of these actions allowed the wound tissue from both sides of the buttock to touch and begin to heal together (premature bridging, altering the contour of the natal cleft). This tissue had to be repeatedly separated using both mechanical force and sharp instruments when the patient was seen in the hospital clinic weekly. As well, persistent friable hypergranulation tissue occurred as there was no dressing material to reduce friction while the patient ambulated. The patient expressed a feeling of discomfort when the dressing was done quickly, stating that it felt loose and as if the dressing material was falling out as soon as he stood up.

Communication was required between the surgeon and the community nurses to emphasize the importance of ensuring this intimate contact between the dressing material and wound throughout the wear time of the dressing (Figure 4). As a result, epithelial cell migration improved with reduced hypergranulation present in the wound base.

Figure 3.
DRESSING APPLIED INCORRECTLY

Photo courtesy/Halton Healthcare Services, Richard Bishop 2011.

Figure 4.
DRESSING CONTOURED INTO THE NATAL CLEFT

Photo courtesy/Halton Healthcare Services, Richard Bishop 2011.

this can greatly affect their ability to perform many activities of daily living (ADLs). Students miss extended time at school, and lost time at work is costly to the individual and the employer. If physical activities are important to the person with a PSW, taking them away can negatively alter his/her quality of life. It may be important to allow them to participate, advising them that they must balance the risk of physical trauma or delayed healing with the pleasure of participating.[17] The healthcare professional needs to provide a number of options for this patient group. Negotiating a plan of care to which the patient will commit requires

- knowledge of the disease state,
- wound healing trajectory,
- patient's lifestyle,
- viable choices that fit within his/her lifestyle and current situation,
- ability to adhere to a plan of care, and
- pain management strategies.

Many patients with PSW are young and do not have the same perspective on illness, morbidity, and mortality as do

more mature individuals. Patient-centered concerns for the younger patient minimize the extent of the impact of their choices on their health. Engaging clients early in their care can be quite challenging. Despite multiple reminders and enablers for personal care to aid healing, it is incredible how often basic hygiene steps are ignored.

10. Unacknowledged psychosocial impact

In addition to the disruption to ADLs and physical activity, living with a PSW can have a negative psychosocial impact. For example, the individual may avoid intimacy because of embarrassment and fear of odor. The fear of recurrent infection and fear of wound deterioration reduce the quality of life.[27]

The authors have found that early engagement of the patient in self-management strategies will result in lessening the psychosocial impact of the PSW. The success of this strategy lies in providing consistent information to the patient and consistent care practice within the team. The PSW protocol has provided continuity of care for this patient group with anecdotal success. Although these data are currently being collected, the staff report decreased average length of stay for patients adherent to the PSW protocol.

11. Improper examination positioning that prevents visualization and cleansing

Side-lying or prone positions do not adequately open the natal cleft for inspection of the wound because the individual is able to tense the gluteus muscles. Embedded hair and debris should be removed at each wound inspection, because of the chronic inflammation that they induce.[8] Turnbull et al[30] recommend a ''prone jackknife'' position as the optimal for visualization of the perianal area. One to 2 pillows under the anterior pelvis with the individual lying prone are required in order to achieve the desired effect. The patient can easily help to separate his/her buttocks using both hands while in this position; it is much more difficult to tense the gluteus muscles. The individual will quickly tell you if your peers are using this positioning. They may say ''no one else makes me lie like this,'' or the converse, if you do not ask them to assume the modified jackknife position, is to ask ''Do you want me to lie on the pillows?''

12. Inadequate personal skin cleansing to address secondary contamination

Søndenaa et al[31] identified an increase in microorganisms in PSW over the postoperative period, which they attributed to late secondary contamination. Healthcare providers who regularly change the dressings of PSW can anecdotally report their experiences with dressings and wounds contaminated by feces, lint from clothing, and periwound hair-containing debris. In addition, the perineal skin often carries *S aureus*,[21] whereas the hair follicles are a nidus for anaerobes and Gram-positive cocci.[31] Harris and Holloway's[16] Delphi panel recommended decontaminating the periwound area extending 5 cm around the wound with a topical agent such as 0.5% chlorhexidine, leaving the solution in place for 1 minute and for 5 minutes in wounds contaminated or infected with *Pseudomonas*. In real life, this concentration may not be available without alcohol, which would sting considerably if it entered the wound. A lower concentration of chlorhexidine not containing alcohol may be readily available, and the authors believe that this is acceptable to use. The authors have received anecdotal reports from colleagues of the visible improvement of the wound shortly after this intervention was started. If an individual is sensitive to chlorhexidine, povidone 10% may be substituted, although it is unclear what length of contact would have the same antimicrobial action.

SUMMARY

After reading this article, clinicians should be better able to identify areas that may contribute to optimal healing conditions or that may delay healing in PSW healing by secondary intention. The authors' review of commonly observed ''mistakes,'' and rationale for diagnosis and treatment from the literature review, observations, and practical applications of knowledge from the authors will enhance the clinician's approach to PSW management. ●

PRACTICE PEARLS

Pilonidal sinus wounds are often recurrent with delayed healing due to a number of factors, including:

- improper local hygiene
- incomplete or traumatic hair removal
- inadequate pain control
- chronic low grade superficial critical colonization and deep or surrounding tissue infection
- excessive local perspiration, friction, and shear forces.

There is no single or simple solution; however, the clinical measures outlined in this article can improve the local pilonidal sinus healing and improve the quality of life of persons with these chronic wounds.

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