Caring for self-inflicted wounds

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An article written to supplement our book *Understanding Repeated Self-injury: a multidisciplinary approach* (Tantam & Huband, 2009).

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Little has been written about the process of caring for self-inflicted wounds. This may be because most cuts or burns are relatively minor, and so are easy to manage. It may also be because there is no obvious physical difference between a self-inflicted wound and an accidental one. It can be argued that the same principles apply in either case, and that these are already described adequately in numerous medical and nursing texts. Whilst we acknowledge that most self-inflicted wounds are not serious, it is the few that are (or that appear to be progressing in that direction) that cause anxiety. The difficulties that arise often stem from emotional reaction, from poor knowledge about specific aspects of wound care, or from uncertainty about when to refer on for specialist treatment. Furthermore, the practical management of such wounds is not always straightforward, especially when there is frequent repetition, intentional contamination or interference with the healing process. This article addresses some of these issues, although is not intended to provide comprehensive guidance on wound care.

Types of self-inflicted wounds return to top

Self-injury takes many forms, some of which are listed below. As explained in the first chapter of our book (Tantam & Huband, 2009), we consider cutting, burning and a number of other behaviours, but not self-poisoning, swallowing dangerous objects, disfiguring injuries and gunshot wounds.

Types of wounds

- *Cuts* – often made with a blade or glass shard; a cut is usually classed as an incision if longer than deep; often described incorrectly as lacerations which, strictly, are tears arising from blunt force injury.
- *Puncture wounds* – made by a pointed object inserted at right angles to the surface and then withdrawn, or inserted at an angle and then left under the skin; a wound is usually classed as a puncture if deeper than it is long.
- *Dry burns* – by contact with a flame or hot object (e.g. clothes iron, cigarette); electrical burns.
- *Scalds* – by contact with hot liquid or steam; external (e.g. via kettle, bath) or internal (e.g. over-hot drinks).
- *Chemical burns* – by contact with caustic substances (e.g. bleach, oven cleaner).
- *Other presentations* – re-opened wounds; bruising following wall punching (potential for fractures), head banging; self-hitting; tissue damage arising from ligaturing an appendage (typically a finger); wounds caused by abrading or scouring the skin; internal damage from reversible insertions (typically urethral, rectal or vaginal).

Skin function return to top

Human skin serves many physical functions. It offers protection against micro-organisms, ultra-violet radiation, excessive heat exchange and water loss. It contains receptors for touch, temperature and pain and shields internal organs from physical damage. It provides a substrate for vitamin D synthesis. It also forms a surface for perspiration, enabling thermo-regulation and the excretion of water and salts.

Disrupting this surface can have significant consequences. Damage increases the risk of infection through microbial invasion, and dehydration through loss of blood and other fluids. A single deep incision may damage tendons and nerves, restricting movement and reducing sensation. Multiple shallow cutting often exposes a large area of tissue, increasing the risk of infection. Skin that has just begun to heal is fragile and offers reduced protection to structures that lie beneath.

Skin structure return to top

The depth of a cut or burn is usually defined in terms of the three main layers of skin tissue.

- Epidermis – This outer layer consists of several types of cells. Keratinocytes (and keratocytes, their derivatives) are the most common. Also present are melanocytes (which synthesize melanin, providing protection from UV radiation), Langerhans cells (which assist with the immune response), and Merkel cells (associated with sensory perception). A scratch that damages only this outer epidermal layer is classified as a *superficial* wound. Superficial wounds usually heal within 24 to 48 hours, normally without visible scarring. Although the epidermis has no blood vessels, superficial cuts still bleed because of damage to the dermal capillaries lying within the small folds (dermal papillae) that project into the epidermis. A burn or scald that damages only the outer epidermal cells is classified as a *superficial partial-thickness* burn.

- *Dermis* – The dermal layer lies directly below the epidermis and comprises connective tissue with components that provide both elasticity (elastin) and strength (collagen). The dermis contains a network of blood capillaries, lymphatic vessels, nerves, hair follicles, sweat glands and sebaceous glands. A cut is defined as *partial thickness* if the epidermis is breached. A partial thickness cut that just penetrates the dermal layer may heal almost invisibly. Damage that goes deeper into the layer often leads to permanent visible scarring and the healed area may be hairless. The degree of bleeding from partial thickness cuts will depend on whether a capillary or a larger vessel has been severed. Burns or scalds that disrupt dermal tissue are classed as *deep partial-thickness* and should be regarded as serious, even though they may not be particularly painful because of damage to sensory nerves.

- *Hypodermis* – This subcutaneous layer is formed of loose connective tissue containing fat globules, nerves and blood vessels. A cut that extends down into this layer is classified as *full thickness* and can be recognized because it gapes, and exposes a glistening layer of white or yellow fat. Full thickness cuts may extend into muscle and there is always the risk of damage to major nerves, tendons and blood vessels. Burns that extend through the full thickness of the skin require careful assessment.

Wound healing return to top

It can be difficult to decide how best to care for damage arising from repetitive self-injury. Each presentation needs individual consideration. Superficial wounds heal quickly and often require little management. The inflammation phase is short and regeneration of the epidermis usually proceeds rapidly. Deeper wounds may require considerable input. Decisions about wound care are made easier if based on an understanding of the way skin tissue heals. The following paragraphs attempt to summarize this process, although more comprehensive reviews of healing in relation to wound management are given elsewhere (e.g. Gill *et al*, 1998; Stone, 2002).

The healing process

Healing can be split into three overlapping phases (inflammation, proliferation and remodelling). The initiation and duration of each phase controlled by chemical messengers (cytokinins).

- *Inflammatory phase* – bleeding initially flushes foreign matter from the wound. Platelets aggregate to form a plug that helps seal any severed vessels and

release vasoconstrictors to reduce blood loss. Damaged tissue releases thromboplastin which causes formation of fibrin strands, coagulating the exudate and forming a jelly-like clot. The clot seals the area and acts as a weak glue to the sides of wound. If the clot is allowed to dry, it forms a scab comprised of fibrin, platelets and dead blood cells. Inflammation then commences which helps to remove microbes and other unwanted material. Local blood flow increases and the area becomes hot, red, stiff, and painful. White blood cells are activated and engulf bacteria and dead cells. Exudate is produced containing white blood cells and various proteins. This inflammatory phase is essential to the overall process, although prolonged inflammation can significantly slow the rate of healing (Nayduch, 1999, p.897).

- *Proliferation phase* – commences from about 48 hours after the injury. If the wound remains open (and especially if there is loss of dermal tissue or infection), healing proceeds by secondary intention with red granular tissue growing from the base upwards to fill the cavity (granulation). This type of healing can result in visible scarring, and often occurs when a wound needs closing but does not receive professional attention. The low oxygen environment stimulates growth of new capillaries and further granulation tissue. Macrophages dissolve the clot but leave any scab intact. Kinins cause specialised fibroblasts to contract and help draw the wound edges together. A thin epithelial layer forms over the granulation tissue, growing from the wound edges and from hair follicles if present. This layer eventually thickens and strengthens, but is fragile initially and vulnerable to infection. This delicate layer is easily damaged by clumsy dressing changes. Epithelialization can take up to three times as long when a wound has dried out because epithelial cells can migrate over moist granulation tissue but cannot migrate over (or through) a dry scab. The scab eventually loses its adherence to the edges of the wound and is sloughed off.

- *Remodelling phase ('maturation')* – the wound strengthens. Scar tissue forms (fibroplasia) and then matures over a period of one to two years. Scar tissue is always weaker than the tissue it replaces and differs from normal skin in appearance and structure. It has a greater density of collagen fibres, no elastin and fewer blood vessels. Wound edges are pulled inwards when the collagen bundles shorten, a process that can distort the skin and restrict blood supply and mobility when, as in deep burns, scarring is significant. The collagen is eventually broken down causing the scar to flatten and shrink. Excess collagen is sometimes produced and leads to a hypertrophic scar (a red, raised area which remains within boundaries of original wound) or a keloid scar (a raised and often puckered mass of tissue which grows beyond the original wound edges). Scars often do not contain hair, sebaceous glands, sweat glands or sensory nerve endings. Large areas of scarring may become inflamed or scaly. They often stand out because of their different appearance to surrounding skin. One feature of repeated self-injury is that a high proportion of wounds are made into scar tissue, and so can be expected to heal less efficiently than a wound to normal tissue.

Factors affecting healing rates

There is conclusive evidence that wounds heal faster when kept moist, as long as they do not become infected. Appropriate use of an occlusive dressing can significantly reduce healing times, sometimes by as much as 50% compared to leaving the wound to dry out (Falabella, 1998). Healing rates tend to be greatest in well-vascularized tissue and where the wound is kept warm. Rapid healing also requires adequate nutrition and hydration (Keithley, 1985; Russell, 2002). Nutritional status (particularly the availability of zinc, iron and vitamins A, B, C & E) can be an issue for people with anorexia, bulimia or depression.

The rate of healing tends to decrease with age. It is slowed where skin tissue is under tension (as on the back of the hand or over an active joint) and where blood supply is

compromised (as beneath an over-tight bandage). Healing can be disrupted when changing dressings that have adhered to the wound since it is very difficult to remove them without damaging the new growth of epithelial tissue beneath. Gram positive bacteria also produce exotoxins that counteract healing.

Smoking slows wound healing by increasing platelet 'stickiness', lowering oxygen tension and increasing the risk of infection. In one randomised controlled trial of 78 healthy subjects with surgical wounds, the infection rate in the smokers was higher (12%) than in the never-smokers (2%), and 4 weeks of abstinence from smoking significantly reduced the incidence of wound infections (Sorensen *et al*, 2003).

The importance of maintaining the temperature of healing tissue is often overlooked. Dressings and bandages help reduce heat loss, but irrigating with cold tap water or leaving the wound exposed when changing dressings will cause a fall in temperature that may persist for several hours. This can delay healing significantly.

Repetition of wounding often results in injury to scar tissue (which heals slowly) or to partly-healed tissue (which prolongs the inflammation response and delays healing). Other factors that adversely affect healing include use of disinfectant cleansing agents which are cytotoxic, taking certain medications (e.g. aspirin, steroids, anticoagulants), certain medical conditions (e.g. diabetes, anaemia, jaundice), and poor dressing choice (such as using an occlusive covering on an infected wound).

Any material that remains embedded in the wound will delay healing by prolonging the inflammation process. Typical contaminants are slough, dirt that was not removed before the wound was dressed, and fibres shed from cotton-wool swabs or from the dressing itself.

Factors that slow wound healing

- Age
- Repeated wounding at the same site e.g. re-opening the wound, picking off the scab, injury to the healing area)
- Infection
- Smoking
- Location (e.g. where skin is under tension or there is excessive movement)
- Dry (rather than moist) wound environment
- Inappropriate choice of dressing
- Embedded foreign material (poor initial cleansing)
- Embedded fibres from dressings or cotton wool swabs
- Wound temperature below 37'C
- Cytotoxic cleansing agents
- Poor blood supply or oxygen perfusion (e.g. from over-tight bandaging)
- Dressings that are stuck to wound
- Taking certain medications (e.g. aspirin, corticosteroids, penicillamine)
- Certain medical conditions (e.g. diabetes, anaemia, jaundice)
- Malnourishment (may result from anorexia, bulimia, depression)
- Poor hydration

Principles of wound care

The fundamental principles are covered by a number of excellent texts such as Wardrope & Edhouse (1999), Gill *et al* (1998) and Cooke *et al* (1998). All wounds require careful assessment and may need initial cleansing to facilitate this. Infection risk is reduced by adopting aseptic techniques and using sterile instruments and materials. Wearing gloves and a plastic apron are sensible precautions to minimize transfer of microbes from clinician to wound and vice versa.

The concept of a moist healing environment has been a major innovation in recent years (Eaglstein, 1998) and supersedes earlier ideas that wounds need to dry out or 'scab up' to heal properly. This change in thinking means that the routine application of a dry dressing might now be considered negligent for certain presentations. A moist wound environment is sought because it speeds healing by encouraging cell migration and facilitating the diffusion of growth factors and enzymes. Semi-occlusive dressings are now available which keep the wound moist. They allow evaporation of excess water that might otherwise cause maceration of surrounding skin and increase the risk of fungal or bacterial infection.

Caring for self-inflicted cuts

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First Aid

Priorities are ensuring a patent airway, sufficient respiratory function and adequate circulation. Whilst most cases of self-injury are not medical emergencies, self-inflicted

wounds can have life-threatening consequences. Immediate action may be needed to control profuse bleeding, to address shock from hypovolaemia, to restore blood perfusion by removing any ligatures, or to stabilize a puncture wound (Mohun, 2002). Attention should be paid to:

- remaining calm
- exploring cuts for presence of glass or other contamination
- exploring puncture wounds to establish whether the penetrating object is still present
- controlling bleeding
- applying a dressing

Physiological shock

- Cause – fluid loss from severe cuts or burns, resulting in reduced blood flow to the extremities. Potentially life-threatening.
- Signs & symptoms – dizziness; restlessness; skin pale, clammy & moist; rapid breathing; rapid pulse.
- First Aid treatment – lie down; make comfortable; keep warm; reassure; raise legs about 30 cm (unless head or back injury is suspected); avoid food or drink.
- Hospital treatment – intravenous fluids (to compensate for fluid loss occurring as a result of significant bleeding or weeping from burns)

After reassuring the person, the wound must be inspected carefully. Haemorrhage is usually controlled by direct pressure on a dressing pad placed over the injury and raising the wound above the chest where this is practical. Firm and uninterrupted pressure should be applied for 10 minutes before checking whether bleeding had stopped. If haemorrhage continues, more absorbent dressing is placed over the existing pad and pressure reapplied for a further 10 minutes.

If, however, a cut contains glass or other sharp material, direct pressure may increase the damage. Bleeding can be reduced in such cases by pinching together the edges of the wound. Care is needed with puncture wounds if the penetrating object is still in place, and it is worth considering whether removing it will be more dangerous than leaving it in place temporarily.

Bleeding that is severe and prolonged suggests damage to a vein or artery. Venous blood is dark red, whereas a damaged artery may spurt bright-red blood in time with the heartbeat. Persistent haemorrhage that appears to come from a sizeable blood vessel may require surgical intervention. Bleeding from capillaries may also flow into tissue to form a bruise or haematoma.

If there is time, is always sensible to wear gloves when dealing with wounds. Many people are concerned about the risk of catching some blood-borne disease such as hepatitis or HIV if they have contact with other people's blood. These viruses cannot penetrate the intact epidermis so just getting infected blood on the skin will not transmit the infection unless the skin is damaged. Further information is available in the Department of Health document entitled *'HIV Post-Exposure Prophylaxis'* (DOH, 2004).

In some cases an individual will actually be in the process of cutting, or will feel strongly driven to cut themselves again and indicate their intent to do so imminently regardless of who is present. This is a difficult situation to deal with because (a) it is extraordinarily difficult to watch someone cutting themselves without intervening physically, and (b) people have a right to do as they wish with their bodies. Attempts at physical restraint are ill-advised, for

there is no guarantee that the client can be safely restrained. Serious wounds can result from trying to wrestle a blade or shard of glass from someone else's hand. Both parties may end up injured, or worse. Verbal communication is usually the better option. It is often helpful to talk calmly, saying that you are offering to attend to those wounds that already exist, but that the choice about further wounding remains with the client.

Inter-personal issues

Several studies have shown that those who cut or burn themselves are often handled with little tolerance, compassion or respect when they seek professional care for their wounds (Reece, 1998; Harris, 2000). Happily, there is now considerable interest in changing this unsatisfactory state of affairs. The National Institute for Clinical Excellence has recently produced guidelines that address some of these issues (NICE, 2004) and include recommendations that:

- full account is taken of the distress experienced by those who self-harm when presenting for treatment
- sufficient information is made available to allow clients an informed choice in treatment options
- the agreed treatment is provided without unnecessary delay

The act of self-injury often results in a significant change in emotional state and a wide range of presentations can be anticipated. The individual may feel unusually calm after cutting, but sensitivity to pain may have replaced the numbness experienced at the time of the cut or burn. Some people who have self-injured are anxious, anticipating a negative reaction to their wounds. Others will be troubled by feelings of shame or guilt.

Establishing wound history

A brief history of the injury should then be obtained by asking:

- *When?* – the longer the interval between a cut occurring and treatment being sought, the higher the risk of infection (Young, 1995). It may be wise to assume infection if a partial thickness cut has remained open to the air for more than 24 hours (Mendez-Eastman & Black, 1999).
- *With what?* – sharp blades give clean incisions but may cut surprisingly deeply. Dirty blades and glass picked up outside may be contaminated. Soil can introduce pathogens, including *Clostridium tetani*. Deliberate contaminants include faecal material and urine. Glass can break, leaving slivers in the wound.
- *Self-care attempted?* – asking the client whether they cleaned the wound will sometimes lead to admission of deliberate contamination. Efforts at self-care may be crude, but are better tolerated than criticized. Individuals who self-harm are often asked to take more responsibility for their actions, but can be discouraged by off-hand comments about, say, trying to bind a deep cut with a tea-towel.
- *Preferred treatment?* – people who repeatedly self-injure may have considerable experience about the best way to handle their wounds. We recommend clinicians always take account of service users' views in relation to their treatment.
- *Consent to treatment* – once assessment is completed, the proposed wound care procedures should be explained to the client. Agreement must be sought before proceeding. There are only a few specific circumstances when treatment

may legally be given against someone's will (see [Tantam & Huband, 2009](), chapter 6).

- *Whether immunised?* – tetanus immunisation status should be established as with any other injury.

However, asking *why* the person self-wounded is usually not helpful. It has no relevance to immediate wound care, and may evoke a justification rather than an explanation, putting the client on the defensive and making them less likely to be co-operative.

The assessment process

All wounds require close visual inspection with particular attention to the possibility of damage to underlying structures. This is the case even when the client considers a wound to be minor. Most wounds produce the greatest tissue damage at the point of entry. Electrical burns are an exception (as are gunshot wounds, which we do not consider here). Assessment is best performed in a warm, quiet and well-lit environment under aseptic conditions. Exploration under local anaesthesia may occasionally be necessary. Gloves are essential, and the use of goggles and an apron should be considered. Choosing latex-free materials reduces the chance of an allergic reaction.

Any makeshift dressing will need removing. This is a procedure that many clients dread and is often the cause of delay in seeking help. Considerable discomfort is anticipated, which is quite realistic if the material has become stuck to the wound. Demonstrating awareness of this difficulty will encourage co-operation and help to build an alliance. Both pain and distress can be minimized by an unhurried approach and by removing the stuck dressing by soaking or high pressure irrigation as described in a later paragraph.

- *Examining the wound itself* – initial cleansing may be required to remove blood clots or sloughy material that mask a clear view (see below). Foreign bodies must be removed and full inspection may require the wound edges to be held apart and wiped with sterile gauze. In some cases anaesthesia will be needed before embarking on such procedures. The colour of an incised wound often provides an indication of its depth. A *pink* wound suggests a *superficial* cut in which the dermis is exposed but not damaged. A *red* coloration suggests a *partial thickness* wound where damage to the dermis is being replaced by bright red granulation tissue, although this is sometimes hidden by a thick film of exudate. A cut that exposes *white* glistening fat is always *full thickness*. The examination should include a careful check for foreign bodies such as glass or soil. Colour can also be useful when assessing a wound's status. A *yellow* appearance suggests the presence of significant amounts of dead tissue (slough). Cutting this material out under anaesthesia (surgical debridement) may be required. A wound that appears *green* or *dark yellow* may be infected (see below). A *black* wound suggests necrosis and is caused when excess slough is produced and dries to a black eschar that requires removal. Deciding whether infection is present can be difficult if there are many cuts or the field is obscured by dried exudate. Infection is suggested by an extended period of inflammation, redness (not to be confused with red granulation tissue), oedema, increased tenderness, and thick smelly liquid, which may be dark yellow or green, coming out of the wound. Fever, anorexia, weight loss, pain, throbbing, or an elevated white cell count are other indicators of infection.

- *Assessing underlying structures* - a cut into the dermis damages blood vessels and nerves and almost always leads to some degree of ischaemia and necrosis. Ischaemia may be worsened by the local release of reactive peptides from damaged macrophages and capillaries. In the rare case when a large vessel

has been cut, blood supply to a vital area may be compromised. This is a surgical emergency. Loss of sensation suggests nerve damage. Loss of movement in a distal appendage suggests nerve or tendon damage. Both may require surgical intervention. Particular care is required when assessing injuries to the hand where the density of vessels, nerves and tendons lying close to the surface is high.

Cleansing and debridement

Some authors view the cleansing of a wound as the most important part of its care, noting that aseptic techniques offer little advantage whilst a wound remains contaminated. Cleansing is achieved with dampened sterile gauze swabs held in forceps or gloved fingers and dragged across the surface. The aim is to ensure material is washed away from the wound rather than into it. Cotton wool is no longer used in the care of open wounds as its fibres tend to become embedded in the wound surface and disrupt the healing process.

The wound is then freely irrigated. Normal saline at body temperature is the preferred cleansing agent, although potable water (tap water in many countries; bottled water) can be used if saline is not available (Fernandez *et al*, 2003). Using water direct from the tap may, however, lead to unhelpful cooling of damaged tissue.

Debridement is the removal of dead tissue and dried exudate. Traditional mechanical methods involve scrubbing which may cause local oedema (Whiteside & Moorehead, 1994), or rubbing with a sterile gauze swab. Both methods are painful and may require anaesthesia. Mechanical debridement requires the co-operation of the client and will result in at least some discomfort. Clients are often concerned that a wound that is already uncomfortable will be intolerably painful if permission is given for slough to be removed mechanically from its surface. The reasons for the procedure should be fully explained to the client, and it should not commence without his or her agreement.

An alternative is *high pressure irrigation*. Here normal saline is directed into the wound as a jet from a syringe fitted with a 18-20g needle and held approximately 2 cm from the skin (Young, 2002, p.95). The saline should ideally be at, or just below, body temperature to minimize heat loss. Whilst the syringe may need refilling many times before the procedure is complete, this hydraulic removal of infected material can be very effective and is usually painless. There is, however, the risk of further damage if the pressure accidentally forces the needle from the syringe and into the wound! Using a syringe without a needle is less effective, but safer. The technique is also valuable when removing dressings that have become stuck.

Some types of dressing provide debridement of slough by autolysis. These are used increasing on wounds healing by secondary intention.

Determining whether closure is required

Primary closure involves holding the wound edges together until healing occurs. Risk of infection, excessive scarring and poor cosmetic outcome is substantially increased if closure is needed but neglected (Hollander & Singer, 1999).

Primary closure may be indicated if the wound is partial or full thickness, clean, not obviously infected, and if its edges can be brought together without tension. Sufficient healthy tissue is required around the wound to anchor sutures or adhesive tapes. Closure may be contra-indicated in wounds that are superficial, severely contaminated, poorly vascularised, or infected. Consider using delayed primary closure for dirty wounds. Sometimes an off-vertical incision results in a skin flap that is longer than it is wide. Such a flap will have a poor blood supply and suturing may be ill-advised.

Method of closure

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Wounds may be closed using sutures, skin adhesive ('glue') or adhesive tapes ('Steristrips'). Metal staples, used increasingly to close surgical wounds, are uncommon in emergency or casualty settings. A recent systematic review concluded no significant difference in cosmetic outcome between tissue adhesives and standard wound closure, or between different tissue adhesives (Farion *et al*, 2002). Current NICE guidelines recommend considering adhesive as the treatment of choice for uncomplicated cuts up to 5 cm in length, or adhesive tapes ('Steristrips') if the client prefers.

Closure using adhesives

Tissue adhesives are based on either butylcyanoacrylate (e.g. Histoacryl) or octylcyanoacrylate (e.g. Dermabond), the latter associated with greater strength and flexibility. Advantages include rapid application, no risk of needlestick injury, and no need for follow-up appointments for removal. Adhesives cause little pain, appear well-tolerated and can produce good cosmetic results. They can be a cost-effective alternative to sutures (Osmond *et al*, 1995).

Tissue adhesives have limitations, however. They cannot be used near the eye, on wounds that are bleeding, or in areas subject to repeated movement or frequent washing. Slightly increased rates of dehiscence and erythema have been reported compared with standard wound closure (Farion *et al*, 2002). Using adhesive near to sutures is ill-advised as the latter may become impossible to remove.

In application, the wound edges are approximated and the adhesive applied to the surface as a continuous bead, or in spots (which is convenient if there is risk of haematoma or infection). Manufacturers recommend that the adhesive does not make contact with the wound itself. The edges are then held together for 30 to 60 seconds for the bond to cure. Use of gloves reduces the risk of the clinician becoming stuck to the person they are treating.

Closure using adhesive tapes

Sterile adhesive tapes ('Steristrips') often cause less discomfort than suturing, are well-tolerated and can be applied quite speedily to uncomplicated wounds. Their use avoids the possibility of suture scars, although scarring may still occur as it is often difficult to align wound edges perfectly when using this method. Steristrips are particularly useful for individuals susceptible to keloid scarring or where the surrounding tissue is too weak to hold sutures. They are, however, difficult to apply on hairy skin and may be unsuitable for use over joints that are not immobilised. Attempting to close a deep cut with Steristrips usually fails because a cavity forms. The strips may be very effective at closing the surface tissue, however, once deep-layer suturing is in place.

Sterile adhesive strips will only adhere to skin that is clean and dry. Adhesion can be improved by first applying Tincture Benz co. around the area. The end of a strip is anchored to skin on one side of wound, the wound edges are brought together and the strip pulled gently across and pressed down on other side. Use of forceps facilitates the procedure which is repeated with further strips until the wound is closed along its length. Adhesion may be improved by adding extra strips at right angles. Steristrips are useful for those who repeatedly self-injure since, with a little practice, is possible to apply them in a way that bridges other partially-healed wounds nearby. The wound should be kept dry as the strips may peel off if they become wet.

Closure using sutures

Suturing may be the only means of closing a deep cut. Disadvantages are that anaesthesia is required and that skill is needed to ensure good cosmetic results. Repeated wounding can make suturing impossible, especially where wounds lie closely together.

Local anaesthesia must be adequate and is usually achieved by infiltrating subcutaneous tissue around the wound with lignocaine (rapid action but contra-indicated in hypovolaemia) or bupivacaine (slower acting, but longer lasting). The client should be asked about any allergy before proceeding. Wardrope & Edhous (1999, p.49) describe various infiltration techniques and observe that the procedure can be painful if not done skilfully. Stone (2002) recommends the maximum dose of lignocaine (without adrenaline) as 4mg/kg body weight; this equates to 36 ml of 1% plain solution for a 70 kg person. Indications of toxicity include numbness in mouth, feeling light-headed, confusion and tinnitus. The maximum recommended dose of bupivacaine (with or without adrenaline) is 2 mg/kg, equating to 28 ml of 0.5% solution for a 70 kg person. Signs of toxicity include anxiety, nausea, agitation, tinnitus and arrhythmia. Both drugs are available with added adrenaline to prolong local effects, but injections containing adrenaline should never be used on the hands, feet, ears, nose or penis due to risk of ischaemia.

Suturing techniques are described elsewhere (e.g. Burkitt & Quick, 2002). Excessive tension should be avoided, particularly where the wound edges do not come easily together; such cases may require surgical intervention to undermine a skin flap. Consider using interrupted sutures if infection is suspected. If necessary, some sutures can be removed early to allow drainage and replaced later. An alternative is a form of delayed primary closure where sutures are placed conventionally, but with their ends left long and untied. Saline-soaked gauze or medicated paraffin gauze is used to pack the wound and is changed daily. Providing there is no sign of infection after 2 to 4 days, the wound can be closed and the sutures tied (Wardrope & Edhouse, 1999, p.82).

The sutured area can be left open or covered with a light, non-adherent dressing. It may be advisable for the area to be kept dry until the stitches are removed to reduce risk of bacterial contamination via the suture tracks.

Managing cuts that have already started healing return to top

It is not unusual to be presented with an open cut that is some days old and has started to heal by secondary intention. Attempts to close a wound that has been open for more than 12 hours are unlikely to succeed. This is partly because the delay will have increased the risk of infection, and partly because closing at this stage risks formation of a cavity wound (risk of haematoma and infection). Allowing healing to continue by secondary intention is often the best option in such cases, even though this may take longer and result in more scarring.

Such wounds often produce dead, necrotic tissue and dried exudate. Removal of this material is essential using either mechanical debridement or an appropriate dressing. Use of dressings for autolytic debridement of surgical wounds healing by secondary intention has been examined in a systematic review (Lewis *et al*, 2001); results suggested these dressings (which included foam, alginate, bead and hydrocolloid types) can have a beneficial effect on healing compared to traditional gauze, and can be cost-effective in comparison.

Dressings return to top

An ideal dressing provides physical protection, thermal insulation and an optimum environment for healing (Turner, 1985). There may also be psychological advantages; some individuals find a dressing or bandage helps deter further wounding. Dressings help protect healing tissue from mechanical damage and sutures from snagging on clothes. They offer

insulation against heat loss that lowers wound temperature and slows healing. Some types of dressing encourage a moist environment that accelerates healing and may reduce pain by preventing local nerve endings from drying out.

An ideal dressing will also provide an impermeable barrier to micro-organisms, preventing their entry into the wound and reducing the risk of cross-infection in the opposite direction. It must be capable of absorbing excess exudate and not shed fibres; it should also be comfortable and easily removed.

Choice of dressing

A simple plaster can be useful for small superficial wounds, and provides a degree of protection against infection, heat loss and physical damage. Deeper or more extensive wounds require an alternative form of dressing. A wide range is available, but choice may depend what is approved locally. The Prescribing Nurse Bulletin (Anon, 1999) provide a helpful summary of the various types, and guidance on the choice of dressing is given by Kloth & McCulloch (2002, p.237).

- *Gauze dressing* – simple, dry dressing. Non-adherent versions are available having a shiny perforated layer in contact with the wound. Often used to protect sutured wounds. Dry gauze dressings can allow open wounds to dry out. Moist gauze is surprisingly permeable to micro-organisms - Alexander *et al*, (1992) showed that *Staphylococcus epidermis* migrated through five layers of moist gauze in just 5 minutes.

- *Tulle dressing* – supplied as paraffin-impregnated open-weave gauze sheets. Has non-adherent properties which decline rapidly. Prompt changes essential before new tissue grows into the weave. Requires a secondary dressing above. Available medicated with povidone-iodine or chlorhexidine.

- *Semi-permeable film dressing* – transparent and impermeable to bacteria and water but allows a degree of gas exchange. Often used post-operatively. Unsuitable for fragile skin or where large amounts of exudate.

- *Hydrocolloid dressing* – occlusive dressing useful in necrotic wounds. Contains a hydrocolloid matrix over a polymer base. The hydrocolloid liquefies on contact with wound and provides a moist environment impervious to gas, liquid and bacteria. Creates hypoxic environment. Avoid if anaerobic infection present.

- *Hydrogel dressing* – polymer based fibrous gel. Provides moist healing environment whilst allowing gaseous exchange. Includes seaweed-based alginate dressings. Useful for infected wounds if changed daily. Unsuitable where large amounts of exudate.

- *Polysaccharide bead dressing* – absorbs exudate, debris and micro-organisms in sloughy or infected wounds. Troublesome to remove if allowed to dry out.

- *Foam dressing* – various types of semi-permeable polyurethane foam available in sheets. Silicone foam type is available in liquid form which will expand to fill cavities; avoid where wound is deep and narrow (risk of foam pieces becoming embedded).

Securing dressings

Self-adhesive products secure themselves, although removing adhesive-backed dressings can lead to inadvertent further injury (Zitelli, 1987). Other dressings may be secured with a bandage, tubular gauze or adhesive tape. When insufficient attention is paid to this task, the bandage quickly falls off and leaves the wound exposed, the dressing contaminated and the client irritated. Attempts by the client to replace a bandage are not always successful, particularly when he or she has only one hand available.

Bandages are most successful when applied at the correct tension and in the standard criss-cross overlapping pattern that maximizes flexibility. A tight bandage can compromise blood supply and delay healing. Asking the client's opinion about tension during application is helpful. Selective use of adhesive tape may help prevent a bandage from slipping. Crepe or elasticated bandages are useful where there is much movement, but can be uncomfortable in hot weather. Discomfort is minimized by winding the bandage in the opposite direction each time it is changed. Tubular gauze (Tubigrip) can be appropriate for wounds to the arms or legs, but will slip if not the correct size.

Adhesive tape (e.g. Micropore) may be used to secure a dressing if there are no allergy issues, and is effective in areas where bandaging is difficult. However, tape does not insulate or protect as a bandage does, and may ride up at the edges and catch on clothing. It is often sensible to provide the client with a replacement bandage and a small role of tape for emergency repairs.

Caring for self-inflicted burns return to top

First Aid for burns

After removing the person from the source of the burn, priorities are ensuring a patent airway (readily compromised by tracheal oedema following drinking over-hot or caustic liquid), satisfactory respiration and adequate circulation. Electric shock rarely causes sudden death at the voltages found in domestic supplies, but arrhythmias are possible and may recur several days after the trauma. Most authorities recommend immediate cold water lavage for a burn or scald. Holding the injured area under cool running water for at least 10 minutes maximizes transfer of heat away from damaged tissue and helps remove contaminants. Any rings or bracelets should be removed if swelling is anticipated, although clothing stuck to burnt tissue is best left in place. Consider temporary protection by wrapping loosely with 'cling-film' whilst avoiding damage to any blisters. Immediate cold water lavage for 20 minutes is recommended for chemical burns. Attempting to neutralize the caustic substance by, for example, applying a weak acid solution to an alkali burn can be disastrous. The resulting reaction may generate considerable heat at the skin's surface.

Assessment of burns

Burns and scalds denature protein causing cell injury or death. The degree of damage depends on both temperature and exposure time. Assessment involves estimating burn depth, the extent of the burned area, and tetanus immunisation status before reaching a decision about whether to refer on. As with cuts, the risk of infection increases with the delay between the burn occurring and treatment being sought. It is reasonable to suspect infection if a burn has been left untreated for more than 6 hours. Burns are classified by depth into three categories:

- *Superficial partial thickness* burns are confined to the upper epidermal layers. There is usually mild pain, redness (erythema) and oedema. Thin-walled blisters may form. The skin appears dry and whitens (blanches) when lightly touched.

This type of burn usually heals without scarring in 2-3 days, often with flaking or peeling (as with sunburn).

- *Deep partial thickness* burns destroy the entire epidermis and may damage dermal tissue. There is considerable pain and marked oedema. Blisters form and fill with clear, thick fluid. The dead layer sloughs off and epidermal re-growth is by migration of cells from the wound edges. Healing occurs in 7-10 days if the dermis not involved, but takes 3 to 4 weeks if the dermis is damaged. Scarring can occur, although the hair follicles and glands often remain functional.

- *Full thickness* burns are often less painful due to nerve damage. The skin appears pale or waxy, and sometimes charred and leathery with marked oedema. It may be bright red and does not blanch when touched. Boiling water from a kettle can cause a full thickness burn. Grafting is often required. Full thickness burns heal slowly and always result in significant scarring which rapidly contracts. It may then act like tourniquet and require incision (escharotomy).

The extent of a burn is estimated as a percentage total body surface area. For guidance, the upper arm in adults (front or back) accounts for about 2%, the forearm (front or back) 1.5%, and the hand (front or back) 1.25%. Thus a scald that affects all the skin on the front and back of a hand and forearm up to the elbow is estimated as covering 5.5% of total body area. Burns inflicted without suicidal intent tend not to be extensive, although they can be deep. A study of 16 subjects by Tuohig *et al*, (1995) found the mean burn size was 1.6% of total body surface area.

A decision will need to be made about referral. Expert opinion is advisable for all but minor burns, and especially where hands, feet, face, eyes, mouth, perineum or genitalia are affected. Wardrope & Edhouse (1999, p.209) recommend referring on to a specialist burn service if partial thickness burns affect 10% body surface area, or if 1% if the burns are full thickness. Casualty departments commonly deal with small-area partial thickness burns, but deep or extensive burns always require specialist treatment in hospital where escharotomy, skin grafting and I/V fluid replacement are available.

Electrical burns need special mention. Assessment is difficult when, as often occurs, much of the damage is to deeper tissues and is therefore concealed. Body tissue heats up as current flows through it, and the heating effect increases as the cross-sectional area reduces. Deep burns are therefore more likely if current flows through the fingers than through the torso.

Caring for burns

Aseptic technique is essential. A chemical burn should be irrigated with water for 20 mins and then treated as any other burn. Silver sulphadiazine (Flamazine) cream is widely used for prophylaxis against infection in small burns but should be avoided in pregnancy or when breast feeding. Transient leucopoenia is a rare side effect. A yellow-grey crust often forms when the cream interacts with the exudate from superficial dermal burns. This crust, though benign and easily removed, it is often mistaken as evidence of infection (Monafo & Bessey, 2002, p.113).

Blisters require careful handling and are often best left intact and not ‘popped’. If one breaks, it can be covered with a sterile non-adhesive dressing that is larger than blister. De-roofing a blister may result in exposure to bacteria (risk of infection) and fluid loss (risk of shock), and the exposed area will be very sensitive. Aspiration whilst leaving the roof intact is an option in some cases.

Burns are commonly dressed with paraffin tulle or other sterile dressing coated with silver sulphadiazine cream. Burn dressings can be secured with a loose bandage or Tubigrip. Bandages are helpful in reducing small changes in temperature and air currents to which deep burns are extremely sensitive (Monafo & Bessey, 2002, p.111). Caution is needed when using tape or adhesive dressings in case the burn is larger than first appears. Burned limbs are usually elevated to minimize swelling.

Attention will need to be given to the client's fluid balance if the skin is burned deeply or extensively. A considerable amount of fluid is lost from full and deep partial-thickness burns which will need to be replaced intravenously. This may cause difficulty as setting up and maintaining a drip is not easily achieved is some settings.

Infection remains a common cause of death in severely burned patients and, until recently, antibiotic prophylaxis has been a routine procedure in management of burns in adults. However, unusual complications can occur with the use of even the safest antibiotics (e.g. Pillai *et al*, 1998) and opinion appears to be changing about the value of using antibiotics prophylactically. Surveys of burns units in the UK and across Europe have shown considerable variations of opinion and practices (Papini *et al*, 1995). The prophylactic use of antibiotics in childhood burns is controversial, and may not reduce the rate of wound infection (Ergun *et al*, 2004).

Caring for other wounds

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Ligatures

String, thread, rubber bands or wire may be wrapped around a limb, digit or other appendage and can be difficult to detect and remove. If such constrictions remain in place, the complications will be similar to those that sometimes observed after tourniquet use in surgery. These include nerve injury, post-tourniquet syndrome (see below) and ischaemia leading to gangrene (Palmer, 1986).

Nerve injury arises indirectly from anoxia and ischaemia in surrounding tissue, or directly from mechanical pressure on the nerve itself. It is more likely to be permanent the longer the ligature remains in place. Prolonged tourniquet use causes a fall in tissue pH, increased capillary permeability and prolonged clotting times (Love, 1979) resulting in 'post-tourniquet syndrome' with pronounced swelling that may remain for many hours. Ligatures to the fingers risk digital artery spasm (arising from mechanical pressure), and gangrene (from ischaemia).

Management may simply involve unwinding the ligature, allowing blood supply and sensation to return to the digit or limb. The client can be warned to anticipate considerable discomfort as blood flow is restored; one study has shown this discomfort peaks approximately 2 minutes after tourniquet release in the forearm (Hutchinson & McClinton, 1993).

It is almost impossible to predict under what circumstances a self-applied ligature will cause irreversible damage. Recommended maximum deployment times for tourniquets in surgery are 30 mins (upper limb) and 60 mins (lower limb) (Burkitt & Quick, 2002, p.74). In contrast, Avci *et al*, (2003) report a case where a tourniquet on an index finger was accidentally left for one and a half days, but where the digit was successfully saved. Self-applied ligatures are often very narrow compared to tourniquets used in surgery, and so mechanical damage is more likely to occur in a shorter time. Consider seeking surgical opinion if oedema, loss of sensation, loss of movement or ischaemia persist after the ligature is removed.

Contusions and fractures

Self-inflicted fractures are likely to be compound and therefore either infected or susceptible to infection. Standard first-aid principles should be followed with immobilization of the

fractured part before referring for specialist assessment. Such fractures are best managed by an orthopaedic team.

In cases where it is certain that tissue damage is confined to bruising, treatment according to the so-called 'RICE formula' may be appropriate. This comprises four elements: Rest – Ice – Compression – Elevation.

Wound aftercare

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Changing dressings

No single factor determines when dressing changes should be undertaken. Although a dressing over a clean cut might be left till the sutures are removed, most wounds produce exudate that causes the dressing to stick. This exudate will eventually 'strike-through' to the outer surface, creating a path for micro-organisms. Daily changes are usual for burns, sloughy wounds and where regular re-assessment is required.

The painless removal of a sticking dressing requires skill and patience. Clients who experience traumatic dressing changes tend to avoid the procedure until it the wound becomes encrusted or smelly. This, in turn, makes the procedure even more difficult. It is important to avoid mechanical damage to healing tissue as the rough removal of a sticking dressing damages new blood vessels (risk of ischaemia) and leads to production of free radicals (risk of halting or reversing the healing process).

Sticking dressings may be removed by soaking or high pressure irrigation using fluid warmed to body temperature. Healing rates are slowed if wounds cool significantly. It can take 3 hours for mitotic/leucocytic activity to return to normal after cleaning a wound (Turner, 1985). Exposure to strong sunlight should also be avoided. Newly-healed tissue is often very sensitive to sunlight and exposure can result in redness, blistering and increased pigmentation.

Pain

Wounds can remain painful for a considerable time whilst they are healing, and consideration should be given to providing appropriate pain relief in such cases. Medication suitable for mild to moderate pain includes the non-steroidal anti-inflammatories such as ibuprofen, diclofenac and naproxen (which may also worsen symptoms of asthma) and paracetamol (which will reduce any pyrexia and thus mask one symptom of infection). More powerful analgesics include codeine/paracetamol combinations, dihydrocodeine (a synthetic opioid with the possibility of dependency) and tramadol (a powerful non-opioid analgesic, normally well-tolerated although some people report unwelcome side effects). Other opioid analgesia may be considered appropriate for certain severe burns.

Recognizing and dealing with infected wounds

Diagnosis is difficult if the infection is at an early stage. The key signs and symptoms are listed in the text box below. Particular attention is needed if wounds to the hand becomes infected (risk of septicaemia).

Wounds can be colonised without being actually infected, and there is evidence that a low bacterial count can even enhance leukocyte function. Where there is infection, common practice is to prescribe flucloxacillin or erythromycin if allergic to penicillin. If anaerobic infection is suspected, occlusive dressings are best avoided (anaerobic bacteria favour hypoxic environments) and co-amoxiclav or metronidazole are often effective. Prophylactic antibiotics are not normally used routinely but may be considered for heavily contaminated or deliberately infected wounds, or for deep punctures (Cooke *et al*, 1998). Possible side

effects of antibiotics include diarrhoea, jaundice and reduced effectiveness of the contraceptive pill.

Physical care involves opening and irrigating the infected wound. The wound is usually allowed to heal by secondary intention with regular dressing changes (daily at first), inspection, and slough removal by debridement. Use of a specialist dressing may be considered (for example, Hydrogel). Some authorities recommend use of povidone-iodine ointment (Betadine ointment) or silver sulphadiazine (Flamazine) cream on infected wounds.

Signs and symptoms of infection

- throbbing pain
- pyrexia
- delayed healing
- increased exudate
- malodour
- intense inflammation
- increased white blood cell count
- green or dark yellow slough
- tender lymph glands

Removing sutures

Sutures are usually removed at a GP surgery. Hand wounds may warrant special attention with the individual being asked to return to a hospital casualty department so that suture removal can coincide with re-assessment. The timing of removal depends on the degree of healing that has taken place. Sutures are conventionally taken out after 4 or 5 days if to the face, after 14 days if to the lower leg, and between 7 and 21 days for other sites (Burkitt & Quick, 2002, p.78). The prompt removal of stitches tends to produce better cosmetic results in cases where there has been adequate healing, whereas premature suture removal can result in a cosmetic disaster if the wound re-opens. One solution is for sutures to be removed promptly and replaced with Steristrips until the wound is strong enough to be unsupported (Hunt, 1980, p.212).

Removing Steristrips

This simple procedure involves taking hold of one end of a strip and peeling it back towards the wound but not beyond. The other end is then peeled back, again towards the wound, and the strip removed. Attempting to pull off each strip in a single movement should be avoided as this risks re-opening the wound.

Scars return to top

Psychological aspects

Consideration should be given to providing clients with information about managing scar tissue. It should not be assumed that people who self-wound are unconcerned about their scars. Scarring often destroys self-confidence, stigmatises, and leads to isolation. Many who cut or burn themselves feel unable to wear T-shirts or go swimming and are very sensitive to other people's reactions if a scarred forearm or calf is accidentally exposed.

Factors that affect scarring

The appearance of a scar depends on wound depth, location and the individual's age. Healed superficial cuts are usually invisible, whereas wounds to the dermis usually produce visible scarring. Superficial burns can leave a depigmented area that gradually returns to normal (Muir *et al*, 1987). Full thickness burns always leave scars.

For cuts, the risk of scarring is reduced by ensuring closure where needed, rigorous cleansing (retained dirt appears tattoo-like), a moist healing environment and timely removal of sutures. Scarring appears more likely if a wound is closed with excessive tension, if sutures are applied too tightly or too loosely, or if the wound edges are inverted. In burns (as well as cuts), the risk is increased where nutrition is inadequate, when sticking dressings are carelessly removed, or when newly healed tissue is exposed to strong sunlight.

Scar development

A simple scar is initially flat, but then typically becomes red, raised, hard, and accompanied by intense itching which may be worse in a warm environment. Itching during a scar's active phase may respond to antipruritic lotions (calamine, crotamiton), or massage with a bland lanolin cream (e.g. E45). Topical antihistamines are probably best avoided. In the final maturation stage the scar flattens, pales and softens. Fading normally occurs within 6 to 24 months depending on location and skin type.

A pale area is always likely to remain noticeable although the final cosmetic appearance depends on several factors. If the injury (or subsequent infection) has destroyed the sebaceous glands, sebum is no longer produced and the scar will tend to dry out and crack. If local hair follicles have been destroyed, the area will be hairless.

Keloids and hypertrophic scarring

Simple scarring can disfigure, but keloid and hypertrophic scars often cause the most concern. Hypertrophic scars are very common after deep partial thickness burns, but also occur following cuts. A hypertrophic scar is very red with a raised surface. Children appear more prone than adults, as are those with lighter skin. The chest, upper arms, face, neck and abdomen are particularly susceptible regions. Hypertrophic scars can take up to two years to mature and soften.

Keloid scars are hard, smooth, shiny and often dome-shaped. The lesion is covered by normal epidermis whose surface is raised above the surrounding skin. They are less common that hypertrophic scars, but cause considerable distress as they are often painful and itchy. A keloid continues to fill with collagen after the wound has healed; it can continue to grow into surrounding tissue for several years and so may be larger than the original wound. The chest and neck appear particularly susceptible areas. The cause is not fully understood but keloids may be seen as an abnormal response to healing involving overproduction of collagen in the dermis (Broker *et al*, 1996). Keloids tend to run in families, and are more prevalent in younger people and in those with dark skin.

Treatments for scars

A summary of treatments for scars is given below, although it is unrealistic to expect that any significant scar will be completely erased. Further information is available from the British Association of Plastic Surgeons at http://www.baaps.org.uk, and from Smith & Nephew's scar information site at http://www.scarinfo.org/therapy.html.

- *Surgery* – surgical excision is often unsuccessful. It can lead to further scarring when attempted on immature hypertrophic tissue, and a keloid that is surgically removed is often replaced by another that is even more disfiguring (Raney,

1993). This may explain why some surgeons are reluctant to intervene until it is certain that a scar is fully mature (a process that can take several years).

- *Pressure garments* – elasticated garments or close-fitting moulds are often advised for large-area burns and deployed 4 to 6 months after the injury in attempt to speed maturation and minimize hypertrophy (O'Sullivan *et al*, 1996). They are often uncomfortable, inconvenient, and need to be worn almost continuously. The mode of action is unclear, but the continuous and evenly-distributed pressure on the skin's surface appears to alter maturation process allowing the resulting scar to be softer, flatter and paler than would otherwise occur. Transparent plastic masks are frequently used after extensive burns to the face and are moulded to fit the individual patient.

- *Silicone sheet* – medical-grade silicone sheet can improve the appearance of scars, but is unsuitable for open wounds or unhealed tissue. It is now readily available over the counter, but is expensive. Prophylactic use immediately after wound closure has been shown to reduce the incidence of hypertrophic & keloid scars (Ahn *et al*, 1991; Gold *et al*, 2001). It can be self-applied to both old and recent scars, but is likely to be more effective on the latter. It is has no effect on old white, flat scars.

- *Topical silicone* – silicone products (oil, gel, creams) provide a waterproof, gas-permeable protective membrane over the scars which can sometimes lead to improvement in their appearance.

- *Radiotherapy* – low-dose radiotherapy may limit re-growth of hypertrophic and keloid scars after surgery, but has little effect on existing hypertrophic scars (Muir *et al*, 1987; Burkitt & Quick, 2002, p.73). Long-term side-effects are a possibility.

- *Laser treatment* – laser surgery may help reduce the coloration of some scars and the height of others, but is not effective in all cases. The research evidence is limited. One study of treatments for keloid and hypertrophic surgical scars found that the clinical improvement after laser surgery was significant but not different from using corticosteroid or cytotoxic injections (Manuskiatti & Fitzpatrick, 2002). However, the combination of carbon dioxide laser resurfacing and thin skin grafting has recently been shown to be effective in camouflaging self-inflicted razor blade incision scars (Acikel *et al*, 2005), although the treated area needs to be protected from sunlight for at least 6 months.

- *Injections* – corticosteroids injected directly into the lesion can improve the appearance of both hypertrophic and keloid scars. The injections are often painful and need repeating regularly. Alternatively, the steroid flurandrenolone is available impregnated in tape that can be applied to the skin's surface. Adverse side effects are a possibility with any steroid treatment. Cytotoxic injections have also been used with some success (Manuskiatti & Fitzpatrick, 2002). Intra-lesional interferon-gamma injections can help suppress further growth after surgical excision (Broker *et al*, 1996).

- *Other physical treatments* – cryotherapy freezes scar tissue in attempt to improve cosmesis. Collagen can be used to raise sunken scarred areas. Dermabrasion may help to reduce scar height.

- *Other self-applied treatments* – sun-block cream is useful in the summer as scar tissue is often particularly sensitive to UV radiation. Vitamin creams moisturise, but one study found Vitamin E cream to have little effect on the cosmetic appearance of surgical scars over a 12 week trial period in 90% of cases (Baumann & Spencer, 1999). Elicina cream, which some consider helpful in treating scars, contains natural secretions of a particular Chilean snail (*Helix aspersa muller*). It is claimed by its manufacturers to improve elasticity and help regenerate damaged tissue. Ingredients include glycolic acid and allantoin which speeds up the formation of new cells.

Emotional aspects of wound management return to top

Self-injury often has considerable impact on those who care for the resulting wounds. Cutting appears to draw its power from having broken through some psychological boundary and so tends to cause strong reactions. These can cause considerable distress for care staff, and there is now recognition that even experienced professionals may require help to deal with the impact. The difficulties most commonly faced can be categorised into three areas.

Emotional response

Self-inflicted wounds often engender strong negative emotions. Feelings of horror, anger and disgust can be natural and understandable but are unhelpful if they lead to over-reaction or a negative attitude towards the client. Feelings of anxiety can arise from fear for the client's safety, from anticipating the repercussions if he or she does 'one cut too many', or from personal feelings about the body or about injury. Feelings of sadness, incomprehension and confusion are also commonly reported. Whilst a number of studies have focused on the impact of such negative emotions (e.g. Arnold, 1995), caring for self-inflicted wounds can also engender protective feelings towards the client, perhaps accompanied by intrigue, fascination, or even love. These strong positive feelings can also cause difficulties for clients who may not welcome an over-protective stance (Huband & Tantam, 2004).

Personal challenge

Self-injury can powerfully challenge views about one's own personal and professional competence, role and autonomy (Breeze & Repper, 1998). Many cuts and minor burns present few problems, but concerns about competence often arise when wounds are extensive, infected or difficult to suture. A further complication is that many who self-wound delay seeking help, or only do so when a cut or burn has 'gone wrong'. Difficult decisions often need to be made and staff may feel challenged if the client wants to be involved in them, even though he or she may have acquired considerable understanding of the relevant medical issues and it may be entirely appropriate to do so.

Staff can also experience disagreement about their role in relation to self-injury. One factor is the failure of different groups to work together respectfully and appreciate the limits of each others' skills. For example, it is sometimes assumed that mental health workers are experts in wound care, or that surgical and Casualty staff have expertise in psychological issues. A second factor is that those who feel unable to work with people who self-wound can be very active in 'referring on' to another staff group. Such misunderstandings can be very unsettling and lead to the client feeling 'dumped' unreasonably.

Mental health staff can also feel powerless, wishing to help but feeling inadequately skilled. Many work in areas where professional input rarely leads to a rapid reduction in self-harm, and so may find themselves feeling disheartened (Arnold & Magill, 1996, p.10). A fresh incident of self-injury by a person who has been in long-term treatment with a particular professional (a psychotherapist, for example) may lead to covert or even overt criticism of that professional's competence.

Defensive reaction

Health care workers, like all human beings, tend to react defensively to such emotions and challenges. Defensive reactions against anxiety may be unconscious, but some are clearly less helpful than others. One defence is to attribute responsibility and blame away from the self and onto the client, resulting in an approach perceived as judgmental. Many of those who self-wound are already sensitive to criticism and rejection, and so an unhelpful cycle

may begin with the client feeling criticized, worse about themselves, and thus more likely to cut again (Babiker & Arnold, 1997, p.89). Alternatively, responsibility and blame get loaded onto the care system rather than the client, leading to conflict with other professionals.

Defensive reactions are manifold. Health care workers who feel powerless may demand that the client stops cutting. Those experiencing incomprehension may insist upon a single explanation for the behaviour and demand that the client accepts it. Some professionals protect themselves by being taciturn, making cynical comments or isolating themselves from their feelings (Arnold & Magill, 2000, p.19).

Key points for clients return to top

- staunch the bleeding from a cut by pressing hard on it. Keep this up without interruption for 10 minutes. If the bleeding continues, repeat by applying more dressing on top. Press on this for another 10 minutes with your hand or use an elasticated bandage.

- if you can't stop the bleeding, telephone immediately for medical help.

- if you have symptoms of physiological shock, telephone immediately for medical help.

- a cut that does not gape open and which has stopped bleeding can usually be cared for at home. Make sure it is clean and cover it with a dressing.

- treat all burns or scalds without delay. Immerse the injured area in cold running water for least 10 minutes.

- burns can usually be cared for at home if they are no larger than the area you can cover with your thumb.

- burns can usually be cared for at home if they just redden the skin (no large blisters, no numb areas; no charring; no bright red areas).

- do not burst or prick the blisters that form on burnt skin.

- if a wound is to your hand, foot, head, stomach or genital area, always seek advice from a GP surgery or hospital emergency department.

- seek medical advice if you begin to suffer dizziness or feel faint (especially when suddenly standing up).

- seek advice if a wound appears infected or isn't healing as you think it should.

- replace fluids lost from a cut or burn by drinking plenty of water or juice.

Key points for clinicians

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- most cuts or burns are relatively minor, but all require careful assessment.
- check for contaminants – particularly glass – before applying direct pressure to control haemorrhaging.
- consider damage to a large blood vessel as a potential surgical emergency.
- consider verbal rather than physical intervention if client is in the process of cutting.
- give information to allow client an informed choice in treatment.
- consider skin adhesive or 'Steri-strips' for uncomplicated cuts up to 5 cm in length.
- don't attempt to suture wounds that are severely contaminated, poorly vascularised, infected, or that have started to heal.
- seek expert opinion for all but minor burns, especially those involving the hands, feet, face, eyes, mouth, perineum or genitalia.
- remove sticking dressings by soaking or pressure irrigation.
- avoid occlusive dressings if anaerobic infection is suspected.
- consider providing clients with information about managing scar tissue.
- remain aware that self-injury often engenders strong emotions.
- remain aware that self-injury can challenge your view of your own competence and role, and may cause you to react defensively.

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