

GUIDELINES FOR THE ASSESSMENT & MANAGEMENT OF WOUNDS

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1. INTRODUCTION

There are a variety of wounds that occur and are treated by Health Care Professionals (HCPs) and these may be caused by trauma, surgical intervention or disease processes.

In most cases these heal normally without a need for complex interventions but where these are necessary there are also a range of treatment modalities available to the HCP.

This guidance considers the processes involved in normal wound healing and measures that can be taken when these fail.

2. PURPOSE

This guidance is to be used by all Health Care Professionals involved in wound care delivery within NHFT regardless of employer and describes the minimum standard of care expected.

Following this guidance will ensure that all wound care delivered at within NHFT is based on established, evidence based care principles to achieve best outcomes for patients.

3. DEFINITIONS

Wound: a break in the continuity of the skin

Complex Wound: a wound that fails to heal for a reason connected or unconnected to the wound itself (e.g. bacterial burden in the wound or systemic effects of another pathology)

Pressure Ulcer: localised injury to the skin and/or underlying tissue, usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated (EPUAP, 2010)

Venous Leg Ulcer (VLU): a wound to the lower leg that fails to heal within 6 weeks due to poor venous return

Arterial Leg Ulcer: a wound to the lower leg that fails to heal within 6 weeks due to insufficient arterial circulation

Mixed Aetiology Leg Ulcer: a wound to the lower leg that fails to heal within 6 weeks due to a combination of arterial and venous impairment

Rheumatoid Leg Ulcer: a wound to the lower leg that fails to heal due to the systemic effects of rheumatic disease

Malignant Leg Ulcer: a wound to the lower leg that fails to heal within 6 weeks due to neoplasm within the wound

Diabetic Foot Ulcer (DFU): a wound to the foot of a diabetic person that fails to heal due to the systemic effects of diabetes

Dehiscence: the partial or complete separation of a closed surgical incision due to infection or other cause

Fungating wound: a neoplasm that erupts through the skin surface

Fistula: an opening between 2 organs or (more relevant to this specialty) from an organ to the skin surface - an entero-cutaneous fistula

TNP: Topical Negative Pressure e.g. V.A.C. Therapy® or Renasys®

4. GUIDELINE PROCESS

The Physiological Process of Wound Healing

There are two main types of healing, primary intention and secondary intention.

- **Primary intention** - these are clean, simple wounds that have minimal tissue loss and edges that can be brought closely together and held by sutures, clips, glue etc. They heal relatively quickly with epithelial continuity in 48 hours.
- **Secondary intention** - these are more complicated and have excessive tissue loss. The edges cannot be brought together. The wounds are 'open' and take much longer to heal.

All tissues in the body are capable of healing through regeneration (replication of cells) and repair (connective tissue replaces damaged tissue).

Healing by Secondary Intention

Wound healing can be broken down into four phases. These phases will overlap and the time taken to progress through these phases will vary and be dependent on many factors including age and general medical condition. In most cases there are no clearly defined gaps or changeovers from one stage to another with both inflammatory and proliferative processes occurring together at varying levels until the wound is epithelialised.

The Vascular Response

Seconds after injury the damaged ends of the blood vessels constrict in order to minimise blood flow and initiate the clotting process. Platelet aggregation and the release of several growth factors needed for wound repair speed this up. A blood clot forms consisting of a fibrin mesh which traps the blood cells and seals the wound. Vasodilatation of the vessels surrounding the wound

also begins to occur and growth factors released which attract white blood cells and inflammatory stage chemicals.

The Inflammatory Phase

Due to increased blood flow to the area and accumulation of fluid in the soft tissue, there are localised signs of erythema, heat and oedema. Pressure is exerted on the sensory nerve causing pain and restriction of movement.

Neutrophils arrive at the wound site within hours of injury and provide initial protection against infection. These are phagocytic and engulf foreign bodies, having a short life being replaced by Monocytes (also phagocytic) but these develop into macrophages and play an important role in the wound healing process.

Clean wounds will spend up to 36 hours in the inflammatory phase, but the process is prolonged if the wound becomes necrotic or infected.

The inflammatory response may be suppressed or absent in patients who are immunosuppressed, for example, people with HIV or AIDS and those receiving immunosuppressive drugs such as NSAIDs, cytotoxics or steroids. Therefore they may fail to activate the normal healing process.

The Proliferation Phase

At this stage the wound begins to fill with connective tissue. Granulation is the term given to formation of new capillary growth in the wound bed, which supports the development of new connective tissue. Granulation tissue is identified by its granular and slightly uneven appearance.

Contraction also occurs during connective tissue production. Myfibroblasts congregate around the wound margin and are able to contract; pulling the edges of the wound together and the size of the wound is reduced.

The Maturation Phase

Connective tissue and epithelialisation have now closed the wound. A scar appears and is remodelled by stimulation from macrophages, until a stronger scar is formed as collagen deposited under the skin is organised into a stronger structure. As the scar matures, the blood supply decreases and finally results in a flatter scar and compression can reduce build-up of scar formation giving a better cosmetic result. At best the scar will only be 80% as strong as uninjured tissue.

Factors Influencing Wound Healing

Intrinsic (Systemic) factors

- **Hydration** Dehydration with resulting electrolyte imbalance will impair cellular function.
- **Nutrition** A poor nutritional state is a major factor in delaying wound healing as calories and other nutrients are needed for cell proliferation

- **Concurrent disease** Any other disease present that disrupts homeostasis will inhibit healing (e.g. heart failure, coronary artery disease, respiratory failure) and those affecting cell division slow new cell production (e.g. rheumatism, cancer, connective tissue disorders)
- **Vascular insufficiencies** A good blood supply is necessary to deliver oxygen and nutrients to the wound.
- **Age** The elderly tend to heal more slowly as a result of changes caused by the aging process.
- **Immunosuppression, drugs and radiation therapy** Suppression may be caused by disease or medication, i.e. anti-inflammatory, anticoagulant and cytotoxic agents all reduce healing rates. Radiation can damage the surrounding tissues.
- **Stress** The physiological effects of stress have been shown to inhibit wound healing whilst motivation of patients and carers can improve both treatment concordance and healing rate.
- **Systemic infection** Infection makes additional demands on both immune and inflammatory processes.
- **Lack of sleep / rest** Tissue repair and rate of cellular division are enhanced by sleep / rest.
- **Substance abuse** Smoking, alcohol and drug dependency can all negatively affect healing.

Extrinsic (local) Factors

- **Pressure** Pressure can cause the capillary network to be disrupted, causing impeding blood flow to surrounding tissues.
- **Micro-environment** Wound healing is most effective in a damp rather than wet or dry microclimate as this allows the growth factors that regulate healing to operate effectively and provides optimal cell proliferation.
- **Temperature** Cooling causes vasoconstriction, limiting capillary circulation so irrigation and dressing changes must be kept to a minimum.
- **Duration of wound** Chronic wounds exhibit changes in growth factor production, reducing or blocking healing.
- **Mechanical stress** Shear or friction forces on the wound bed may be caused by poor lifting or bandaging techniques. Wounds on or close to joints are also slower to heal.

- **Bacterial burden** Whilst all wounds have some bacteria present, if there are enough or they are of a virulent strain, healing may be impaired
- **Size of wound** Large or deep wounds with extensive tissue loss will, by default, take longer to heal.
- **Necrotic tissue / slough** Necrotic tissue is dead tissue in response to injury, disease or occlusion of blood flow. Sloughy (devitalised) tissue (dead white cells, bacteria, rehydrated necrotic tissue), has a yellow / white / grey hue. This must be removed by inflammation (or physical intervention) and often prolongs the inflammatory stage for up to several weeks. **Caution:** if DFU or ischaemia refer to specialist for advice.
- **Skin maceration** Exposure to high volumes of fluid can damage the surrounding skin.
- **Foreign Bodies** Cause tissue irritation and prolong the inflammatory response and can result in infection.
- **Surgical technique / excessive handling of tissue** Tight skin closures that place traction on surrounding tissues will delay wound healing.

(EWMA, 2004)

Wound Assessment

There are key factors to consider in order to identify treatment objectives at any given time when assessing wounds (Heinrichs *et al*, 2005) Although various methods exist to support this, the simplest to use is the **TIME** approach (Schultz *et al*, 2003)

T = Tissue – the colour of the wound will identify whether any devitalised or unhealthy tissue is present. It is important to differentiate between slough (devitalised tissue) and biofilm (a layer of bacteria on the wound bed) which can appear similar in colour. Devitalised tissue will prolong the inflammatory phase of healing and the proliferation stage will be delayed or inhibited by this.

It is often advisable to actively debride this using sharp debridement, larvae or active dressings (e.g. hydrogel or manuka honey) to speed up this process. **Debridement is NOT advised for pressure ulcers to heels in the absence of good arterial circulation as the risk of infection in these cases outweighs the delayed healing (Wounds UK, 2013). This principle also applies to DFU – refer to Diabetic Foot Team for advice.**

I = Infection – Significant bacterial presence in a wound prolongs the inflammatory stage and causes discomfort for the patient as well as introducing the potential risk of systemic infection. Appropriate action to reduce the bacterial burden must be taken as soon as possible.

Signs of clinical infection vary according to type of organism and may include odour, discoloured exudate or increased pain. A patient may also be pyrexial and feel generally unwell if there is spread into the body.

However, the presence of some bacteria in a wound is to be expected. The important point is whether that is significant, based on two factors:

1. The amount of bacteria which can range from:
 - a. Contaminated – there are bacteria present but they are essentially inert and pose no threat to wound healing
 - b. Colonisation – bacteria are present and actively dividing but pose no threat to wound healing or risk of spread into surrounding tissues.
 - c. Critical colonisation / local infection – the bacteria are proliferating and inhibiting wound healing but have not spread into surrounding tissues.
 - d. Infection – the bacteria are invading surrounding tissues causing local and / or systemic signs of infection.

Treatment is not required for colonised or contaminated wounds. For critically colonised wounds, a topical antimicrobial will have far more effect than systemic antibiotics as these don't 'leak' into the wound (White et al, 2002; White & Cooper, 2003; Scanlon & Stubbs, 2003; Cutting & White, 2004). If infection is spreading, systemic antibiotics should be used in addition to, but not instead of, a topical antimicrobial (EWMA, 2005; EWMA, 2006; Wounds UK, 2013a).

2. Type of organism or impaired immune response
 - a. High risk organisms such as haemolytic streptococci, MRSA, ESBL formers etc. should always be treated as infection
 - b. In patients with a reduced immune response (e.g. receiving chemotherapy, on systemic steroids or post-transplant) the risk of infection spreading is higher so advice on antibiotic use should be sought from a microbiologist and a topical antimicrobial should always be used.

Never irrigate or pack wounds with **hypochlorite, povidone iodine solution or mercuric compounds** as these are non-selective and will destroy healthy tissue as well as bacteria. **Iodine solution** is also an **inter-cellular poison** that can cause **renal failure** and **metabolic acidosis**.

M = Moisture – wounds heal properly when they are 'damp' so the fluid level in the wound is a critical factor. If they are too dry, growth factors are unable to activate granulation and angiogenesis. If a wound is too wet, these growth factors are too dilute to be effective or are simply washed away.

The nature of the wound fluid changes in chronic wounds, having a higher concentration of metalloproteinase, which destroys tissue in the inflammatory phase. These chemicals then damage granulation tissue, slowing or stopping healing (Wounds UK, 2013b)

E = Edge – exposure of skin to wound fluid causes maceration from the skin absorbing excess water, irritation due to the chemicals contained in body fluids and excoriation from the acidity or alkalinity of exudate from some bacteria (e.g. pseudomonas). This will inhibit healing at the wound margin or may increase the size of the wound as bacteria move into the newly damaged areas.

If there is a risk of skin damage from fluid (or it is already present) a barrier, emollient or topical steroid should be used to prevent or reduce these changes.

It is also important that epithelial cells migrate in from the wound edge so wound assessment should include whether this is happening (EWMA, 2004).

Other factors in wound assessment

Pain – normally healing wounds should not be painful. Pain is an indicator of infection or inflammation. Whether pain is constant or on contact is also important as analgesia may be needed constantly or for dressing changes only.

If touching a wound is painful, the patient will become sensitised to that and the pain level will become more severe due to anxiety at dressing change.

Pain may either be Noiceptor or Neuropathic derived. Because of this, adjunctive treatment for neuropathic pain (e.g. amitryptilline or gabapentin) may be needed in addition to analgesia (EWMA, 2002)

Staging / Grading / Category – this is a concept that only applies to pressure ulcers. Any pressure ulcers should be assessed to include stage, location and size. The staging system to be used is that provided by the EPUAP (2009)

Documentation of Wounds

It is essential to keep accurate nursing records of the assessment and the wound healing process in order to determine whether progression or deterioration is occurring, and to monitor the effectiveness of the care given. A Wound Assessment Document (including wound measurements) should be completed at least weekly.

Measuring surface area - wounds can be estimated by measuring the widest and longest parts of the wound with a sterile tape measure. This method is imprecise but does provide a baseline for objective evaluation of healing.

Measuring depth and undermining (tunnelling) – depth and undermining edges should be measured using a sterile plastic probe or if unavailable, use a wound swab and sterile tape measure.

Photographing wounds – Images must only be taken using NHFT digital devices. Patient consent must be gained prior to taking any photographs for treatment or assessment purposes (even if there is no possibility of the patient being recognised).

Measurements or photographs should be attached to, or recorded in the wound assessment documentation.

These images may also be used for education or research purposes without express consent as long as the policy is well publicised. Specific consent must be obtained for any form of publication.

Prevention of Cross Contamination

Hand washing has been identified as the single most important factor in preventing the spread of infection and should be carried out before and after all procedures.

The introduction of alcohol gel for the decontamination of hands between general patient contacts has been introduced into many healthcare settings. This does not eliminate the need for hand washing, but allows the healthcare worker to move between patients without the constant need for hand washing. Hands still need to be washed before and after wound care, invasive procedures, after wearing gloves and after contact with a patient with a clinical infection.

Healthcare workers responsible for the management of wounds and other susceptible sites must use an **Aseptic Non Touch Technique (ANTT)** to prevent the contamination of those sites. Refer to NHFT procedure for ANTT.

However it should also be recognised that chronic wounds, particularly leg ulcers are often heavily colonised, rather than infected, and the emphasis in this case will be the prevention of cross infection. Therefore the 'clean technique' is sometimes used (based on individual risk assessment).

Nutrition for Wound Healing

Energy: An inadequate intake (from fat, carbohydrate and protein), will inevitably lead to the loss of subcutaneous tissue and muscle wasting. This in turn may precipitate wound complications and increase the risk of pressure ulcers. An adequate energy intake from fat and carbohydrate is therefore essential in order to:

- Meet energy demands imposed by tissue synthesis and repair
- Preserve subcutaneous tissue providing padding and protection to bony sites of the body
- Prevent proteins in the diet being utilised as an energy source
- However an excessive intake of energy leading to obesity also gives rise to problems with wound healing as a result of decreased mobility and increased weight.

Protein: Protein is perhaps the most important nutrient involved in the healing process, particularly as patients can become deficient in protein due to losses from the wound. It is therefore essential that an adequate supply of protein is provided via the diet. Proteins perform many functions within the body.

- Tissue synthesis and repair – proteins form the major structural components of the body cells e.g. cell membranes, collagen, connective tissue and keratin
- Metabolic function – Nucleic acid, hormones, enzymes
- Immune system – Main components of the immune system - lymphocytes, neutrophils, T cells and macrophages
- Energy Source – In the absence of adequate supplies of carbohydrate, proteins will be utilised as a source of energy, thus leading to muscle wasting and poor healing

Fat: Fatty acids are essential for cell structure and are also involved in the inflammatory process. There is an increased requirement for polyunsaturated fatty acids during healing.

Vitamin C: This is a major vitamin required during the healing process as it is vital for collagen synthesis. Benefits to wound healing process can be gained from the use of vitamin C supplements in deficient individuals.

Zinc: Zinc deficiency inhibits wound healing by reducing the rate of epithelialisation and cellular proliferation. Low zinc levels have been directly associated with poor wound healing and inadequate tissue repair. Supplementation, in deficient individuals has enhanced the healing process.

Nutritional Assessment

Assessment of a patient's requirements should consider the following factors:

- Appearance
- Body weight / weight loss
- Biochemistry
- Appetite and nutritional intake

A number of assessment tools have been developed to identify those patients whose nutritional status may be compromised and therefore be at risk of delayed wound healing or of developing pressure ulcers e.g. **nutritional scoring system, pressure ulcer risk assessment score.**

Plan of action:

- Ensure availability of food and encourage feeding
- Offer nourishing snacks from the snack menu (creamy yoghurts, milk drinks, ice cream). Try to meet food preferences.
- Seek dietetic advice about available / appropriate supplements (sip feeds, supplementary drinks)
- If necessary refer patient to dietician.

(Benbow, 2005)

Wound Management

It is important to remember that wound management is not wound healing – the actual generation of granulation tissue etc. is physiologically done by the patient and is more dependent on nutrition than dressings (Russell, 2002).

There is no such thing as an 'Ideal Dressing' that can be universally applied. Selection is dependent on the wound assessment, intended treatment outcome, patient preference from previous experience and many other factors (Hampton & Collins, 2004).

The aim of good wound management is simply to provide and maintain a warm, moist, non-toxic environment which supports natural wound healing. A good wound management programme also aims to treat the whole patient not just their wound in isolation, including the patient's physical and mental condition.

Wound management should be carried out in parallel with the treatment of any other medical problems and may have to be varied to compensate for the effects of those (Vowden, 2006). The properties of the correct dressing for a wound can be summarised as:

The treatment must be:

Safe and simple to use
Non-irritant
Non allergic
Non adherent
Cost effective
Absorbent (as appropriate to wound fluid level)
Supported by clinical evidence

The treatment should be:

Acceptable to the patient
Easy to use
Soothing
Pain free on application
Pain free on removal

The approved Dressing Formulary for Northamptonshire only includes products that have these properties and is available through the NHFT intranet (Tissue Viability pages).

Principles of Wound Care

- Do warm solutions used to irrigate before use to maintain optimum wound healing. (N.B. Irrigation should only be performed when clinically indicated to remove debris or bacteria and not as a standard practice).
- Do allow patients with wounds to shower or bath as long as the wound is more than 2 days old and opposed (1st intention) or 2 weeks old (2nd intention) but only if the water is clean enough to drink and has not been stored in a tank in the building (hospital or domestic). This decision must be made following a risk assessment – as per NHFT ANTT Procedure
- Do not clean the wound with cotton wool or swabs as this will disturb healing tissue and leave fibres in the wound. There are specialist products for this that can be used if required.
- Do not use high-pressure irrigation as this can damage delicate granulating and epithelialising tissue. Gentle irrigation to remove loose debris and excess secretions is the preferred method if cleansing is required.

- Do not routinely cleanse wounds. Only cleanse to remove superficial slough, excess exudate, visible debris or foreign bodies and any material from previous dressings.
- Do not use multi-use saline canisters for more than one patient as this will increase the risk of cross infection.
- Do not use tap water routinely for wound cleansing (see above). If tap water is used it should be of drinking quality and the tap run for several minutes before use. Boiled and cooled tap water may also be used.
- Do not use topical antiseptics or antibiotics unless under medical supervision and then only for short periods.
- Do not use hydrocolloids on wounds infected with anaerobic bacteria.

Types of Dressing Materials and their properties

ACTIVATED CHARCOAL DRESSINGS - For use on malodorous, wounds including faecal fistulae and fungating carcinomas where the activated charcoal component of these dressings adsorbs odour but does not resolve the cause of it. For this reason they should only be used temporarily with attention given to eliminating the cause of the odour (usually infection).

ALGINATE DRESSINGS - Used for wet wounds.

These dressings contain either calcium or mixed sodium and calcium alginates obtained from seaweed – those higher in calcium more readily convert to a gel on contact with sodium ions in wound exudate. Alginates are available in sheet, ribbon or packing presentations and work by controlling the moisture level at the wound surface. Trauma at removal is minimised by ensuring the dressing is soaked either in exudate or by irrigating with warm sodium chloride.

Most alginates have haemostatic properties and can be used on friable granulation tissue where fine capillaries are prone to bleeding. The dressing may also be applied to a wide range of exuding lesions including leg ulcers, pressure ulcers and other wounds.

ANTIBIOTICS AND ANTISEPTICS (TOPICAL)

ANTIBIOTICS – Systemic antibiotics are advocated for use only where clinical infection is identified outside the wound. The use of topical antibiotics in wound care is not advocated as topical anti-microbials have broader action and less risk of resistance. Topical antibiotics produce antibiotic resistance more rapidly than those given systemically so should only be used under expert supervision.

ANTIMICROBIAL – There are a variety of active antimicrobial substances available in various presentations with more being developed each year. It is important to remember that these should only be used if there is a significant bacterial burden in a wound, not simply because a swab has shown growth.

Iodine – works by infiltrating the bacterial cell and replacing the normal fluid (cytoplasm).

Relatively safe substance in the concentrations found in licensed wound care products but can have adverse side effects and develop contact reactions with long exposure. Absorption can cause elevated protein bound iodine and thyroid abnormalities so caution should be taken with patients who have thyroid or renal problems and patients who are pregnant. Iodine is not appropriate for the routine treatment of chronic wounds. Do not use iodine to treat neonates or the very young as they can absorb the compound very quickly.

Silver – works by physically damaging either the nucleus or mitochondria OR by physically damaging/blocking cell walls and/or receptors, depending on the bacteria.

There are a wide variety of silver-containing products ranging from Silver Sulphadiazine cream (Flamazine) to silver impregnated foams, alginate and hydrofibre. The choice of which to use is based on the fluid level in the wound as some are inherently active whilst others need to absorb wound fluid so the sodium in that can react with the silver to release it.

Do not use silver to treat neonates or the very young as they can absorb it leading to systemic argyria. Avoid silver for patients with metal allergies or who are likely to need MRI or CT scans as the metal (silver) can be heated by the magnetic fields within those imaging systems. SSD should not be applied without a secondary dressing as it causes argyria skin staining if exposed to sunlight.

Manuka Honey – works by reacting with wound fluid to replicate the peroxidase found in white blood cells.

Available in various presentations and derivations from simple tubes of pure honey to honey-covered alginate to extracted oil impregnated non-adherent sheets. Has an additional function in aiding autolytic debridement. Caution should be used to avoid poly-floral honey based products that have little or no evidence to support their effectiveness.

No adverse reactions to the product have yet been recorded – safe for neonates. However, ensure patient is not allergic to bee venom. Some patients report pain for a short time after application, usually in low exudate wounds. Eating Manuka honey has no health benefit over any other type though there is some evidence that it may treat helicobacter.

Miscellaneous anti-microbial dressings – There are a variety of anti-microbials that are specific to one product and, due to their specificity in application, these should only be used in accordance with the manufacturer's instructions.

These currently include:

DACC – binds bacteria to itself and prevents cell division leading to rapid reduction in burden as the individual bacteria die

PHMB – a contact antimicrobial effective against all bacteria, and

Glucose oxidase – changes the wound pH so that bacteria can't thrive. There is some doubt as to the range of bacteria this product is effective against.

N.B. Anti-microbial products should initially be used for 2 weeks. If there is no significant improvement after that time, stop use and consider an alternative or identify other factor impeding healing

ADHESIVE FILM DRESSINGS – usually used as secondary securing of primary dressings where lower adherence and / or trauma on removal are required.

Semi-permeable, hypoallergenic adhesive coated films of variable transparency depending upon product, also available with silicon adhesive to further reduce trauma on removal. Used to maintain a moist environment but does not have any absorbency.

COMPRESSION THERAPY – improves venous return in a limb to overcome venous or lymphatic insufficiency

May only be used following full assessment from a suitably qualified health care professional. There is a risk of limb damage / loss if compression is wrongly applied to those with arterial insufficiency or another contra-indication to therapy.

Patients with symptomatic heart failure must have the compression removed as this will reduce venous return and load on the right side of the heart. This also applies to patients with severe congestion of the lungs, for similar reasons.

FOAM DRESSINGS – a basic 'sponge' used to absorb exudate and maintain a moist environment to encourage healing. Suitable for moderate to heavily exuding clean wounds but can be used as secondary dressings over packed cavities to reduce dressing frequency.

Those with adhesive margins may cause local irritation. Thin or standard foams are suitable for lightly exuding wounds whilst thicker products are available which are more absorbent and can therefore be used on heavily exuding wounds.

Available as flat non-adhesive, bordered adhesive, silicon adhesive or cavity filling products, any reactions are usually to adhesive borders rather than the actual foam

HYDROCOLLOID DRESSINGS – for use on flat damp or moist wounds
Consist of a semi-permeable outer layer (film) and an inner layer that absorbs exudate to form a gel that balances fluid level at the wound bed.

The gel swells, forming a 'blister' under the dressing and applying pressure to the wound base which may improve granulation. They support autolysis to debride wounds that are sloughy or necrotic and can be used on dry or damp wounds regardless of origin / aetiology. May also be used as an alternative to a hydrogel to rehydrate a wound but this will take longer.

Do not use for wounds with a significant bacterial burden, especially if coliforms or anaerobes are present. Use caution and check each patient's cultural / religious beliefs as some products contain animal (pork or beef) derived gelling agents.

HYDROFIBRES – these effectively have the same properties and presentations as alginates with the exception that they are less likely to allow maceration at the wound edge.

HYDROGELS – have a single function – to donate fluid to dry tissue. They have no active ingredients to dissolve or remove slough.

Pre-mixed, sterile gels usually made from co-polymer starch, these may be amorphous or formed into a cohesive sheet. They have a high water content, which aids rehydration of hard eschar and promotes autolysis in necrotic or dry sloughy wounds. They do not actively debride and have little absorptive capability but are useful to ensure that haematomas empty without clotting as long as there is a break in the skin above the injury.

Do not use sheet versions on wounds with a significant bacterial burden, especially if anaerobes, mixed growth or coliforms are present. Be mindful that use of an absorbent dressing over a liquid gel may cause the moisture to enter the dressing rather than the intended dry tissue.

NON-ADHERENT DRESSINGS – prevent adherence of secondary dressings (i.e. gauze, dressing pads or wadding bandages) but are not needed under foams, hydrogels, films or hydrocolloids.

Made of various materials (polyester mesh coated with either silicone or another materials including hydrocolloid) these are designed as primary dressings for granulating or epithelialising wounds and need a secondary dressing to manage exudate. They can also be used as an interface dressing under another type of product (e.g. TNP) in cavities and may be used as a carrier for a hydrogel or cream (e.g. SSD).

LARVAL THERAPY – used for the management of devitalised and / or infected tissue.

Larvae are used to debride wounds including pressure ulcers, leg ulcers and burns. It is imperative that patients are prepared psychologically before therapy is undertaken. A suitably qualified professional must prescribe and supervise treatment.

Do not apply to a patient who cannot give informed consent or to a wound that bleeds easily. Do not apply to a wound with a fistula or a wound that connects to vital organs. Do not apply to a wound that is close to an exposed blood vessel as bleeding can occur due to erosion of the vessel wall.

SUPER ABSORBENT DRESSINGS – are used for wounds with extremely high fluid output.

These contain particles of expanding absorbent material that actively attract fluid into them and are capable of holding extremely high amounts of fluid. They expand as they absorb and can become heavy as a result so may limit mobility if too many are used on one limb. Adhesive and non-adhesive versions are available.

NEGATIVE PRESSURE WOUND THERAPY (NPWT) – used to accelerate granulation of cavity wounds.

A low-pressure vacuum is applied to the wound bed, possibly increasing circulation and cellular nutrition though the evidence for these functions is contradictory – it may be this or the creation of hypoxic granulation tissue that accelerates tissue regeneration. The true mechanism of NPWT is not yet known.

Specific training is needed to apply this system and is given when each patient's treatment begins and throughout the use of the therapy (if the health care professionals are not familiar with the therapy).

The indications and contra indications for this product are such that it is only to be used following agreement between the patient, Hospital Consultant or GP, and NHFT Tissue Viability Team.

Although there are circumstances where a specialist may use NPWT for complex wounds following specific assessment, the general rules are not to apply NPWT if:

- The intention is solely to manage fluid – this is a wound therapy not a drain
- There is untreated osteomyelitis of exposed bone in the wound as NPWT will cause this to fragment
- There is significant devitalised tissue (slough or necrosis) as NPWT will increase this
- There is a fistula that leads to the wound as NPWT will maintain and potentially increase flow through it
- In the presence of exposed blood vessel(s) as they may be damaged by the vacuum
- The wound bleeds freely as NPWT will increase bleeding
- There is any malignancy or tumour in the wound bed as NPWT will accelerate growth of this

POTASSIUM PERMANGANATE SOAKS - Potassium permanganate is occasionally used in wound care because of its antiseptic and antimicrobial

properties. It is available as a solution for further dilution and as a tablet preparation, which is dissolved in water and further diluted to a specified concentration. It is for external use only and can be fatal if ingested orally due to local inflammatory reactions that block the airways or cause perforations of the gastrointestinal tract (NHS England Patient Safety Alert 22.12.14)

Specific Challenges

Management of malodorous malignant wounds

Management of malignant wounds is often palliative. Activated charcoal dressing can help to treat and absorb odour. However, it is better to manage the source of the odour (usually bacteria on the exposed wound) and topical antimicrobials are most effective for this. Superficial bleeding can be controlled using alginate dressings.

Management of skin graft and donor sites

Dressings should be used and changed as per surgeons instructions.

Management of Diabetic Foot Ulcers

Diabetic foot ulcers (DFU) are vulnerable and require immediate attention as uncontrolled infection rapidly leads to tissue necrosis and the usual signs and symptoms of infection may be masked. Systemic antibiotics may be required if infection is suspected so injury or infection prone diabetic feet need regular inspection. A multidisciplinary approach is the key to successful treatment and should always involve a podiatrist for specialist advice.

People with diabetes are at special risk of developing pressure ulcers or of an existing pressure ulcer deteriorating.

Diabetic Foot Problems: Prevention and Management (NICE NG 19) advocates that If a person has a limb threatening or life threatening diabetic foot problem they should be referred immediately to acute services and the diabetic foot team informed. For all other new diabetic foot problems the person should be referred to diabetic foot team within 1 working day.

South - Battle House, Northampton General Hospital (01604 545422)

North - Diabetes Centre, Kettering General Hospital (01536 492207)

Management of external fixators, including pin sites and traction sites

Pin and fixator sites are at an increased risk of infection. These should be managed under the supervision of the surgeon responsible for their insertion.

Management of overgranulating wounds

Overgranulation prevents epithelial cells from spreading across the wound and is usually caused by oedema or low level infection in the granulation tissue. Silver nitrate sticks are non-selective and will destroy healthy as well as proud tissue so should be avoided whenever possible. Foam dressings under pressure and topical antimicrobials can both be effective in reducing the level of over-granulating tissue, depending on the cause.

Management of blisters

Any blistering of the skin should be investigated to ascertain the cause which may be shear, infection or a dermatological condition. Blisters should be left intact where possible but may be lanced or aspirated with a sterile needle to prevent the whole of the blister being deroofed which carries a higher risk of infection.

Blisters caused by burns or scalds are best left intact for the first 72 hours. If blister is over a joint or likely to be subject to shearing force it can be aspirated with a sterile needle and syringe.

Dressings for Inclusion in the Northants Dressings Formulary

Products are considered for inclusion in the Dressings Formulary under the aegis of the Northants Tissue Viability Group (NTVG). This is following clinical evaluation by the East Midlands Wound Care Steering Group (EMWCSG – a sub-group of the East Midlands Tissue Viability Forum, which includes all NHS providers within the region). NTVG includes representatives from all NHS provider organisations in Northamptonshire. There are several questions that will be asked before any new product is introduced to the formulary.

These include:

1. Is the product safe?
2. Is the product effective?
 - Is it clinically superior to established treatments?
 - Is there good evidence to support manufacturer's claims?
3. Is it acceptable to patients?
4. Is it necessary?
 - What does it do?
 - Can we do this already?
 - Do we need another dressing of this type?
5. Is it cost effective?
 - Are any extra costs justified?
 - Is there a potential to reduce cost for same benefit?
 - Are there any hidden costs (e.g. special equipment, training, secondary dressings, more frequent dressing changes etc.)

Other issues may need to be addressed such as availability (e.g. FP10 prescribing list), ease of use, range of sizes and whether there may be issues related to the dressing's ingredients for patients or carers.

It may be necessary, on occasion, to evaluate new products within the trusts in order to determine their therapeutic effect and assist in deciding whether it is appropriate to include these in the formulary. In these cases, the structure of the evaluation will be agreed under the EMWCSG Standard Operating Procedure to ensure robust data on which to base a decision.

5. EQUALITY CONSIDERATIONS

The author has considered the needs of the protected characteristics in relation to the operation of this policy and protocol to align with the outcomes

with Aseptic Non Touch Technique procedure. We have identified that ensuring that communication reaches all vulnerable groups. The service has been designed to ensure communication relevant to any wound management issues reaches all sections of the community. This includes taking into consideration communication barriers relating to language or specific needs to reach the whole population. IP&C work closely with multi agency groups and community partners where appropriate we will undertake engagement and outreach activity. We targeted action to relevant groups follow public health England's communication framework. Some groups are particularly vulnerable in relation to their protected characteristics, e.g. age, ethnic minority communities and disability and where we identify that, the expectation is that staff will meet the needs appropriately.

6. REFERENCES & ACKNOWLEDGEMENTS

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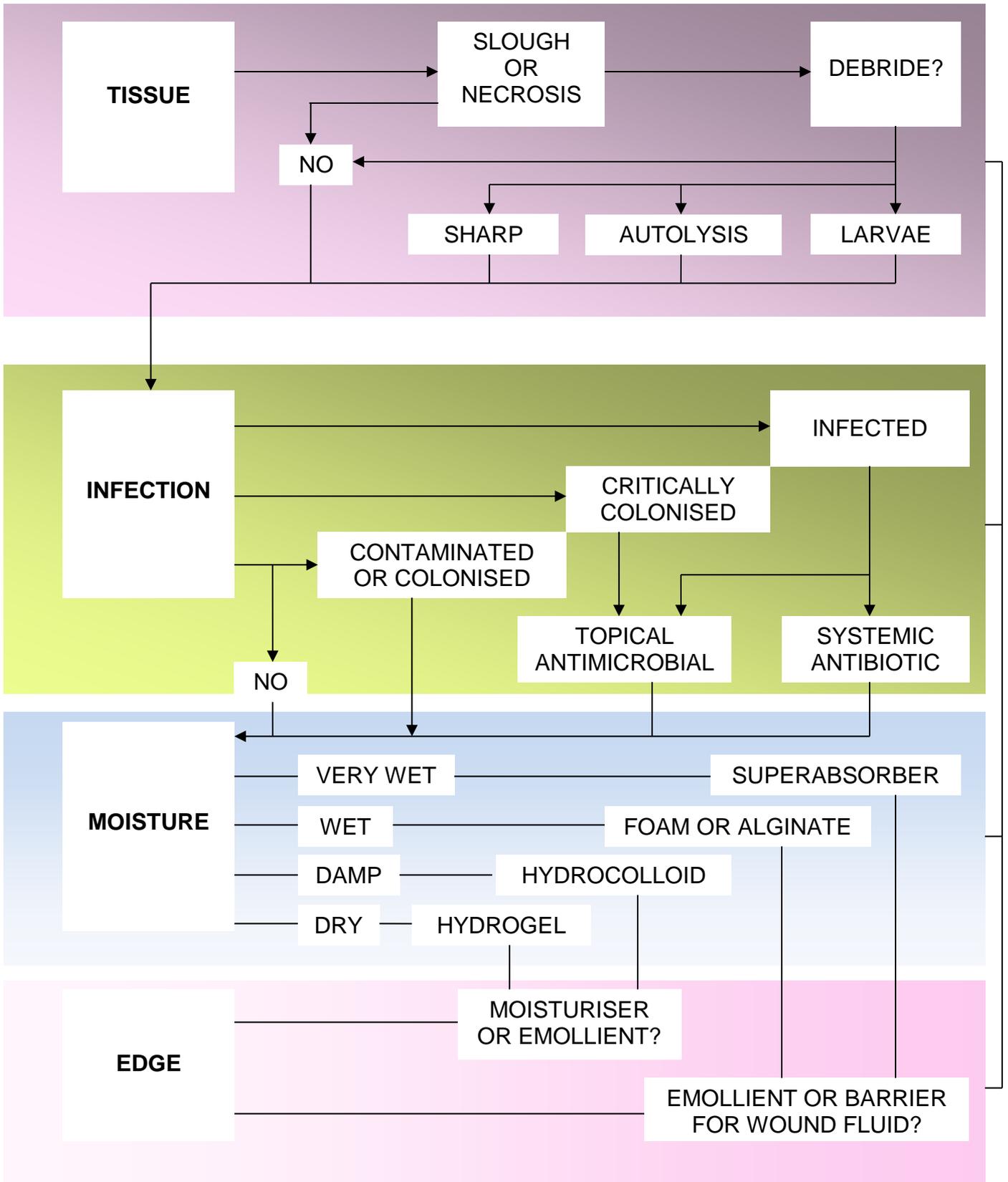
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APPENDIX 1 DECISION-MAKING ALGORITHM FOR WOUND MANAGEMENT



APPENDIX 2 WOUND MANAGEMENT COMPETENCY

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Has been assessed as competent to perform aseptic non touch / clean dressing technique Ref: 1						
Can identify the 4 main phases of wound healing Ref: 8						
Can carry out full wound assessment Ref: 5						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Can state the clinical appearance of: (i) Epithelializing tissue (ii) Granulation tissue (iii) Slough (iv) Maceration (v) Necrotic tissue (vi) Infected wound Ref: 5						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Can rationalise the use of various types of dressing: (i) hydrofilm (ii) hydrocolloid (iii) hydrofibre (iv) hydrogel (v) alginates (vi) antimicrobial Ref: 9						
Records assessment findings on wound care template on SystemOne. Records evidence of ongoing assessment. Ref: 5						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Can advise patients about principles of good nutrition, hygiene, mobility and elevation of limbs where this has an impact upon wound care. Ref: 2, 7						
Can correctly state the method used in taking a wound swab and when this should be done. Ref: 6						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Disposes of clinical waste in accordance with local waste Policy and Procedures. Ref: 3						
Can recognise the need for wound debridement and can identify when this should and shouldn't be done. Ref: 5, 9						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Has attended pressure Ulcer Prevention Training within last 2 years Ref: 2						
Has completed accredited leg ulcer course and can perform full holistic assessment of leg ulcer patients including Doppler assessment (RN only). Ref: 7						
Has undertaken trust training and has competency to apply compression bandages. Ref: 7						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Recognises own limitations with the management of wounds and refers for further assessment promptly from: <ul style="list-style-type: none"> (i) Wound Care Link Nurse (ii) Tissue Viability Nurse (iii) Vascular Surgeon via GP (iv) Dermatology Consultant via GP Ref: 2, 5, 7						

STATEMENTS OF WOUND MANAGEMENT COMPETENCY FOR:						
CANDIDATES NAME:		BAND:		PLACE OF PRACTICE:		
ASSESSORS NAME:		BAND:		START DATE:		
DEMONSTRATE APPROPRIATE ATTITUDE, KNOWLEDGE AND SKILLS IN RELATION TO ASSESSMENT AND MANAGEMENT						
COMPETENCE	TAUGHT	PRACTISED	COMPETENCE ACHIEVE		REVIEW DATE	COMMENTS
	Date:	Date:	Sign & Print Name	Date		
Refers all diabetic patients with new foot ulceration / infections including pressure ulcers to the diabetic foot team within one working day. If limb threatening or life threatening they should be referred immediately to acute services and the diabetic foot team informed. Ref: 4						
Record potentially how often the candidate will carry out this competency: e.g. daily, weekly, monthly, annually						

(Appendix 2 - Wound Management Competency Document written by: Kate Brawn – January 2017)

KNOWLEDGE AND SKILLS GUIDELINES ON:

References:

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Name

Wound Management Quiz

1. Place the 4 main stages of wound healing in chronological order

- () Proliferation
- () Maturation
- () Inflammation
- () Haemostasis

2. Wound Assessment requires the nurse to take a holistic view of the patient.

True or False

3. What colour best describes the wound bed tissue for the following

- Epithelialisation
- Granulation
- Necrotic
- Sloughy

4. Which of the following symptoms suggests a wound may have an infection (tick **seven** boxes as appropriate)

- Increased odour
- Higher exudate level
- A red wound surround
- Increase in skin temperature close to the wound
- Sudden deterioration of the wound
- Islands of epithelial tissue within the wound bed
- An increase in pain within or close to wound
- Fragile granulation tissue which bleeds easily

5. A wound swab should be taken if (tick **one** box as appropriate)

- The wound is healing but you want to ensure it does not have any detrimental bacteria within it.
- The wound has 2 or more signs of infection and you are considering that the patient may need antibiotic therapy.
- The wound is sloughy.

7. A dressing pack should be used at every wound dressing change

True or False

8. Name 3 factors that will increase the patient's risk of wound infection. (Tick **three** boxes only)

- Incorrect hand washing
- A dressing pack has been used appropriately
- Secondary dressings have exudate strikethrough on the outside of the dressing
- An antimicrobial dressing has not been used
- Bandage scissors have been used to cut primary dressings
- Healthcare worker is bare below the elbows when changing the dressing

9. A wound swab should be taken using the following method. (Tick **three** boxes only)

- Swab any necrotic tissue within the wound bed
- Only Swab viable tissue
- Swab any areas within the wound that look infected
- Irrigate/clean the wound first
- Use a Zig Zag method to cover the entire wound twisting the swab at the same time

10. The wound should be cleaned using normal saline at every dressing change

True or False

11. All necrotic tissue within a wound needs to be debrided as soon as possible so that the healing process can begin.

True or False

12. Doris has a sloughy arterial leg ulcer and has been referred to the Vascular Surgeon. There is no current indication that the ulcer is infected but it has a moderate to high level of exudate. Select an appropriate primary dressing from the following (Tick **one** box)

- Hydrocolloid
- Hydrofibre
- Inadine
- Hydrogel

13. Desmond has a dry necrotic sacral pressure ulcer and is now on the correct care as per SSKIN bundle. Desmond has had a full holistic assessment and a decision has been made, in his best interest, to debride the wound. (Tick **one** box only).

- Apply alginate dressing and cover with adhesive foam dressing. Change daily
- Use hydrogel dressing and keep applying until wound is completely debrided.
- Use a charcoal dressing in case it smells. Cover with adhesive foam.
- Protect wound edges with film stick skin protection. Apply small amount of hydrogel taking account of the fact that it may spread onto good skin if you use too much. Cover with adhesive foam. Change dressing as required, before exudate strikethrough occurs. Reassess appropriateness of dressing at each dressing change.
- Take swab and apply an antimicrobial dressing.

.14. An Inadine dressing should be used - (tick **one** box only)

- If the wound is wet as an Inadine dressing will help to dry it out
- Because you have used it before and it worked really well
- The patient has had the dressing on for 6 months and it suits them well
- If the patient has a skin tear
- The exudate level is low but you suspect the wound has an infection or is colonised with bacteria that are having a detrimental effect on wound healing.

15. All types of wounds should be graded so that we know how much tissue has been damaged.

True or False

16. Any patient with a wound should be advised regarding nutrition, mobility, hygiene and limb elevation if appropriate.

True or False

17. Derek is a diabetic patient with a wound on his foot. Who should he be referred to and how? (Tick **one** box)

- Tissue Viability Nurse by telephone
- Vascular surgeon via GP
- Diabetic Foot Team within one working day by telephone or fax

18. All clinical waste should be disposed of in accordance with local waste policy and procedures.

True or False

APPENDIX 3 REFERRAL PROCESS FOR NHFT TISSUE VIABILITY TEAM

Which patients should be referred?

Referrals can be made for any type of complex wound that is not responding to the current care plan or is deteriorating despite appropriate intervention. Complex wounds that fall outside of the nurses expected field of knowledge including:

- Pressure ulcer prevention and management.
- Leg ulcer prevention and management.
- Wounds requiring topical negative pressure e.g. VAC Therapy or Renasys.
- Surgical dehisced wounds.
- Malignant fungating wounds.

Which patients should not be referred?

Patients with skin conditions should be referred to GP / Dermatology.
Patients with diabetic foot wounds should be referred to Specialist Diabetic Foot Team.

Who can make a referral?

Referrals will be accepted from Community Nurses, Practice Nurses, Hospices, Rehabilitation Wards, Intermediate Care Team, Podiatrists, Physical Health Team (Mental Health), Physical Health Leads (Mental Health Inpatients) and HMP Nurses. Referrals can only be accepted for patients registered with a Northamptonshire GP.

Community Nurses are required to provide first line one-off advice to Nursing Homes. Following assessment the Community Nurse should only refer on to the Tissue Viability team if the patient's tissue viability needs are complex and require specialist input.

Where will patients be assessed?

Telephone advice will be given when appropriate. If required, patients may be seen in their own homes, community inpatient areas, care homes and GP surgeries.

Method of referral:

All referrals need to be made via telephone to:

Kate Brawn Tissue Viability Nurse 07917 758472
Georgina Ellis Tissue Viability Nurse 07775 912812
Maureen Goulding Tissue Viability Nurse 07825 206913

For information on Northamptonshire Dressing Formulary, Tissue Viability Education, Pressure Ulcer Prevention, TNP (Topical Negative Pressure e.g. V.A.C. Therapy®, Renasys®), see NHFT Tissue Viability Pages on The Staff Room. Follow us on Twitter @TVN_NHFT

Information required by the Tissue Viability Team on telephone referral:

- Patient name, Date of Birth, NHS Number
- Reason for referral
- Past Medical History
- How long has the wound been present?
- Wound Dimensions
- Grade (if pressure ulcer)
- Waterlow Score
- ABPI & Doppler Sounds (if leg ulcer)
- Signs of infection?
- Swab taken?
- What pressure relieving equipment in place if at risk of pressure ulceration?
- MUST Score
- Dietician involvement or referral (if appropriate)
- Current wound management (i.e. dressings / compression therapy)
- Previous wound management options used
- Is the patient under the care of or been referred to another specialist i.e. Vascular / Dermatology / Diabetic Foot Team / other?