Basic Wound Management
Self-Directed Learning Package

Name: ________________________
Service: ______________________
Date: ________________________
Introduction

Wound management is an integral component of contemporary nursing practise. In support of professional development and evidence based practice this self directed learning package (SDLP) is available. This package will provide health care professionals with the knowledge to improve evidence based best practice wound management and planning.

The SDLP is to be completed within the first three months of employment, further knowledge and development of skills is encouraged; seek guidance from your Direct Line Manager, Nurse Educator, Clinical Nurse Wound Clinic or Clinical Nurse Consultant Wound and Stoma.

Forward the completed SDLP to your line manager and retain a copy for your professional development portfolio.
Objectives

Completion of this SDLP will enable clinicians to:

- Identify the anatomy of the skin.
- Describe wound healing physiology.
- Describe and explain holistic wound assessment.
- Identify factors impacting on wound healing.
- Describe clinical assessment and development of client focussed wound management.
- Identify and describe the classification and actions of main dressing groups.
- Describe and demonstrate wound management documentation.
- Discuss strategies to promote education and client engagement in wound management and health and wellness goals.
Anatomy of the Skin

Skin or integument is the barrier between the body and external environment. It is the largest organ of the body, accounting for 15% of body weight and receiving 33% of circulating blood. The skin’s primary functions include protection, sensation, heat regulation, storage, absorption, communication, metabolic synthesis and body image (Carville 2012).

<table>
<thead>
<tr>
<th>Structure of the Skin</th>
<th>Diagram of the skin 31/10/11 Retrieved from cksinfo.com</th>
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</thead>
<tbody>
<tr>
<td>Consists of 3 layers:</td>
<td></td>
</tr>
<tr>
<td>• Epidermis</td>
<td>Epidermis</td>
</tr>
<tr>
<td>• Dermis</td>
<td>Dermis</td>
</tr>
<tr>
<td>• Hypodermis</td>
<td>Fatty Tissue</td>
</tr>
<tr>
<td></td>
<td>Nerve</td>
</tr>
<tr>
<td></td>
<td>Follicle</td>
</tr>
<tr>
<td></td>
<td>Oil Gland</td>
</tr>
<tr>
<td></td>
<td>Sweat Gland</td>
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</table>

**Epidermis**

The epidermis is the outer most layer of the skin; it is vascular and receives nutrients from the dermis. The anatomy of the epidermis supports the unique ability of epithelial cells to migrate is an important function in wound healing.

**Dermis**

The dermis consists of collagen and elastin fibres, nerve endings and lymphatics, supported in a connective tissue matrix. Dermal thickness and strength varies to support function of various body areas.

**Hypodermis**

It consists of adipose tissue, blood vessels and connective tissue. Functions as a thermal regulator, energy store and disperses pressure, protecting the underlying tissues and organs. Thickness varies dependent on the individual and body position.
Physiology of Wound Healing

Wound healing can be defined as the physiological processes by which the body replaces and restores function to damaged tissue. Wound healing is a complex sequence of events that are influenced by physiological and psychological factors including haemostasis, tissue repair and regeneration. Irrespective of the nature or type of wound, the same biochemical and cellular processes are required to bring about healing. The wound healing process is a predictable, orderly sequence of events with one phase merging, and at times overlapping, into the next.

Uncompromised wound healing can be divided into four phases:

- Haemostasis
- Inflammation
- Reconstruction
- Maturation
Haemostasis (Immediate)

- Vasoconstriction response: The injured ends of blood vessels constrict immediately in order to minimise blood loss and initiate the clotting mechanism.
- Platelet response: leads to formation of a platelet plug.
- Biochemical response: A complex process involving a release of clotting factors; the cycle includes the development, retraction and compaction of the clot and eventual breakdown of the clot by fibrinolysis.

Inflammation (0-3 days)

The inflammatory stage starts at the time of injury. There is increased blood flow during this stage therefore, erythema, swelling, heat and discomfort may be visible in and around the wound.

Reconstruction (2-24 days)

The wound fills and covers undergoing the following processes:

- Granulation
- Contraction
- Epithelialisation

Granulation

- New capillaries (small vessels) are formed
- Red granulation tissue appears in the wound
- Macrophages stimulate fibroblasts to produce collagen
- Macrophages attract endothelial cells

Contraction

- Once the process of connective tissue production is complete, special cells (fibroblasts) congregate around the wound margin and are able to contract, pulling the edges of the wound together so that the size of the wound area is reduced.
Epithelialisation

- Epithelial cells multiply and migrate across the wound surface from the edges
- New epithelium appears like a thin, translucent film across the wound surface
- When epithelialisation is complete the wound has healed

Maturation (24 days – 1 year)

- Transformation of collagen produced during wound healing will increase the strength of the connective tissue.
- Some of the capillaries formed during granulation will disappear to create a normal blood supply.
- Duration – can be greater than a year.

Scar tissue achieves approx 70-80 % of tensile strength of non-injured tissue increasing the risk of future injury.

Wound Healing Classifications

Primary healing – minimal tissue loss, wound edges held together by sutures, clips or tapes

Delayed Primary healing – When wounds are infected, contaminated or have a foreign body and may require thorough cleaning prior to closure 3-7 days later.

Secondary healing - Natural healing which occurs through the process of granulation, contraction and epithelialisation, with scarring.

Skin Graft and Flap- Surgical relocation of adjacent tissue to cover or fill a deficit and promote healing.
Contemporary Wound Healing Principles

The provision of a supported micro-environment at the wound surface is important to maximise the healing potential of a wound. The methods used by health professionals to manage wounds should not interfere with, nor disrupt the processes of healing. Wound cleansing and dressing techniques should therefore maintain, as close as possible, an optimal environment for wound healing.

Wound Healing Theory

Until the 1960’s it was believed that a wound had to be kept dry to prevent bacterial infection and the ideal wound dressing was thought to be one that absorbed and removed all traces of wound fluid. This has since been proven to be suboptimal with a moist wound healing environment being shown to improve wound healing by up to 50% faster than in a dry environment. Moist wound healing has become the benchmark for promoting optimal wound healing.

Epithelial cells remain viable and migrate more readily across a moist surface. Non-viable or dry tissue acts as a mechanical obstruction therefore the epithelial cells have to burrow beneath the obstruction before migration can occur across the wound bed. Exudate covers and protects nerve endings, which assists in reducing pain. Exudate is also rich in essential nutrients, growth factors and phagocytic cells that bathe and cleanse the wound bed. Excess exudate may cause peri wound maceration, skin breakdown and provides an environment for bacterial multiplication and should be managed or removed. (Carville, 2012)
WOUND ASSESSMENT

Wound assessment requires holistic assessment as this identifies extrinsic and intrinsic factors that have the potential to delay or inhibit optimal wound healing. Holistic assessment should facilitate the assessment of the relationships between the patient, the wound and the management. The wound and client must be comprehensively assessed at the initial assessment and at every treatment or if deterioration of wound occurs. Timely completion of the wound assessment tool and wound management plan is required and supporting information is to be documented in the clinical record.

Type of wound

- Acute Wound (less than or equal to 4 weeks)
  - Acute wounds are most often considered surgical wounds, traumatic wounds, or burns and progress through the healing phases in a timely and orderly fashion.

- Chronic Wound (> 4 weeks)
  - Chronic wounds begin as an acute wound or injury but for unknown reasons do not progress through the normal phases of wound healing and stall in the inflammatory phase. Healing is complicated and delayed by intrinsic and extrinsic factors that impact on the person, the wound or the environment. (Spear 2013).

Individual factors that could impact on wound healing

Extrinsic:

- Advanced age
- Disease processes (diabetes, peripheral vascular disease, malignancy)
- Poor nutritional status / obesity
- Medications (steroids, cytotoxics)
- Smoking
- Inactivity/decreased mobility
- Altered psychological status (eg, stress, anxiety, depression)
- Systemic infections
- Cultural considerations
- Environmental factors
- Disorders of sensation and movement
- Radiation therapy
- Socioeconomic factors
Intrinsic:

- Infected or highly colonised wounds
- Non viable / necrotic tissue
- Foreign bodies (sutures, dressing debris)
- Moisture balance
- Wound temperature
- Pressure, friction, shearing forces
- Inappropriate wound management practices
- Location (eg. Bony prominences, skin folds)
- Acute / chronic
- Age of wound

Assessment

Assessment and evaluation are ongoing throughout the healing process. The wound assessment should include:

1. **Measurement of Dimensions** (Ruler, Grid)
   - Depth
   - Width
   - Length
   - Undermining

2. **Photographic Record if able** (consent is required)

3. **Periwound**
   - Oedema (eg. Pitting, weeping, etc)
   - Maceration
   - Eczema/dermatitis
   - Colour and warmth
   - Integrity (frail, thin, dry, scaly)
   - Erythema
   - Hardening /induration
   - Dermatitis/eczema
4. **Wound Edges** (Characteristics to observe)

- Evidence of contraction and epithelialisation
- Raised or rolled edges
- Shape of circumference
- Colour changes
- Sensation changes

5. **Clinical Appearance** (Tissue)

- **Black Necrotic**
  - Dehydrated dead tissue
  - Delays healing
  - Can be soft or can form an eschar

- **Slough**
  - Slough is a collection of cellular debris
  - Yellow devitalised fibrous tissue

- **Red Granulation**
  - Highly vascular
  - May look slightly uneven in texture

- **Pink Epithelium**
  - Newly resurfaced tissue, partially translucent

- **Infection or Green Tissue**
  - Clinical signs of infection present; pain, heat, swelling, redness and purulence or increased malodour of exudate

- **Hypergranulation - Exuberant granulation tissue (proud flesh)**
  - Fragile
  - Easy to bleed
  - Boggy

- **Exposed underlying structures**
  - Muscle, bone, vessel or tendon
6. Exudate

- **Type and colour**
  - Serous – clear, straw colour
  - Haemoserous – slightly blood stained
  - Sangineous – frank or heavily blood stained
  - Purulent – contains pus

- **Amount** (excessive loss can interfere with fluid and electrolyte balances)
  - Dry
  - Moist
  - Saturate
  - Leaking

- **Odour / malodour**
  - Present
  - Absent

7. Wound Pain

- Non-cyclic wound pain-suture removal or debridement
- Cyclic wound pain – daily dressing
- Chronic wound pain – not related to manipulated interventions
- Assess pain utilising pain scale 0-10

**GUIDING PRINCIPLES IN WOUND MANAGEMENT**

Standards for Wound Management, Standard 4 - Australian Wound Management Association (pg 13-18)

4.1 Determine when an aseptic wound management technique is required if the individual, their wound and their healing environment is compromised

4.2 Determine when a clean wound management technique is acceptable if the individual, their wound and their healing environment are not compromised

4.3 Maintain an optimal wound moisture balance

4.4 Maintain a constant wound temperature…..

4.5 Maintain a neutral or slightly acidic pH in the wound……

4.6 Prevent and manage infection
4.7 Minimise the actual and potential impact of pain

4.8 Protect the wound environment

4.9 Maintain the integrity of the wound management products, pharmaceuticals and devices

4.10 Use products, pharmaceuticals and devices in accordance with licensing acts and/or regulatory bodies and manufacturer guidelines

**Infection control**

Hand washing refer to relevant infection control ANTT procedures links provided below.


http://www.antt-training.com/content/about/about.jsp

**References & Resources**


http://en.wikipedia.org/wiki/Wound_Man


http://www.wounds-uk.com/best-practice-statements
Orsted, H., Keast, D., Forest-LaLande, L., Megie, M.F. Basic Principles of Wound Healing. Wound Care Canada Spring 2011 Volume 9, Number 2 pg 4-12

https://www.youtube.com/watch?v=rmwry5p9ftk

Timmons, J. Skin Function and Wound Healing Physiology Wound Essentials Volume 1 2006 pg 8-17

Wounds West – on line learning modules
(7 x 60 minute modules, CNE points ACN (RCNA))
Core fundamentals of wound assessment and management principles
Pressure Ulcer
Foot Ulcer
Burns
Skin Tears
Leg Ulcers
Aboriginal Health workers.

Link -

iLearn@QHealth
Pressure Injury Prevention course (140 minutes)

Mandatory training PAH
Skin inspection (15 minute online video)

Where to from Here?

Following completion of the written assessment, contact the Post Acute Care Services Wound Clinic CN and arrange a review of the Basic Wound Management SDLP assessment. This is a once only evaluation on completion notify your line manager and retain a copy of the SDLP and assessment for your professional portfolio.

If you have further interest in developing knowledge and skills in Wound Management, information is available on line at the Australian Wound Management Association web page (www.awma.com.au)
Assessment

1. Match the correct order of wound healing stages below:

   Haemostasis        four
   Inflammation       one
   Remodelling        three
   Maturation         two

2. Identify the following factors as either extrinsic (E) or intrinsic (I):

   ________ Advanced age
   ________ Moisture balance
   ________ Disorders of sensation and movement
   ________ Poor nutritional status / obesity
   ________ Non viable / necrotic tissue
   ________ Age of wound
   ________ Disease processes (diabetes, peripheral vascular disease, malignancy
   ________ Environmental factors
   ________ Radiation therapy
   ________ Foreign bodies (sutures, dressing debris)
   ________ Location (eg. Bony prominences, skin folds)
   ________ Acute / chronic

3. Identify and label the layers of the skin:
4. What are the most significant factor(s) in reducing wound infections?

↑ Moist wound healing has become the benchmark for promoting optimal wound healing.
↑ A wound bed has to be kept dry to prevent bacterial infection.
↑ Non-viable or dry tissue acts as a mechanical obstruction.
↑ Excess exudate will improve peri wound integrity.

5. Match the exudate type with the descriptions:

<table>
<thead>
<tr>
<th>Exudate Type</th>
<th>Description</th>
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<tr>
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<td>contains pus</td>
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<tr>
<td>Haemoserous</td>
<td>clear, straw colour</td>
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<tr>
<td>Sangineous</td>
<td>slightly blood stained</td>
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<tr>
<td>Purulent</td>
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6. Answer true or false to the following statements:

________ Scabs are to be encouraged because they promote healing
________ Epithelial migration proceeds faster in a moist environment
________ Temperature has no effect on the rate of healing
________ Exudate should be removed from the wound surface.

RESULT: (circle)  ACHIEVED  NOT ACHIEVED

Comments
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Signature of Assessor___________________________________Date     /     /
Name________________________________________________

Signature of Assessee___________________________________Date     /     /
Name________________________________________________