Hertfordshire Care Providers Association

WOUND CARE WORKBOOK

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Use as an additional resource to accompany face to face training. For care home and homecare settings.

Contents

Welcome to the wound care workbook.

The aim of this workbook and the associated activities are designed as a useful learning resource to accompany face to face training in care home and homecare settings.

BACKGROUND

Wounds represent a significant burden for healthcare services. The huge cost is set to increase year on year with an ageing population, associated comorbidities, earlier hospital discharges and more complex wounds in the community. Provision of quality wound care in the community setting in recent years has therefore become increasingly challenging. Numbers of District Nurses has fallen whilst there has been a significant rise in community nurse recorded visits (Guest et al,2020). Wound Care can be challenging! The aim of this workbook and the associated activities are designed to increase your understanding in –

- Anatomy and physiology of the skin
- Physiology of wound healing
- Holistic wound assessment

This workbook is designed to be used as a learning/revision tool and can assist you in teaching patients/clients, carers, families and work colleagues in different aspects of wound care. Each section can be taken separately for lite bite teaching sessions.

How to use the workbook

The workbook is an educational tool and has exercises, activities and discussion/reflection points throughout the text.


Written Activity symbol


Discussion/reflection symbol

In each section there is space to make your own notes during and after the training session.

Section 1 - Anatomy and Physiology of the skin

Skin health is essential to the wellbeing of a person. The skin is the largest organ in the body and is concerned with -

Protection – The skin acts a s a barrier to prevent entry of substances that may be harmful and the loss of vital fluids from the body. It also provides protection against physical trauma such as pressure, shearing and friction.

Absorption - In the presence of UV light from the sun Vitamin D is produced and circulates in the blood and is used in the mineralisation of the bone, along with calcium and phosphate. Other products are absorbed by the skin such as steroids, analgesia, HRT and nicotine patches.

Sensory perception – the nerve endings in the skin allow the body to detect pain and changes in temperature, touch and pressure. This is a protective mechanism designed to remove us from dangerous situations.

Temperature regulation – the skin allows the body to respond to certain changes in temperature by constricting or dilating blood vessels within it. The sweat glands produce sweat, which stays on the skin to allow the body to cool down as it evaporates. When the body is cold the erector pili muscles will contract raising the hair, trapping warm air next to the skin.

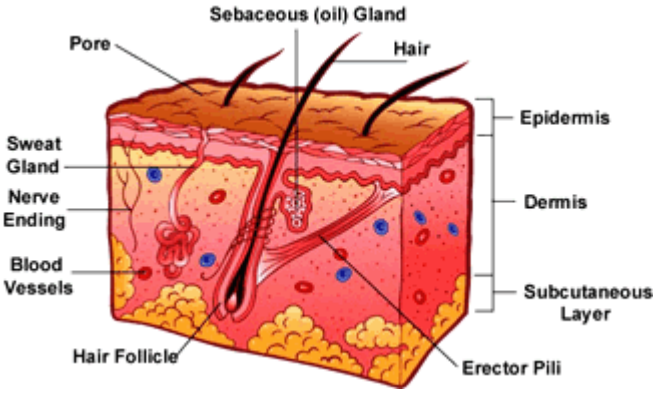
Storage and synthesis – the skin enables the synthesis of vitamin D when ultraviolet light is present. Vitamin D is essential in allowing the body to manufacture certain hormones.

Excretion of waste products – the skin excretes waste products in sweat and sebum from sebaceous glands to help lubricate and protect skin**.**

Non- verbal communication – the skin can convey many changes within the body through colour changes such as blushing. It gives many clues about the physical wellbeing of individuals.

It is vital that skin remains intact to allow the body to perform essential functions. It contains 3 main layers.

Fig 1 Diagram of the skin



Epidermis – The epidermis is very thin and contains no blood vessels. It is made up of 5 cellular layers and the cells move from the base of the epidermis through the layers to the surface changing shape and structure as they go. The outer layer is renewed every 3-4 weeks**.** Once damaged the epidermis repairs itself by a process known as regeneration. The epidermis is nourished by the dermis.

Dermis – the main function of the dermis is to provide physical support and nutrients to the epidermis. Key substances found in the dermis include collagen and elastin. Collagen is important because it helps give support and protection within the skin. The dermis also contains nerve endings, sweat glands, sebaceous glands, hair follicles and blood vessels. The nerve endings sense pain, touch, temperature and pressure and are a vital part of the body's protective mechanisms. There are more nerve endings certain parts of the body such as the fingers and toes. Sweat glands produce sweat which contains body waste products, water and salt. Evaporating sweat causes cooling of the body. Sweat from the axilla and groin area is more oily in nature and produces characteristic odour when digested by the skin bacteria.

Sebaceous glands secrete sebum into hair follicles. Sebum is an oily substance that keeps skin moist and acts as a barrier against foreign substances.

Hair follicles produce various hair types that can be found around the body, so can affect a person's appearance. Hair is also involved in protecting the body from injury and can improve sensation.

The blood vessels within the dermis are also involved in temperature regulation.

Subcutaneous layer – is made up of adipose tissue, connective tissue and contains larger blood vessels. The function of this layer is to provide support to the dermis, protection and insulation.

The effects of ageing on the skin

Ageing results in both visible and structural changes to the skin. Sebum, the skins natural moisturiser decreases secretion and this can lead to the skin becoming drier, flaky and more fragile.

Dry skin is itchy and this can lead to scratching and skin breakdown. Nerve endings decrease in number as we age which may have an impact on the protective function of the skin. As we get older, there is a decrease in collagen present in the skin, which causes it to appear thinner and less elastic. This affects its ability to protect the underlying structures of the body.

Written Activity 

Question 1

How does the body obtain vitamin D?

Question 2

What stimulates sweat glands to produce perspiration?

Question 3

What are the nerve receptors located in the skin sensitive to?

Discussion point 

Think about an elderly patient in your care and identify the factors that affect their skin?

What special measures should be observed when caring for elderly patients/residents with fragile skin?

Notes

Section 2 – Wound healing

Phases of wound healing

Heamostasis – this phase is a physiological response which starts immediately after injury. It is achieved by a combination of vasoconstriction to conserve blood loss, the release of clotting factors, where the clot serves as a barrier against bacteria and a frame work for migrating cells. Before haemostasis is achieved fibrin forms a mesh trapping blood cells. The fibrin together with platelets provide limited structural strength for the clot to seal blood vessels.

Not all wounds will follow this process as it is very much dependent on the nature of the wound. Many chronic wounds such as pressure ulcers and leg ulcers would not go through this heamostatic phase.

Inflammation – is a normal vascular and cellular response to any injury and healing cannot progress if inflammation does not occur. Inflammation can be seen locally as the presence of heat, swelling, erythema and discomfort. These signs should not be confused with inflammation.

Neutrophils cleanse the area of bacteria and devitalised tissue by phagocytosis. Monocytes are also attracted to these areas; these transform into macrophages and help with the process of phagocystosis.

Wound exudate is produced at this stage. In healthy wounds it contains substances that are vital for wound healing, including neutrophils, macrophages, lymphocytes, proteases, and growth factors.

Although the presence of exudate is vital for normal wound healing it can also damage healthy intact skin and therefore it is important to manage exudate levels effectively in order to prevent further breakdown.

Slough is a collection of dead cellular debris on the wound surface and is often seen in the inflammatory phase.

Proliferation – this phase starts at about day 3 to 14. Growth factors are secreted by macrophages to stimulate growth of new blood vessels (angiogenesis) which are important in the delivery of oxygen and nutrients to healing tissues.

An extra cellular matrix is formed from substances including collagen. This provides a scaffolding into which new blood vessels can grow forming granulation tissue. The new granulation tissue should be pink/red in colour. Darker dusky granulation tissue that bleeds easily denotes an additional symptom of infection.

Wound contraction occurs during this phase. Fibroblast, collagen and elastin all contract pulling the wound edges together. Once this has taken place new growth of epithelial cells across the wound surface can take place. New epithelial cells migrate from the wound edges, sweat glands, hair follicles and sebaceous glands. Once they meet other epithelial cells across the wound surface they will stop migrating. Epithelial migration is accelerated in a moist environment.

Maturation – the onset of this phase varies depending on the size of the wound and whether it was initially left closed or open. In chronic wounds this stage may take longer. During maturation the wound is strengthened and scar tissue changes colour.

The wound becomes stronger as macrophages stimulate collagen bundles to mature and form strong organised layers. The tensile strength of scar tissue compared to normal skin is about 70%.

The scar will change colour gradually and become pale and white in appearance. The mature scar tissue does not have hair, sebaceous or sweat glands.

Moist wound healing – the traditional way for a wound to heal was to allow it to dry out and forma scab. It is now widely accepted that a moist wound healing environment encourages faster epithelialisation.

Moist wound healing can also reduce the amount of pain that a patient may feel when living with a wound.

Moisture levels in a wound must be controlled. Modern day dressings are designed to manage exudate and provide a moist wound healing environment.

Chronic Wounds

A chronic wound is defined as a wound that has failed to heal as anticipated or becomes fixed in any one phase of healing. The expected healing time can be defined as 6 weeks to 3 months but would be dependent on the size and nature of the wound.

It is thought that chronic wounds may lack the initial trigger that begins the healing process. This might be due to underlying disease processes such as vascular insufficiency.

Chronic wounds behave differently to acute wounds and this can make them more difficult to heal. Careful dressing selection is important to provide the optimum healing environment.

Written activity 

Question 4

Slough is a collection of dead cellular debris on the wound surface, it often occurs in which phase?

Question 5

Describe how healthy granulation tissue should appear?

Discussion 

Chronic wounds are wounds that are failing to heal as anticipated. Identify a chronic wound that a patient/resident has in your care and discuss the issues that make it challenging to progress to healing.

Notes

Section 3 – Holistic wound Management

Holistic Patient assessment

Regulated health professionals will conduct an In depth holistic patient assessment to help identify the factors that may affect wound healing giving valuable insight into the aetiology of the wound. These may include -

Underlying medical conditions – these may include metabolic disorders such as diabetes, renal and liver failure. Malabsorption disorders such as Crohn's disease or ulcerative colitis. Disorders affecting mobility and sensation including stroke, spinal injury, neuropathy, multiple sclerosis. Immune deficiency disorders such as rheumatoid arthritis. Any disease that affects perfusion and oxygenation, such as anaemia, peripheral vascular disease, heart failure, arteriosclerosis, hypertension and Chronic Obstructive Airways Disease.

Social History –smoking, alcohol, recreational drugs, environment,

Baseline observations – temperature, BP, pulse, oxygen saturation, full blood count, c-reactive protein (CRP), urea and electrolytes.

Communication – discussion with patients and families/carers about their concerns causing stress and anxiety, worry about wound odour, leakage, body image, social isolation. Chronic stress delays dermal healing by stimulation of the sympathetic nervous system prolonging the inflammatory process.

Non-concordance –wherever possible it is important to explore uncover the reasons why patients may be non-concordant with treatment. It is rarely the case that patients want to be 'difficult '. Discussion around their reasons (include family and friends) may reveal why they do not want a particular dressing, bandage or piece of equipment.

Nutrition and dehydration – has a vital role to play in the process of wound healing, malnutrition will complicate or inhibit the process. Dehydration can cause an electrolyte imbalance.

Medication – different medications can affect the healing process such as steroids, anticoagulants, immunosuppressant's and cytotoxic drugs.

Pain – wound pain is often underestimated and can be a significant problem for the patient that experiences it. Chronic wound pain can be debilitating. Accurate pain assessment and treatment is essential.

Age – an important factor to consider when assessing wounds and planning care

Wound Assessment

Any practitioner who cares for a patient with a wound must possess the skills to accurately assess and understand the results of those assessments allowing for appropriate evidence based treatment plans to be developed.

Wound assessment can be defined as information obtained using observation, physical examination and clinical investigations in order to formulate a management plan (Nix, 2012)

Initial assessment should be made by a qualified nurse and continued wound management can involve delegated members of the multidisciplinary team following a wound care plan. It is important that during assessment the practitioner should recognise the limits of their knowledge and refer the patient to specialist groups where necessary (Eagle, 2009). Involvement of the patient where possible, families and carers will ensure that there is concordance with planned interventions. This can be achieved by discussion of expectations, treatment options with clear explanations.

Exudate – Record the level and type (e.g. consistency and colour). Minimising the potentially harmful effects of excessive exudate is a challenge, it can lead to infection, delayed healing, pain and malodour. The aim is to treat the cause (e.g. compression therapy) and manage the moisture balance with appropriate dressings.

Infection – local infection may result in **pain, erythema, oedema, local warmth, delayed healing, bleeding friable granulation tissue, malodour or pocketing**. Spreading/systemic infection may present as local infection with possible **pyrexia, abscess, pus, wound breakdown, cellulitis, general malaise, raised WBC count. Record all signs and symptoms and escalate concerns.**

Microbiological tests should not be used routinely. It is important when taking wound swabs that accurate and relevant information is given to microbiology in order to facilitate appropriate wound investigation and treatment (Bowler et al, 2001). The wound should be cleansed prior to swabbing to remove surface contaminants.

Remember that signs and symptoms of wound infection vary according to wound type for example diabetic patients with neuropathy and an infected foot ulcer may not report pain

Tissue Types

Identify the tissue types in the pictures

It is important to be able to describe tissue types when documenting wound care. Observe for red, pink, yellow or black tissue. Record exudate levels as low, medium or heavy and if any odour is present.

Written Activity 

Question 6

What is the aim of wound management? Please tick the appropriate answers

- **Optimise moist wound healing**
- **Remove and manage exudate**
- **Protect from infection**
- **Encourage growth of new tissue**
- **Prevent infection**
- **Cause trauma to the wound**
- **Remove slough**

Discussion

Think of a situation when a patient has been non-concordant/compliant. What are the possible reasons for this and how could you overcome the issue or reach a compromise in the future?

Remember

A dressing will not heal a wound, it will create the right environment for healing to take place.

References

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