Hertfordshire Care Providers Association

PRESSURE ULCER PREVENTION WORKBOOK

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Contents

Welcome to the pressure ulcer workbook.

The aim of this workbook and the associated activities is designed to increase your understanding in –

The physiology of pressure ulcer development

Identification of vulnerable patients

The importance of Skin inspection for individuals at risk of pressure damage

The Identification of pressure damage

Why it is important to keep patients moving

The importance in use of equipment to prevent pressure damage

The knowledge and identification of the difference between a moisture lesion and a pressure ulcer

Strategies for prevention of moisture lesions

The principles of treatment for moisture associated skin damage

The importance of nutrition in pressure ulcer prevention

Why giving information is important in pressure ulcer prevention strategies

Each section in the work book can be taken separately for bite size learning/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

Introduction

Pressure ulcers also known as pressure sores have occurred since time began and can affect people all over the world. They are a cause of pain, embarrassment, loss of independence, poor quality of life, depression, social isolation and distress as well as being potentially life threatening (Keen, 2009). Identified as one of the top 10 harms in the NHS in England. The cost to the NHS is estimated at 1.4 million each day which is 4% of its total expenditure.

Pressure ulcers are caused when an area of the skin and underlying tissues are damaged as a result of being placed under pressure sufficient to impair its blood supply (NICE, 2014). Each year, approximately half a million people in the UK develop pressure ulcers), with most occurring in the community among individuals with underlying comorbidities, frailty, mobility issues and a dependence on carers.

Section One

Keeping skin healthy

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 as 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 – UV rays from the sun are converted by the skin into vitamin D. the body needs vitamin D to strengthen bones alongside calcium and phosphorous. Other substances can be absorbed by the skin such as steroids, analgesia, nicotine patches and HRT.

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.

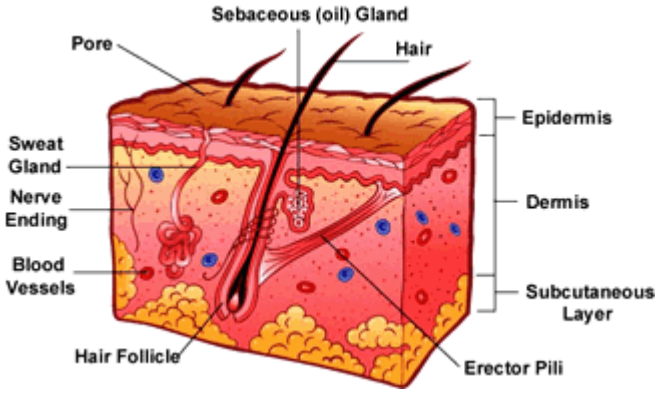
Storage and synthesis – the skin enables the synthesis of vitamin D when ultraviolet light is present. Vitamin D is essential in allowing the body to manufacture certain hormones.

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.

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 (elastic fibres). 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

The skin is the largest organ in the body and has many functions. Describe 5 functions.

1.
2.
3.
4.
5.

Question 2 what is the dermis composed of to make it tough and elastic?

Discussion point

How do you think an older person's skin differs from that of a younger person?

What special measures do you take for patients/residents who have fragile skin?

How do pressure ulcers develop?

The body can withstand certain levels of pressure. The subcutaneous tissue provides a natural padding to prevent damage occurring. In healthy, fully mobile individuals movement is a natural process when pressure becomes uncomfortable. People who are immobile cannot move independently and individuals who have reduced sensation will not respond to the normal pain signal to move position. If pressure is sustained pressure damage will occur.

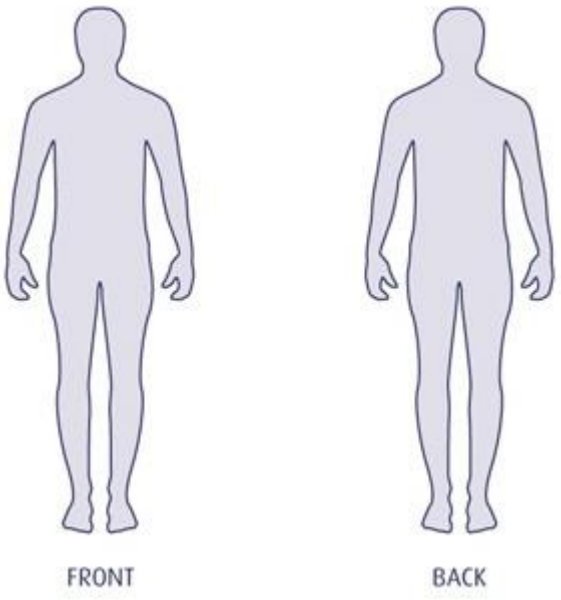
The layers of the skin require fluid for hydration, oxygen and nutrients as a continual process. If there is pressure exerted onto an area for a period of time the blood vessels become squashed. This reduces or stops blood flow to the tissues and in turn this will alter the supply of oxygen, fluid for hydration and nutrients. Eventually the cells become weaker and weaker until they eventually die.

As the bones push down into muscle and tissue layers when no movement is taking place, the highest point of pressure will be in the deep layer of tissue near the bone. Eventually the pressure will radiate through the layers to the skin and a red mark will appear in light coloured skin, in dark toned skin it may be a subtle darkened area This is the first sign that pressure is interfering with blood flow to the tissues. If there is no movement for a prolonged period of time the mark will turn purple/darker/black as tissue death takes place.

Written Activity 

Question 3

Mark on the diagram all the areas you think pressure damage may occur



Discussion point 

Can you think of any medical devices or objects that you come across in the work place that could cause pressure damage?

Other causes of skin damage are-

Shearing – a mechanical force that causes a person's body to slide down a surface such as a chair or bed. As the skeleton slides down the bed or chair the skin is dragged in the opposite direction and the result is a tearing of the tissues. Shearing In combination with pressure will cause a pressure ulcer.

Friction – occurs when the skin is rubbed in an abrasive action against another surface this could be due to badly fitting footwear, poor manual handling techniques or moisture damaged skin.

Moisture – when moisture is present on the skin due to incontinence or perspiration it will increase the risk of skin breakdown.

Written Activity 

Question 4

Shearing can occur (circle all that apply)

A. **When a patient /resident is lying flat on the bed**
B. **A patient/resident is sliding down the bed**
C. **A patient/resident is sliding off a chair**
D. **A patient/resident is walking to the toilet**

Question 5

Friction can occur (circle all that apply)

A. **Hoisting a patient/resident off the bed**
B. **Changing sheets when a patient/resident in bed**
C. **Lifting a patient up the bed using a bed sheet**
D. **Feet resting against the bed end**

Identifying patients/residents at risk of skin damage

We have already discussed pressure, shear, friction and moisture. These are extrinsic factors (that occur outside of the body).

There are numerous Intrinsic risk factors –

Nutrition/hydration – adequate nutrition and hydration are considered important to prevent as well as heal pressure ulcers.

Obesity and/or malnourished – if fat reserves are reduced due to inadequate nutrition this will interfere with the fatty padding to protect against pressure damage. Anyone who is extremely overweight and immobile is at risk.

Immobility – damage can start within 1 – 6 hours. This may be dependent on underlying comorbidities (other illnesses/disease processes)

Sensory – a person who has lost feeling and/or is unable to move independently is at increased risk. A person who has suffered a cerebrovascular accident, has multiple sclerosis, spinal cord injury or neuropathy may have impaired sensation. Unconsciousness, alcohol or substance abuse and use of strong analgesia may also reduce the pain sensation.

Extremes of age – the skin is less able to tolerate pressure and more susceptible to friction, moisture and shear.

End of Life – the skin is mostly likely to fail at the end of life and can result in unavoidable skin damage.

Non-concordance – on occasions some patients/residents may refuse to use support surfaces provided. In this instance it is necessary to assess their mental capacity.

Compromised vascular supply – If the arterial flow is diminished this may reduce the amount of oxygen to the skin. If the person is subjected to pressure, this will result in rapid deterioration. The heels are a good example of this in a person who has diminished blood supply.

Written Activity

Question 6

Write down a list of factors that might increase a person's risk of developing a pressure ulcer. For example, a person who has had a stroke will have restricted movement and feeling, both of which increase their risk of pressure ulceration.

Discussion Point

Reflect on the people you may have cared for. How many of them were experiencing pain and taking analgesia for it? Do you think this might have increased their risk of developing a pressure ulcer?

Tools for assessing pressure ulcer risk

Early recognition of individuals at risk of pressure damage is an essential part of pressure ulcer prevention. Formal assessment of risk enables the correct interventions to be started and maintained. The most commonly used risk assessment tool until recently is Waterlow, however Purpose T (Pressure Ulcer Risk Primary or Secondary Educational Tool) is now used in many areas (CTRU, Leeds, 2022). All Individuals should be reassessed regularly. If there is a change in their physical or mental status this may increase their risk and further assessment should be performed.

As well as formal risk assessment, consider the factors that are not covered by the tool. This involves informal assessment and part of this would include skin inspection. This is a vital part of daily care for patients/residents. **Early detection means early intervention**.

Early signs of pressure damage include

- Reddened areas of skin on light skinned people
- Blue/purple patches on dark skinned people
- Blisters
- Hot/cool areas
- Swelling
- Patches of hard skin

Non-blanching persistent erythema

When an area of redness or skin discolouration is observed over a bony prominence non blanching erythema can be detected by applying light finger pressure over the area for 10 seconds. The area in healthy skin should turn white and when pressure is released will return to normal colour. In an area of erythema, the skin will remain reddened when applying pressure.

It is important to be culturally competent in skin assessment in dark toned skin (Salmanu, 2025), engaging in using all senses including touch to identify any changes. It may also be necessary to adjust lighting in the room to enable comparison of normal and damaged skin. This will be the point of identification of risk and should trigger the use of the SSKIN bundle.

A	Assess risk
S	Skin assessment and skin care
S	Surface
K	Keep moving
I	Incontinence
N	Nutrition
G	Giving information

The SSKIN bundle is a powerful tool as it defines and ties best practices together.

- Makes the process visible to all
- Minimises variations
- Reliably delivers all elements at every care opportunity

Section Two

Supporting Patients

When a patient/resident is lying or sitting, pressure is exerted through the sin onto the soft tissue. The amount of pressure is related to the patient's weight and the size of the contact area between the patient/resident and the surface. Using an appropriate support surface is key to preventing and managing pressure ulcers as well as increasing comfort.

A support surface is a specialist bed or mattress, overlays, chair or wheelchair cushions and heel protectors. A support surface reduces the likelihood of a pressure ulcer developing by preventing build up of pressure on one area of tissue. This is known as pressure redistribution**.**

Support surfaces redistribute pressure by either allowing the patient's body to sink into them, therefore the weight is spread over a larger area or by Intermittently removing pressure from certain areas of the body allowing tissues to recover before pressure is exerted again.

When should a support surface be used?

Anyone at risk or suffering with existing pressure damage should be nursed on a support surface, and as a bare minimum on a high density foam mattress. When a patient/resident is nursed in bed, is sitting in a chair or travelling in a vehicle a support surface should be used. Any patient/resident sitting in a chair for long periods of time is at greater risk because pressure is exerted on a smaller area.

There are many different types of support surfaces –

- Mattresses (foam, air filled, air fluidised and alternating pressure)
- Specialist beds for patients with high BMI
- Cushions
- Overlays
- Heel Protectors

By choosing and using the correct support surface the incidence of tissue damage caused by pressure can be reduced. Remember that regular inspection of the skin over bony prominences will allow for early detection of reddened areas even when using a support surface.

Think about your practice

It is **important** to remember that if you are using a support surface patients/residents should still be encouraged to change position or be repositioned at least every two hours.

Maintain a daily record that staff check that alternating air mattress settings are correct for your patients/resident's weight and that the mattress is switched on and working.

Make sure everyone knows how to use support surfaces correctly

Read the manufacturers guidance!

There is a huge range of mattresses and other support surfaces available. The cost can be a challenge to individual organisations and approaching the correct person to gain advice is essential. It may be necessary to contact specialist services and apply for funding when there are patients/residents with special requirements.

Written Activity 

Question 7

Write down all the different mattresses and support surfaces you use within your care setting.

What type of support surface do they offer?

Discussion point 

How often should patients/residents be repositioned when using a support surface? Does it differ for each individual person?

When is it necessary to reposition more frequently?

Section Three

Keep Patients Moving

It is important that you work with patients/residents to find ways to help them move around and change position. This will include the importance of

- Sitting and lying correctly
- Making regular small adjustments to their position
- Offloading pressure on the heels
- Using equipment correctly

Patients/residents who are unable to get out of bed or a chair should be encouraged to do so often. Sitting time should be restricted to less than 2 hours in any one period. This will reduce the amount of time spent on a damaged or at risk area. It is important to ensure the chair and cushions allow for correct support distribution of weight, postural alignment and support of the feet. This may include using heel protectors and/or placing feet on a footstool.

If the patient/resident is to remain in bed, his or her position should be changed at regular intervals. This should be at least every 2 hours. Pillows can be used to position your patient/resident on alternate sides to avoid pressure on a bony prominence for a prolonged period. Maintain a 30 degree lying position where possible. Ensure that you are not putting the patient into a position that will put pressure on another part of the body

At risk patients/residents need to have a repositioning chart in place. This should be regularly reviewed to assess how often repositioning, should take place. Turning clocks can be used together with charts to act as a visual reminder.

Regular inspection of the skin over bony prominences when moving and assisting patients/residents will help to inform the time period needed between position changes and to identify areas of damage early.

Written Activity 

Question 8

Write a list of all actions you would take when a patient/resident is identified to be at risk of pressure damage.

Question 9

How long should a patient/resident sit out in a chair when they are identified to be at risk of pressure damage?

Discussion Point 

Repositioning is not always easy and your own safety and patient comfort is important. What aids do you use or special measures might you take to ensure that patients/residents are moved safely and comfortably.

Section Four

Managing Incontinence and moisture

Both incontinence and pressure ulcers are common and often co-exist. Patients with incontinence are most likely to be immobile and elderly, both of which increase pressure ulcer development.

Who is at risk

Between 30-85% of nursing home residents are incontinent. Urinary incontinence affects over 50%, and a majority of these residents also will have faecal incontinence. It is important to establish the cause of incontinence through a full assessment. This should

include an examination of the urine to exclude a urinary tract infection. Where possible the cause of the incontinence should be addressed as well as the symptoms.

Moisture damage

Intact skin provides a barrier against excessive moisture. If the skin is in contact with fluid such as sweat, urine or faeces for a prolonged period it will become wrinkled, soft and soggy. This will make it more susceptible to damage. When ageing skin is exposed to moisture because it is thinner and more fragile it is even more vulnerable.

The normal pH of the skin is between 4.5 – 5.5, in patients with urinary incontinence urea can change the skin environment and when mixed with faecal enzymes the barrier begins to breakdown changing the natural pH making it more alkaline. This causes the skin to become red and break down. This skin irritation is known as maceration, moisture associated incontinence dermatitis or excoriation.

If the skin is not protected from exposure to urine and faeces this can eventually lead to a pin prick pattern of redness and eventually to excoriated weepy skin lesions. If a lesion develops it is important to identify whether it is due to moisture associated damage or pressure damage.

A skin care programme should be implemented immediately to prevent damage.

Skin protection

The maintenance of skin integrity is vital for the prevention of pressure ulcers and moisture associated skin damage. The aim is to keep skin clean and dry. This can be achieved by the following –

- Protective skin barrier products
- Gentle skin cleansers
- Simple moisturisers
- Incontinence products
- Faecal management systems

A barrier film or cream can act as a waterproof physical barrier between the skin and other substances. This can be used in combination with continence products. Selection of a pad is important to have the suitable level of absorbency and shape for the patient/resident. Using large amounts of thick creams and ointments must be avoided. Ensure that all care staff are made aware of the correct amounts of each product to use for a skin care regime to ensure the incontinence pads are able to absorb fluid effectively.

After each episode of incontinence the area should be cleansed avoiding harsh soaps. The skin should then be carefully dried and the barrier product of choice applied correctly.

Differentiating between pressure ulcers and moisture lesions

It is important to understand the difference between moisture lesions and pressure ulcers because the treatment approaches are different.

Moisture lesions are due to exposure of excessive moisture and are not caused by pressure

Assessment of patients/residents should help to identify if the individual is at risk of developing a moisture lesion. Additionally a pressure ulcer risk assessment should be undertaken.

There is often confusion when trying to assess whether a resident/patient has a moisture lesion or a pressure ulcer. EPUAP/NPUAP/PPIA (2014) and NICE clinical guideline 179 (2014) offer advice on differentiating between a pressure ulcer and a moisture lesion. It is important to remember that if moisture lesions are not treated correctly, they can worsen and individuals can develop secondary pressure damage and ulceration.

The table below describes the differences between a pressure ulcer and a moisture lesion.

Pressure ulcers	Moisture lesions
Pressure or shear must be present Situated over a bony prominence Have a regular shape, mostly circular Will have depth, partial thickness or full thickness skin loss with distinct wound edges Necrosis can be present Red skin non blanchable	Moisture will be present A lesion that is limited to the natal cleft and has a linear shape is likely to be a moisture lesion Diffuse different superficial spots over the buttocks often seen as an irregular kissing shape No necrosis will be present in a moisture lesion Perianal redness and skin irritation

Written Activity 

Question 10

What are the causes of moisture lesions?

Question 11

What happens to the skin when the pH rises?

Question 12

What is the likely shape of a moisture lesion?

Discussion Point

How much barrier cream or spray should be used and how often should it be applied?

Demonstrate to your colleagues the amounts of each product and how it should be applied.

Section Five

Nutrition and Hydration

Eating well and drinking enough water is very important for good skin health. It is particularly important for people at risk of developing a pressure ulcer or those with an existing pressure ulcer as their condition may worsen without it.

As we have discussed pressure ulcers are caused by many different factors. While immobility is an important factor in the development of pressure ulcers, there is also a strong relationship between nutrition and hydration and development of skin damage. Malnutrition is likely to influence the ability of the skin to deal with pressure and the damage that it causes. Fortunately, malnutrition is a reversible risk factor and it is therefore important to get nutritional care right in healthcare settings.

Impact on skin and body function

As the body gets older, cell loss and organ degeneration can significantly change body function. There can be loss of muscle and an increase and re-distribution of body fat. This can lead to obesity with a reduction of mobility. Bone density also reduces with age and bones become thinner. This leads to an increased risk of bone fracture and a loss of height.

As we have seen previously in the workbook as skin ages it becomes thinner, loses its tensile strength and elasticity. Blood vessels become more fragile, making bruising easier. There is an increased risk of injury even a small injury can damage the skin which takes longer to repair. All this can happen in healthy normally nourished individuals. If you add in the effects of under-nutrition, where the right building blocks for tissue repair are missing then it is easy to see how important nutritional care is.

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Recognising Malnutrition and dehydration

Malnutrition is common and often under recognised. The effects can take weeks or even months to become noticeable. Screening for malnutrition is a way that nutritional problems can be identified early to enable treatment to take place. Signs of dehydration may be recurrent urinary infection, constipation, dark urine, dry mouth, dry skin, headache and history of falls. It can be caused by sweating, hot weather, diarrhoea, diuretic therapy and dysphagia. Patients/residents need 6-8 cups of fluid per day to stay well hydrated.

Written Activity 

Question 11

What are the possible causes of under-nutrition in the elderly?

Question 12

Why is nutrition and hydration important for wound healing?

Discussion Point

How do you and your colleagues ensure adequate nutrition and hydration for patients/residents in your care setting. Is there anything that you could do to improve adequate access to food and drink?

Section Six

Giving Information

Most people want to be involved in engaging with shared decision making, deciding what treatment they have and when and where to receive it. It is important to Involve individuals, families and friends and the wider multidisciplinary team, taking into consoderation cultural beliefs and concerns, adopting a range of strategies to enable understanding and facilitate engagement in a way that allows people to make choices.

Listening to patients/residents makes them feel that those caring for them have time and gives them an opportunity to ask questions. It also allows any barriers to communication to be identified and all discussions should be open and non-judgemental, responding positively will help with motivation.

Consider giving information leaflets to individuals and families to enable understanding of prevention strategies.

Consider resource boards accessible to staff, residents/patients and families.

References

CTRU Leeds (2022) Purpose – T Registration, https://ctru.leeds.ac.uk/PURPOSE/PURPOSE-t/

Dealey C, Posnett J, Walker A (2012) The cost of pressure ulcers in the United Kingdom. *Journal of Wound Care.* 21(6): 261-66

Keen, DC (2009) Should care homes adopt a static-led approach to pressure ulcer prevention. *British Journal of Nursing*. 18(20 Suppl) S4 -S10.

NHS Improvement (2018) *Pressure Ulcer Core Curriculum*. https://www.england.nhs.uk/wp-content/uploads/2021/09/pressure-ulcer-core-curriculum.pdf

NICE (2014) *Pressure ulcers: prevention and management of pressure ulcers*. NICE clinical guideline 179. www.guidance.nice.org.uk/cg/179

NPUAP/EPUAP/PPIA (2014) *Prevention and treatment of Pressure ulcers: Quick reference guide*. www.epuap.org

Salmanu RA (2025) Impact of targeted training on nurses' awareness of skin tone diversity. *Wounds UK*. 21 (2): 78-81