

Preventing Pressure Ulcers

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Abstract

Pressure ulcers are not a forgone conclusion when it comes to our patients. Revisiting and revising the factors that prevent them, an assessment format and what we as nurses can do about them, we realise that the simple measure we can all take will prevent our patients from developing this serious complication of immobility.

Saeed Moh'd, has been admitted with right-sided paralysis following a cerebrovascular accident. He responds to verbal commands, but he can't always speak and tell you what he needs. He's incontinent of urine, usually at least three times a day. Because he has difficulty walking, he spends most of the day in a chair. He can't change positions by himself and he needs assistance with all activities of daily living. He's having trouble swallowing, he lacks an appetite, and he's unable to use his right arm to feed himself, so he's eating only half of his meals. (Ayello and Braden 2001)

Besides the obvious physical problems, Mr. Saeed may be at risk for another serious complication that could hinder his recovery: a pressure ulcer.

The good news is that nurses can take steps to prevent them from developing. The key is to recognise the threat before it's too late.

What is a pressure ulcer?

Pressure is considered the essential factor leading to the development of these sores, the term pressure ulcers is recommended even though it a variety of names like; a bed sore, a decubitus ulcer etc....

A pressure ulcer is a localised area of tissue necrosis that tends to occur when soft tissue is compressed between a bony prominence and an external surface such as a mattress, a chair, a wheelchair, or even other parts of the body, for a prolonged period of time (NHANRC 2002); or, it is defined as an

ischaemic skin damage occurring as a result of unrelieved pressure in combination with the effect of other variables.

When pressure applied with great force for a short period or with less force for a long period of time, it disrupts blood supply to the capillary network impeding blood flow to surrounding tissues and depriving tissues of oxygen and nutrients. This leads in turn to local ischaemia, hypoxia, oedema, inflammation and cell death. (Rycroft-Malone 2001)

RISK FACTORS

A EXTRINSIC FACTORS

The extrinsic (external) factors involved in tissue damage should be removed or diminished to prevent injury.

1 PRESSURE

It is the primary external cause of ischaemic damage and tissue necrosis. This causes compression and possible capillary occlusion, which if prolonged can cause ischaemia. The intensity, duration and individual's tissue tolerance for pressure are the key factors in causing tissue damage.

2 FRICTION

It happens when two surfaces move across each other, which causes removal of superficial layers of skin. It often occurs as a result of poor lifting technique.

3 SHEARING

It can happen when the bones and deep fascia slides downwards towards gravity, while the skin and upper fascia remain in the original position. It mostly occurs when individual's head is raised to fowler's position and he slides downward or is dragged upward.

4 EXCESSIVE MOISTURE, MACERATION AND MEDICATION

Maceration of the skin due to incontinence of urine and faeces, wound drainage and sweat can irritate the skin causing pressure damage. Sedatives and hypnotics may make an individual excessively sleepy and thus decreased mobility causing pressure sore. Non-steroidal anti-inflammatory drugs can impair inflammatory response to pressure injury. Inotropes can cause peripheral vasoconstriction and tissue hypoxia. Analgesics may reduce normal stimulus to relieve pressure.

(Rycroft-Malone 2001)

B INTRINSIC FACTORS

An individual's potential to develop pressure ulcer could be influenced by the intrinsic (internal) factors, which should be considered when performing a risk assessment.

1 Reduced mobility or immobility :- It is a key factor in the development of pressure sore. E.g. Patients with old age, spinal cord injury, long term illness such as osteoarthritis, CVA, patients who are unconscious or patients after a pressure operation can cause pressure ulcers easily due to less mobility.

2 Extremes of age:- An age less than 5 years, neonates and individuals over 65 years of age are at greater risk of developing pressure sore. Neonates and children are in risk due to the immatured skin and disproportionate head to body weight. The factors that place children and neonates at risk of developing pressure sore is same as that of adult but the site of greatest risk and nature of injury may differ. E.g. There is a greater risk of pressure damage for children are head, on ears due to repeated oxygen

saturation probe placement, from repeated heel pricks for blood studies etc.

- 3 **Sensory impairment:** - Neurological disease result in reduced sensation and thus result in insensitivity to pain or discomfort, which cause a lacking stimulus to relieve pressure.
- 4 **Level of consciousness:**- A reduced level of consciousness may reduce the awareness of the need to relieve pressure, similar to an anaesthetized person who has no independence to reposition to himself.
- 5 **Vascular diseases:**- This makes individuals more vulnerable to pressure ulcers. E.g.: - smoking.
- 6 **Severe chronic terminal illness:** - This places individual at risk because of for example, multi organ failure, poor perfusion and immobility.
- 7 **Previous history of pressure ulcer:**- The individuals with previous ulcers has a greater risk of developing further ulcer than pre-

viously pressure ulcer free individuals as Scar tissue from the previous pressure ulcer is weaker and more prone for further damage.

- 8 **Malnutrition and dehydration:** - Both emaciated and obese individuals are vulnerable to develop pressure sore. Loosing too much weight can cause loss of padding over bony points. Dehydration may decrease the elasticity of tissue and thus increase tissue deformity under pressure
- 9 **Acute illness:** - this can also cause developing pressure ulcer.
(Rycroft-Malone 2001)

How can we prevent them?

One of the first activities in preventing pressure ulcers is the early identification of patients who are susceptible to developing them. The earliest phase of pressure ulcer development may not show any visible sign of damage. Therefore, it is important that patients at risk are given an immediate prevention plan.

Patients are assessed for their risk of

developing pressure ulcers based on their clinical presentation. When Saeed was admitted he had a number of risk factors, including impaired mobility and incontinence. The timing of any risk assessment will vary, but it should take place within 6 hours of admission to the unit along with the nursing physical assessment but, in some situations, like acute and critical care, risk assessment are carried out IMMEDIATELY so as not to delay appropriate preventive measures. If a patient is considered not at risk on initial assessment, reassessment should be carried out if there is any deterioration or change in condition. All assessments nurses make should be recorded or documented in the patient file.

How to use of risk assessment scales

Risk assessment scales are used as an aide memory as they do not replace clinical judgement. Various scales have been developed to identify individuals at risk of developing pressure sore. Braden, Norton, Knoll, and Waterlow scales are all tools that can be used to assess risk.

The Waterlow scale is used here as an example

THE WATERLOW SCORE

Ring scores in table, add total. Several score per category can be used.

Build / weight for height		Skin types visual risk area		Sex / Age		Major Surgery / Trauma	
Average	0	Healthy	0	Male	1	Orthopaedic - below - waist, spinal 5 On table > 2 hrs. 5	
Above	1	Tissue paper dry	1	Female	2		
Obese	2	Oedematous	1	14-49	1		
Below average	3	Clammy (Temp. ^)	1	50-64	2		
		Discoloured	2	65-74	3		
		Broken/spot	3	75-80	4		
				81+	5		
Continence		Mobility		Special Risks Neurological Deficit		Tissue Malnutrition	
Complete/catheterised	0	Fully Mobile	0	e.g. Diabetes, MS		e.g. Terminal cachexia	8
Occasional incontinence	1	Restless/fidgety	1	CVA, motor/sensory		Cardiac failure	5
Cath/incontinent of faeces	2	Apathetic	2	Paraplegia	4-6	Peripheral vascular - disease	5
		Restricted	3			Anaemia	2
Doubly incontinent	3	Inert/traction	4			Smoking	1
		Chair bound	5				
Appetite		Medication					
Average	0	Cytotoxics, high dose					
Poor	1	Steroids, anti-					
NG tube/fluids only	2	inflammatory	4				
NBM/anorexic	3						

WATERLOW CHART (EXPLANATION)

BUILD / WEIGHT FOR HEIGHT	
A simple classification is based on the Body Mass Index (BMI), which is: weight in kgs. ÷ height in metres ² (The normal range is 20-25).	
<i>Average</i>	Patient is within the recommended weight range for height and built.
<i>Above average</i>	Patient is above the recommended weight for height and built.
<i>Below average</i>	Patient is below the recommended weight for height and built.
<i>Obese</i>	Grade 1 = BMI 25-30 Grade 2 = BMI 30-40 Grade 3 = BMI > 40
CONTINENCE	
<i>Complete / catheterised</i>	Continent of both urine and faeces/urinary catheter in situ, continent of faeces.
<i>Occasionally incontinent</i>	Majority of the time the patient is continent of both urine and faeces.
<i>Catheter / incontinent of Faeces</i>	Urinary catheter in situ, incontinent of faeces all the time.
<i>Doubly incontinent</i>	Always incontinent of urine and faeces, absence of bowel/bladder control.
APPETITE	
<i>Average</i>	Healthy appetite, tolerating diet as planned.
<i>Poor</i>	Taking only small amounts of food/fluids, or not at all.
<i>NGT / fluids</i>	NG tube in situ, fluids feeds only.
<i>NBM / anorexia</i>	Nil by mouth/loss of appetite - not eating sufficient amounts to maintain a normal body weight.
SKIN TYPES: VISUAL RISKS AREAS	
<i>Healthy</i>	Skin is intact and well hydrated.
<i>Dry</i>	Skin is flaky/scaly/dehydrated.
<i>Oedematous</i>	There is an excessive accumulation of fluid in the tissues
<i>Clammy</i>	Skin is cold and damp.
<i>Discoloured</i>	An area of skin which differs from the patient's general skin colouring.
<i>Broken / Spot</i>	Skin is damaged, i.e. abrasion or ulcerated area.
MOBILITY	
<i>Fully mobile</i>	Patient can walk/move around unaided.
<i>Restless / fidgety</i>	Patient is unsettled whilst in bed, i.e. perhaps due to pyrexia/confusion.
<i>Apathetic</i>	Patient is lethargic/lacks interest/is unconcerned/indifferent/passive.
<i>Restricted</i>	Patient is restricted physically in some way, i.e. wrist restraints/heavy P.O.P. cast in situ limiting patient's ability to change own position.
<i>Inert / traction</i>	Patient is inactive due to traction.
<i>Chair bound</i>	Patient is confined to bed or chair, either due to limb contractures/absences of limbs/paralysis. Does not have the ability to walk or move unaided.
NEUROLOGICAL DEFICIT	
<i>Score in dependent on the assessor's interpretation of the patient's condition:</i>	
a. Is the patient diabetic, if so, controlled or not?	
b. If multiple sclerosis present, how debilitated is the patient?	
c. If patient has had a C.V.A. again how debilitated is the patient?	
MEDICATION	
<i>Self-explanatory</i>	Is the patient receiving any drug from the classification specified.
MAJOR SURGERY / TRAUMA	
<i>Orthopaedic</i>	Has the patient just undergone orthopaedic surgery on pelvis/hip/lower limbs? <i>below waist / spinal</i>
<i>On table > 2 hours</i>	Patient is immediately post-op, how long did the surgery last?
TISSUE MALNUTRITION	
<i>Terminal Cachexia</i>	A condition of abnormally low weight, weakness, and general bodily decline associated with chronic disease, such as cancer.
<i>Cardiac Failure</i>	Patient is presently in cardiac failure, i.e. oedematous. PMH of cardiac failure not significant if patient is controlled on medication i.e. Lasix.
<i>Peripheral Vascular Disease</i>	Patient has a diagnosis of P.V.D. (past or present).
<i>Anaemia</i>	Patient has a present diagnosis of being anaemic.
<i>Smoking</i>	Patient smokes tobacco

A recorded assessment scale provides an accurate record of an individual's progress and risk status and it is a key factor for accountability, responsibility, risk management and evaluation.

Do I really have to do one?

In a word, YES. An informal risk assessment can't take the place of a formal risk assessment like the Waterlow Scale.

Research has shown that in the absence of formal risk assessment, nurses tended to intervene consistently only at the highest levels of risk. For example, in studies, turning--an important facet of pressure ulcer prevention--was prescribed for fewer than 50% of patients at mild or moderate risk for developing pressure ulcers. Pressure reduction was prescribed more than turning, but not with adequate consistency.

In studies where formal risk assessment was introduced and levels of risk were linked to preventive protocols, the incidence of pressure ulcers dropped by 60%; severity of pressure ulcers and cost of care decreased as well. This was likely due to better identification of patients at mild and moderate risk and a more consistent use of preventive interventions for patients in all risk categories. (Ayello and Braden 2001)

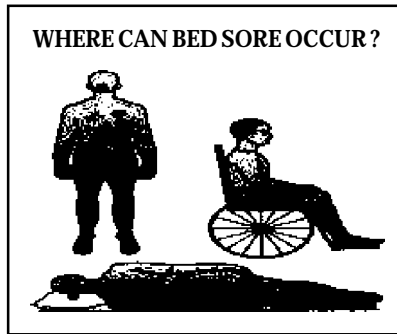
Looking at the skin

Skin inspection provides essential information for both assessment and prevention. A regular assessment of most vulnerable areas of the body will enable early detection of pressure damage. The frequency of skin inspection should be determined in response to the changes in patient's condition in relation to recovery and deterioration.

Following education, patients who are willing and able, can be encouraged to inspect their own skin. Wheelchair users should be encouraged to use a mirror to inspect the areas that they cannot see easily or get others to inspect them.

Nurses should be vigilant to observe the vulnerable areas as shown below. Special attention to be given for the parts of the body where there are external forces exerted by equipments and clothing, e.g.: Corners of the mouth and tip of the nose if an endo-tracheal tube is present; Tip of the nose if the nasogastric tube is inserted; Sites of Intravenous line; Pulse oximetry; Catheters; Limbs or extremities with non

invasive blood pressure cuffs; Elastic clothing; Restraints.



(Patient information brochure, Mafraq Hospital)

While inspecting the skin, look for,

- Purplish or bluish patches on dark skinned people
- Red patches on light skinned people
- Swelling
- Blisters
- Shiny areas
- Dry patches
- Cracks, calluses, wrinkles

Moreover, feel for

- Hard areas,
- Warm areas
- Swollen skin over bony points.

Using pressure relieving devices

Decision about which pressure redistributing device to use should be based on an overall assessment of the patient and not just on the basis of score from risk assessment scale. Repositioning should still occur when individuals are on pressure redistributing devices. Frequency shall to be determined by the result of skin inspection, patient's comfort and general condition. Patients at 'Very high risk' in developing pressure sore should be placed on pressure redistributing systems.

CAUTION: Some aids we see should come with warning signs. Inflated doughnut type devices can adversely affect lymphatic drainage and circulation and thus are likely to cause rather than preventing pressure ulcers and filling gloves with water and placing under heels is not effective because the small surface area of the heel means it is not possible to redistribute pressure by this localised method.

POSITIONING

Individuals who are at risk of developing pressure ulcers should be repositioned. It could take into consideration other aspect of an individual's condition like breathing, medical condition

and should fit into the overall plan of care like activities such as physiotherapy, meal time etc.

- ❖ Position of the patient should ensure that
- ❖ Prolonged pressure on bony prominence is minimized,
- ❖ Bony prominences are kept from direct contact with one another.
- ❖ Friction and shear damage is diminished.
- ❖ Individuals who are willing and able should be taught to redistribute their own weight.
- ❖ A written repositioning schedule agreed with the individual should be established.
- ❖ The nurse must describe and demonstrate proper technique of repositioning.
- ❖ All patients who are unable to position themselves should be kept on draw sheets.
- ❖ Manual handling devices like trapeze and side rails should be provided with individuals who are to reposition with support and to be instructed the correct use to minimize shear and friction damage.

When individual is on bed,

Avoid making him lie on the pressure sore.

Use foam pads or pillow to relieve pressure on the bony prominence.



(Patient information brochure, Mafraq Hospital)

Keep on changing the position at least 2 hourly.

Give a 30-degree side lying position to avoid intense pressure on the greater trochanter and lateral malleolus.

When the individual is on the back,

Keep his heels off the bed by placing a thin pad or pillow under the legs from midcalf to ankle

Place pillows or small foam pads to keep knees and ankles from touching each other.

Unless indicated, the head of the bed to be placed not more than 30 degree, to avoid shear force.

• **Keep the heels off from the bed**



IF SITTING ON THE CHAIR

- Do not make the patient sit continuously for more than 2 hours.
- Give good posture & straight position.
- Use cushions & arm-support to relieve pressure & to rest hand.



(Patient information brochure, Mafraq Hospital)

Positioning of individuals who spends more time in a wheel chair should take into account of distribution of weight, postural alignment and support of feet. A good position will help the individual to move more easily and help to prevent new sores.

Patient should be taught, if possible, to shift their weight every 15 min to help to distribute body weight and promote blood flow to the tissue.

Individuals who are acutely at risk of developing pressure sore should restrict chair sitting to less than 2 hours until condition improves as sitting position creates intense pressure on the ischeal tuberosities.

Individuals should be provided with a wrinkle or crease free mattress.

If the patient needed to be lifted or shifted, do it with the draw sheet.

If patient is with endo tracheal tube, assessment should be made everyday for the corner of the mouth and or nose for any ulceration.

Urinary catheters, I.V tubing etc... to be fixed in such a way that the tubing will not be in direct contact with the skin to exert continuous pressure.

Change the areas of pressure applied externally on a regular basis, with the non- invasive B.P. cuff, pulse oximetry probe etc...

Avoid restraining the individual by tying the finger. If unavoidable, restrain by wrist but make sure that it is adequately loose to avoid compression.

SKIN CARE

- Skin should be cleaned as soon as it is soiled with urine, stool, excessive sweat or wound drainage. A

GENERAL PRINCIPLE OF PRESSURE ULCER TREATMENT COMPRISED of,

Relief of pressure

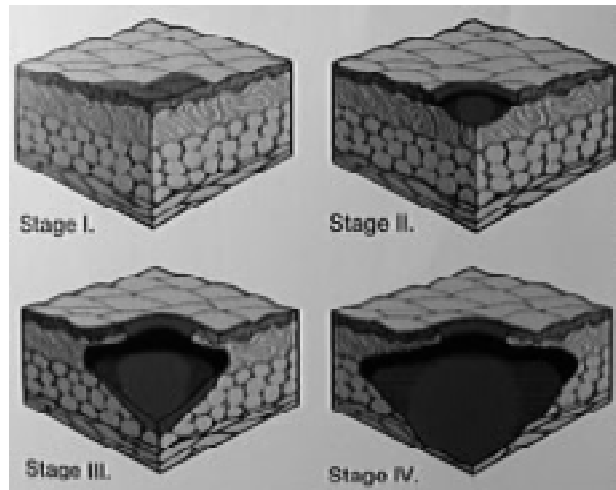
Removal of devitalised tissue

Optimisation of wound environment to promote granulation and epithelialisation

Avoidance of maceration, trauma, friction or shearing force

A search for reversible underlying conditions, which may predispose to ulcer development or impede wound healing.

STAGES OF PRESSURE SORE



1 STAGE ONE

Skin is not broken but is red or discoloured. The redness or discolour does not fade within 30min after pressure is removed.

MANAGEMENT

A General

Keep pressure off the area.

Maintain good hygiene and wash with mild soap and water, pat dry carefully and gently. **HOWEVER, DO NOT RUB VIGOROUSLY DIRECTLY OVER THE AREA.**

mild detergent with warm (rather than hot) water can be used to minimize irritation and drying.

- Use pads, briefs etc... for a temporary management of incontinence and treat for the cause
- Give a bath only when needed for comfort or cleanliness. Avoid using hot water or too much of soap.
- Use creams or moisturizer and avoid cold or dry air to prevent dryness of skin.
- Do not massage the skin over bony prominence as it may squeeze and damage the tissue under the skin.
- Heat lamps and similar devices should not be used to treat pressure ulcers.

Check out the diet- should have enough protein, calories, vitamin A and C, zinc and iron.

Review the contact surface like bed, wheel chair, turning technique etc...

B Special

If the sore is seemed to be due to friction, protect the area with transparent dressing to allow the skin to slide easily without further damage.

If the discoloration does not heal

within few days, seek the help of the healthcare provider.

STAGE TWO

The epidermis or top most layer and dermis or the second layer of the skin is broken or form as a blister, creating a shallow open sore. Drainage may or may not be present. Most of the time, this type of wound is red in colour (granulating type).

MANAGEMENT

A General

Follow steps from 1 to 4

B Special

1. Clean the wound with only saline and dry carefully.
2. Apply either a transparent dressing or a hydrocolloid dressing. Transparent dressing or a hydrocolloid dressing can be left in place until they wrinkle, are saturated, or loosen by it.
3. Check for signs of wound healing or infection with each dressing changes.
4. If any signs of infection, seek the help of health care provider.

STAGE THREE

The wound extends through the dermis(epidermis and dermis)into the subcutaneous fat tissue (i.e., including epidermis, dermis, a portion or full amount of subcutaneous tissue involvement).

MANAGEMENT

A General

B Special care of stage two

Remember

1. Wound may need additional wound care with special cleaning like irrigation and debridement either by autolytic, or surgical method.
2. May need different packing agents, which is according to the exudates.

3. May need a special bed with pressure relieving mattress.

STAGE FOUR

The wound extends into the muscle or may be down to bones. It usually has lots of drainage and dead tissues.

MANAGEMENT

- Consult for an expert opinion
- Good cleaning with normal saline and debridement(surgically or autolytically) may be needed.
- Once the wound got derided, surgical repair with a skin graft or a flap may be needed.
- Once the sore will get smaller, there will be pinkish tissue formation starting along the edges of the sore and moves towards the centre, there may be smooth and bumpy surface of new tissue and there could be some bleeding with very good visual red tissues in the wound, the wound is said to be healing.

COMPLICATIONS OF PRESSURE SORE

Pain

Septicaemia, Infection

Prolonged bed rest and hospital stay

Psychological trauma etc...

Once the pressure sore is healed, which means that the epidermis is unbroken and normal colouring is returned to the area, pressure should be applied slowly and carefully. sometimes the area will remain as a scar, which will remain somewhat different colour from the surrounding skin. It is never as tough as uninjured skin. When for the first time applying pressure to the healed area, apply the pressure for a short time(ie,15 min at the most) and inspect it for redness. If redness is present, observe the time how long it takes to fade to the colour of the surrounding tissue or the colour it was before the pressure was applied in the case of a scar. If fading occurs within 15 min or less, no damage has occurred. Wait at least 1 hour and repeat pressure application.

After 3 successful 15 min trails, increase to 30 min and repeat the above process

of a 15 min or less fading time as a successful trail. After 3 successful 30 min trail, the time can be increased by 30 min each day. If at any point a trail is not successful, hold at that level until 3 successful trails are accomplished.

SUMMARY OF RECOMMENDATIONS FOR ACHIEVING CONTINUOUS QUALITY IMPROVEMENT

Education program for prevention of pressure sore should be directed at all levels of health care system, patients and other care givers which should include:

- The causes of and risk factors for pressure ulcer.
- Risk assessment tools and their application.
- Skin assessment.
- Nutritional assessment.
- Selection and or use of support surface.
- Development and implementation of an individualized program of skin care.
- Demonstration of positioning to reduce risk of pressure ulcer.

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