

PRESSURE ULCER PREVENTION MANUAL

WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY

RING SCORES IN TABLE, ADD TOTAL. MORE THAN 1 SCORE/CATEGORY CAN BE USED
(Nutrition Vol.15, No.6 1999 - Australia)

BUILD/WEIGHT FOR HEIGHT	SKIN TYPE VISUAL RISK AREAS	SEX AGE	MALNUTRITION SCREENING TOOL (MST)
AVERAGE BMI = 20-24.9 ABOVE AVERAGE BMI = 25-29.9 OBESE BMI > 30 BELOW AVERAGE BMI < 20 BMI=Wt(Kg)/Ht (M) ²	0 HEALTHY TISSUE PAPER 1 DRY 2 OEDEMATOUS 3 CLAMMY, PYREXIA 4 DISCOLOURED GRADE 1 5 BROKEN/SPOTS GRADE 2-4	0 MALE 1 FEMALE 2 14 - 49 3 50 - 64 4 65 - 74 5 75 - 80 6 81 +	A - HAS PATIENT LOST WEIGHT RECENTLY YES - GO TO B NO - GO TO C UNSURE - GO TO C AND SCORE 2 B - WEIGHT LOSS SCORE 0.5 - 5kg = 1 5 - 10kg = 2 10 - 15kg = 3 > 15kg = 4 unsure = 2 C - PATIENT EATING POORLY OR LACK OF APPETITE 'NO' = 0; 'YES' SCORE = 1 NUTRITION SCORE If > 2 refer for nutrition assessment / intervention
CONTINENCE	MOBILITY	TISSUE MALNUTRITION	
0 COMPLETE/ CATHETERISED 1 URINE INCONT. 2 FAECAL INCONT. 3 URINARY + FAECAL INCONTINENCE	0 FULLY RESTLESS/FIDGETY 1 APATHETIC 2 RESTRICTED 3 BEDBOUND e.g. TRACTION 4 CHAIRBOUND 5 e.g. WHEELCHAIR	0 TERMINAL CACHEXIA 1 MULTIPLE ORGAN FAILURE 2 SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC,) 3 PERIPHERAL VASCULAR DISEASE 4 ANAEMIA (Hb < 8) 5 SMOKING	
SCORE		SPECIAL RISKS	
10+ AT RISK 15+ HIGH RISK 20+ VERY HIGH RISK		8 NEUROLOGICAL DEFICIT 8 DIABETES, MS, CVA 8 MOTOR/SENSORY 5 PARAPLEGIA (MAX OF 6) 5 MAJOR SURGERY or TRAUMA 2 ORTHOPAEDIC/SPINAL ON TABLE > 2 HR# 1 ON TABLE > 6 HR# MAX OF 4 5 MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY 8	

Scores can be discounted after 48 hours provided patient is recovering normally

www.judy-waterlow.co.uk

REVISED
2005

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 * Obtainable from the Nook, Stoke Road, Henlade TAUNTON TA3 5LX
 * The 2005 revision incorporates the research undertaken by Queensland Health.

This Manual, originally produced in 1994, has undergone a complete revision. The Waterlow pressure ulcer risk assessment scoring system has been modified in the light of a large research programme conducted for the Queensland Government by Queensland Health¹. In addition to presenting the modified 'Waterlow', the opportunity has been taken to revise, expand and update all other areas of the Manual. The updated Manual, as the original, which had been produced in response to all the questions the author had been asked over the years, is still produced as a simple guide to help readers understand the causes of pressure ulcers, and how they may be prevented. In particular it explains how 'Waterlow', designed and researched in 1985^{2,3} should be used. The complete results of the research were published in CARE Science & Practice – the original name of the Tissue Viability Journal.

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Every effort has been made by the author to ensure the accuracy of the information in this Manual. The author cannot be held accountable for any acts or omissions by individual practitioners resulting from the use of this publication

FOREWORD - Risk is an essential element of holistic pressure ulcer assessment and prevention. The recommended use of a risk assessment tool as an aide memoire, which assists objectivity is recognised (NICE 2001) Judy Waterlow developed her tool as a result of a 650 patient research project. This practical Manual provides support, in using risk assessment tools, for clinicians and should be available to every health care practitioner responsible for risk assessment. Wound Care Society members will find it a valuable asset. The physical, psychological, and social effects of pressure ulcers can be very detrimental to patients. Pressure damage prevention is seen as a quality indicator (Clarke 2004) and more needs to be done to raise it on the political agenda. Although often referred to as 'essential' or as 'basic', pressure ulcer prevention is complex but ensuring 'essential' care is implemented makes a major difference to patients. The challenge is to increase knowledge by professionals, patients and politicians, which the Wound Care Society will increasingly seek to do

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Pressure ulcers in general are associated with considerable morbidity - prevention is therefore an important clinical and humanitarian issue. The resulting lesions are usually painful and distressing both for the patients and their relatives, they delay rehabilitation and may contribute to serious complications such as cellulitis, osteomyelitis, limb amputation and even death. Recent guidelines conclude that there is not enough evidence to support the use of any one assessment tool over another, but support the use of one as an aide-memoire. It therefore gives me great pleasure to introduce you to this updated manual, not only because Judy Waterlow is a friend, but also because she is rightly considered a pioneer in this field. Since its inception in 1985, the Waterlow Score has become the most widely taught and used risk calculator throughout the United Kingdom - in all healthcare settings - and this manual will assist those who utilize this assessment tool to understand both the principles of pressure ulcer prevention and the rationale for the numerous factors identified on the card. The latest revision of this important assessment tool is in response not only to the many questions that the author continues to get regarding the practical use of the tool, but also in the light of findings from a major research project conducted on behalf of the Queensland Govt. The changes are the incorporation of objective measures within the Build/Weight and Nutrition Sections of the assessment tool. This revised manual is a welcome addition to the evidence based resources available to support practitioners today, prevention of pressure ulcers is as applicable today as it was in the eighties to all patients in any age group and being managed in any healthcare setting. I commend this manual to you and as importantly commend the integration of theory into practice for *your* patient's benefit.

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INTRODUCTION

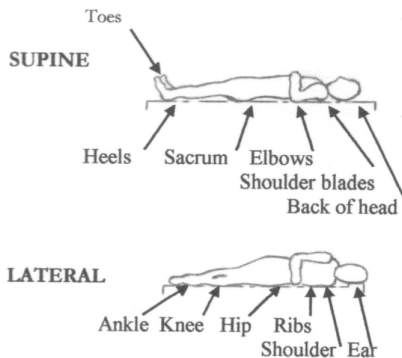
1. The Manual provides a resume of the causes of pressure ulcers and an overview of the management activities associated with the introduction of a Pressure Ulcer Prevention Policy. Particular attention is given to the assessment of risk, and an explanation of the reasoning behind the choice of parameters used in the Pressure Ulcer Risk Assessment system which forms the heart of the Waterlow Pressure Ulcer Prevention/Treatment Policy tool. Examples are given of how the card can provide a valuable aid to nurses and carers in their fight to reduce the unnecessary cost and pain of pressure ulcers. The Waterlow tool was designed to be a quick, and simple to use 2 sided laminated card. Side 1 being the assessment scoring system and Side 2 providing guidelines on care, prevention and wound care. This Manual endeavours to be similarly 'user friendly'.

The Waterlow Scale should be used in conjunction with a nurse's professional judgment to evaluate the risk of a patient developing a pressure ulcer. The objective evidence provided by the assessment **must** be documented. A Care Plan should be prepared defining the actions which need to be taken in areas such as; provision of pressure relieving devices, nursing care, nutritional supplements etc. The entry should be signed and dated by the assessor. If the patient is assessed, or reassessed as the case may be, and then the score is just noted down without action being taken the whole exercise becomes a waste of time.

PRESSURE ULCERS

2. Pressure ulcers are most likely to occur when a hard bony area covered by a thin layer of tissue is in contact with a hard surface, such as a bed, trolley, theatre table, wheelchair etc. The figures show the areas of the body which will be most at risk.

The body can withstand high interface pressures for a very short period of time. It is when the pressure is not regularly



relieved that damage occurs and a pressure ulcer develops.

Pressure ulcer, bed sore, decubatus ulcer - from the Latin decumbare – to lie down, are really all misnomers because:

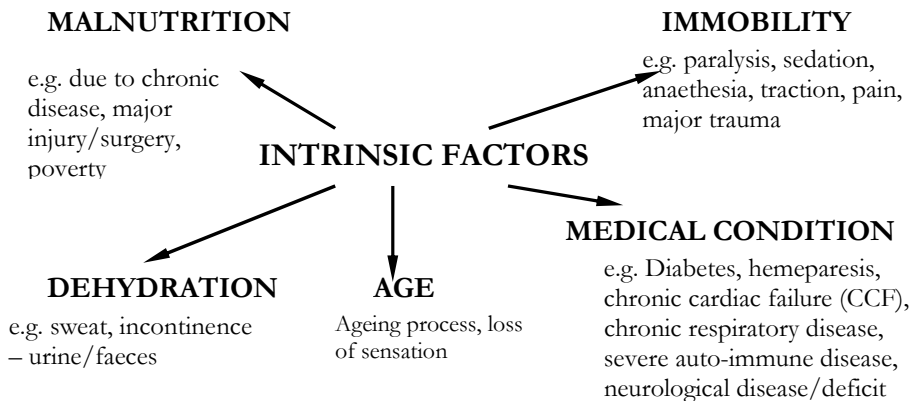
a) Pressure, though the main factor in causing pressure ulcers, is not the only one.

b) People sitting on a chair or wheelchair for long periods, without pressure being relieved, will be at greater risk, as the interface pressures are higher due to the fact that the mass of the body is distributed over a smaller area of tissue than when a person is lying in bed.

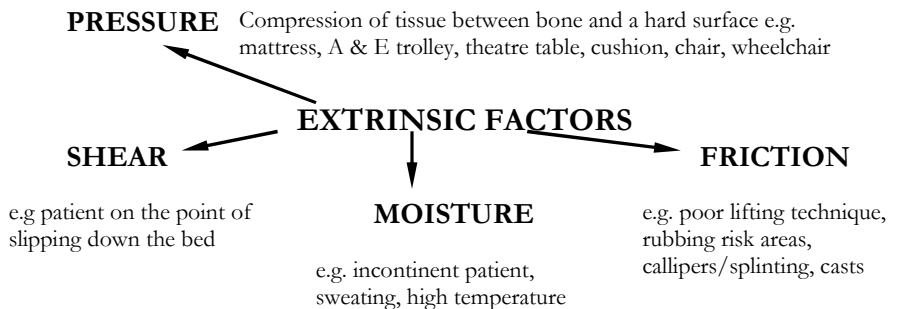
AETIOLOGY OF PRESSURE ULCERS

3. The factors causing pressure ulcers are divided into 2 Groups:

a) **INTRINSIC** – Disease, medication, malnourishment, age, dehydration/fluid status, lack of mobility, incontinence, skin condition, weight.



b) **EXTRINSIC** – External influences which cause skin distortion – Pressure, shear, friction. Moisture etc ⁴.



PRESSURE

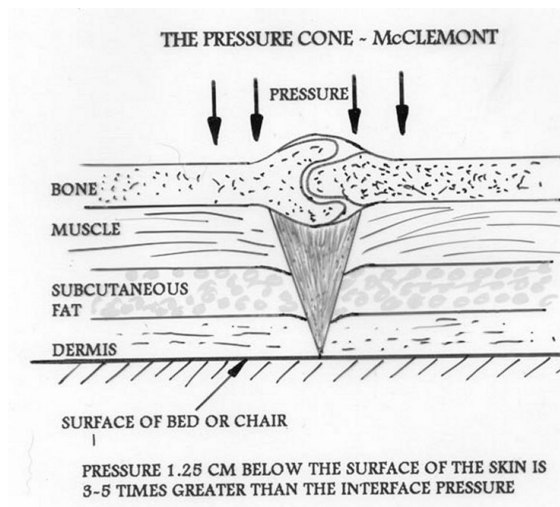
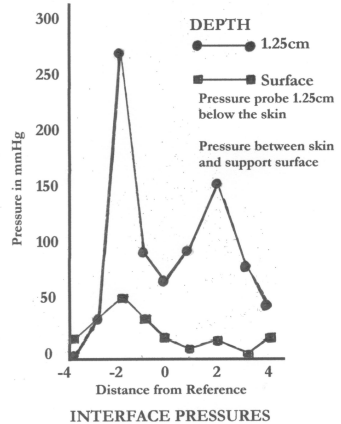
4. Interface Pressure – this is the pressure measured in mmHg between the skin and the supporting surface. There are many sensors and measuring instruments available to researchers to establish accurately what those pressure are when a person is lying in a bed or sitting in a chair. However this interface pressure does not reveal the extent of the pressure which is causing the damage to tissue towards the bone. It has been found by experiments that the pressure is 3 to 5 times greater at a depth of 12.5mm below the skin surface⁵.

The result of this effect is shown by the “McClemont Cone” effect⁶.

Dr. McClemont’s work showed that there is a coned shaped volume of damaged tissue which is at its maximum at the bone/tissue interface where the pressure is at its highest, up to the skin surface where the pressure has dissipated and the damage is at its least.

A small area of brown/black necrotic skin seen on the surface, when desloughed, could reveal a large crater of damaged, perhaps necrotic tissue perhaps down to the bone, with tracks and sinuses.

The effect of pressure is to overcome the blood pressure within the venules and arterioles of the capillary system causing the occlusion of



these vessels.

For a young adult –

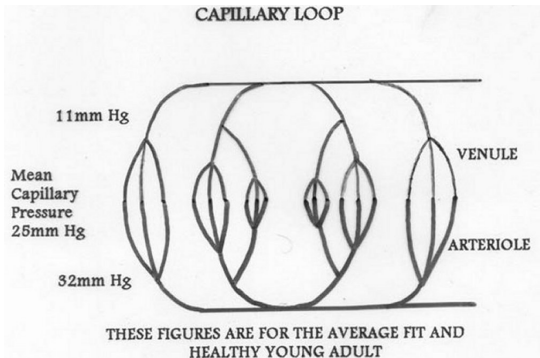
capillary pressure is:

Arteriole 32mmHg

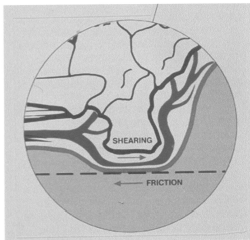
Venule 11mmHg:

Mean 26mmHg⁷

Once these vessels have been shut off, nutrients cannot be brought to the cells by the arterioles or waste products removed by



HEEL INTERFACE PRESSURES



Opposing shearing forces and friction compress blood capillaries in the skin interface pressures can be as high as 200 mmHg

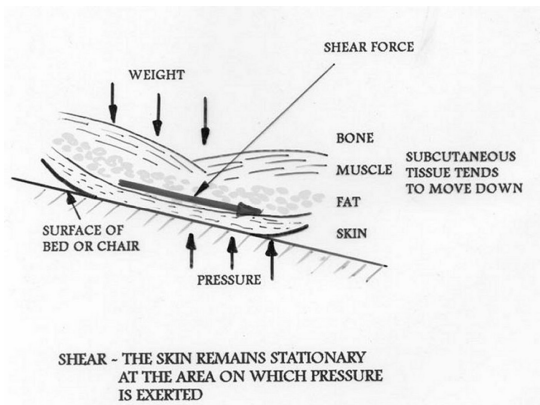
the venules and lymphatics. It is the occlusion of these vessels which is the precursor to tissue death. Pressure ulcers can start to develop in one hour if the pressure is not relieved and the capillary bed opened up to the flow of blood.

SHEAR

5. Shearing forces, which can damage tissue, will only exist if pressure is also present. The pressure is usually caused by the patients own weight.

Shear forces are initiated when a part of the body tries to move, but the surface of the skin remains motionless against the support surface.

An example of this is when a patient starts to slip down in bed but their bottom does not actually move on the sheet. This causes the layer of tissue between the skin and the internal skeleton to distort sideways. This distortion can cause arterioles and

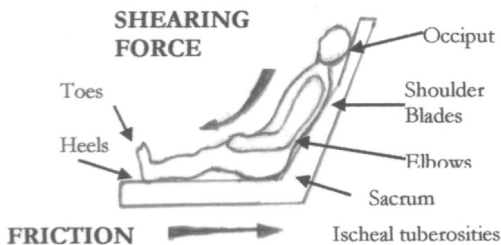


venules to break, leading to oozing of blood to surrounding tissue and bruising the surface of the skin. The broken blood vessels can no longer supply oxygen and nutrients to the tissue or remove waste products. This can lead to death of deep tissue and show as black necrotic skin. Shearing forces can easily be demonstrated by placing a hand onto a table top, pushing down at the same time trying to move the hand sideways.

FRICITION

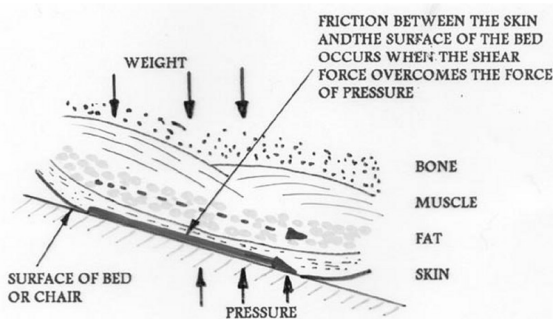
6. Friction forces come about when the shearing force, increases sufficiently

to overcome the bodies resistance to being moved, and the area of tissue in contact with the support surface begins to slide. The tissue is still distorted but in addition there is an abrasive action as the skin slides. An example of this is when patients slip down the bed. As with 'shear', friction forces can be demonstrated using a hand pressed against a table top. The is distorted, but as the hand starts to slide the skin feels hot.



Peak Interface pressures over the sacrum and heels of a subject semi-recumbant on a standard hospital mattress:

Sacrum – Average 95 mmHg
Heels – Average 158 mmHg



FRICITION - OCCURS WHEN SHEAR OVERCOMES THE FORCE OF PRESSURE

POLICY MAKING

7. The first Pressure Ulcer Policy was produced in 1987⁸ by Ms P.J. Hibbs OBE.BA.RGN.RHV. Chief Nursing Officer with the City & Hackney health Authority, In this Policy she stated **“95% of all**

Pressure Ulcers are Preventable”

She also stated that **“pressure ulcers are an epidemic under the sheets”**. This statement not only called attention to the frequency of occurrence but also alluded to the way in which their presence can be hidden, both physically and mentally by nurses. This attitude of denial was something that the author also came across when lecturing around the country. By producing the policy, and ensuring that it was implemented, Ms Hibbs demonstrated that the target of ‘95%’ was not idle speculation by reducing the occurrence of pressure ulcers from over 16% to 1.8%. This was achieved by raising awareness, education of staff, constant monitoring of performance and the judicious use of pressure relieving devices. In order to make management ‘aware’ she demonstrated that the cost of treating a Grade 4/5 pressure ulcer was an ‘opportunity lost’ for using the money to treat other patients⁶. All nurses, whatever their grade, must be prepared to put forward financial arguments demonstrating ‘cost effectiveness’ should this be necessary to try and obtain resources for their patients.

LITIGATION

8. It should be noted that in 1993, research found that 50% of patients admitted to hospital from the Community, residential and Nursing Homes already had pressure ulcers⁹. Now in the 21st Century litigation is a very important factor. A good framework of Policies supported with adequate resources by management provides a clear audit trail to defend against accusations of mal-practice.

Over the last few years the costs associated with treating one severe pressure sore have risen from a quoted £26,000 in 1987 to £40,000 in 1993. Apart from the treatment of costs or ‘lost opportunity costs’ as they are sometimes called there is also the grave risk of a Hospital having to pay litigation costs. As stated earlier Ms Hibb’s statement that 95% of pressure ulcers are preventable is well known to all lawyers working in the field. Costs of over £250,000 were awarded in one case in Gloucestershire in 1992.

MULTIDISCIPLINARY APPROACH

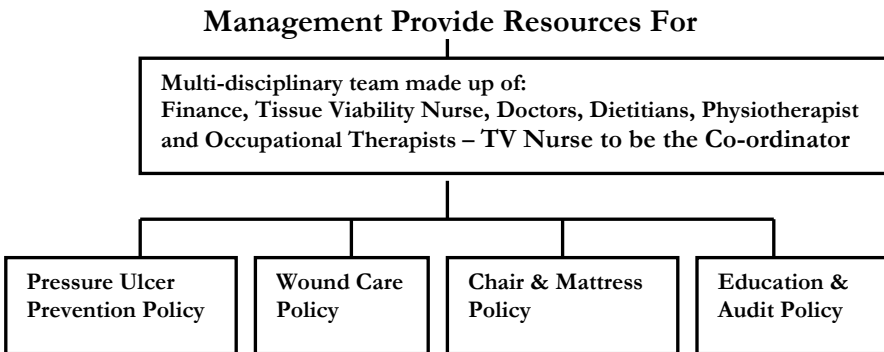
9. One of the first steps is to realise that this is not just a ‘nursing’ problem. What is needed is a Multi-disciplinary team approach, and this

team should consist of members from all areas of the Hospital, Nursing/Residential Home, the Community and Primary Care Trusts .

Hospital Managements for example, must accept that pressure ulcers are not just a painful condition that patients endure, but are the cause of a considerable loss to the hospitals finances due to the cost of treatment, possible litigation costs, and the lost opportunity to treat more patients. To tackle this problem, the multidisciplinary team must be given the authority to create Policies and Standards which specify preventative measures, and be allocated an adequate budget to implement cost effective measures.

The medical staff must also realise that pressure ulcer prevention is a management problem as much as a medical one, and that the problem will therefore need to be looked at in management terms. Generally speaking this can be summarised as:

- a. Recognise the extent of the problem.
- b. Evaluate how it is to be dealt with.
- c. Document all decisions.
- d. Audit the result.
- e. Feedback the results of the audit to improve procedures.



Pressure Ulcer Prevention Policy

10.Using this methodology for pressure area care would entail:

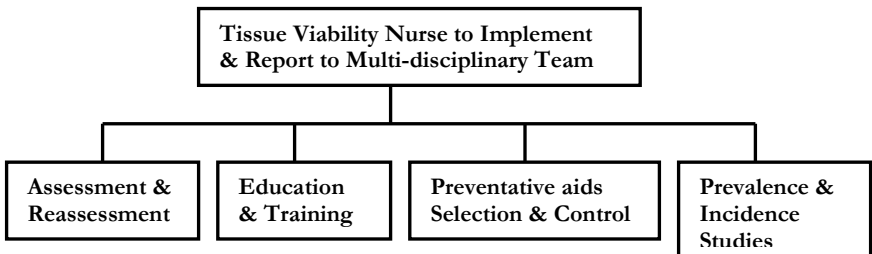
- a) Deciding how and when patients are going to be objectively assessed for risk of developing ulcers.
- b) Deciding how ulcers are to be classified should be present.
- c) Conducting a pressure ulcer prevalence and/or incidence study

across all areas of care.

d) Deciding on a range of types of preventative aids which will be purchased and used against the various Classifications of ulcers.

e) Write a Policy/Standards document so that there will be a set of consistent rules applied across the whole Hospital. The policy should define how its procedures and standards are to be audited.

Shown below is a typical example of items which would feature in a Pressure Ulcer Prevention Policy. Other policies could include a 'Wound Care Policy', an 'Education & Audit Policy' or a 'Chair and Mattress Policy'

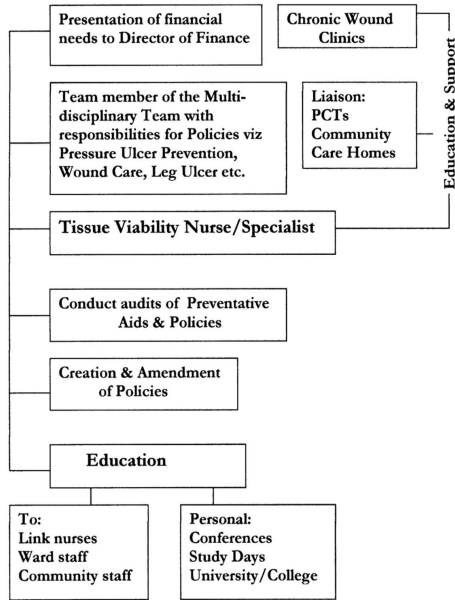


For example, a Mattress Policy would ensure that patients lie on a suitable surface. All mattress covers should be made of two way stretch, vapour permeable materials.

The Multidisciplinary team, when appointed, should manage the writing of the Hospital Policy, consider the findings of the audits, ensure that documentation is updated and that suitable training is available. It would be their responsibility to make suitable representations to the Hospital Management should extra resources of either staff or material be required. To assist the team, there should be 'Link Nurses' in each area of care to disseminate knowledge and make suitable representations to the team if necessary. A **Tissue Viability Nurse** is essential in co-ordinating the implementation of the Policy and the education of Link nurses and all care staff.

Role of the Tissue Viability Nurse⁹

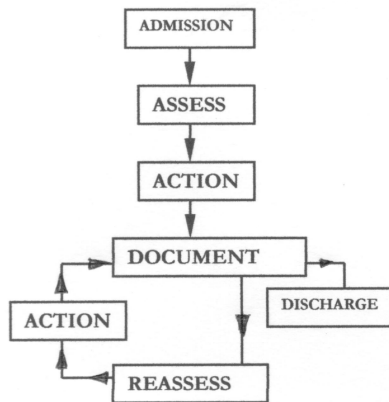
11. The Tissue Viability Nurse or Nurse Specialist has a pivotal role in a Trust's responsibility to reduce pressure ulcers. The diagram attempts to portray the TVNs many and varied duties and responsibilities. The TVN can play a major role, as a member of a Trust's multi-disciplinary team in ensuring that the Trust's pressure ulcer prevention objectives are met.



Enthusiastic **Link Nurses**, working with the TVN, can play a vital role in ensuring that the Policies are understood, and give a feedback to the TVN so that education programmes and Policies can be made more effective.

CYCLE OF MONITORING

12. A good Hospital Policy will ensure that there is a system which continually monitors a patients condition from admission to discharge. It will also ensure that the results of the monitoring are documented. A suggested cycle of



monitoring for the assessment of risk is shown.

ASSESSMENT

13. Having briefly mentioned the overall method of attack, the particular area which this manual will concentrate on is the assessment and reassessment of patients.

Assessment is the key to pressure ulcer prevention.

The Waterlow pressure ulcer risk assessment scoring system has been shown to be, by far, the most frequently used system in UK Acute Hospitals¹⁰. It is certainly one that is most easily understood and can be used by staff involved with the admission of patients to Hospital, or nurses/carers working in Community/Nursing Homes. It must be made very clear that like all simplistic scoring systems it cannot scientifically predict with 100% precision the chance of a patient developing a pressure ulcer. What it can do is ensure that all patients are assessed objectively to the same system and thereby placed in a priority order for preventative aids. It also provides evidence to management of the need to purchase equipment. The Waterlow card is another weapon in the armoury of nurses, it is not a replacement for their knowledge and their skills.

Details of the research which led to the development of 'Waterlow' are given in Appendix 1.

If the Waterlow scoring system is adopted as part of a Hospital Policy¹¹ and continually monitored, then adjustments can be made for each area of care. This will enable the degree of risk to be modified by an allowance for the preventative measures taken.

As a result of an assessment, patients will be either found to be 'Not at Risk' or will be put into one of three Risk Categories – At Risk – High Risk – Very High Risk.

There is very little point in assessing patients unless the assessor is given guidance in what to do as a result of that assessment.

It is this aspect that makes Waterlow card such a powerful tool. The card gives guidance on the types of preventative aid which are appropriate to the risk category established earlier. The card quite deliberately avoids listing aids by trade names as it is the responsibility of Hospital management to empower the Tissue Viability Nurse to

institute a cost effective buying policy, selecting from the many good and effective items of equipment which are to be found on the market. Ideally, the efficacy of aids should be judged on independent evidence of trials conducted on the equipment¹². Many of the smaller companies would find it prohibitively expensive to fund such a series of trials. It would be foolish to exclude products for not meeting this criteria. However it's the responsibility of the purchasers to find out from colleagues in their own and other areas of care whether there is a good empirical or anecdotal evidence to support a manufacturers claims. As is to be expected in a general hospital more patients are to be found 'not at risk' or 'at risk' than those in 'very high risk' category. Statistical evidence of need can be gathered if assessments are documented. This evidence can be very useful in determining stock levels needed for each preventative aid. The longer period of time that records are kept, the more accurate will be the information. Ideally the Waterlow scoring system should be used as the assessment and reassessment element of a Hospital Policy¹². In this way the assessor can be given specific instructions as to what course of action to follow should a patient be deemed to be at risk. This could be the provision of a suitable preventative aid from the range held by the hospital or could be an instruction to call on the services of a Tissue Viability Nurse to help in deciding what course of action to follow.

Apart from the anguish suffered by patients, the failure to prevent pressure ulcers can be very expensive. Though it is difficult to accurately assess the cost of treating a pressure ulcer, costing exercises have been carried out (See Para 8).

REASSESSMENT

14. Having undertaken and documented the assessment, reassessment of the patient at regular intervals is equally important. The interval of time between assessments will depend on the patient's condition, treatment etc, and is really a matter of nursing judgement. However guidelines should be laid down in a Hospitals Policy document. Reassessment ensures that the patients condition, and therefore their needs change, so the provision of aids is reviewed. Provided that the original provision was suitable this will usually result in the 'high tec' preventative aids being released as a patient's condition improves,

allowing the aid to be reallocated or if rented, returned.

Sophisticated pressure relieving bed systems are very expensive and should only be used where they are necessary. These systems should not be used however, as a last resort to recover from a situation where inadequate provision has been made and a pressure ulcer has developed. This emergency action does not absolve the Hospital from a charge of neglect.

As risk recedes patients can be quite adequately protected on cheaper less sophisticated equipment. This is what is meant by the cost effective provision of preventative aids.

Note: There is no point in hiring a sophisticated pressure relieving piece of equipment if the patient is allowed to sit out of bed most of the day in a standard hospital chair.

THE WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY CARD

15. The following paragraphs expand on the reasons why the parameters chosen for the assessment of patients were selected and how they should be interpreted and used. The card states that several scores per category can be used. (See Para 27) shows how this concept should be applied.

Build/Weight For Height

16. Body weight increases pressure over any area where the bone is only thinly covered by tissue. This especially applies to the sacrum, heels and trochanters for a patient in bed, and ischeal tuberosities when seated. The distortion and compression of tissues reduces the blood supply, causing a loss of nutrients and inefficient removal of waste products.

If weight is below average the amount of tissue covering the bony prominence is reduced resulting in the concentration of the weight onto a smaller area of tissue, thus increasing the interface pressure, hence the '3'.

Obese people with a lot of body fat have a risk score of '2' because fatty tissue (lipose) has a poor blood supply.

Weight status can be estimated by using a Body Mass Index chart¹³ The BMI plots body weight against height and indicates by coloured bands whether a person is considered to be 'underweight', 'healthy', 'overweight', obese or 'very obese' (See Para 22).

There may be occasions when the condition of the patient, on admission, prevents height and weight measurements to be taken. In this case, it is the responsibility of the nurse conducting the assessment, to use their professional judgement in allocating a score e.g. skin folds, loose clothes etc.

AVERAGE BMI (20.0- 24.9)	0
ABOVE AVERAGE BMI (25.0 – 29.9)	1
OBESE BMI > 30	2
BELOW AVERAGE BMI < 20	3

$$\text{BMI} = \text{Weight (Kg)}/\text{Height (m}^2\text{)}$$

Continence

17. Moisture and acid from urine and faeces can rapidly cause maceration of the skin, as a result of changing the skins normal pH status, thus reducing the skins tensile strength (see Skin Type below).

Incontinent patients should have soiled areas washed and gently dried, as soon as possible – **NOT**

COMPLETE/ CATHETERISED	0
URINE INCONTINENCE	1
FAECAL INCONTINENCE	2
URINARY AND FAECAL INCONTINENCE	3

rubbed, as this can cause shear damage¹⁵. If a patient lies on a plastic sheet, the impervious nature of the material prevents removal of moisture from the skin and also changes the flora which are naturally present. Vapour permeable drawsheets reduce the problem or, if necessary, highly absorbent drawsheets can be used which absorb large quantities of urine and will keep the patient's skin virtually dry for a longer period. In the case of long term care of the elderly that if possible catheterisation should be considered as a last resort due to the risk of urinary tract infection and loss of function etc.

18. SKIN TYPE/VISUAL RISK AREAS – See Para 27

a. **Tissue paper skin**, often found in the very elderly, or those who have had high doss of steroids etc. over a long period of time, is very friable, increasing the risk of breakdown. The ageing process causes the epidermis to be separated from dermis more easily. In addition, the mechanical properties of the skin deteriorate the ability of the skin to recover after stretching diminish with age, as does sensation.

HEALTHY	0
TISSUE PAPER	1
DRY	1
OEDEMATOUS	1
CLAMMY, PYREXIA	1
DISCOLOURED STAGE 1	2
PRESSURE ULCER STAGE 2 - 4	3

b. **Very dry skin** is at risk of 'cracking, becoming infected, and developing into a pressure ulcer.

An unscented moisturising cream should be gently applied NOT 'rubbed' in.

c) **Oedematous Skin**, due for example to Chronic Cardiac, Liver or Renal Failure, becomes stretched and waterlogged, nutrients are unable to reach the area, waste products cannot be removed through the bloodstream and lymphatic system. If the skin breaks down, the body's natural ability to heal is reduced.

d) **Sweaty Skin** (perspiration) can be due to a raised temperature, a plastic mattress cover or drawsheet. Two-way stretch vapour permeable mattress covers provide lower 'interface' pressures and lessen tissue distortion. They also prevent a build up of moisture. In both aspects they are preferable to non-stretch mattress covers.

e) **Discoloured skin** is already an incipient pressure ulcer. Pressure is at its highest at the bone/soft tissue interface. The pressure reduces in intensity up to the surface of the skin. These skin/support pressure measurements give little indication of the pressure that is acting inside the tissue and causing damage. Compression (occlusion) and distortion of tissues causes the breaking of arterioles and venules in the capillary bed causing stagnation of blood, leading to waste products not being removed. This can rapidly lead to death of tissue and develop into a deep pressure ulcer. (See Para 4). It is difficult to see any discoloration when testing non-white skin e.g. Afro-Caribbean. The best ways to test for any skin damage are:

i. With back of the hand, test the temperature of the skin, first near the suspect area and then on the suspect area. If it feels warmer score as 'discoloured' i.e. '2'.

ii. Position yourself level with the suspect area and observe if there is any swelling or indentation.

f) **Broken/Spotted skin** is already a pressure ulcer (EPUAP Gr.1). A break in the continuity of the skin enables bacteria to penetrate the surface, leading to infection and further skin breakdown. This item and score are to enable an increase in the total score to bring attention to the need to take action immediately to prevent further damage, by providing appropriate aids and nursing care.

Note – Any patient/client who has previously had a pressure ulcer, will always be at greater risk of getting another ulcer in the same area.

MOBILITY - See Para 27

19. Patients, carers and staff need to understand that the correct lifting and transferring of patients is an important factor in pressure ulcer prevention. Devices to help people move themselves, be moved or transferred are often available throughout the UK on loan e.g. from the Red Cross or Occupational Therapy, or to buy.

FULLY MOBILE	0
RESTLESS/FIDGETY	1
APATHETIC	2
RESTRICTED	3
BEDBOUND E.G. TRACTION	4
CHAIRBOUND E.G. WHEELCHAIR	5

a) **Restless/fidgety** patients are liable to damage the surface of their skin, or cause damage to deep tissue by continual movement when either sitting or lying in the usual semi-recumbant position in bed. This is due to a combination of friction (if there is movement)), or shearing (if the body moves but the area of skin in contact with support does not move (See Paras 5 & 6).

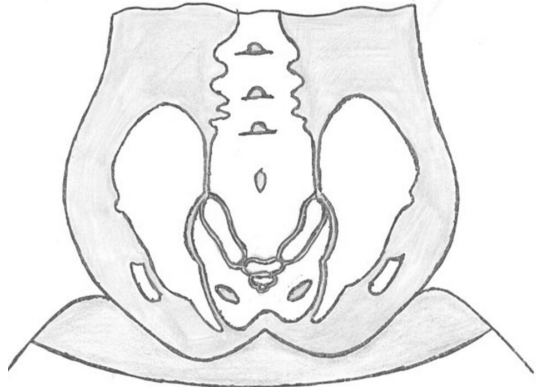
b) An **Apathetic** person could be one who is depressed or sedated, who sits or lies, rarely moving, so that same area of tissue remains under compression, preventing movement of blood through the compressed tissue.

c) **Restricted** patients are those who are restricted in their mobility by for example, chronic disease, drainage tubes, IV infusion, or splints. Splints e.g Plaster of Paris/acrylic can be the cause of pressure, shear or friction ulcers. Callipers and splints e.g. casts of acrylic/plaster of paris are a particular risk that children face.

d) **Inert/Traction** – A patient who is inert through sedation or injury is unable to move naturally, thereby relieving pressure on tissue and allowing a reactive hyperaemia to occur. Patients on traction are restricted in movement, and more at risk from shearing forces due to the weights that have been applied, or the bed being set at an angle of tilt. The protection of the occiput of ventilated patients is important

and should be given careful consideration due to the weight of the head and the ventilation apparatus etc.

e) **Chairbound** – People who are chairbound have their whole upper body weight concentrated on a small area of tissue, thus increasing the interface pressure. It has been said that 65% of pressure ulcers on the buttocks are due to inappropriate seating.



RISK AREAS WHEN SEATED

SEX

20. Research carried out by Margaret Versylusen¹⁶ in 1986, and recent research in a Hospice setting¹⁹⁹⁵¹⁷ found that women were twice as likely as men to get pressure ulcer. Why that should be, is the question that the author is most frequently asked since undertaking her research. She believes that it is due to the anatomical differences between men and women.

MALE	1
FEMALE	2

AGE

21. As a person gets older the risk increases. The ageing process causes the skin to become thinner and lose its elasticity. The range of ulcers reflects the increasing problems that ageing brings. There is an increased risk in skin breakdown and slower wound healing. The risk is not however

14 – 49	
50 – 64	
65 – 74	
75 – 80	
81+	

confined to the elderly age group, the author found, for example, that 5% of patients in the age group 14 – 49 developed pressure ulcers. A paediatric version of the Waterlow scoring system was researched². This study indicated that though a paediatric version of the adult scale

illness, can all contribute to the problem. More emphasis should be put on teaching and understanding the need for a good balanced diet, well cooked and well presented in all areas of care. The role of the dietitian and the advice that they are able to provide, should be appreciated. Much can and should be done at the ward level to improve the nutritional status of patients. Ensure that food looks palatable, is accessible, and is in the correct amount for the patient. If necessary, special cutlery e.g large handles, non slip pads, plate guards etc should be provided. Notice should be taken as to what has, and has not, been eaten. The patient should be encourage to eat 'little and often'. Fluid balance charts should be used and the provision of extra food in the form of 'sips'.

Good mouth care and adequate fluid intake are essential for everybody. It should be remembered that many elderly people, or those with restricted mobility, restrict their fluids, particularly in the evening. Reduced hydration increases the problem of constipation which, in its turn, increases the risk of sacral pressure ulcers. Ideally people should eat 3 balanced meals a day. When a nurse takes the history and assesses a patient on admission it is extremely important that the patient as a whole person is considered. A nutritional assessment should include a Body Mass Index Chart, asking a few simple questions and a brief physical examination including grip – strength for age, cough reflex, skin folds, loose clothes etc.

Good nutrition is essential for both prevention and the treatment of pressure ulcers. The basic daily protein requirements for patients without complications in medical and surgical wards differs:

	Protein (gms)	Energy (Kcals)
Medical patients	45 – 75	1500 – 2000
Surgical patients	75 – 125	2000 – 3500

Many elderly people, in particular those who live alone, are disabled and/or depressed are not only protein deficient but may also be deficient of minerals and vitamins. The provision of supplements can improve their nutritional status. Medical investigations which can aid the diagnosis of a patients nutritional status will include:

Full blood count; Albumen; Thin Layer Chromatography (TLC)
Patients who have a nasogastric tube for aspiration and I.V fluids have often had surgery preceded by a period of starvation for investigation

and/or preoperative preparations. Food intake may also have been reduced/restricted due to ill health. Both situations can lead to malnutrition^{20,21}

It must not be forgotten that a very obese patient who has undergone surgery or suffered severe trauma, can rapidly become protein deficient. The work of the Queensland Project team has greatly improved Nutrition ‘awareness’. There is a need for careful assessment, and requesting, if necessary, the assistance of a dietitian. The Diabetic Dept. can arrange for a special diet where there are acute problems. In the case of diagnosed or suspected anorexia, 24 hour Fluid Balance charts will provide evidence of fluid intake urinary, and other, drainage as necessary.

SPECIAL RISKS (See para 27)

23. TISSUE MALNUTRITION

a. Terminal

Cachexia – If the patient is terminal, then general comfort becomes the prime factor. Every effort should be made to ensure that the patient doesn’t have to suffer the extra

TERMINAL CACHEXIA	8
MULTIPLE ORGAN FAILURE	8
SINGLE ORGAN FAILURE (RESP.,RENAL,CARDIAC)	5
PERIPHERAL VASCULAR DISEASE	5
ANAEMIA (Hb < 8)	2
SMOKING	1

suffering of pressure ulcers. Appropriate pressure relieving bed/mattress/cushions should be provided. Food and drink should be as nourishing as possible, with supplements added as necessary if normal eating is difficult. Food should be what the patient wants. Mouth care becomes more important in this situation.

b. Multiple and single organ failures, for a variety of reasons constitute a considerable risk to the patient of developing an ulcer.

c. Peripheral Vascular Disease – This condition can cause the blood supply to risk areas to be insufficient. This is especially noticeable in the added risk of developing pressure ulcers on the lower leg.

d. Anaemia – When a person is anaemic there is a reduction in oxygen

supplied to the tissue cells. This increases the risk of pressure ulcers, due to anoxia of the tissue.

e. Smoking – The inhalation of smoke into the lungs, not only increases the risk of cancer, and heart problems but can cause thickening in the blood vessels, leading to the development of athero – sclerosis throughout the body.

24. NEUROLOGICAL DEFICIT – MAX SCORE OF 6

a. Diabetes, stroke, multiple sclerosis, cerebrovascular accident - The risk score for this parameter can vary between 4 and 6. The variation is provided so that

DIABETES MOTOR/SENSORY PARAPLEGIA (maximum of 6)	4 - 6
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due allowance can be made for the degree of damage which the patient has suffered. It is the responsibility of the assessor to use their clinical knowledge, based on the medical evidence, to select the appropriate score.

b. Paraplegia - Anybody who has any major nerve disruption e.g paraplegia or tetraplegia will be at a very high risk of developing pressure ulcers as their have lost their normal sense of pain/discomfort which warns the person to change their position, if they have been in one position for to long a period. Great emphasis needs to be placed on education, if ulcers are to be avoided. Those able to do so, should be taught to lift themselves every 15 minutes, to allow oxygen and nutrients to flow to the area of compressed tissue and waste products to be removed. With all their other problems, it is sometimes very difficult to convince someone to accept that, unless they do have appropriate seating and follow a strict lifting regime, they are very likely to develop pressure ulcers. If a ulcer does develop, it can lead to a long stay in hospital, possibly 3 months or more to heal the ulcer, and/or quite possibly major plastic surgery. Once a ulcer has developed the risk of re-occurrence is greatly increased.

Dementia - It has been suggested that where a patient has been suffering from dementia that a score of 4, when the condition is mild, and 6, when the dementia is severe, is appropriate.

25. MAJOR SURGERY/ TRAUMA

ORTHOPAEDIC/SPINAL	5
ON TABLE > 2 Hrs[#]	5
ON TABLE > 6 Hrs[#]	8

Orthopaedic - Below Waist/Spinal -The risk of

developing pressure ulcers is due to immobility and theatre trauma, caused by

Score can be discounted after 48 Hrs provided patient is recovering normally

pressure and shear while undergoing orthopaedic surgery. e.g hip replacement.

Note: The scores for a patient being on the operating table for either over 2 hours, or over 6 hours is only to be awarded for the period of 48 hours following surgery. The score can be discounted, provided that the patient’s rate of recovery is normal.

There are several reasons for the development of pressure ulcers to be associated with major surgery:

- i. Weight, and the time that the patient is immobile²².
- ii. Pre - disposing causes for surgery e.g Cardiac insufficiency, malignancy, severely disrupted digestion/absorption of nutrients, severe vascular disruption to lower limbs etc.
- iii. The lowering of a patient's blood pressure/temperature during surgery due to blood loss, anaesthetic medication, shock etc.
- iv. Trauma - Patients who are unable to be moved as a result of injuries sustained should be nursed on an appropriate specialised bed which has the facilities of tilting, turning or relieving pressure under the body in a cyclical manner. Special care needs to be taken to protect the head and the heels.

26. MEDICATION – MAX OF 4

a. Cytotoxic drugs have a deleterious effect on the immune system and therefore slow the healing process.

CYTOTOXICS STEROIDS – Long term, High dose. ANTI-INFLAMMATORY	MAX 4
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b. High dose steroids

and anti-inflammatory drugs when taken over a long period of time have a thinning effect on the skin e.g in the treatment of rheumatoid arthritis. If the patient is only on a short course of these drugs then a score should not be awarded.

27. NOTE – Possible use of more than 1 score/category

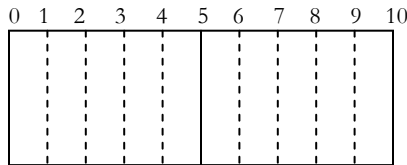
At the top of the card it is stated that more than 1 scores/category can be used. This is another area where it is expected that the assessor will use their clinical knowledge, and not just make an arithmetic total. If the Waterlow Card is being used as part of a hospitals documentation, then it is important to note the judgements that have been made, so that in the event of an audit, the fact that the total score is not the sum of all the items has been accounted for, rather than being put down as poor arithmetic. Teaching, understanding and agreement at Ward level will encourage consistent patient assessment. The Waterlow card is intended to be used as a weapon in a nurses armoury, to be used alongside her clinical knowledge and acquired expertise. It is not a 'tablet of stone' to be followed slavishly as a way of avoiding making decisions. Decisions always need to be made, and responsibility for those decisions taken²³. Documentation and reassessment remain essential.

This covers the parameters shown on front of the card. One parameter that often mentioned, but the author considers should not be used is 'pain'.

PAIN

28. Pain is what the patient feels, and not what medical or nursing/care staff think the person feels. Pain can, and often is, increased by worry, fear etc. Though some assessment cards use pain as a parameter, it is considered that pain should NOT be included as just one of many factors to be used in the assessment of patients risk of getting pressure ulcers. The control of pain is a very important area of care in its own right. A 'pain chart' assists

patients to define a level of pain, however subjective, to their nurse/carer. It assists pain control medication and can provide a continuous record of the patient/clients pain status. Hopefully, it can



0 = No pain: 3 = Ache; 5 = Pain;
8 = severe pain 10 = Very severe
(unbearable) pain

be controlled within at most 40 minutes after admission. Every 4 hours there should be a reassessment of pain (Unless the patients pain has not been adequately relieved, and efforts to control the pain are ongoing), and the appropriate measures taken. Pressure ulcer risk assessment would only be carried out every 24 hours at its most frequent, so within that period, the 'pain' score, had it been included, could have changed several times.

PREVENTATIVE AIDS – GUIDANCE ON SELECTION

29. The question should be asked - do you know the condition of your mattresses/chairs?

30. MATTRESS/BEDS

a.Mattress/Overlays/Covers – Selection should be made where possible, using independent research evidence^{13,24}. If this is not available then one can only rely on the reputation of the chosen manufacturer or the anecdotal empirical evidence provided by colleagues.

b.Mattress Testing - Within the Hospital's overall Pressure Ulcer Prevention Policy there should be a separate Mattress Policy setting out the time intervals for testing and replacement. It has been found, particularly since the introduction of fire resistant materials, that the life of a standard UK Standard Hospital mattress is only 9 – 18 months. After this time they 'bottom out'. This can be tested for by spreading the hands and pushing down on the middle third of the mattress. The bed base should not be able to be felt. Though a very simplistic test, it is one that is easily carried out in the Ward, and gives you a very good idea of the state of the mattress.

Mattresses and mattress covers should be examined for damage or staining, which will create a risk of cross infection. All covers should be made of 2 way stretch material, to reduce the risk of adding to the shearing forces on a patients sacral area, in particular.

All mattresses should be dated at the time of first use. The ends of the bed should be identified – from 1-4 to give an easy reference to systematic turning, end to end, and top to bottom. Some companies supply mattresses already marked with this information. Mattresses will last much longer if rotated at regular intervals. A monthly interval is suitable for long stay patients, otherwise this can be done when patients

are discharged, and the bed prepared for the next occupant.

All overlays should have vapour permeable covers, thus preventing the overlays being damaged by too many visits to the Hospital laundry. Mattresses and beds should be cleaned only using soap and water. The properties of all fibre filled overlays are quickly ruined by the high temperatures and washing methods usually used in hospital laundries.

The types of preventative aid are shown on the reverse of the Waterlow card have been grouped to correlate with 3 risk categories of the assessment system. Advice was taken on the constitution of aids in each groupings from Professor Ian Swain a Bio – Engineer who has conducted a series of research projects on support surfaces for the Department of Health (UK)¹².

The mattresses and overlays mentioned above, provide comfort for the patient, as well as providing a degree of pressure relief. This in itself, if they allow the patient to sleep more soundly, will be efficacious in aiding the healing process and promote their general and well being.

c. Bed/Mattress Automatic Pressure Relieving Systems – These are very expensive sophisticated products which, in the case of high and very high risk patients, can make all the difference to the patient's susceptibility to pressure ulcer damage. Some are for general use, others for specialised purposes where, for example, there may be a high exudates problem. Various independent studies have been conducted on the efficacy of these systems and due to their high cost, purchasers should make every effort to ensure that their choice is cost effective and based on independent evidence.

ACCIDENT & EMERGENCY DEPARTMENT

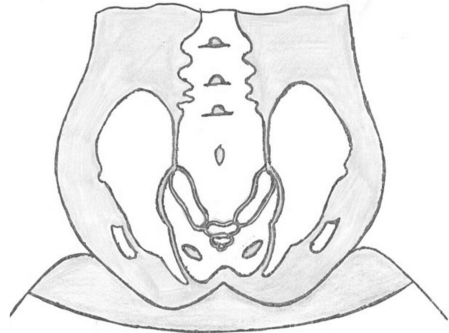
31. Reports have shown that patients are spending from 4-36 hours in Accident and Emergency Units (A&E) on hard trolleys or chairs and wheelchairs that have very firm seats. A pressure ulcer can start to develop in 1-2 hours. All A&E trolleys should have an adequate protection layer of at least 100mm of foam or an overlay. Elderly patients are also at risk in Out Patients departments where seating is often inadequate. When patients are admitted they should be assessed as soon as possible and the Ward notified, if they come into a 'risk category'. This will enable the provision of appropriate preventative aids, so that the bed is ready when the patient arrives. Patients admitted

to a Ward/Nursing home should be assessed within 1 hour of arrival.

CHAIRS & CUSHIONS

32. Patients in A&E, Out Patients Depts., and patients sitting out in the Ward, can all be at risk when the surfaces of the standard Hospital chair or wheelchair are considered. All patients should have some form of protection, even if at worst, it is a spare pillow (the risk of infection should however be recognised). For high risk patients, there are Specialist load spreading Gels or high quality specialised cushions. For very high risk patients, there are more sophisticated passive and active cushion pressure relieving systems available which can be adjusted to suit individual patients.

Interface pressures are greater when patients sit out, as the whole body weight is taken on the ischeal tuberosities and surrounding tissue. It has been said that 65% of all ulcers on the buttocks are due to seating.

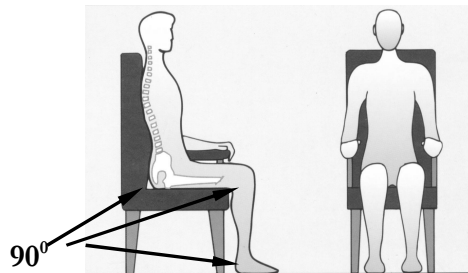


RISK AREAS WHEN SEATED

These pressures are increased dramatically if the patient is not seated correctly in the chair/wheel chair.

i. If a chair is too low or has a tilted back, the bodyweight is taken on a smaller area of tissue and the patient has difficulty in standing up.

ii. If the chair is too high, all of the body weight is taken on the ischeal tuberosities as the feet and legs are not supporting their own weight.



iii. If a person has suffered a severe stroke he/she will have his/her weight taken on one side of the body. Care must be taken to support

the affected side to prevent the full weight of the body being put on the ischium.

Adjustment should be made to enable the patient to sit with his/her back upright, thighs at an angle of 90° to the body, lower legs at an angle of 90° to the thighs and feet resting comfortably on the ground or a step at an angle of 90° to the lower legs.

Ring shaped cushions should NOT be used on any occasion. The use of these cushions increase pressure on the buttocks (ischial tuberosities) to a very high level and the hole in the centre acts as a tourniquet, cutting of blood supply to the soft tissue.

NOTE - If someone has been unfortunate enough to have developed a severe pressure ulcer then they should be nursed mainly in bed, only being got up when necessary, e.g mealtimes, toilet, washing etc.

Hospitalised patients are got out of bed as soon as possible to mobilise. Though this is an excellent philosophy to stop muscle deterioration etc., staff need to realise how damaging this can be, unless preventative measures are taken e.g seating, and how tiring sitting out for long periods, can be for patients.

33. BED CLOTHING

Plastic draw sheets and plastic mattress covers should be avoided as they are likely to cause the patient to sweat. This causes moisture to increase which is an extrinsic factor in pressure ulcer susceptibility (See also 'Incontinence' – Para 17).

If bed clothes are tightly tucked in, pressure on the heels is invariably increased, this also negates the advantages of even the best alternating pressure bed systems.

Duvets – Lightweight (Low Tog) duvets with waterproof, vapour permeable covers, reduce significantly the weight of bed clothes on the legs and can enable the patient's feet to keep warm, reducing the need for bed cradle. They are also cost effective by reducing bed making time, cross infection and laundering cots.

34. NURSING CARE

General care – Frequent changes of position are important, not only for patient comfort, but to ensure that no area of tissue remains under

compression for any length of time. Care must be taken not to slide the patient across the bed or chair surfaces when moving them. Pillows, with vapour permeable covers, can be used to support various parts of the body to reduce pressure locally whether in bed or sitting out, if in an appropriate cushion is not available. The use of pillows under the length of the leg is particularly effective in taking weight off of a patients heels. Pillows can also be used to support patients in bed to alter weight bearing areas.

Pain – The topic of pain as a risk parameter was covered earlier (See Para 28). Every effort should be made to control pain.

Nutrition – All elderly patients admitted to hospital, residential/nursing homes or in Community Care should be weighed and measured to assess their Body Mass Index¹⁴. Many patients are found to be malnourished on admission to hospital, and having to spend hours under a ‘nil by mouth’ regime, so need special supplements. It has been established that poor nutrition can retard the healing process²⁵. Even if food is available, patients, due to a variety of reasons, such as poor appetite, disease, ill fitting dentures, inability to use normal utensils etc. may not be getting sufficient nourishment. It is up to staff to watch out for patients with difficulties and if necessary call in the services of a dietitian or occupational therapist.

Patient Handling – Various aids are available to help move the patient easily with as little strain as possible being imposed on the nurses/carers. Back injuries are very expensive, as staff have to be paid for ‘sick leave’, and a replacement found, and very painful for the individual. The essential feature of all patient movement is that the surface of the skin must not be slid across the support surface.

Comfort Aids – Sheepskin does not significantly relieve pressure. Provided lambswool or, to a lesser extent, its nylon equivalent is washed carefully it can help reduce friction on elbows, heels etc. Heel and Elbow Pads can also be used to reduce friction in these sensitive areas. Bed cradles effectively remove the weight of bedclothes from a patient in bed, but are sometimes disliked by patients as they can cause the patients to feel cold. The use of a duvet may obviate the need for a cradle.

Operating Table/Theatre/ A&E Trolley – Increasingly long and complicated surgery is being performed on sick and injured patients.

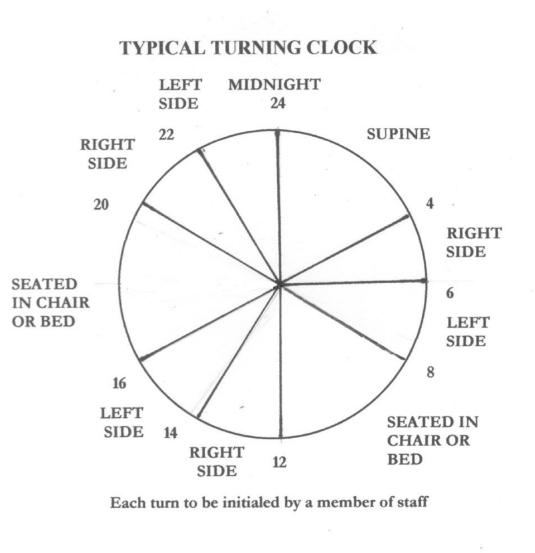
Patients undergoing major orthopaedic heart and vascular surgery are particularly at risk. Theatre tables should have at least a 100mm thick cover or specialist pressure relieving cover. Theatre trolleys should be similarly treated and the patient transferred to a suitable bed as soon as possible.

Skin Care – Rubbing of the skin causes shearing forces which can initiate the onset of pressure ulcers. A gentle daily wash (without rubbing) using soap and water is adequate. If the patient is incontinent the area should be washed, dried and a water repellent barrier cream applied each time, to prevent excoriation of the skin. Talcum powder, if used, should be used **very** sparingly. Highly scented powders should be avoided. Powder on the skin inhibits the ability of the skin to excrete waste products. Moisturiser can be applied to help to alleviate very dry skin.

Correct lifting and handling techniques will ensure the surface of the skin is not scraped across a support surface and will save the cost of back injuries to staff.

Turning²⁷ – A pressure ulcer can occur within one hour! 2 hour turning of patients has been the regime for over 50 years. This is a good example of ritualistic practice which has no medical basis. It came about during

the 1939 – 1945 war when there were there many fit young Service men in hospital as a result of serious burns. The plastic surgeons at Roehampton & East Grinstead decided to have a ‘pair of turners’ each side of the ‘Nightingale’ style wards who would continuously around their plastic surgery wards. It took 2 hours to complete the hospital, so



the 2 hour cycle was born!

With the introduction of modern technology, and staff numbers reducing, it is essential that turning is kept to a minimum, by the use of preventative devices distributed to those whose need has been established by a policy of assessment and reassessment of risk. Movement/Turning should be seen as a means of keeping the patient comfortable and for physiotherapy. It should not be used as the prime method of pressure ulcer prevention.

30° Tilt¹⁴ - When a patient lies on their side the average interface pressures under the trochanter is 158 mmHg. If the patient can be supported at an angle of 30° by pillows laid lengthwise in the bed, then the weight of the patient is taken on the more padded buttocks and interface pressures are reduced. By utilising the angles of 30° and moving the pillows slightly to the right and then the left, several changes of position can be utilised without the patient being manhandled to any great extent. The cycle of turning – usually referred to as a turning clock²⁷ can be established in consultation with the patient so that he/she is in a preferred position when receiving visitors, mealtimes etc.

Sleep – Sleep is essential for everybody. Sleep is also the period when the body heals itself. After the first 2 hours of sleep there is a surge in the healing mechanism²⁸ which is disrupted if the patient is under a 2 hour turning regime.



WOUND CLASSIFICATION

35. The reverse of the Waterlow Card shows the wound classification system devised by the European Pressure Ulcer Advisory Panel (EPUAP) in 1998²⁹. The EPUAP provides 4 Grades of ulcer definition and is now becoming the preferred system of wound classification in the UK.

As has been stated, it is hoped that the number of pressure ulcers

can be drastically reduced, by systematic assessment/reassessment. However, there will always be patients with pressure ulcers and, as with 'risk', it is important that all pressure ulcers are assessed and classified objectively.

It must be stressed however that the whole subject of wound assessment/classification and treatment is a very complex and outside the scope of this publication. However for completeness it was decided that the Waterlow card should at least give some simple guidance in this area and the selection of appropriate wound dressings.

36. EPUAP WOUND CLASSIFICATION SYSTEM

GRADE 1

Discolouration of intact skin not affected by light finger pressure (non blanching erythema)

This may be difficult to identify in darkly pigmented skin

GRADE 2

Partial-thickness skin loss or damage involving epidermis and/or dermis.

The pressure ulcer is superficial and presents clinically as an abrasion, blister or shallow crater.

GRADE 3

Full thickness skin loss involving damage of subcutaneous tissue but not extending to the underlying fascia.

The pressure ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

GRADE 4

Full thickness skin loss with extensive destruction and necrosis extending to underlying tissue.

37. SPSSS

The Stirling Pressure Sore Severity Scale (SPSSS), though not featured on the Waterlow Card has been included in the Manual for completeness as many people still use this scale. The SPSSS resulted from the deliberations of a UK Consensus Conference held in Stirling in 1992³⁰. The author, as a member of the Consensus Conference believes that for accurate assessment, for patient documentation, which should be carried out by a qualified nurse, the sub-digits are a valuable

tool in giving a more accurate picture of the ulcer. The system has 5 stages and several levels of sub-division.

Stage 0 – No clinical evidence of a pressure ulcer. Normal appearance, intact skin.

0.1 Healed with scarring.

0.2 Tissue damage, but not assessed as a pressure sore

Stage 1 – Discolouration of intact skin (light finger pressure applied the site does not alter the discolouration)

1.1 non-blanchable erythema with increased local heat

1.2 Blue/purple/black discolouration. The sore is at least Stage 1.

Stage 2 – Partial–thickness skin loss or damage involving epidermis and/or dermis

2.1 Blister

2.2 Abrasion

2.3 Shallow ulcer, without undermining of adjacent tissue.

2.4 Any of these with underlying blue/purple/black discolouration.

The sore is at least Stage 2.

Stage 3 – Full–thickness skin involving damage or necrosis of subcutaneous tissue but not extending to underlying bone tendon or joint capsule.

3.1 Crater, without undermining of adjacent tissue

3.2 Crater with undermining of adjacent tissue.

3.3 Sinus, the full extent of which is not certain.

3.4 Full thickness skin loss but wound bed covered with necrotic tissue (hard or leathery black/brown tissue or softer yellow/cream/grey/slough) which masks the true extent of tissue damage. The sore is at least Stage 3. Until debrided it is not possible to observe whether damage extends into muscle or involves damage to bone or supporting structures.

Stage 4 – Full–thickness skin loss with extensive destruction and tissue necrosis extending to underlying bone, tendon or joint capsule.

4.1 Visible exposure of bone, tendon or capsule.

4.2 Sinus assessed as extending to bone, tendon or capsule.

For research purposes a third and fourth digit classification are available to provide information on the nature of the wound bed and for infective complications.

38. The Uses of the Waterlow Card

- a. To provide a quick, simple and comprehensive method of assessing the risk of a patient developing a pressure ulcer.
- b. To place patients in one of three bands of increasing risk to enable appropriate cost effective preventative aids and nursing resources to be allocated.
- c. To provide objective evidence of risk so that patients can be placed into a priority order for the allocation of resources.
- d. To provide objective evidence of need to management, should extra resources be needed.

Note: Nurses by virtue of their ‘accountability’ to their patients’ , must be prepared to present sound financial formal proposals to management based on objective evidence if there is a need. If management does not respond, then the nurses ‘accountability’ should be, again formally, passed on to the person in the management structure who refuses the request, and documented in the patient’s notes.

e. To ensure by periodic reassessment, that equipment, such as the more expensive automated bed systems, is reallocated when a patient starts to recover, and their risk category reduces.

The frequency of reassessment depends on the area of care. In acute areas of care for example, reassessment could be needed daily. In long stay residential care or Community, monthly reassessments would be adequate, unless the patients condition had changed due to a cold, change in medication etc.

f. To form the cornerstone of a Hospital Pressure Ulcer Prevention Policy, which must include Assessment and Reassessment, as no Policy will be effective unless patients are effectively screened for risk on admission and for the duration of their stay. The advantages of a Policy cannot be too highly stressed. It is the document, subject to audit and review, which can add flesh to bare bones of scoring system, from evidence collected within the hospital. It can give guidance on:

- i. The appropriate risk thresholds to be applied in various areas.
- ii. The timing of reassessments.
- iii. The value of preventative aids and nursing regimes in reducing risk.

The word 'guidance' is used deliberately. As no one patient is identical to another, it is still the responsibility of the assessing nurse to consider all the factors when making a professional judgement on what course of action to take. The decisions and reasons for those decisions must be documented.

g. To provide objective evidence that the appropriate measures were taken, should the questions of litigation arise.

COMMUNICATION

39. Education and communication are a vital part of Nursing. Pressure ulcer prevention is a multidisciplinary activity and it is essential that staff in all the areas of care involved continually communicate with each other. The main people involved are the patient, and their family, the main carer and nursing staff in the Care Home or Ward. It is important that, as far as possible, the need for moving/turning, eating, drinking etc. are explained fully and gently repeated as necessary.

The involvement of a physiotherapist, dietitian, continence advisor, doctor, occupational therapist, social worker etc. may also be necessary. All actions, decisions etc should be documented in the Care Plan/Patient's notes.

APPLICABILITY

40. The Waterlow card is applicable to all areas of care, from A&E to Residential Nursing Homes. It is however a simplistic tool, and it is the responsibility of assessors to use the risk assessment system and the advice on the selection of preventative aids, in conjunction with their own expertise and their own area of care's specific constraints.

41. COMMUNITY, NURSING & RESIDENTIAL HOME USE

When the Waterlow card is being used in the Community or in the Nursing and Residential homes it is vital to recognise that this environment is markedly different from the one in which the scoring system was developed. The risk factors are still the same, but can be alleviated by the client having:

- i. A good quality mattress, duvet for his/her bed.
- ii. A good quality armchair to sit out in.
- iii. A caring relative or friend who keeps a constant eye on them and

provides good nutritious meals, for example.

These factors raise the risk threshold so that if a person is discharged from Hospital with a stated 'Waterlow score' this score must be reviewed in the light of the changed circumstances to determine the requirements of the clients. By working in this manner and using the same assessment system in all areas of care, the patient can receive 'seamless care' as they move to and fro between Hospital, nursing/residential homes, or their own home.

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APPENDIX 1

A BRIEF HISTORY AND BIOGRAPHY OF THE ORIGINS OF 'WATERLOW'

'Waterlow' was designed and researched by Judy Waterlow in 1984/85². The pressure ulcer risk assessment scoring system was arrived at from Judy's extensive knowledge gained from an excellent training at St Thomas's Hospital in London, followed by many years in clinical practice, including operating theatres with a speciality of vascular and plastic surgery. Waterlow was originally designed for the use of student nurses at Musgrove Park Hospital in Taunton where Judy was employed as a Clinical Nurse Teacher. Apart from her own extensive knowledge Judy

consulted all available references in the Medical Library (at that time very little Nursing Research was readily available. Details of the Norton scoring system was the only piece of research available in Taunton, and the internet did not exist!). Having conducted a Pilot Study in the Elderly Care Unit, to test the system, a full scale research study was conducted in the Medical, including Coronary and Intensive Care, Surgical, Orthopaedic and Elderly Care Units. A total of 649 patients

were involved in the Study, each patient being assessed on admission and then, every 3 days until death or discharge. The overall results of

Total No. of patients	Total with ulcers	% with ulcers
649	111	17.1%

OVERALL SUMMARY

Department	Total No.	Total with ulcers	% with ulcers
Orthopaedic	146	36	24.7%
Surgical	160	24	15.0%
Medical	233	29	12.4%
Elderly Care	110	22	20.0%

SUMMARY BY DEPARTMENT

Score	Total No.	Total with ulcers	% with ulcers
0 – 9	282	0	0%
10 – 14	178	25	15%
15 – 19	139	54	41%
20+	50	32	66%

the research were as shown.

At the time that the research was conducted, patients were lying on standard NHS mattresses. The hospital had no pressure reducing mattresses, the only preventative aids were 3 very heavy water beds (Mediscus) which required 3 nurses when treating the pressure ulcers. These were only used for patients who had already developed, what would now be classed as Grade 4 ulcers. Other 'aids' available at that time were monofilament nylon sheepskins (now known as a comfort aid) and booties, which were mostly used in the Elderly Care Units. As a Clinical Nurse Teacher Judy was not able to influence the care of patients identified as 'at risk'.

The combination of a lack of preventative aids and the inability to initiate preventative actions to alleviate the 'risk' resulted in the scoring system demonstrating a predictive capacity. Nowadays, after carrying out an assessment of risk, it would be completely unethical not to take whatever measures are deemed necessary to prevent the development of a pressure ulcer. This has meant that risk assessment tools can not be judged by statistical methods based on a predictive capacity.

Over the last 5 years Nancy Magazinovic, the Nursing Director for Thoracic Services employed by Queensland Health has undertaken a major research project to produce Resource Guidelines on Pressure Ulcer Prevention and Management for the Queensland Government¹. The Project team, after considerable investigation, chose 'Waterlow' as the pressure ulcer risk assessment scoring system they would use. Nancy contacted Judy to discuss in detail the origins, evidence of research underpinning the scoring system etc. and since that time Judy has worked closely with Nancy and her team. In 2003 Judy visited Brisbane to discuss the results of their research and to talk to the staff of the Prince Charles Hospital Brisbane. Having looked at the evidence, and discussed the slight adjustments which the Project team were proposing to make to the scoring system Judy decided to modify 'Waterlow' to incorporate these adjustments.

APPENDIX 2

Detailed comparison of the revised Waterlow Risk Assessment Scoring System with the original.

1. Build/Weight for height – BMI scores added
2. Continence – specific references to urinary and faecal incontinence used instead of ‘doubly incontinent’
3. Skin Type, Visual Risk Areas – definitions of ‘Discoloured’ and Broken/Spot given in terms of ulcer classification grade.
4. Mobility – extended definitions of Bedbound and Chairbound e.g ‘traction’ and ‘wheelchair bound’
5. Sex, Age – No change
6. Appetite – This has been replaced by ‘Nutritional Status’, to enhance the importance of nutrition. The score has been calculated by using a Malnutrition Screening Tool (MST)
7. Tissue Malnutrition – 2 definitions have been added to take account of single and multiple organ failure. Anaemia is now identified by $Hb < 8$.
8. Neurological Deficit – Limits the score for this parameter to 6.
9. Major Surgery/Trauma – Extends items to include a period of over 6 hours on the operating table. Warning is given that, provided that recovery is straightforward, this score can be discounted after 48 hours. Due to advances in surgical techniques and anaesthetics ‘on table >6 hours’ has been added.
10. Medication – A maximum of 4 is allowed for this parameter.