EUROPEAN PRESSURE ULCER ADVISORY PANEL

Trustees of the European Pressure Ulcer Advisory Panel

Mission Statement The European Pressure Ulcer Advisory Panel's objective is to provide the relief of persons suffering from, or at risk of pressure ulcers, in particular through research and the education of the public.

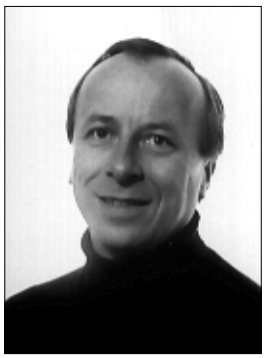
EPUAP Business Office: *Administrator:* Christine Cherry (England)
68 Church Way
Iffley, Oxford, OX4 4EF, UK

Tel: +44 (0)1865 714358
Fax: +44 (0)1865 714373

E-mail: EPUAP@aol.com

Letter from the President

DEAR FRIENDS



Denis Colin

WELCOME to our 2005 Open Meeting in Aberdeen. As in previous years, we will once again have the opportunity to share our growing knowledge and increasing experiences with each other. Nevertheless, the 2005 meeting does offer us additional dimensions.

This year the UK Tissue Viability Society conference precedes our meeting. This excellent initiative will give us the chance to meet new contacts and learn of new experiences that are very complimentary to our own. The theme of the Tissue Viability Society meeting is centered on the same theme chosen this year by the EPUAP: The fundamental principles and good practice in tissue viability

We are also very fortunate to have during this Open Meeting several international wound care organizations represented, such as the Japanese Pressure Ulcer Panel and the US National Pressure Ulcer Advisory Panel (NPUAP). Our strength in the war against pressure ulcers lies in our ability to meet, exchange ideas and learn from each other on an international level. It is for this reason that several EPUAP members attended the NPUAP meeting held in Tampa in February 2005. In Tampa, we were again able to reinforce the value of these international contacts and we returned with the conviction that together, our forces can unite to diffuse knowledge throughout the world.

The idea of returning to the fundamental principles is certainly a sign of wisdom and maturity for our group. It is an opportunity to analyze and debate the concepts that are often taken for granted under the pressure of new technologies and new practices. Returning regularly to the fundamentals of pressure ulcer prevention and treatment helps us to evolve as an organization by better meeting the population's changing needs for healthcare that flow from the continual progress of medicine.

I sincerely hope that this congress will be a positive step towards motivating each of us to win together the war on pressure ulcers. Let us take this opportunity to reflect on the long road we have already traveled and the knowledge and experiences this journey has brought us, but let us not forget to look towards the road that lies ahead. Let us embrace this road together, free from preconceptions of the nature of the journey, in order to reach new levels of educational attainment and improved prevention and treatment of pressure ulcers.

Denis Colin
President

Letter from the Editor

EDITORIAL

Dr Michael Clark

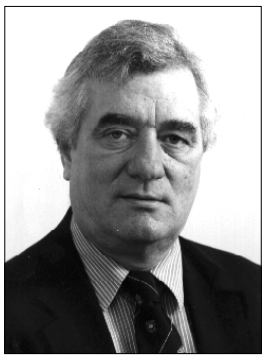
BY the time you read this year's Open meeting of the European Pressure Ulcer Advisory Panel will be a fond memory for many of us. What do we take away from the event? Apart from recollections of informative presentations, good company and Scottish entertainment; there is a general awareness that EPUAP has achieved a lot, but that there is much more to do. One of these 'things to do' is a much-needed update of our prevention and treatment guidelines. Keep an eye on this Review and the EPUAP web-site for your opportunities to be involved in this review process. One of the things we have done is to issue practical guidance on collecting prevalence and incidence data with this position document reproduced in this issue of the *EPUAP Review*. Read, comment and perhaps participate in the pilot study which aims in 2005/6 to test the incidence data collection methods outlined in the position document.

This issue of the *EPUAP Review* also includes a position statement to help discriminate between pressure ulcers and skin and soft tissue wounds arising from contact with moisture. This document has been issued to help reduce confusion over apparent Grade 2 pressure ulcers where in reality their aetiology has little to do with pressure. The two position statements within this issue of the Review are complementary; for the classification guide will help to reduce false identifications of pressure ulcers when undertaking prevalence or incidence monitoring. That the EPUAP is able to issue two important position statements shortly after the annual Open Meeting is a clear demonstration of the vitality and enthusiasm of the organisation. With the forthcoming review of the pressure ulcer prevention guideline, EPUAP continues to have much to offer to the pressure ulcer community.

Perhaps you would like to get more involved with the activities of the EPUAP? Future issues of the *EPUAP Review* will carry information upon the various active working groups with contact details of each group leader. Get in touch with a group leader if you feel you have contributions to offer – the work can be demanding on your time but is ultimately rewarding given that through our efforts on behalf of the EPUAP we can help to improve the quality of pressure ulcer prevention and treatment.

Michael Clark
Editor

News from the Business Office



Dr George Cherry

THE Business Office has been extremely active, particularly with the organisation of our 8th Annual EPUAP Open Meeting in Aberdeen, Scotland, in May 2005.

The interest in this meeting has been considerable and this is reflected in the fact that we expect more than 500 participants to attend. In addition, support for the meeting from our EPUAP corporate members, as well as other industrial companies, has been extremely good. More than eighty abstracts have been submitted for the meeting – again showing the strong interest in pressure ulcers.

Support from the Aberdeen Exhibition and Conference Centre as well as the Convention Bureau of Aberdeen has also been excellent. They were part of our EPUAP stand at the World Union of Wound Healing Societies in Paris last August, promoting Aberdeen and its lovely surrounding countryside.

A number of the trustees attended the 9th National Conference of the NPUAP in Tampa Florida, USA at which the EPUAP had an exhibit stand which was well received, particularly the educational computerized PUCLAS programme. Tom Defloor our President-elect was an invited speaker at this meeting in which a good portion of the programme consisted of re-examining the concept of pressure ulcer staging introducing the concept of deep tissue injury.

Figure 1. Site visit to Berliner Congress Center, Berlin, Germany.
From left to right: Jacqui Fletcher, Christine Cherry, Michael Clark and Willi Jung.

Figure 2.
George Rodeheaver receiving the Kosiak Award from the President of the NPUAP, Mary Ellen Posthauer, Tampa, 2005.

In addition future joint initiatives between the two pressure ulcer organisations were discussed with regard to international guidelines and the concept of shear forces. A follow-up meeting will be held on the afternoon of May 7th. Dr George Rodeheaver, past president and founding member of NPUAP received the esteemed Kosiak Award at this meeting.

Members of the scientific committee, Business Office as well as Willi Jung of Germany made a site visit to Berlin where next year's meeting will be held from 31 August – 2 September 2006. We were well impressed with the Berliner Congress Center where the meeting will be held as well as the number of hotels and other facilities which should make next year's meeting in Berlin as excellent as our past annual meetings.

Lastly the trustees met in Brugge Belgium in March at a meeting hosted by Tom Defloor. This meeting was very successful and many of the past and new activities of the EPUAP were discussed.

We look forward to seeing you in Aberdeen where we will all experience excellent Scottish hospitality as well as a superb scientific programme.

Dr George W. Cherry
Secretary/Treasurer

Figure 3. First announcement for the Ninth EPUAP Open Meeting, 2006, at the Berliner Congress Center, Germany.

EUROPEAN PRESSURE ULCER ADVISORY PANEL

Pressure Ulcer Classification

EPUAP STATEMENT ON PREVALENCE AND INCIDENCE MONITORING OF PRESSURE ULCER OCCURRENCE 2005

Tom Defloor, Michael Clark, Anne Witherow, Denis Colin, Christina Lindholm, Lisette Schoonhoven and Zena Moore

SUPPORTED BY THE EPUAP TRUSTEES:
BALE S., BELLINGERI A., CHERRY G., DASSEN T., DEALEY C., FLETCHER J., FURTADO K., GULACSI L., HEYMAN H., HIETANEN H., LUBBERS M., ROMANELLI M. AND VERDU SORIANO J.

This document is based on: Defloor T, Bours G, Schoonhoven L, Clark M. Prevalence and incidence monitoring. Draft EPUAP Statement on prevalence and incidence monitoring. EPUAP Review *2002; 4(1): 13–15.*

BOTH prevalence and incidence are used to measure disease frequency. While both have been used to record the number of people with pressure ulcers, they provide different perspectives on the scale of the problem.[1]

Prevalence of pressure ulcers

Prevalence is defined as a cross-sectional count of the number of cases at a specific point in time, or the number of persons with pressure ulcers who exist in a patient population at a particular moment in time (see Table 1).[2]

Incidence of pressure ulcers

Incidence is defined as the number of persons who develop a new pressure ulcer, within a particular time period in a particular population.

Several approaches to measuring incidence have been explored (see table 2).

Characteristics of Prevalence and Incidence

As mentioned earlier, prevalence and incidence are different measures of disease frequency.

The characteristics of prevalence and incidence are summarized in Table 3.

Purpose

Before deciding to measure either pressure ulcer prevalence or incidence it is useful to consider the information the different measures can provide.

Prevalence measures the number of patients with pressure ulcers at a certain point or period in time. Thus, it provides an institution with insight into the magnitude of the problem of pressure ulcers at a given point in time, and may be an aid in planning for health resources and facilities. For example, during a prevalence survey it is possible to record how many devices (e.g., alternating mattresses) are being used at that specific moment.

Given that many prevalence surveys also collect information upon aspects of prevention and treatment, such surveys may allow inferences to be made regarding the compliance with prevention and treatment protocols at that specific moment.

Incidence measures the number of persons developing new pressure ulcers during a period in time and thereby provides insight into the nature of patient groups who are at risk of pressure ulcer development. Furthermore, incidence may allow inferences to be made regarding the effectiveness of preventive measures and the compliance with prevention and treatment protocols.

Table 1: Prevalence

Pressure Ulcer Point Prevalence =

$$\frac{\text{Number of persons with a pressure ulcer x 100}}{\text{Number of persons in a population at a particular point in time}}$$

Pressure Ulcer Period Prevalence =

$$\frac{\text{Number of persons with a pressure ulcer x 100}}{\text{Number of persons in a population during a particular period in time}}$$

Table 2: Incidence

Pressure Ulcer Cumulative Incidence =

$$\frac{\text{Number of persons developing new pressure ulcers x 100}}{\text{Number of persons (with or without pressure ulcers) in the population during the data collection period}}$$

Pressure Ulcer Incidence Density =

Incidence Rate =

$$\frac{\text{Number of persons developing new pressure ulcers}}{\text{Total person days*}}$$

*Sum of all the days over which each patient participated in the study

Table 3: Characteristics of Prevalence and Incidence

Characteristic	Prevalence	Incidence
Purpose	Gain insight into the magnitude of the problem of pressure	Gain insight into the magnitude of the problem of pressure ulcers
		Gain insight into the causation of pressure ulcers
	Planning for health resources and facilities	Planning for and evaluation of health resources and facilities
	Compliance with prevention and treatment guidelines/protocols	Compliance with prevention guidelines/protocols
	–	Evaluation of effectiveness of preventive measures and treatment
Figures affected by	Pressure ulcers present at admission	–
	Admission and discharge practices	Discharge practices
	–	Follow-up period (only for cumulative incidence)
	Case mix	Case mix
	Effectiveness of the prevention and treatment protocols	Effectiveness of the prevention and treatment protocols
	Compliance to the prevention and treatment protocol	Compliance to the prevention protocol
Time investment and cost for research	Low	Higher

The interpretation of prevalence and incidence date can be challenging

When interpreting particular prevalence or incidence data it is important to understand the factors that may influence the apparent size of the pressure ulcer population.

Prevalence will be affected by the number of persons with a pressure ulcer present at admission to the current care provider. If this number is high, prevalence proportions may be high too. For example, where patients with pressure ulcers are referred to a specific institution, because of the expertise of the institution in pressure ulcer treatment, this admission practice will influence the prevalence of pressure ulcers. Prevalence is also influenced by discharge practices. For example, a hospital that is able to quickly discharge patients with a pressure ulcer or, even before it is apparent, to a nursing home may have a lower prevalence of pressure ulcers than a hospital that can only discharge patients after the pressure ulcer has healed.

If the prevention and treatment protocols are of low quality or compliance with these protocols is low, then it is likely that both the prevention and treatment of pressure ulcers will be sub-optimal. This may lead to patients experiencing their pressure ulcers for a longer period of time. These patients will then be more likely to be identified during a prevalence survey and hence prevalence may be high.

Incidence is also affected by discharge practices. For example, a hospital that discharges patients within a few days, i.e., before pressure ulcers have a chance to develop, is likely to have a lower incidence than a hospital that admits patients for a longer period of time. It is generally assumed (although unproven) that pressure damage may first appear 3 to 5 days after the insult to the skin and soft tissues occurred. In patients with a length of stay of, for example only 3 days, pressure damage may have occurred but not yet be visible. These pressure ulcers would not be registered, resulting in a lower incidence rate (both the incidence density and the cumulative incidence will be lower).

If the prevention protocol is of low quality or the compliance with good protocols is poor, then preventive care may not be optimal and therefore incidence may be higher. As patients with an existing ulcer but who develop additional pressure ulcers may be included in incidence studies, then adherence to treatment protocols may also influence incidence. Where a pressure ulcer heals quickly due to staff compliance with a high quality treatment protocol, it is possible that a pressure ulcer may then re-occur on the previously injured site and this may then be counted as a 'new' ulcer. This illustrates the complexity of determining which pressure ulcers, and which patients, to include in any incidence monitoring project.

Both prevalence and incidence are influenced by the case mix of the institution. While variations may arise it is likely that where two institutions provide identical preventative care then the centre with more patients at high risk of developing pressure ulcers may have a higher incidence of pressure ulcers. In the previous example the prevalence of pressure ulcers within the centre with more high risk patients may also be higher but this indicator will be susceptible to the admission of patients with pre-existing pressure ulcers.

Practical issues related to the collection of prevalence and incidence data

Measuring incidence rates requires a longitudinal design and in consequence such studies are likely to be more labour intensive, and hence more costly than would be a point prevalence survey.

The frequency of patient observation to record incidence of new pressure ulcers may depend upon the care setting, but it is likely that in acute care daily observation of the skin would be required. Regardless of whether incidence or prevalence is to be recorded the accuracy of the submitted data needs to be assessed.

Despite the fact that many studies have been performed in various countries to record incidence and (primarily) prevalence, comparison between this data are extremely re-

stricted given factors such as the use of different pressure ulcer classification systems, incomparable patient groups, small samples and differences in data sources.[2–4] Therefore, data must always be examined in light of the specific study methodology.[2] Appendix 1 gives some practical suggestions for measuring prevalence and incidence.

The selection of either prevalence or incidence data as a means of illustrating the occurrence of pressure ulcers should be made following a detailed consideration of the strengths and limitations of both epidemiological measures.

The European Pressure Ulcer Advisory Panel considers that measuring pressure ulcer incidence is the most appropriate approach if the goal is to understand how the introduction of new protocols and interventions has affected the number of patients with pressure ulcers or to predict pressure ulcers or develop and evaluate risk assessment scales. Where the goal is to identify the current size and characteristics of the pressure ulcer affected population, then prevalence may be more appropriate.

Reference list

1. Rothman K. and Greenland S. *Modern Epidemiology.* Second Edition. Philadelphia: Lippincott Williams & Wilkins, 1998.
2. National Pressure Ulcer Advisory Panel. *Pressure Ulcers in America: Prevalence, Incidence, and Implications for the Future.* Cuddigan J, Ayello EA, Sussman C, editors. 2001. Reston, VA, NPUAP.
3. Allman RM. Pressure ulcer prevalence, incidence, risk factors, and impact. *Clin Geriatr Med* 1997; 13(3): 421–436.
4. van-Rijswijk L. Epidemiology. In: Morison M, editor. *The Prevention and Treatment of Pressure Ulcers.* London: Mosby, 2001: 7–15.
5. Defloor T, Bours G, Schoonhoven L, and Clark M. Prevalence and incidence monitoring. Draft EPUAP Statement on prevalence and incidence monitoring. *EPUAP Review* 2002; 4(1): 13–15.
6. Bours, G. J., Halfens, R. J., Lubbers, M. and Haalboom, J. R. (1999). The development of a national registration form to measure the prevalence of pressure ulcers in The Netherlands. *Ostomy/Wound Management*, 45, 28–8, 40.

Appendix 1: Practical recommendations for measuring both pressure ulcer prevalence and incidence

OVERVIEW

1) Pressure ulcer definitions.

2) Preparation.

a. Purpose
b. Duration.
c. Frequency.
d. Size of population.
e. Inclusion and exclusion criteria.
f. Ethical approval
g. Data collection forms.
h. Education.
i. Data collection and reliability
j. Data handling and analysis.
k. Cost.
l. Awareness.
m. Bench-marking.
n. Assessing quality.

3) Reporting of pressure ulcer incidence and prevalence data.

a. General issues.
b. Specific issues related to the reporting of Incidence data.

1) Pressure ulcer definitions.

- It is recommended to use the EPUAP classification system for assessing the severity of pressure ulcers.
- Grade 1 pressure ulcers should be recorded as 'warning signals', but not included in the calculation of either prevalence or incidence rates.
- Blue/black heels would be recorded as grade 4 pressure ulcers.
- The incidence or prevalence of pressure ulcer lesions (grade 2, and a combined total of grade 3 or grade 4) should be reported.
- Clinical incidents would be defined as those individuals who develop grade 3 or grade 4 pressure ulcers.

2) Preparation.

a. Purpose

- All care settings should define their prevalence of pressure ulcers at least 4 times each year.
- Incidence data should only be collected where
  - ✔ information is required to solve a problem (prevalence too high when compared with existing data or other care providers);
  - ✔ to evaluate the effectiveness of preventive care;
  - ✔ to evaluate risk assessment tools.

Always bear in mind why pressure ulcer occurrence data is being collected – this question will influence both the selection of method (prevalence or incidence) and the variables that need to be collected

b. Duration.

Incidence data collection should be time-limited with data being collected for 4 to 8 weeks only. This 1 to 2 month incidence monitoring should occur whenever prevalence or incident data indicates that there may be a problem. Longer-term incidence recording may not be beneficial due to a probable reduction in data quality as time passes. While it may be superficially attractive to undertake long-term incidence recording using electronic patient records the reliability of this data source with the potential for under-reporting of pressure ulcers is apparent.

Follow-up

Patients included in data collection should be observed during the total follow-up time. If a patient develops a pressure ulcer, data collection continues until the end of follow-up time, in order to collect information about the course of the pressure ulcer. However, if this patient develops a

pressure ulcer on another location this is not counted in the incidence measurement again, i.e. a patient can only be counted once.

c. Frequency.

When considering acute care, it may be considered to be a general rule that the less frequently patients are observed, the less reliable the collected incidence data becomes. Incidence should be recorded at least daily in acute care (and probably more frequently in areas such as intensive care). In non-acute care incidence should be recorded on each occasion that the client is seen by a health professional in combination with family/carer education where they are asked to call the relevant health professional if they see a break in the skin.

d. Size of population.

It is unlikely that reliable incidence data will be gathered across an entire facility. In acute care incidence should be recorded at ward level with further input required to clarify the appropriate unit of data collection in non-acute care settings.

Where incidence is being used to evaluate the effectiveness of preventive interventions or to develop or evaluate risk factors and risk assessment scales then the population to be included in the incidence monitoring should be dictated by power analysis.

e. Inclusion and exclusion criteria.

Clearly define the population to be surveyed before starting data collection.

All patients within the surveyed population should be included while monitoring incidence or prevalence. When measuring incidence, patients with an established pressure ulcer at the start of data collection will be excluded.

There should be few exclusion criteria as the ability to make general comments from the data will be diminished if multiple exclusion criteria are used.

f. Ethical approval

Formal research ethics approval appears unnecessary where prevalence data are collected or where incidence is being collected to help understand areas with high pressure ulcer prevalence. Research ethics approval will be required where incidence is being used to evaluate the effectiveness of interventions.

g. Data collection forms.

The data collection form needs to include the outcome measure – pressure ulcer development – along with data gathered to enable standardisation of the incidence or prevalence rates – for example age, risk, continence.

The identification of preventive care interventions would also be appropriate although these would have to be grouped generically. In general the greater the number of data items collected the higher the costs (financial and time) of the incidence monitoring and the lower the reliability of the data.

In incidence surveys, some of the information on the form will be collected once – age, sex. Some will be collected daily – pressure ulcer development; other elements will be collected on a regular (defined as when change in condition occurs) basis – risk, continence. Information upon admission and discharge locations, the anatomical location of the pressure ulcer and significant events such as 'has the patient been to the operating theatre or interventional x-ray' should be included.

h. Education.

Prior to incidence monitoring there is a need for training of staff to:

- classify pressure ulcers. It is essential that the assessors are able to distinguish a pressure ulcer lesion from other types of wounds, for instance incontinence damage, to prevent misclassification. Therefore observers should be trained in the classification of pressure ulcers (the use of the PUCLAS software may be useful). Interrater reliability should be checked and reported.
- complete the data collection forms appropriately.

i. Data collection and reliability

Inspect the pressure areas of each individual patient. Using medical or nursing records is not a very reliable method of data collection. Caregivers are not always aware of the existence of pressure ulcers. Use a transparent device for facilitating the assessment of grade 1 (non-blanchable erythema) (see figure 1).

In prevalence surveys, assessing the skin of the surveyed patients should be carried out by two observers working independently; ideally one of the observers should not be a

Figure 1. Transparent device

Figure 1: transparent device

staff member of the unit where the patient is located. This has proven to be a reliable method.[6]

In incidence surveys, it would be ideal if two independent observers were to assess the skin of each patient, but this is unlikely to be practical. The reliability of data could be quantified through unannounced visits from a third-party (specialist nurse for example) with ward nurses aware that at least one visit will take place within the 4 weeks of data collection. If the third-party sees a random sample of patients then inter-observer reliability could be calculated.

The use of preventive interventions should be recorded during prevalence and incidence surveys; it is important to note which devices are in place at the bedside or chair of each surveyed patient to have the possibility to evaluate the compliance with the pressure ulcer protocol (prevalence and incidence) or to evaluate the effectiveness of preventive or therapeutic measures (incidence). Data on position changes should be gathered from questioning patients and/or the nurse. Not all preventive measures used are reported in records while not all preventive measures mentioned in the medical and/or nursing records are used as prescribed.

j. Data handling and analysis.

Data handling and analysis should be decided upon before collecting data. It may be helpful to plan a short pilot study to test handling and processing of data prior to the first time incidence is collected within a health care facility.

k. Cost.

The cost of incidence recording may be high as the number of variables rises. Incidence should only be measured where and when it is necessary otherwise use prevalence surveys to monitor pressure ulcer occurrence.

l. Awareness.

There may be a Hawthorne effect upon informing staff that incidence is going to be recorded. This may be monitored by comparing each ward's incidence data with the previously collected prevalence data.

m. Bench-marking.

This is attractive to many health care professionals and institutions. However, without standardization of the data this is meaningless and even with standardization interpretation can be challenging.

n. Assessing quality.

There are currently no agreed levels of pressure ulcer incidence that mark good or bad quality care. It was recommended that in time EPUAP should conduct a pilot study of pressure ulcer incidence to establish baseline data.

3) Reporting of pressure ulcer incidence and prevalence data.

a. General issues.

In all cases the population surveyed should be fully described in any report or publication; this facilitates comparison with other pressure ulcer epidemiological data. Among the items that may be described are patient ages, gender, vulnerability to developing pressure ulcers, mobility, activity, expected length of stay and care location (acute, non-acute, and specific populations such as intensive care).

Pressure ulcer incidence and prevalence data should be based upon the number of patients with pressure ulcers. If any individual has more than one pressure ulcer, that person is counted only once.

The data should be reported in two formats; the first including all pressure damage (including areas of non-broken skin), the second excluding grade 1 pressure ulcers and so reporting only areas where the skin was broken (pressure ulcer lesions: grade 2, 3 or 4).

Comparison of results (be they incidence or prevalence) between different care providers or within a single provider over time should be done with caution (if at all). In any comparison patient characteristics and case mix should be taken into account.

b. Specific issues related to the reporting of Incidence data.

It is possible that those pressure ulcers that develop during the first few days that a patient is being monitored were the result of excessive tissue loading prior to the entry into their current care location. Always remember that both prevalence and incidence are calculated upon the number of people who have or develop pressure ulcers and not upon the number of pressure ulcers they may develop! So a person who develops several pressure ulcers over a period of time would only be counted once in calculations of prevalence or incidence.

4) Quality indicators.

a. Prevalence indicators

- Number of patients with pressure ulcers
  * *The number of patients with pressure ulcers*

$$PUPI = \frac{P_{PU}}{P_{TOT}} * 100$$

PUPI = Pressure ulcer prevalence indicator
P_{PU} = Number of patients on the ward/institution with pressure ulcers grade 2 or higher
P_{TOT} = Number of patients on the ward/institution
Norm = Depends on type of patient/ward and prevention strategy

  * *The number of patients with a pressure ulcer at the heels*

$$HPUPI = \frac{P_{HEEL}}{P_{TOT}} * 100$$

HPUPI= Pressure ulcer at heels prevalence indicator
P_{HEEL} = Number of patients with pressure ulcer grade 2 or higher at the heels (patients are only counted once even if bilateral heel ulceration)
P_{TOT} = Number of patients on the ward /institution
Norm = 0%

- Protocol
  * *The number of patients at risk, receiving adequate preventive measures*

    Patients at risk are those patients with pressure

ulcer (grade 1, 2, 3 or 4), when non-blanchable erythema is used as risk assessment method. When using a risk assessment scale, patients at risk are those patients with a risk score according to the risk assessment scale or with existing pressure ulcers.

° *Total prevention*

$$PPI = \frac{P_{PREV}}{P_{RIS}} *100$$

PPI = Prevention prevalence indicator
P_{PREV} = Number of patients at risk receiving adequate prevention while lying or sitting
P_{RIS} = Number of patients at risk on the ward/institution
Norm = 100%

° *Prevention while lying*

$$LPPI = \frac{P_{LY}}{P_{RIS}} *100$$

LPPI = Lying prevention prevalence indicator
P_{LY} = Number of patients at risk receiving adequate prevention while lying
P_{RIS} = Number of patients at risk on the ward /institution
Norm = 100%

° *Prevention while sitting*

$$SPPI = \frac{P_{SIT}}{P_{SRIS}} *100$$

SPPI = Sitting prevention prevalence indicator
P_{SIT} = Number of patients at risk receiving adequate prevention while sitting
P_{SRIS} = Number of patients at risk on the ward/institution, sitting up in a seat, at a chair or wheelchair
Norm = 100%

b. Incidence-indicators

The starting point is the cumulative incidence. Incidence density is calculated by dividing the number of patients by the total period of follow-up (see earlier).

- Number of patients with pressure ulcers

  Patients with pressure ulcers at admission will not be included as long the pressure ulcer(s) is (are) not healed.

  * *Number of patients developing pressure ulcers*

$$PUII = \frac{P_{PU}}{P_{TOT}} *100$$

PUII = Pressure ulcer incidence indicator
P_{PU} = Number of patients on the ward/institution developing pressure ulcers grade 2 or higher during the observation period
P_{TOT} = Number of patients admitted to the ward/ institution during the observation period
Norm = Depends on type of patient/ward and prevention strategy

* *Number of patients developing pressure ulcers at the heels*

$$HPUII = \frac{P_{HEEL}}{P_{TOT}} *100$$

HPUII = Pressure ulcer at heels incidence indicator
P_{HEEL} = Number of patients on the ward/institution developing pressure ulcers grade 2 or higher at the heels during the observation period
P_{TOT} = Number of patients admitted to the ward/ institution during the observation period
Norm = 0%

- Protocol

  * *Number of patients receiving permanent (24 at 24 hours) adequate preventive measures*

  Patients at risk are those patients with pressure ulcer (grade 1, 2, 3 or 4), when non-blanchable erythema is used as risk assessment method. When using a risk assessment scale, patients at risk are those patients with a risk score according to the risk assessment scale or with existing pressure ulcers.

  ° *Total prevention*

$$PII = \frac{P_{PREV}}{P_{RIS}} *100$$

PII = Prevention incidence indicator
P_{PREV} = Number of patients at risk receiving permanent adequate prevention in bed or seat/chair during the observation period
P_{RIS} = Number of patients at risk on the ward/institution during the observation period
Norm = 100%

° *Prevention while lying*

$$LPII = \frac{P_{LY}}{P_{RIS}} *100$$

LPII = Lying prevention incidence indicator
P_{LY} = Number of patients at risk receiving permanent adequate prevention while lying in bed during the observation period
P_{RIS} = Number of patients at risk on the ward/institution during the observation period
Norm = 100%

° *Prevention while sitting*

$$SPII = \frac{P_{SIT}}{P_{SRIS}} *100$$

SPII = Sitting prevention incidence indicator
P_{SIT} = Number of patients at risk receiving permanent adequate prevention while sitting in seat/chair during the observation period
P_{SRIS} = Number of patients at risk on the ward/institution, sitting up in a seat, at a chair or wheelchair
Norm = 100%

* *Number of patients with pressure ulcers increasing in grade and/or becoming more serious which requires adaptation of the preventive measures*

$$APII = \frac{P_{ADAP}}{P_{PUE}} *100$$

APII = Adaptation prevention incidence indicator
P_{ADAP} = Number of pressure ulcer patients requiring adaptation of the preventive measures after the increase of pressure ulcers in grade or seriousness
P_{PUE} = Number of patients with pressure ulcers on the ward/institution where an increase of pressure ulcers in grade or seriousness was stated during the observation period
Norm = 100%

* *Number of patients where information on necessary preventive measures at home was giving to family members and primary care professionals (before discharge)*

Patients at risk are those patients with pressure ulcer (grade 1, 2, 3 or 4), when non-blanchable erythema is used as risk assessment method. When using a risk assessment scale, patients at risk are those patients with a risk score according to the risk assessment scale or with existing pressure ulcers.

$$DISII = \frac{P_{INF}}{P_{DIS}} *100$$

DISII = Discharge incidence indicator
P_{INF} = Number of patients at risk on the ward/institution where information on necessary preventive measures at home was given at family members or primary care or other health care professionals (before discharge)
P_{DIS} = Number of patients at risk on the ward/institution who were as discharged
Norm = 100%

* *Number of patients developing pressure ulcers despite the preventive measures*

Prevention: this can be a specific preventive material or the total prevention strategy

$$DPII = \frac{P_{DPREV}}{P_{PREV}} *100$$

DPII = Effect prevention incidence indicator
P_{DPREV} = Number of patients developing new pressure ulcers grade 2 or higher despite permanent adequate prevention
P_{PREV} = Number of patients on the ward/institution receiving permanent adequate prevention
Norm = Depends on type of patient/ward and prevention strategy

EUROPEAN PRESSURE ULCER ADVISORY PANEL

EPUAP Statement

Pressure Ulcer Classification Differentiation between Pressure Ulcers and Moisture Lesions

Defloor T., Schoonhoven L., Fletcher J., Furtado K., Heyman H., Lubbers M., Lyder C. and Witherow A.

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Bale S., Bellingeri A., Cherry G., Clark M., Colin D., Dassen T., Dealey C., Gulacsi L., Haalboom J., Halfens R., Hietanen H., Lindholm C., Moore Z., Romanelli M., Verdu J.

A Pressure Ulcer is an area of localised damage to the skin and underlying tissue caused by pressure or shear and or a combination of these.

The identification of pressure damage is an essential and integral part of clinical practice and pressure ulcer research. Pressure ulcer classification is a method of determining the severity of a pressure ulcer that is also used to distinguish pressure ulcers from other skin lesions. A classification system describes a series of numbered grades or stages each determining a different degree of tissue damage.

The European Pressure Ulcer Advisory Panel (EPUAP) defined four different pressure ulcer grades (see Table 1).

Non-blanchable erythema should be considered as an alarm signal that pressure and shear are causing tissue damage and preventive measures should be taken without delay to prevent the development of pressure ulcer lesions (grade 2, 3 or 4).

The diagnosis of the existence of a pressure ulcer is more difficult than one commonly assumes. There is often confusion between a pressure ulcer and a lesion that is caused by the presence of moisture, for instance because of incontinence of urine and/or faeces. The differentiation between the two is of clinical importance since prevention and treatment strategies differ largely and the consequences of the outcome for the patient are of imminent importance.

This statement on pressure ulcer classification is limited to the differentiation between pressure ulcers and moisture lesions. Obviously there are numerous other lesions that might be misclassified as a pressure ulcer (e.g., leg ulcer, diabetic foot). Previous experience has shown that, due to the location of moisture lesions, these lesions are the ones most often misclassified as pressure ulcers (2–3).

Wound related characteristics (causes, location, shape, depth, edges, and colour) and patient related characteristics are helpful to make a differentiation between a pressure ulcer and a moisture lesion (see Tables 2 and 3).

Table 1: EPUAP Classification (1)

Grade	Short description	Definition
Grade 1	Non-blanchable erythema of intact skin	Non-blanchable erythema of intact skin. Discolouration of the skin, warmth, oedema, induration or hardness may also be used as indicators, particularly on individuals with darker skin.
Grade 2	Blister	Partial thickness skin loss involving epidermis, dermis, or both. The ulcer is superficial and presents clinically as an abrasion or blister.
Grade 3	Superficial ulcer	Full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through, underlying fascia.
Grade 4	Deep ulcer	Extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures with or without full thickness skin loss.

Table 2: Wound Related Characteristics

	Pressure ulcer	Moisture lesion	Remarks
Causes	Pressure and/or shear must be present.	Moisture must be present (e.g. shining, wet skin caused by urinary incontinence or diarrhoea)	If moisture and pressure/shear are simultaneously present, the lesion could be a pressure ulcer as well as a moisture lesion (combined lesion).
	Pressure ulcer	**Moisture lesion**	**Remarks**
Location	A wound not over a bony prominence is unlikely to be a pressure ulcer.	A moisture lesion may occur over a bony prominence. However, pressure and shear should be excluded as causes, and moisture should be present. A combination of moisture and friction may cause moisture lesions in skin folds. A lesion that is limited to the anal cleft only and has a linear shape is no pressure ulcer and is likely to be a moisture lesion. Peri-anal redness / skin irritation is most likely to be a moisture lesion due to faeces.	It is possible to develop a pressure ulcer where soft tissue is compressed (e.g., by a nutrition tube, nasal oxygen tube, urinary catheter). Wounds in skin folds of bariatric patients may be caused by a combination of friction, moisture and pressure. Bones may be more prominent where there is significant tissue loss (weight loss).
	Pressure ulcer	**Moisture lesion**	**Remarks**
Shape	If the lesion is limited to one spot, it is likely to be a pressure ulcer. Circular wounds or wounds with a regular shape are most likely pressure ulcers, however, the possibility of friction injury has to be excluded.	Diffuse, different superficial spots are more likely to be moisture lesions. In a kissing ulcer (copy lesion) at least one of the wounds is most likely caused by moisture (urine, faeces, transpiration or wound exudate).	Irregular wound shapes are often present in a combined lesion (pressure ulcer and moisture lesion). Friction on the heels may also cause a circular lesion with full thickness skin loss. The distinction between a friction lesion and a pressure ulcer should be made based on history and observation.
	Pressure ulcer	**Moisture lesion**	**Remarks**
Depth	Partial thickness skin loss is present when only the top layer of the skin is damaged (grade 2). In full thickness skin loss, all skin layers are damaged (grade 3 or 4). If there is a full thickness skin loss and the muscular layer is intact, the lesion is a grade 3 pressure ulcer. If the muscular layer is not intact, the lesion should be diagnosed as a grade 4 pressure ulcer.	Moisture lesions are superficial (partial thickness skin loss). In cases where the moisture lesion gets infected, the depth and extent of the lesion can be enlarged/deepened extensively.	An abrasion is caused by friction. If friction is exerted on a moisture lesion, this will result in superficial skin loss in which skin fragments are torn and jagged.

Table 2: Wound Related Characteristics

	Pressure ulcer	Moisture lesion	Remarks
Necrosis	A black necrotic scab on a bony prominence is a pressure ulcer grade 3 or 4. If there is no or limited muscular mass underlying the necrosis, the lesion is a pressure ulcer grade 4. Necrosis can also be considered present at the heel when the skin is intact and a black/blue shimmer is visible under the skin (the lesion will most likely evolve into a necrotic escar).	There is no necrosis in a moisture lesion.	Necrosis starts without a sharp edge, but evolves into sharp edges. Necrosis softens up and changes colour (e.g. blue, brown, yellow, grey), but is never superficial. Distinction should be made between a black necrotic scab and a dried up blood blister.

	Pressure ulcer	Moisture lesion	Remarks
Edges	If the edges are distinct, the lesion is most likely to be a pressure ulcer. Wounds with raised and thickened edges are old wounds.	Moisture lesions often have diffuse or irregular edges.	Jagged edges are seen in moisture lesions that have been exposed to friction.

	Pressure ulcer	Moisture lesion	Remarks
Colour	***Red skin:*** If redness is non-blanchable, this is most likely a pressure ulcer grade 1. For people with darkly pigmented skin persistent redness may manifest as blue or purple. ***Red in wound bed:*** If there is red tissue in the wound bed, the wound is either a grade 2, a grade 3 or a grade 4 pressure ulcer with granulation tissue in wound bed; ***Yellow in wound bed:*** Softened necrosis is yellow and not superficial; it is either a grade 3 or a grade 4 pressure ulcer. Slough is a creamy, thin and superficial layer; it is a grade 3 or a grade 4 pressure ulcer. ***Black in the wound bed:*** Black necrotic tissue in the wound bed indicates a pressure ulcer grade 3 or grade 4.	***Red skin:*** If the redness is not uniformly distributed, the lesion is likely to be a moisture lesion ***Pink or white surrounding skin:*** maceration due to moisture.	***Red skin:*** If the skin (or lesion) is red and dry or red with a white sheen, it could be a. o. a fungal infection or intertrigo. This is often observed in the anal cleft. ***Green in wound bed:*** Infection. Be aware that zinc oxide ointments may result in whitened skin. Whilst eosine is not recommended, it is still used in some areas. It will turn the skin red/brown and obstruct the observation of the skin.

Table 3: Patient Related Characteristics

Try to find out the causes of the lesion:

Check the (wound) history in the patient record

- If the lesion commenced as a large and deep lesion, it is unlikely that it is a moisture lesion.
- If the lesion developed after a long period of pressure and/or shear (e.g., surgery, emergency department, radiology), even if the pressure and/or shear are not currently present, it is likely the lesion is a pressure ulcer.

Which measures are taken/ what care is provided?

- Superficial linear lesions are often caused by removing sticking plaster and are neither pressure ulcers nor moisture lesions.
- If the pressure ulcer does not improve despite pressure relieving measures and suitable dressings for more than 7 to 10 days, and moisture is present, consider the possibility that the lesion is a moisture lesion.
- If the moisture lesion does not improve despite the use of skin barrier products and incontinence/moisture management for more than two days, and pressure and/or shear is present, consider the possibility that the lesion is a pressure ulcer. Exclude the possibility of contact sensitivity (e.g., latex allergy). A dermatological consultation is recommended when in doubt about the diagnosis of contact allergy.

What is the skin condition at the different pressure points?

- If a pressure ulcer is present at another pressure point, it is likely this new lesion is also a pressure ulcer

Check whether the movements, transfers and position (changes) of the patient, may have caused the lesion.

- If the affected area is a pressure point, a pressure ulcer is likely.
- If the affected area is not a pressure point, it is unlikely that the lesion is a pressure ulcer.
- If friction is exerted on a moisture lesion, this will result in superficial skin loss in which skin fragments are torn and jagged
- Continuous friction causes abrasions
- If shear deforms the superficial and deeper tissue layers, a pressure ulcer may be the result.
- If a lesion occurs on the heel, check if the lesion was caused by:
  a) pressure and/or shear => likely a pressure ulcer,
  b) movement/transfer/shoes => likely a friction lesion/abrasion not pressure ulcer.

If a patient is incontinent, consider whether the lesion is a moisture lesion or not.

- If skin barrier products are used in patients who are incontinent, then the chance that a new lesion is a moisture lesion is limited.
- If diapers or incontinence pads are often saturated, consider possibility of a moisture lesion.

Exclude other possible causes.

- Sometimes it can be difficult to differentiate between a moisture lesion and an infection (e.g., candida intertrigo), also characterised by irregular edges and satellite lesions ('islands in front of the coastline'). In these cases the clinical picture (fever, leucocytosis) should differentiate from moisture lesions.
- Other dermatological conditions should be considered when in doubt about the diagnosis of pressure ulcer or moisture lesion. A dermatological consultation is then recommended.

Table 3: Patient Related Characteristics

Additional parameters

Texture of the skin

- Dead tissue feels dry / leathery and not pliable.

Temperature of the skin

- Compare the temperature of the skin at the pressure point with the temperature of the surrounding skin. This may also be an indicator for detecting grade 1 pressure ulcer in patients with a darkly pigmented skin.
    a) If the temperature is higher than that of the surrounding skin, hyperaemia is present and the lesion is recent.
    b) If the temperature is lower than that of the surrounding skin, the blood flow is limited and the lesion is not recent.

Pain

- Pain is described in 37% to 87% of the patients with pressure ulcers.[4] Therefore pain is not a discriminating characteristic for pressure ulcers.
- Pain is caused:
    a) by irritation of the sensory nerve endings in and around the ulcer;
    b) when the wound is debrided;
    c) when aids are applied too tightly (e.g., tubes, drains);
    d) when dressings rub against the surface of the wound;
    e) when dressings that stick to the wound surface are removed.
- Patients with pressure ulcers experience both acute and chronic pain and describe the sensation as burning, stinging, sharp, stabbing and tingling.

References

1 European Pressure Ulcer Advisory Panel (1999) Guidelines on treatment of pressure ulcers. *EPUAP Review* 1, 31–33.

2 Defloor, T. De Bacquer, D.D., and Grypdonck, M.H. (2005). The effect of a pressure reducing mattress on turning intervals in geriatric patients at risk of developing pressure ulcers. *International Journal of Nursing Studies*, 42(1): 37–46.

3 Defloor, T. and Schoonhoven, L. (08/13-07-2004) Interrater and intrarater reliability of the EPUAP pressure ulcer classification system. In (pp. 56). *Paris: 2nd World Union of Wound Healing Societies' Meeting.*

4. De Laat HEW, Scholte op Reimer WJM, and van Achterberg T. (2005) Pressure ulcers: diagnostics and interventions aimed at wound-related complaints: a review of the literature. *Journal of Clinical Nursing*, 14: 464–472.