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.

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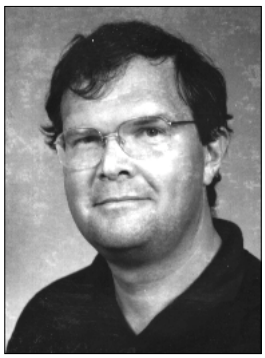
LETTER FROM THE PRESIDENT



Dr Jeen Haalboom

THERE are two things I want to share with you in this message. EPUAP discovered America in June and the forthcoming Pisa conference will be a success – as usual.

Our American counterpart (The National Pressure Ulcer Advisory Panel) invited Michael Clark and myself to participate in a meeting in New York University Medical School in late June 2000. This meeting was organised to exchange opinions and insights about pressure ulcers from North America, Europe, The Middle East, Japan and Korea. The American pressure ulcer guidelines are to be reviewed by the NPUAP in the coming year and so an exchange of opinions was most useful, especially about how we develop our programmes and guidelines.

During the meeting, we presented lectures about debridement and dressings (Michael) and about mattress overlays and risk assessment tools (myself). The presence of Barbara Braden made the discussions about the use of risk assessment tools exciting and serious as well. Our participation in this meeting certainly marks the initiation of long lasting cooperation between the EPUAP, the NPUAP and the other pressure ulcer organisations worldwide. Officials of the NPUAP will visit our conference in Pisa next month and it is quite possible that a similar meeting to that organised in the United States will be repeated perhaps on a yearly basis.

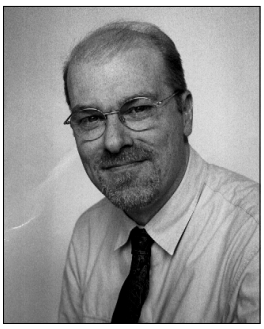
The next conference in Pisa is only six weeks away. The programme is dedicated to discussion of the technology around pressure ulcers with various clinical and scientific themes. One key event in Pisa will be the reports provided by four working groups created last year in Amsterdam. These groups will report their deliberations upon the laboratory and clinical evaluation of support surfaces, the effects of pressure upon skin and soft tissue and finally, and perhaps of greatest import, the EPUAP pressure ulcer prevalence project.

For next year's conference (2001), conference themes are already coming up and in particular risk assessment. Also a potential highlight for 2001 will be presentations from the members of the European Pressure Ulcer Research Group(EPURG), a new group of rather young researchers drawn from members of EPUAP.

See you in Pisa, the city where pressure and friction not only caused a leaning tower but also a great university and the interest of the whole world.

Jeen Haalboom
President

LETTER FROM THE RECORDER



Professor Gerry Bennett

WELCOME to Pisa and the 4th EPUAP Open Meeting. The beauty of the host city will, we know, be balanced by the strength of the Scientific Programme. The conference theme is: Pressure Ulcers – Technology in the New Millennium. The programme aims to inform and educate in many new areas including; telemedicine, tissue engineering, cell biology, support surface technology as well as providing a unique European perspective on current research, audit and education tools. A record number of free papers (in both English and Italian) and posters will add to the impressive knowledge base. Delegates will be able to update their skills in debridement, dermatology, risk assessment tools as well as attending lectures that focus on the important issues of physical therapy and the importance of seating.

When the mind is full, feed the body in the Techno Cafe' and other venue eateries, and at the end of the academic days feed the soul and body by attending the spectacular social events in an ancient monastery and a sea edge restaurant. At the close of the conference the beauties of Pisa have been laid on in a guided tour.

The EPUAP conferences have a reputation for being the 'friendly' wound care event of the year. Meet old friends, make new ones and, metaphorically, bathe in the science and art this conference has to offer.

This conference would not be possible without the considerable input from many people. We would like to thank the Local organisers, the EPUAP Business Office, The Recorder's Office, the EPUAP Executive, our Technical Advisors, the Corporate Sponsors, Chairs of Sessions, Oral and Poster Presenters and, last but not least, you the delegates who make the event so enjoyable.

Gerry Bennett
Recorder

Letter from the Editor

EDITORIAL

Dr Michael Clark

IT is now mid-summer and this edition of the *EPUAP Review* is being completed to allow for its publication to coincide with the forthcoming 4th Open Meeting of the European Pressure Ulcer Advisory Panel, to be held in Pisa, Italy. This meeting promises to live up to the excellent reputation of the previous annual meetings – with a lively mixture of scientific and clinical presentations and, of course, a series of enjoyable social events! I look forward to meeting you in Pisa.

One of the key activities of the European Pressure Ulcer Advisory Panel this year has been the initiation of a project designed to measure the prevalence of pressure ulcers across European hospitals in a consistent manner. Such an initiative has been required for some time – many events and conferences enter relatively meaningless debates regarding whether pressure ulcers are a bigger problem in one country, or in one region of a country than in surrounding areas. These discussions have always been flawed by the lack of consistency in data collection and reporting methods between studies. By tackling the development of a common data set the EPUAP hopes to provide the first comparison of a common risk-adjusted data set that highlights the prevalence of pressure ulcers across Europe. The first stages of this ambitious programme are discussed within this issue of the *EPUAP Review*.

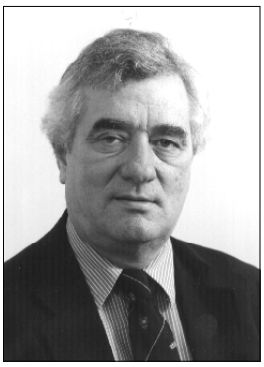
Included in the last issue of the *EPUAP Review* was a list of references related to the laboratory evaluation of support surfaces. The compilation and publication of such reference lists appears to find favour with readers and, as such, a further list of references is offered in this issue. This covers issues related to local treatment of pressure ulcers, particularly the role of ulcer debridement and the use of wound dressings. If there are topics you would like to see covered in such reference lists please do not hesitate to contact the EPUAP Business Office and we will try and cover these areas in future issues of the *Review*.

Our President, Jeen Haalboom, and I have recently returned from a meeting held in the United States devoted to those common issues related to pressure ulcers that affect all developed countries – for example epidemiology, risk assessment, the use of support surfaces and local treatments. The major topics of the meeting are discussed in this issue of the *EPUAP Review*.

Once again I would encourage all EPUAP members to consider contributing to the *Review* – be it a short report of a recent meeting, an outline of ongoing or recent research, or developments in clinical practice. The more we exchange information the better our understanding of the issues related to pressure ulcer prevention and treatment will become. This is such an obvious statement, but it does depend upon members sharing their news!

Michael Clark
Editor

BUSINESS OFFICE – EPUAP SERVICES



Dr George Cherry

OUR Annual Meeting this year in Pisa, Italy, is as Gerry Bennett states in his letter in this issue, shaping up to be one of the most successful and exciting meetings in our short history. This is due to the hard work of Gerry Bennett, our Recorder, and the local organizing committee: Prof Paolo Barachini, Prof Gregorio Cervadoro, Dr Marco Romanelli and Mrs Graziana Battaglia; and backed up by support from the EPUAP Business Office.

Our membership continues to grow. The benefits of EPUAP membership include a reduction in registration fee at the annual meeting as well as receiving the *EPUAP Review* three times per year. Mike Clark the editor has worked hard to make this publication informative and stimulating, as can be seen by the variety of subjects covered in this issue.

The EPUAP Business Office has been involved in the co-ordinating of a number of events, particularly in the setting up of the Prevalence Study in January which has made real progress, as reported by Mike Clark in this issue. Reports on the main working groups within the EPUAP: Laboratory evaluation of support surfaces, by Alastair McLeod; Clinical evaluation of support surfaces, by Jeen Haalboom; and the Prevalence project – Minimum Data Set, by Gerrie Bours, will be given at the Pisa meeting.

We would like to make our website more interactive and would encourage people to visit the site: **http://www.epuap.org** and send their comments via e-mail to: **EuropeanPressureUlcerAdvisPanel@compuserve.com** at the EPUAP Business Office.

The guidelines continue to be a great success and requests are received daily to our office for these. 5000 Italian Guidelines have been distributed and the German and Swedish Guidelines are now in the final stages of publication. We have just heard from Elaine Pina, our Trustee from Portugal, that the EPUAP Treatment Guidelines have now been published in Portuguese.

We look forward to seeing you at Pisa at the EPUAP stand.

George Cherry
Secretary/Treasurer

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EUROPEAN PRESSURE ULCER ADVISORY PANEL

Abstracts from the New York Meeting, June 2000

THE STATE OF PRESSURE ULCERS AROUND THE WORLD: COMMON PROBLEMS AND SOLUTIONS

Report of a Meeting held in New York University Medical Center, 23–24 June 2000

PRESSURE ulcers are a world-wide problem, at least within developed countries with large populations of elderly people. This meeting focused on the common problems faced by all developed health care systems when tackling the prevention and treatment of pressure ulcers. Organized by the Center for Continuing Education in Nursing (New York University) and sponsored by Smith & Nephew, and Ross Products Division (Abbott Laboratories Inc); the meeting provided a forum for discussions between the EPUAP, the US National Pressure Ulcer Advisory Panel (NPUAP) and the Japanese Pressure Ulcer Society.

Over two days, panels of invited speakers debated the common challenges within prevention and treatment of pressure ulcers. On the first day attention focused upon prevention with three principal topics: risk assessment, guidelines for support surface use, and nutritional care. The second day discussed treatment ranging from methods of debridement, ulcer cleansing and dressing, the measurement of healing and the role of complementary therapies. Throughout the lengthy discussion periods over the two days it was clear that we all face similar challenges that are often exacerbated by the structure of the health care systems within which we work. Increasing communication between the various national and supra-national pressure ulcer groups is vital if we are going to best learn from each other's initiatives and mistakes, and so develop a universal understanding of what constitutes the causes of pressure ulcers and what represents the best clinical practices in both prevention and treatment. The meeting organised in New York provided the first opportunity for such dialogue to take place between pressure ulcer organisations. Perhaps the EPUAP should consider hosting a follow-up meeting say in two years time?

Selected abstracts from the 'State of Pressure Ulcers around the World' meeting are reproduced below, with permission.

RISK ASSESSMENT: WHICH TOOL SHOULD YOU USE

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In this age of enlightened and educated nurses, we should be using evidence to fashion our practice. However, there is sometimes confusion around the type of evidence that is required for specific types of nursing practice or interventions. In considering a tool for determining risk for pressure ulcer development, there are several types of evidence that one must consider. Reliability and validity are important issues. Paper and pencil rating scales have the best reliability and validity in relationship to risk for pressure ulcer development. With these types of scales, we must be concerned with both construct and predictive validity as well as interrater reliability. Construct validity will be reviewed for the three most commonly used risk assessment scales and the studies performed to determine interrater reliability and predictive validity of the Braden Scale will be summarized. In addition, evidence related to clinical utility is important. A tool that has good clinical utility is able to demonstrate ease of use as well as improved outcomes and decreased or neutral costs with use.

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* *research reports related to tests of reliability and validity.*
† *details considerations m assigning specific subscale scores.*

RISK ASSESSMENT OF PRESSURE ULCER FOR BEDFAST ELDERLY IN JAPAN

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One of the problems with pressure ulcers facing elderly Japanese patients is that 60% of all cases[1] extend to stage III or IV which are full-thickness wounds. Furthermore, the decrease in tissue tolerance amongst elderly patients augments patients' discomfort and leads to a lesser quality of life. The lengthy period required to cure increases the caregiver's burden as well as increasing the cost of pressure ulcer healing. To resolve this problem, we need to better predict the development of pressure ulcers. In this presentation, I introduce risk assessment of pressure ulcer based on our laboratory research, and discuss the future issues of risk assessment for the elderly.

Topics to be discussed:

1. **Epidemiological Data in Japan**
   Prevalence of facilities and the homecare setting
   Frequency distribution stages of Pressure Ulcers (PU)
2. **Introduction of the Braden Scale in Japan**
   Sensitivity and specificity of the Braden Scale at Kanazawa University Hospital
   The incidence of PU before and after introducing the Braden Scale
3. **Discovery of a New Risk Factor in Japan**
   Evaluation of elderly risk factors in Japan
   Relationship between Extreme Bony Prominence (EBP) and PU development
   How to measure the EBP
4. **Future Issues of Risk Assessment in Japan**
   Considering a two-step risk assessment
   Step 1. Underlying factors
   Step 2. Trigger factors
   Considering EBP as a new risk factor

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SOME REMARKS ABOUT OVERLAYS IN THE PREVENTION AND TREATMENT OF PRESSURE ULCERS

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In this paper some aspects about overlays used in the prevention (and treatment) of pressure ulcers are discussed. The opinion of the EPUAP is given, followed by some reflections on pressure reduction and the development of tissue damage.

EPUAP made its first guidelines about prevention of PU in 1997[1]. Guidelines about treatment followed in 1998. In both, a model was used in which the available literature was judged following strict criteria of scientific proof. The literature was only reviewed starting in 1992, the year the NPUAP guidelines were published, in which an extensive overview of the literature until then was given. For overlays (mattresses, various types of air systems and air-fluidized bed systems) no specific advice was given; in the literature there were no investigations to be found justifying the use of a particular system. The scarce trials in which different overlays or bed systems were compared did not match the quality criteria. In the recent Cochrane survey on beds and overlays it is only stated that 'foam mattresses of at least 8 cm thick are better than standard mattresses and there is a tendency towards some better effects of air systems; it is considered to be proven that air fluidized systems perform best'.[2]

It is not easy to state which overlay should be used in prevention or treatment of pressure ulcers. In this paper some aspects about overlays are discussed; it is possible to approach the item from several views.

The easiest and least controversial approach is from the economical and logistical side. It not only concerns such aspects as lifetime, costs, and after-sales service from the manufacturer; but also the time between call and delivery, and the time between the recognition of a failure and reparation. Once inside the institution there are aspects such as cleaning, and the possibility of sterilization; since the MRSA (methicilline resistant *staphylococcus aureus*) occurs more often in hospitals, this aspect has become more important.

In Europe, foam mattresses are usually bought by an institution, but as a rule the more sophisticated systems, such as the newest low-air-loss systems and especially air-fluidized beds, are leased. Several investigations at institutional level showed that the process of cleaning and refilling these systems with new granules was too expensive and time consuming to undertake inside the institutions. Here, also, the number of units leased is important; in Europe they only account for approximately 6–7% of all patients, the rest using more simple systems or mattresses. When the number of air-fluidized units in use is doubled, purchasing instead of leasing could be more cost effective. Until now the daily contacts with manufacturers and their service (delivery, reparation, costs) play an important role in the selection of materials to use. As a rule, pure anti-pressure ulcer characteristics of the materials seem not to be the main reason to select a specific device.

A second view on anti-pressure ulcer devices could be from the theoretical side. In the prevention of pressure ul-

cers it is generally accepted that pressure, shear and friction play important roles. So materials and devices that reduce these physical entities should have a positive effect on the incidence of pressure ulcers. Some remarks about this theory are made later on in this paper. Reduction of pressure is usually achieved by spreading the body weight over a larger surface, usually by a kind of semi-submerging of the body in substances like foams (mattresses), or fluids (air-fluidized beds). The larger the supported area of the body surface, the lower the pressures will be. Low-air-loss systems increase the surface by creating air chambers with low pressures and – increasingly popular – by changing the pressure in seperate air chambers following a more or less fixed pattern. During an hour, for example, the sacral area is pressure-relieved for four periods of 10 minutes, and for two periods of 10 minutes there is a normal pressure. This is only an example, different manufacturers have different systems with different pressure relieving schedules. In all these systems one attempts to create a combination of alternating pressures, thereby simulating changes in body position.

A fakir lies rather comfortably on a bed of sharp needles (I am told), he does not like to lie on one needle! The relation between body weight and surface is clear. For overlays there are also some basic principles. Starting with foam mattresses. The characteristics of the foam are important. The lower the specific weight, the more a body can sink into the foam and the larger the supported area of the body will be. In the literature there is only one paper about the changes in the foam itself when pressure is applied: the specific weight changes under pressure[3]. When the foam is compressed, air is removed and the specific weight increases, thereby creating totally different characteristics as compared with foam without weight upon it. The construction of a test mattress consisting of several layers of foam, each layer with a less specific weight than the one immediately on top of it, illustrated this clearly. Furthermore, the surface of the foam should also be judged: Is it water resistant? Is it resistant to tear (agitated patients sometimes try to tear the mattress to pieces)? Does it inhibit the effects of heat or even flames (fire resistance)? Other aspects are the memory function of the foam (does it return to the shape it had before the patient was placed upon it?) and does it retain this function after some time of intensive use? These characteristics are of especial importance when making decisions to buy larger quantities. In the early ninetees we could demonstrate that an eggbox-shaped camping-site mattress (like hippies used to carry on their trips to India in the flower-power era) placed upon a normal hospital bed created the same low pressures as an expensive anti-pressure ulcer device; the camping-site mattress only costed about $10. The problem was that after two or three weeks it just fell apart. So life expectancy of the material also plays a role.

Usually a foam mattress is protected by a cover of some kind of polyethylene. The characteristics of the mattress, however, are changed dramatically when a cover is used. When the cover is not elastic enough in all directions it stimulates shearing forces and is therefore responsible for the faster development of pressure ulcers[4]. Even tightly fixed blankets can exert such a hammock effect. Pressure recordings as provided by manufacturers are, as a rule, performed with matresses without a cover, so the actual reductions are not correctly presented.

Lastly, it is clear that the overlay should be thick enough to prevent the bottoming of the body on the usually hard under-layer. This is obvious for mattresses, but this effect can also occur in air-fluidized beds (usually with patients weighing more than 100 kg). So for heavyweight patients – and in this context the term may be used for patients weighing more than about 75 kg – other materials should be used than for lightweight patients. Again, in the figures provided by the manufacturers, as a rule the weight of the 'guinea-pigs' they used is not given.

The removal of parts of the mattresses under locations at risk should be avoided. Body weight is unchanged, but the supported area becomes smaller, so pressure in other parts simply increases, especially at the edges of the gap that has been created – this is called the 'doughnut-effect'. Several recordings illustrate this effect dramatically. There are investigations in small groups of patients with specific problems (hip fractures) showing a possible positive effect of such a device, but there are serious methodological problems with the paper[5]. Whatever the results, the theoretical background is incorrect and the possible beneficial effect seems to be coincidental. Patients tend to sit in bed, thereby creating high pressures delivered to the sacral area. Their sitting position also creates shearing forces: patients tend to slip to the foot of their beds when they are in a half-sitting position. In patients suffering with incontinence for urine the combination of pressure and shear is serious, since shearing increases when the skin is humid and less slippery. These effects are in part prevented by bending the overlay in the hips and in the knees; the patient is wedged in the overlay.[6] For elderly patients especially, this creates another problem, since they tend to slide sideways, thereby creating shearing forces to shoulders and elbows.

In summary, there are many important aspects to consider when making a decision as to which device is advisable or even best. Until now, only pure physical aspects and logistics seem to prevail.

Thirdly, one could look at devices from a medical-theoretical side. In the development of pressure ulcers there are some important assumptions:

1. without pressure – no pressure ulcers,
2. to diminish pressure, body weight should be spread over an area as large as possible,
3. the removal of parts of overlays creates doughnut effects and should be avoided,
4. body positions should be changed on a regular basis, with an optimum frequency of once every three hours, and
5. sitting is worse than lying.

The turning once every two hours, in nursing an axioma, is not based on scientific proof, but is derived from history: in a ward in a British military hospital during World War II the order was given to two nurses to turn every patient as frequently as possible, and eventually it was possible to turn every patient once every two hours. There is no scientific basis for positive effects of this two-hour scheme. Defloor studied the effects on the incidence of pressure ulcers in a large number of patients in Belgian nursing homes, using different turning schemes together with different overlays.[7] In a beautifully designed and executed study he was able to demonstrate that the use of a good performing foam mat-

tress, together with turning every three hours, implicated the smallest number of patients with pressure ulcers. The incidence of pressure ulcers with three hours turns was less than with two hours and he suggested that it was even possible that the friction caused by the turning itself was harmfull.

Still, it is not so clear as it seems to be. Pressure does not always create pressure ulcers, there must be more. Everyone knows of patients with, for instance, multiple sclerosis, lying for years in the same position, with turning nearly impossible because of contractures etc, but without pressure ulcers. These only appeared when the patient contracted pneumonia. The model of pressure ulcers is now evolving towards a combination of pressure and tissue tolerance. Pressure alone doesn't do it, there must be combined factors.

In the evaluation of the effects of overlays there is much attention for pressure recordings and attempts are made to measure shearing forces. Contact pressure could be measured using several types of instruments. The first recordings were made using a bed with 1000 nails, each individually connected with calibrated springs, and the possibility to construct isobares lines between points with the same pressures.[8,9] It seemed to be somewhat easier when sensors to measure tissue-interface pressure were used. There are three main types: fluid filled balloons, connected with a pressure transducer; electric sensors, measuring pressure by means of capacity, induction or resistance; and electropneumatic sensors, using the pressure needed to split two contacts on overlying sides of a balloon.

The sensors are usually placed under bony prominences of the body. The correct placement of the sensors, however, is very difficult and almost impossible to standardize, even in repeated measurements in one patient. It is clear that this aspect is essential in the explanation of differences in recordings.[10] Somewhat later devices were constructed in which large numbers of sensors were integrated. The useability of these mattresses is dependent of the number of sensors, the lack of dynamic changes in time, the influence of the sensor itself on the recordings (size, thickness) and the characteristics of the mattress itself (flexibility for instance).[11-13] Again it is obvious that the comparison of results of measurements is difficult. All systems have advantages and disadvantages.[14]

However, despite all these technical achievements the major problem is still the fact that it is not known which pressure relates to the development of pressure ulcers. It seems a very simple question but it is not established that tissue-interface pressure (the pressure between the skin of the patient and the surface of the pressure reducing device) represents the pressure inside the body. Recordings of pressure between deep tissue layers and bone or fascia seem to be better in this respect, but they are only applicable in *in vitro* experiments for obvious reasons. In 1990 Staarink performed studies with cushions using the pelvis and upper extremities of a skeleton, with sensors placed on the bones.[4] The body was reconstructed using materials exactly resembling muscles, fat and skin. The results of these studies showed that the measurements were not comparable with those with extracorporeal sensors, as could be expected, but that they had a much larger correlation between pressure ulcers than the more conventional recordings. In the introduction of a quality mark for overlays in the Netherlands (2000–2002) a model for a complete body will be used.

The use of dynamic systems makes things even more difficult, since pressures are changing constantly. Some researchers use minimum and maximum pressures,[15] others use mean pressures in time[16] and even the cumulative time in which a pressure of, for instance, lower than 10, 20 or 30 mmHg was recorded.[17] Shearing forces are difficult to measure, allthough some very sophisticated devices are developed.[18,19]

During the last decade the possibility has arisen that not pressure, but merely tissue deformation causes pressure ulcers. Deformation not only causes different pressures to tissue but also the stretching of blood vessels, impairing blood flow even more than rectangular pressure. Some CT-scannings illustrated this phenomenon,[20] but magnetic resonance imaging makes it even more obvious. In figures from Utrecht University Hospital is was shown what happened when an active healthy sportsman lies face downwards, with no pressure on his buttocks, and when he lies on a hard table (the figures were shown during the conference).

It was obvious that the muscles are stretched, even in the presence of a normal layer of adipose tissue. In an MRI one actually measures the number of energy-rich phosphate molecules, and it is possible to get an idea about the energy pool in muscle, or the blood supply. It is obvious that the muscle under pressure is more grey and with a patchy aspect. And this is a healthy sportsman. In this view it is important to realise that the perfusion of the skin is derived from vessels out of the underlying muscles. Animal experiences with pressure application showed that the tissue damage not only occurred immediately below the pressure heads, but also beside them, following a vascular pattern. In this experiment it became obvious that not only pressure, but also vascular damage (because of occlusion-reperfusion) caused lesions.[20]

And there it is: a connection between pressure and what was called tissue tolerance. There are many reasons for vascular or even more detailed endothelial damage, causing this specific reaction. Activation of the immune modulation system is a reason as is the circulation of clusters of leucocytes and complement as is found in the adult respiratory distress syndrome (ARDS) and in septicaemia, serious situations in which patients often develop pressure ulcers. So the concept of only pressure inducing pressure ulcers becomes less obvious, it is changing its position with that of the combination of pressure with tissue tolerance.

As a conclusion: there are still many aspects about overlays that are not sufficiently dealt with by researchers. The necessity to clarify is obvious. Western population grows older but this in some aspects positive evolution is accompanied by increasing numbers of patients with pressure ulcers. Although not so extensively as in the USA, a growing number of patients are suing the hospital for obviously not taking enough precautions. So the choice of materials for prevention and treatment of pressure ulcers is important also from this aspect.

This paper illustrates that there are still aspects not fully understood. Governments ask for more and more advice based on evidence. For the pharmaceutical industry the development of new medication follows a distinct path, starting with theoretical aspects, phase 1 and 2 trials, and eventually release on the market. For most anti-pressure ulcer

devices the first steps are skipped: they seem to be simply released. In Europe there is a growing tendency to demand scientific proof before such a device is allowed to be used. The EPUAP has recognized the imminent problem and during the 2000 Amsterdam meeting a working group was installed dealing with devices: which theory should be followed (for instance pressure or tissue deformation), which tests are needed, and in which direction should further development go. In January 2000 the highest advisory board of the Dutch Government, the Health Council, advised the installation of a quality mark for anti-pressure ulcer devices.[21] In May 2000, a special committee started with the definitions to which materials should perform, eventually leading to a selection of the devices currently available for extensive testing. This will be done using the advice of the EPUAP working group. The project will last for two full years and eventually a quality mark will exist, that fits into the known ISO, DIN and CE markings.

Regrettably this paper cannot give the answer to the question which overlay is best, however, it does give some thoughts about the aspects needed to select one eventually.

Literature

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NUTRITION PRACTICE IN THE PREVENTING/ TREATING OF PRESSURE ULCERS – TAIWAN EXPERIENCE

Shyh-Dye Lee, MD, MPH
Taiwan

General Information

Taiwan is a special country in the world, whatever its political-economic status and the well-developed high technology in the category of electronics and computerizing. However, it is sparsely mentioned or referred to in its long-term care system. Lots of problems call attention from the publicity to the long-term care delivery in Taiwan. 'Pressure ulcer' is usually a common one of them, it can be observed in the hospitals, facilities, others institutions and even in the community settings. In general, nutrition has not deserved its key status in the health care system under medical care-centered environment. But, as an important component, nutrition always plays a key role in itself, in preventing or treating pressure ulcers.

What Practice is Taking Place for Pressure Ulcers in Taiwan

1. Screening, Assessment and Planning Intervention

There are more than 80,000 elderly being supposed to take the service delivery of long-term care. Among them, 22–26% are cared for in institutions, and the remainder stay in their communities. All patients or residents showing the potential or risk of developing pressure ulcers are mandatory to be screened or assessed early. Especially those with impaired ability – such as bed- or chair-bound individuals – should be assessed for additional factors that increase risk for developing pressure ulcers. But it is not always performed well.

Assessing the status/conditions of the risk for pressure ulcers might pose the needs on the care foci such as nutrition, hydration, circulation, pressure reduction, skin care, supporting, underlying medical care and even the patient/caregiver education. Based on risk factors schema, the victims or possible victims of pressure ulcer are supposed to be evaluated with the tool of Braden Scale.

General health function level and nutrition indicators, such as total calories, protein (plasma protein, serum albumin and transferrin …), cholesterol, vitamin, and zinc level, are the main parts to pay attention to during care practice on the victims or possible victims of pressure ulcers.

In Taiwan, owing to the reluctance of measuring the accurate length/height of the impaired ones, Harris-Benedict Equation is usually adopted regularly for the evaluation of the nutrition needs of care receivers, applied by the dieticians or nutrition professional personnel during their practice of care. Recently, knee-height caliberization was begun as an alternative way to approach the nutrition needs.

2. Specific Intervention for Pressure Ulcers

Just as in most parts in the world, specific intervention is settled according the stage of the pressure ulcer. In Stage I, the tactics of intervention is prevention, i.e. applying pressure reduction techniques along with application of transparent adhesive films or hydrocolloid dressings to protect 'reddened' areas of skin at risk for breakdown. In Stage II, it is cleansing/protection; and in Stage III and IV, disinfection, debridement, absorption and protection are taken. Certainly, some but not much complementary therapy exist, such as home health application, patient/caregiver education and alternative medication approaches in preventing or treating pressure ulcers.

3. Education/Training for the Care Personnel

Related education/training program is frequently carried out during policy making. Mostly, the issues of pressure ulcers are incorporated into the theme of wound care in the nursing training programs. Annual continuous education course is composed of a package design, with 22 topic-hours (i.e. 14 hours for lectures and 8 hours for practice)

4. Home Care Application

Home care is the main stream of the long-term care. The patient and main caregiver will, of necessity, have a very active role in the pressure ulcer care under home setting because the home health nurses' exposure to the wound care will be only periodically or sporadically. Ideally, the frequency of planned visits is based on the patient/caregiver education needs as well as the condition of the pressure ulcer, and visits can be increased or decreased as deemed necessary by the home health nurse.

5. Patient/Caregiver Education

Although home health nurses should perform dressing changes by using sterile technique, it is more practical to instruct the patient/caregiver to apply clean technique. As for the main themes of patient education, it does always include pressure ulcer assessment, skin care, dressing changes and related procedural care, medications (purpose, action, dosage, side effects and administration), infection control pressure reduction/relief (device use, operating, and maintenance), and lifestyle that influence pressure ulcer healing and skin breakdown and preventative interventions.

6. Alternative Medication Approach

In Taiwan, even in Oriental regions, alternative medication, especially in the isolated or rural areas, takes its root in the mind of the population. Pressure ulcers couldn't be exemplified. In addition to care by western medication, some herb medications might be tried P.O. and topically in the mean time occasionally.

Perspective of Tasks on Pressure Ulcer

There are lots of components and determinants in the long-term care system, including, at least, need/demand estimation, resources providing, financial & economic support, organizing, planning, administration, policy, and service delivery, etc. Now, here today, the theme of pressure ulcer is just an important part of it. So far, there is still no fundamental epidemiological data about 'Pressure Ulcers' to be presented, the incoming tasks are to survey these problems, to set up the framework of 'Pressure Ulcer Care' and to construct the delivery model in the long-term care system.

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WOUND ASSESSMENT AND HEALING AN OVERVIEW OF TECHNIQUES AND NEW TOOLS

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Wound assessment is pivotal to the development of the plan of care and evaluation of healing. This session will focus on assessment of wounds and measurement of healing. Healing by primary and secondary intention will be addressed. Strategies to evaluate healing will be compared. Principles of documentation will be discussed.

Objectives

Upon completion of this presentation, the participant will be able to:

- Assess wounds healing by primary and secondary intention.

- Compare and contrast several approaches to evaluate healing.
- Propose critical dimensions of documenting wound assessment and healing.

Content Outline

Assess wounds healing by primary and secondary intention

Assessment of healing by primary intention
- Approximation of wound edges.
- Inflammation
- Drainage
- Healing ridge

Assessment of healing by secondary intention
- Location
- Size
- Tissue type: Granulation, slough, necrotic,
- Epithelial edge
- Exudate
- Undermining/tunneling
- Stage if pressure ulcer

Assessment items that do not tell you directly about the wound
- Erythema of surround tissue
- Breaks in surrounding tissue
- Edema
- Rashes

Must assess the wound in relation to the underlying cause
- Surgical wound: reason for surgery, surgical course
- Vascular disease: arterial vs. venous
- Diabetic ulcer: neuropathy; glucose/A1C level.
- Pressure ulcer: Immobility, inactivity, incontinence, LOC, nutrition

May use a validated instrument such as the Pressure Sore Status Tool (PSST).

Compare and contrast several approaches to evaluate healing.

Healing is restoration of structural and functional integrity.

Requires
- Assessment of the wound
- Evaluation of healing based on pre-set criteria

Available Ways to Evaluate Healing
- Routine examine
- Use of validated instrument:
  - Staging
  - Sessing Tool
  - Sussman Tool
  - PSST
  - PUSH Tool

Propose critical dimensions of documenting wound assessment and healing.

Documentation Principles
- Know the protocol for your facility
- Document every dimension assessed [include diagrams and photographs]
- Do NOT make up findings if you forget to assess them
- Document what is not present as well as what is present
- Include all aspects of care in your documentation

Fit Between Healing and Principles of Care
- The goal of care for most wounds is healing – if you question it, clarify
- Wounds heal fastest in a moist environment – not a wet or a dry environment – provide it
- Dead tissue impairs healing – remove it
- Bacteria burden slows healing – remove it
- Pain slows healing & occurs not only when dressings are changed – treat it
- Vasoconstriction slows healing – mitigate it by providing adequate intravascular volume, reducing pain, reducing unnecessary noise, reducing cold, recognizing and helping the patient mitigate stress.

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EUROPEAN PRESSURE ULCER ADVISORY PANEL

Pressure Sore Prevention

CAN PRESSURE ULCER PREVENTION BE A WASTE OF TIME?

Further Comments on Hagisawa and Barbenel's important study (1999)

The limits of pressure ulcer prevention

In the last issue of the *EPUAP Review* several authors gave their opinions upon the setting of appropriate minimum rates of pressure ulcer occurrence. This debate was sparked by the publication by Hagisawa and Barbenel of apparent limits to pressure ulcer prevention among a defined patient population. In this issue, Ruud Halfens of the University of Maastricht continues the debate. Further commentary on this contentious issue is welcomed. A subsequent issue will contain a response from Hagisawa and Barbanel to the comments offered by EPUAP members.

AN angry physician approached a tissue viability nurse about an AIDS patient in a terminal phase, who developed a pressure ulcer: 'How is it possible that this patient developed a pressure ulcer? You are paid to prevent pressure ulcers!' The nurse looked at him and answered: 'As soon as you have cured the patient from AIDS, I guarantee you that I will have him free of pressure ulcers'.

Not all pressure ulcers can be prevented. Although one of the main goals of the EPUAP is to reduce both the incidence and prevalence of pressure ulcers, to what level of occurrence do we want to reduce them? What is a realistic target?

Recently an interesting study from Japan was published in the *Journal of the Royal Society of Medicine* (Hagisawa & Barbenel, 1999). Pressure ulcer prevalence and incidence were assessed in 275 patients, who were either admitted to a well-staffed internal medicine ward during a 12-month period or who were present on day 1 of the study. Patients scored as being at high risk on the Braden scale (score 16 or less) received active preventive care, weekly assessment and continuous monitoring. The preventive measures included turning the patient every two hours, skin inspection at least once a day, the use of an alternating pressure air cell mattress, keeping the skin clean and dry by bathing, rinsing the perineum after every bowel movement, evaluation of nutritional status and fluid/electrolyte balance, and urinary catheter and bowel management. In addition careful attention was paid to avoidance of friction when transferring from bed to chair and vice versa. If skin redness was detected that did not resolve within 30 minutes, a hydrocolloid dressing was applied to the reddened area which was continuously monitored until the redness disappeared. So, in fact one could say that 'best current practice' was used during this study. Incidence and prevalence figures found were reported to be the lowest achievable for this patient population.

In the study a pressure ulcer was defined as an area of broken skin (stage 2 or higher). The incidence among all patients (both those at high risk and minimal risk) was 4.4 while the prevalence was 5.1%. None of the minimal-risk patients (Braden score 17 or higher) developed a pressure ulcer. For the high-risk patients (n = 36) alone the incidence was 33.3%. Patients who developed a pressure ulcer (n = 12) were all severely ill patients: including five patients with Creutzfeldt-Jakob disease, multiple sclerosis and multi-organ failure, and four with lung cancer.

So this study suggests that even when using 'best current practice' with regard to pressure ulcer prevention, the incidence and prevalence of pressure ulcer in this internal medicine ward was 4.4% and 5.1%. While not all pressure ulcers can be prevented, data of such studies are useful to obtain insight into what the lowest, and presumably therefore acceptable incidence and prevalence rates may be.

However, from a broader perspective, I would like to discuss two problems with the study reported by Hagisawa and Barbebel. Can the results be applied to other populations (the question of generalization)? If Stage 1 ulcers had also been considered by Hagisawa and Barbenel then a doubling of the prevalence rate to about 10% would not have been surprising. A 10% prevalence is broadly similar to that reported in other surveys that have considered medical patients. This figure is not completely different to other prevalence rates for this patient population. For example, the Dutch National prevalence study (Bours *et al*, 1999) reported a pressure ulcer prevalence rate within internal medicine wards of university hospitals of 11.2 % (5.7% without stage 1). However, considering only those internal medicine wards within non-teaching hospitals the prevalence rate was twice as high, namely 21.5% (10.6% without stage 1). Does the similarity between the prevalence rate reported by Hagisawa and Barbenel, and the data gathered within Dutch teaching hospitals suggest that the prevalence rates achieved within the Dutch internal medicine wards are the lowest achievable? However, the knowledge we have about the preventive measures used in these university hospitals would appear to suggest that practice may not reflect the 'best available' and so this suggests that a lower prevalence rate must be possible. From this comparison it would appear that one hospital's lowest achievable pressure ulcer prevalence rate may not reflect the performance achievable within other care providers or health systems

A more fundamental challenge within Hagisawa and Barbenel's study was its objective of defining the lowest achievable pressure ulcer incidence and prevalence rates! Although, in theory, all pressure ulcers can be prevented this is not the case in practice for perhaps two main reasons. Firstly, aggressive preventive care may be discontinued for ethical reasons – for example in the terminally ill. Additionally we do not possess enough knowledge, methods and time to practically protect all patients from pressure and shearing forces. So, does this mean that we do have to search for the lowest achievable rates, and accept that not all pressure ulcers can be prevented? One of the dangers of acceptable occurrence rates may be their use as an excuse for the development of pressure ulcers. In my opinion it is better to investigate why a patient developed a pressure ulcer even where 'best current practice' was adopted. Such an approach may give more insight as to why pressure ulcers occur, and this knowledge could be used to guide the development of new and appropriate preventive methods. In Hagisawa and Barbenel, most recruited patients were very ill, and of the twenty-two patients who died, eight died with a pressure ulcer. Perhaps aggressive preventive care ceased as death approached? Or perhaps these patients were so ill that preventive activities were ineffective. Perhaps the pressure ulcers were even the cause of death? The publication offered no information regarding these points.

In conclusion, Hagisawa and Barbenel is a useful study that sets out to determine the lowest achievable pressure ulcer incidence and prevalence rates. However, do we have to accept these minimum rates or must we continue to investigate why patients develop pressure ulcers? In my view the last point should form the basis for our actions and even if determined, and agreed, a lowest achievable occurrence rate should never be accepted as an excuse for the development of a pressure ulcer.

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Plate 2 (*right*):
Mike Clark and Jacqui Fletcher
leading the EPUAP Prevalence Study
group discussion, 29 January 2000 (see *opposite*).

Plate 1: First working party on developing a pilot European Prevalence Study, London meeting, 29 January 2000 (see *opposite*).

DEVELOPING A MINIMUM COMMON DATA SET TO RECORD THE PREVALENCE OF PRESSURE ULCERS IN EUROPEAN HOSPITALS

SINCE the early 1970s many investigators have reported the prevalence of pressure ulcers in different care set tings and across different countries and a forthcoming *EPUAP Review* will publish a comprehensive list of such publications and reports. Such data lends itself to immediate comparison between health care providers and their respective countries. For example, a prevalence of 9% in one location and 5% in a second often gives rise to the impression that the second centre somehow is 'better' in terms of its pressure ulcer prevention and management. Such impressions of the quality and effectiveness of care may have major consequences in health care systems where the allocation of funding is partly dependent upon a care provider's position within 'league tables' of comparisons between competing providers. However, to date comparisons based upon pressure ulcer prevalence rates are essentially meaningless due to issues of methodology. These methodological differences between studies have included:

- The definitions of pressure ulcers – with some studies reporting non-blanchable erythema with others restricted to reporting breaks in the epidermis
- How data is collected – is the data generated through discussion with ward staff or has the skin of all patients been inspected for the presence of pressure ulcers?
- Who gets included in the comparison – some studies (in hospitals) have reported upon all in-patients including paediatrics, maternity and new-born babies others have only surveyed specific in-patient populations
- How has the denominator been calculated – how has each study decided the total number of patients present during the survey?
- Was the survey conducted on a single day or over a period of time?
- How have data collectors been trained, and to what effect?

These are some, but by no means all, of the methodological issues that have restricted comparison between pressure ulcer prevalence surveys. One further pitfall remains before appropriate comparisons can be made – the patient populations covered by different care providers differ – some populations may be intrinsically healthier than others (often influenced by socio-economic factors), and so a 5% prevalence in a 'healthy' population may reflect a greater problem than a 10% prevalence in another care provider. Any attempt to compare pressure ulcer prevalence rates must consider how to adjust the raw epidemiological data to remove the influence of differences between patient populations.

All of these influences upon comparisons of pressure ulcer prevalence rates were discussed during the 3rd Open Meeting of the European Pressure Ulcer Advisory Panel, last year in Amsterdam. One action arising from these discussions was the formation of a working group charged with the development of a common minimum data set that will allow capture of risk-adjusted prevalence rates. This working group (*Plate 1, opposite*) included representatives from eleven European countries, with 18 members in attendance when the group met at Heathrow Airport, London on 29 January 2000. Chaired by Jacqui Fletcher (England) and Michael Clark (Wales) (*Plate 2, opposite*) substantial progress was made on the day, with three key decisions reached:

- Initially the focus of the use of the minimum data set would be to record the prevalence of pressure ulcers across European acute care providers. Extension of the minimum data set to other care settings is a goal for future activity of the EPUAP.
- The items considered to be required in a minimum data set consisted of general data listing the country, type and size of hospital and patient specific data reporting age, gender, Braden score, continence (as indicated by the continence item of the Norton scale), severity and location of pressure ulcers and any interventions used to assist prevention (support surfaces and repositioning). Other data items such as wound dressing use, nutritional status could be collected by individual centres that participated in the survey but these items would not form part of the minimum data set. The minimum data set items would be collected for all in-patients regardless of the presence of a pressure ulcer.
- Data upon the presence of pressure ulcers would be collected only through thorough skin inspection and would not rely upon reports that an individual patient had a pressure ulcer(s).

The meeting decided that a pilot project would be established during 2000 and that the results and recommendations from this pilot work would be presented during the 4th Open Meeting of the EPUAP in Pisa during September 2000. A small group was formed to undertake the detailed work involved in preparing a data collection form and the organisation of the pilot survey. This group included Gerry Bennett (England), Gerrie Bours (Netherlands), Michael

European Pressure Ulcer Prevalence Study

Minimum Data Set

Clark (Wales), Tom Defloor (Belgium), Jacqui Fletcher (England) and Luc Téot (France). During the spring and early summer of 2000, the group met on two occasions to develop the data collection instrument, with a third meeting scheduled for August 2000. The latest version of this instrument is illustrated in Figure 1 (*opposite*) and we would welcome your comments upon both its content and presentation. The reverse of the form presents a series of notes aimed at assisting data collectors to complete the form in a manner that will allow the automated processing of the data forms received by the EPUAP.

Over the summer the minimum dataset data collection form has been translated into several languages – English, French, Dutch, Flemish, Spanish, Finnish, Portuguese, Italian and German forms now exist and pilot data collection is underway across several countries. The purpose of the data collection (covering 30–40 patients per country) is not to provide definitive comment upon the prevalence of pressure ulcers across Europe but to:

a) explore issues that arise in the completion of the form,
b) identify any country specific challenges that are encountered, and
c) to provide data to allow different case-mix adjust ment models to be explored.

The fruits of this pilot stage will be presented during the forthcoming Pisa meeting of the EPUAP, following comments from conference participants any modifications to the form will be made and widespread data collection across European hospitals is planned to occur during 2001. If you would like to become involved in this project through comments on the data collection instrument or to volunteer to collect data next year, please do not hesitate to contact the EPUAP Business Office.

One of the key training needs for potential data collectors lies in the identification of the severity of encountered pressure ulcers. Plate 3 illustrates (in monochrome) a draft classification guide that will be developed over the coming months. The aim of the guide is to provide illustrations of the different presentations of the four stages of pressure ulcers as described in the EPUAP guidelines on pressure ulcer treatment. For EPUAP members two immediate challenges present; for clinicians we would welcome copies of slides showing 'difficult to grade' pressure ulcers along with good illustrations of each grade, these should be forwarded to the EPUAP Business Office and for commercial sponsors we seek support both to produce and disseminate this classification guide. Once again contact the Business Office if your company would be interested in helping the EPUAP produce the classification guide.

Figure 1 (*left*):
Latest version of the European Pressure Ulcer Prevalence Study minimum data set

Plate 3 (*above*): EPUAP Pressure Ulcer Classification Guide

Future meetings

SEPTEMBER 2000

28 – 30 4th European Pressure Ulcer Panel
Open Meeting
Pisa, Italy
Contact: EPUAP Business Office,
Department of Dermatology,
Churchill Hospital, Old Road,
Headington, Oxford, OX3 7LJ
Tel: +44 (0)1865 228269 / 228264
Fax: +44 (0)1865 228233

OCTOBER 2000

21 – 22 Surgical Applications of Tissue Sealants
Wyndham Chicago, Illinois, USA
Cambridge Healthtech Institute
1037 Chestnut Street, New Upper falls
MA 02464, USA
Tel: 001 617 630 1300

25 – 29 8th International Cochrane Colloquium
South Africa
Medical Research Council of South Africa
PO Box 19070, 7505 Tygerberg, SA
E-mail enquiries to:
charleen.daries@mrc.ac.za or:
mandy.salomo@mrc.ac.za
Tel: +27 21 938 0433 / 202
Fax: +27 21 938 0395 / 418
http://www.mrc.ac.za/conference/cochrane

27 – 28 The 4th Annual Meeting of the European Conference of Scientists and Plastic Surgeons
Hopital St Louis, Paris, France
Dr Eric Arnaud, 130 Rue de la Pompe
75116 Paris, France
Tel: +33 (0)1 47 27 44 31
Fax: +33 (0)1 47 27 65 15
E-mail: ECSAPS2000@hotmail.com

NOVEMBER 2000

4 – 6 Wound Care 2000: Integrating Science into Practice: The Art of Healing – 6th Annual Congress of the Canadian Association of Wound Care
Hotel Wyndham Montreal
1255 rue Jeanne-Mance, Montreal
Quebec, Canada
Tel: 001 877 215 2949

MARCH 2001

29 – 31 6th European Forum on Quality Improvement in Health Care
Richard Smith, Editor BMJ
Conference Unit, BMA House
Tavistock Square, London, WC1H 9JP, UK
Tel: + 44 (0)387 4499
E-mail: Quality@bma.org.uk

MAY 2001

21 – 23 European Wound Management Association Back to the Future – 11th Conference
Dublin, Ireland
Conference Secretariat
Congress Consultants, Martensens Alle 8
DK–1828 Frederiksberg C, Denmark
Tel: +45 70 20 03 05
Fax: +45 70 20 03 15
E-mail: ewma@congress-consult.com

SEPTEMBER 2001

4 – 7 Joint ETRS / Wound Healing Society Meeting
Cardiff International Arena, Wales
Contact: Prof Keith Harding, ETRS2001,
Wound Healing Research Unit, UWCM,
Cardiff Medicentre, Heath Park,
Cardiff, CF14 4UJ, Wales
Fax: +44 (0)29 2075 4217

9 – 14 14th World Congess of Union Internationale de Phlebologie
Rome, Italy
Contact: GC Congressi
Via P. Borsieri, 12 – 00185
Roma, Italy
Tel: +39 06 370 0541
Fax: +39 06 373 52337
E-mail: angiolsg@pronet.it

EUROPEAN PRESSURE ULCER ADVISORY PANEL

Literature Review

PRESSURE ULCER LOCAL TREATMENT PUBLICATIONS

THE following references comprise a selection of publications related to the debridement and local dressing of pressure ulcers. It is not intended that this is a comprehensive listing of all relevant literature but it does serve as an introduction to this area of pressure ulcer management.

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