

Clinical report

**Results from a real-world evaluation of
CUROCELL® AREA ZONE**



Introduction

Elderly people are often prone to hip fractures, especially those suffering from osteoporosis. In some cases, they suffer from multiple diseases and can include dementia. Of hip fracture patients, approximately 70 % are female and 30 % are male. Hip fractures are one of the more serious injuries when taking into consideration morbidity, mortality and costs ⁽¹⁾.

Aim

The purpose of this project was to determine and document whether the CuroCell® AREA Zone actually works in the prevention of pressure ulcers, for patients undergoing emergency hip surgery and how the patients themselves experienced the performance of the mattress in terms of comfort, turning and repositioning.

The hospital ward's aim was to use the result as a foundation for the introduction of a health care program that could be used in many different hospitals.

Background

According to RIKSHÖFT (The Swedish National Registry of hip fracture patient care) this is the single largest patient category in terms of inpatients requiring orthopaedic emergency care. This evaluation project has been undertaken in cooperation with an orthopaedic ward at Kristianstad Central Hospital (CSK).

CSK covers both the south - eastern and the north - eastern parts of Skåne. In this area there are approximately 45 emergency hip surgeries carried out each month.

CSK began working with the healthcare processes for hip fractures in 2005. A defined process is now in place determining the procedures to be carried out from the time an emergency call is received. This process includes the emergency and a 4-month postoperative care plan. The goal is that all hip fracture patients be operated within 24 hours. The present status is between 80-90 %. The duration of inpatient care for hip fracture patients is 7-8 days ⁽²⁾.

The orthopaedic ward has enough room for 26 patients. There are always 2 extra beds ready for immediate use for hip fracture patients, one of them is located on the emergency ward and the other on the x-ray ward. All hip fracture patients were prescribed a bed with a CuroCell® AREA Zone mattress

Definition

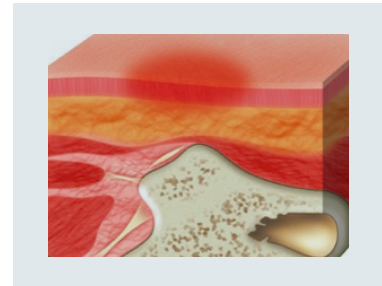
A pressure ulcer is a localised injury to the skin and/or underlying tissue usually over a bony prominence, resulting from sustained pressure (including pressure associated with shear). A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated. ⁽³⁾.



International NPUAP/EPUAP Pressure Ulcer Classification System.

Category/Stage I:

Intact skin with non-blanchable redness of a localised area usually over a bony prominences. Darkly pigmented skin may not have visible blanching; it's colour may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Category/Stage I may be difficult to detect in individuals with dark skin tones. May indicate "at risk" individuals (a heralding sign of risk).

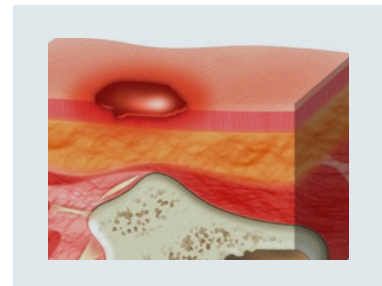


Category/Stage I

Category/Stage II:

Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister. Presents as a shiny or dry shallow ulcer without slough or bruising*. This Category/Stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation.

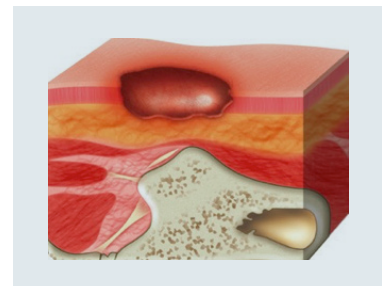
*Bruising indicates suspected deep tissue injury.



Category/Stage II

Category/Stage III:

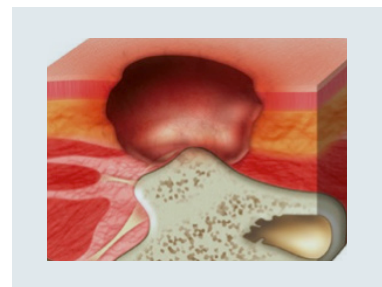
Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling. The depth of Category/Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and Category/Stage III ulcers can be shallow. In contrast areas of significant adiposity can develop extremely deep Category/Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.



Category/Stage III

Category/Stage IV:

Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunnelling. The depth of a Category/Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and these ulcers can be shallow. Category/Stage IV ulcers can extend into muscle and/or supporting structures (e.g. fascia, tendon or joint capsule) making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable⁽³⁾.



Category/Stage IV



Support surfaces and repositioning.

PU/PI are associated with prolonged exposure to an applied external mechanical load ⁽⁴⁾. This load comprises all types of external forces applied to the patient's skin and underlying tissue due to contact with support surfaces. The extent of skin and/or tissue damage depends on the duration and magnitude of the applied load (pressure and shear). A high mechanical load for a short period, as well as a low mechanical load applied for a long period, can lead to tissue damage ⁽⁵⁾.

Static or reactive mattresses are an example of a constant low-pressure support. Static air mattresses maintain a continuous low air pressure pressure, exerting a pressure-redistribution effect. There are two main principles for how pressure redistribution takes place by using constant low-pressure supports, immersion and envelopment ⁽⁵⁾.

Mattresses shall provide a functional lying position, good comfort and either pressure redistribution or pressure relief. These factors give the patient the best possible opportunity to reduce damage to the peripheral circulation ⁽⁶⁾.

Lying in a prone position without repositioning means, for many patients, an increased risk of PU. Regardless of the mattress, repositioning must always be performed, with the time interval determined based on the patients status, diagnosis and general condition. Support surfaces alone, neither prevent nor heal PU/PI, alone they are to be used as a part of the total care program, to improve pressure redistribution/ relief, shearing and micro climate (heat and moisture control) ⁽³⁾.

Mattresses to be used in the prevention and or treatment of pressure ulcers are designed to provide either pressure redistribution or pressure relief and should minimise the risk of both shearing and moisture. Time, pressure, shearing and moisture are areas which are important for the emergence of pressure ulcers ⁽³⁾.



Performance

Before the project started we performed four training sessions for all staff on the hospital ward. These sessions included:

- Pressure ulcers (PU) definition.
- Difference between PU/IAD (Incontinence associated dermatitis).
- Risk factors.
- Preventive measures.
- Nutrition.
- Positioning.
- Product training.

After the sessions all staff received a certificate of attendance.

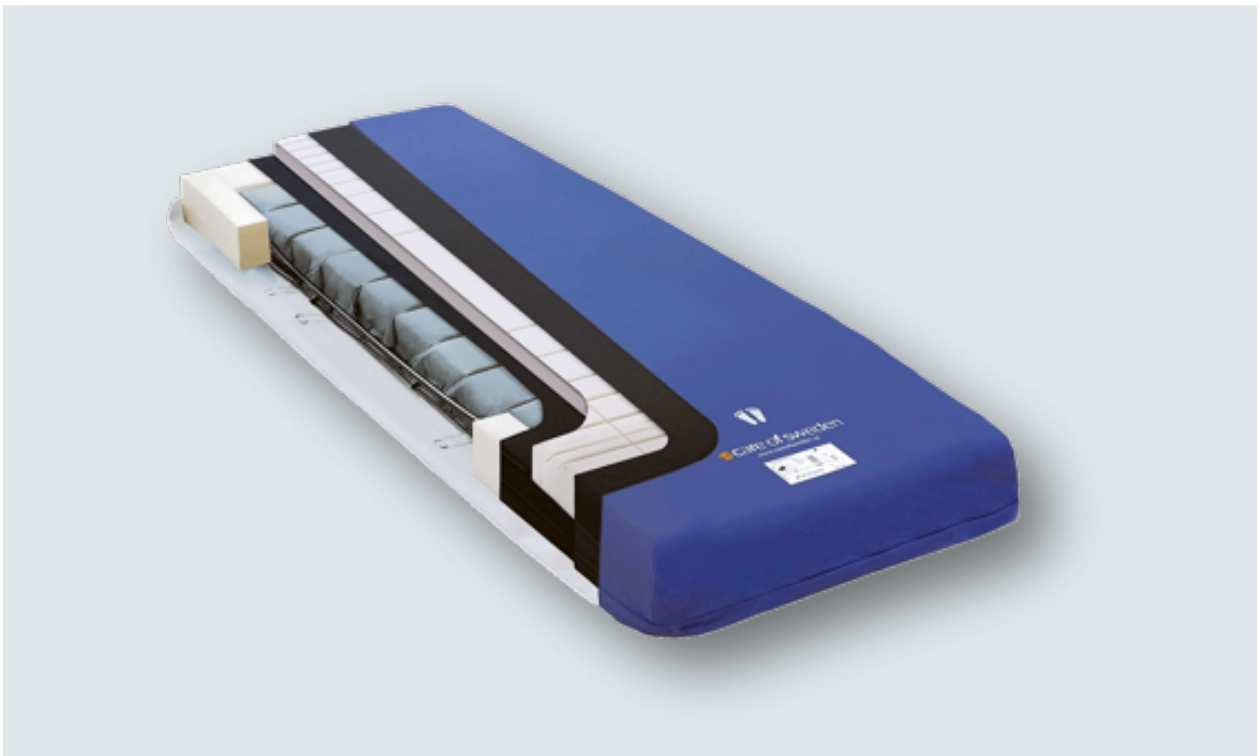


All staff received a
certificate
of attendance

We started in February 2017, and all mattresses were replaced at the same time. The mattresses in use thus far have been of the model Optimal 5zon, and now the time has come to renew the wards stock of mattresses.

According to the SALAR (Swedish Association of Local Authorities and Regions) the PPM (Point Prevalence measurements) for pressure ulcers in patients, at hospitals (April 2017) was 13.5 %. Hospital acquired PU (patient who had been at the hospital at least 24 hours) was 10 % ⁽⁷⁾.

The wards PPM has varied, and during 2016, hip fracture patients accounted for 72.1 % of all PU at the hospital. All patients are assessed according to the Modified Norton scale and skin and wound assessments are performed on a daily basis. The ward also implemented a continuous monitoring with regard to pneumonia, urinary infection and risk of falling. Joint staff meetings are held regularly, either collectively or separately for the respectively personnel category. All patients are served an extra nutritional drink every evening cushion to prevent hunger during the night. All patients with exiting PU are provided with a gel seat, and for patients with PU category 4 an alternating air pressure mattress is always used.



CuroCell® AREA Zone

CuroCell® AREA Zone is an 18 cm high full replacement mattress, combining air with foam for pressure redistribution. The mattress is self-adjusting and non-powered. It is used as an aid in the prevention and treatment of PU up to and including category 3. The mattress has nine air cells that are divided into three zones, which adjust automatically to the patient weight, providing an individual configuration. It is built up with multiple layers of high quality foam. The mattress's special design reduces shearing and the integrated heel slope reduces pressure on the heels. The maximum user weight is up to 230 kg.

The hygienic cover is elastic and flexible, waterproof and vapour permeable. Covers can be wipe-cleaned with cleaning agents and/or disinfectants. The cover can also be machine washed at 95° and can be tumble dried.



Results

During February, four PU occurred, one category 1 and three category 2. These patients were admitted to the hospital during winter time with heavy snowfall, which put a lot of pressure on the emergency ward and resulted in long waiting times for the patients.

During March, three category 1 PU occurred, and during April, May and June, no PU occurred. During July, two category 2 PU occurred, but this was during the holiday season when the ward was partially staffed by untrained personnel.

Pressure ulcer results during the period 1 February 2017- 31 July 2017.

Month	Number of hip surgeries	Women	Men	Number of PU	PU Categories	PU localisation
February	31	19	12	4	1 (1), 2 (3)	Sacrum, Gluteal
March	27	15	12	3	1	Gluteal
April	25	14	11	0	-	-
May	32	24	8	0	-	-
June	27	19	8	0	-	-
July	25	24	11	2	2 (2)	Sacrum

Note! No pressure ulcers have occurred on heels during this period

Hospital Acquired Pressure Ulcers at CSK 1 February 2016 - 31 July 2016

Total hip fracture patients	187
Of which female	119
Of which male	68
Proportion of hospital acquired PU	13/187 = 7.0%

Hospital Acquired Pressure Ulcers at CSK 1 February 2017- 31 July 2017

Total hip fracture patients	177
Of which female	115
Of which male	62
Proportion of hospital acquired PU	9/177 = 5.1%

Of the amount of hospital acquired pressure ulcers two of them occurred due to medical devices (plaster) which produces the true result of $7/177 = 4\%$



Results of the patient survey.

A total of 58 patients answered the three questions on the survey.

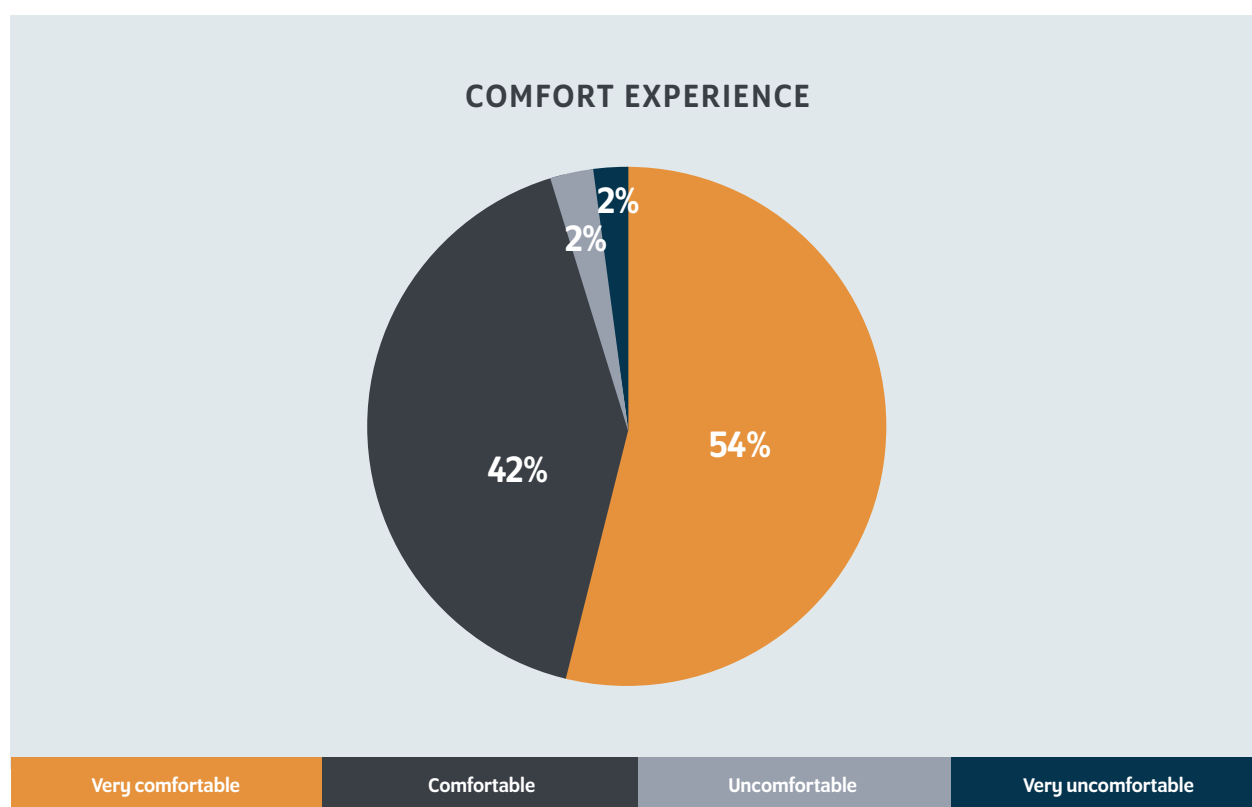
How did you experience the comfort of the mattress?

Very comfortable: 52.2 % (32)

Comfortable: 41.4 % (24)

Uncomfortable: 1.7 % (1)

Very uncomfortable: 1.7 % (1)





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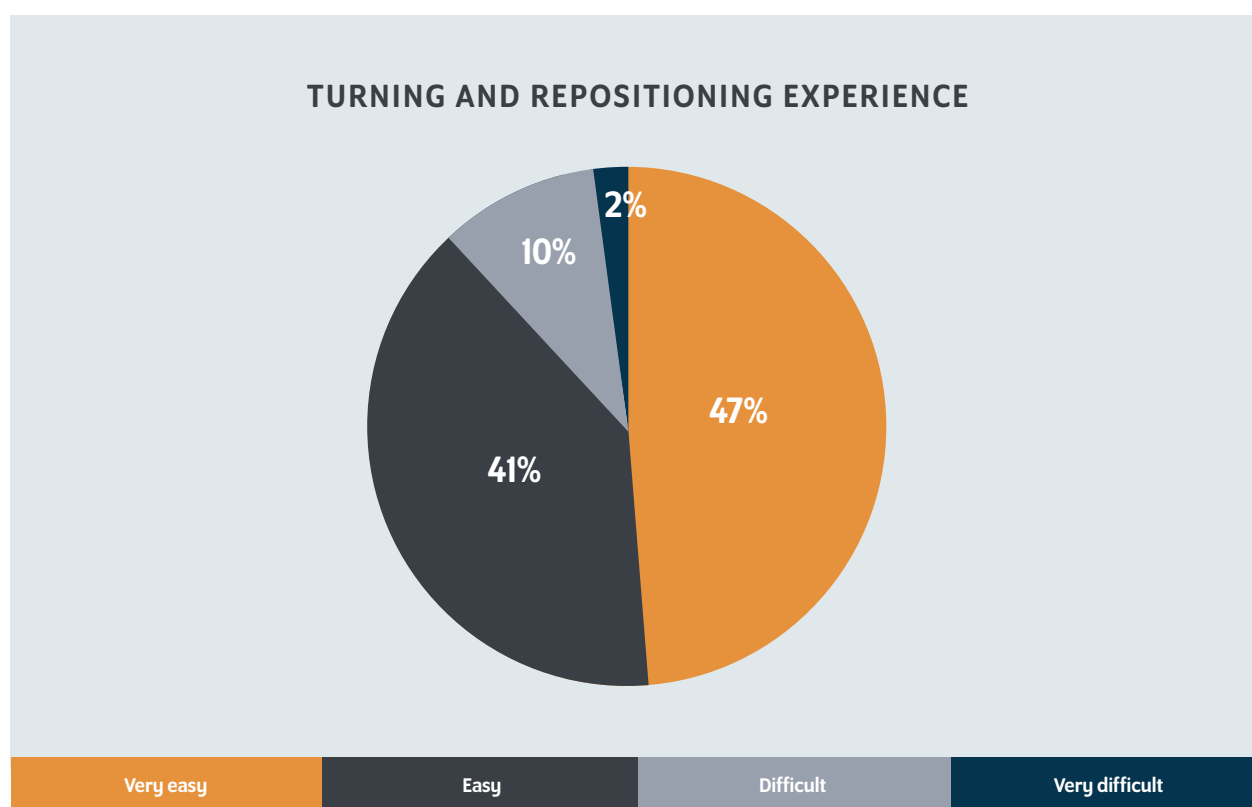
How did you experience turning/repositioning on the mattress?

Very easy: 46.6 % (27)

Easy: 41.4 % (24)

Difficult: 10.3 % (6)

Very difficult: 1.7 % (1)





Results of the patient survey.

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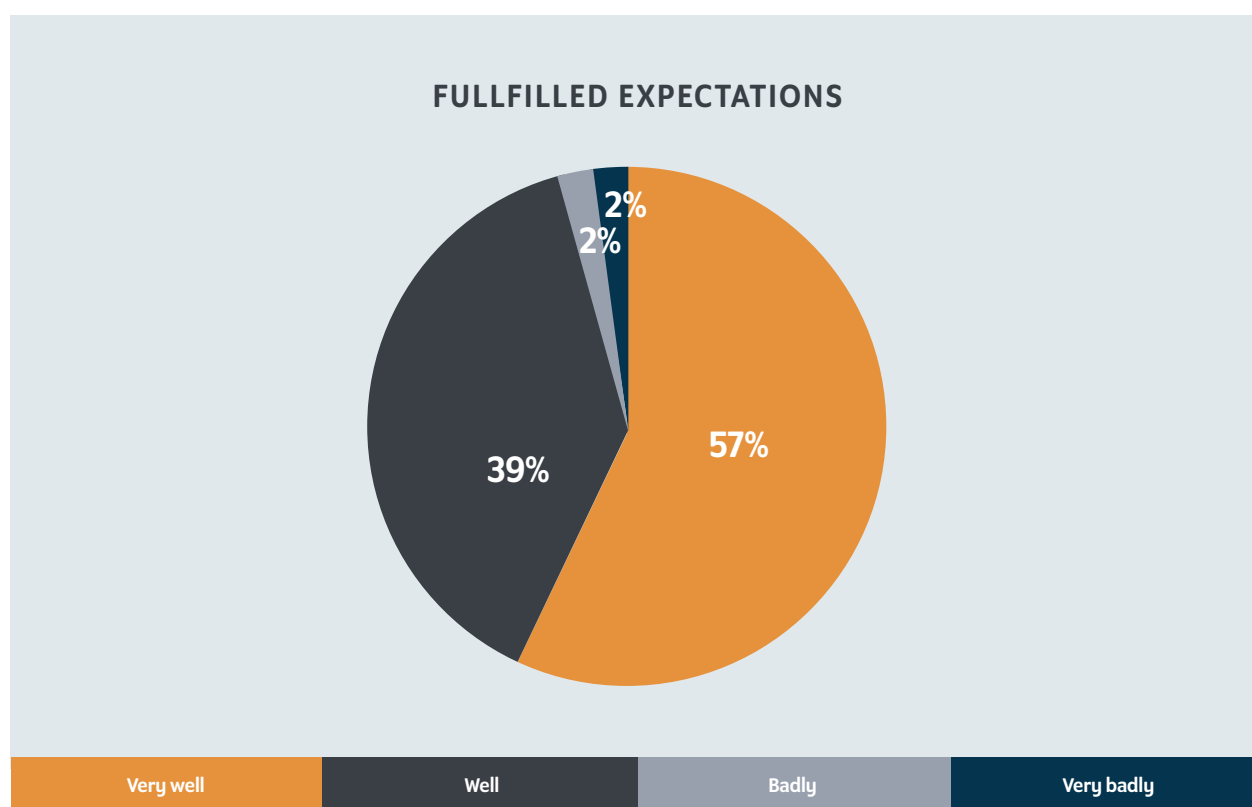
How well has the mattress fulfilled your expectations?

Very well: 56.9 % (33)

Well: 39.7 % (23)

Badly: 1.7 % (1)

Very badly: 1.7 % (1)





Conclusion

This is the result of a short trial period, but data will continue to be compiled as the ward continues its measurements and assessments. Compared with the same period last year when the result of pressure ulcers that occurred in the department was 7%, the result has now improved. When excluded the two pressure ulcers caused by medical devices the result was instead 4%.

The PPM target for the Skåne Region's is 3.5% and PU category 1 is neither counted nor included in these results. If we remove the ward's category 1 PU, the result would be 2.8% this year and 4.8% for 2016. CSKs own target is 5 %, including PU category 1.

The conclusion is that the CuroCell® AREA Zone, when combined with all other interventions, works very well in the prevention of pressure ulcers for hip fracture patients undergoing emergency surgery.

2019-02: At this point the Orthopaedics ward still show low prevalence of pressure ulcers. Category 2-4 = 0,6% and overall category 1-4 equals 4%.



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