*Pressure Sores*

(Bedsores; Decubitus Ulcers; Trophic Ulcers)

- **ischemic necrosis & ulceration** over bony prominences due to prolonged pressure against external object (e.g. bed, wheelchair, cast, splint).

* most common localization: sacrum, ischia, greater trochanters, external malleoli, heels, knees, anterior-superior iliac spines.

Etiology

**Intrinsic factors**

* 1. ***diminished / absent sensation*** (of pain and pressure) – *no signaling* to shift position and relieve pressure.
	2. ***debilitated, emaciated, paralyzed*** patients → *immobility*, minimal fat & muscle *padding*.
		+ - *spasticity* (esp. in spinal cord injuries) places shearing force on blood vessels.
	3. ***incontinence*** of bowel or bladder → *moisture*. *see below*
	4. *compromised circulation* due to ***hypotension***, ***dehydration***, ***vascular disease***, ***paralysis*** (vascular tone↓ → lowered circulatory rate).

**Extrinsic factors**

1. ***infrequent*** patient's ***position shifting*** → **pressure injury**
	* + - in immobilized patient, severe pressure can impair local circulation in < 3 h.
2. skin ***friction, irritation, pulling*** (ill-adjusted supports, wrinkled bedding or clothing; patient in sloped position or is rubbing constantly against underlying surfaces) → **shear injury**: local blood vessels are stretched and separated from underlying perforating vessels.
3. complicating feature of all pressure ulcers - ***moisture*** (perspiration, incontinence) → maceration (skin softening), sticking to underlying surfaces, easy access for infection.

Stages

* pressure sores should be photographed to establish baseline

|  |  |
| --- | --- |
| **Stage** | **Characteristics** |
| **1** | **intact skin** with nonblanchable erythema. |
| **2** | **partial-thickness** epidermal or dermal loss (as abrasion, blister, shallow crater). |
| **3** | **full-thickness** necrosis down to underlying fascia (as deep crater ± adjacent tissue undermining). |
| **4** | damage to **muscle, bone, supporting structures** (undermining, sinus tracts, osteomyelitis, septic arthritis, etc.). |

***Ulcer is analogous to iceberg*** - small visible surface with extensive unknown base.

There is no good method to determine tissue damage extent.



Prophylaxis

1. **position must be changed at least q 2 h** (until tolerance for longer periods can be demonstrated - by redness absence);
	* ***Stryker frame*** facilitates turning spinal cord injury patients.
	* *wheelchair-bound patients* must shift position **q 10-15 min** (even if pressure-relieving pillow is used).

N.B. special mattresses (air-filled alternating-pressure mattresses, sponge-rubber eggcrate mattresses, silicone gel or water mattresses) do not negate need for position changes q 2 h.!

1. **pressure relief** on sensitive areas (spaudimas turi būti < 30-35 mmHg – t.y. mažesnis už kapiliarinį);
	* standard mattress can generate pressures as high as 150 mmHg.
	* ***air flotation mattresses*** provide pressure maximal relief;
	* ***protective padding*** (e.g. sheepskin or synthetic equivalent) at bony prominences, esp. under braces or plaster casts;
	* ***window*** ***in cast*** should be cut at potential pressure sites.
	* avoid ring supports (“donuts”) (restrict circulation and even promote pressure sores!!!).
2. **inspection** **& palpation** (at least once/day) under adequate light – erythema, trauma?
3. **cleanliness & dryness** **to prevent maceration and secondary infection**.
	* bedding & clothing should be changed frequently;
	* sheets should be soft, clean, free from wrinkles and particulate matter;
	* lying on ***sheepskin*** helps keep skin in good condition.
	* protective padding, pillows, or sheepskin can be used to separate body surfaces.
	* most areas may be powdered with ***plain talc***.
	* skin sponging in hot weather, thorough drying after baths.
	* diversion of urine and absorption of fluids from other sources (such as perspiration or spillage).
4. **encourage activity** - avoid oversedation.
5. **physiotherapy** (**passive and active exercises,** hydrotherapy**).**
6. **well-balanced diet** (supplemental *vitamin C* and *zinc* help healing).

Treatment

* patient must be in optimal general condition (adequate nutrition, not anemic, muscle spasms prevented, infections [esp. UTI] treated).

Incipient sores (stages 1-2):

1. **all prophylactic measures** (to prevent necrosis) - keep area exposed, dry, free from pressure.
2. **gentle massage** (galima su spiritu, po to sutepti briliantine žaluma) to stimulate circulation.

Stage 3 ulcers - may heal spontaneously (within 6 months) if ***pressure is removed*** and ***area is small***.

* debridement. *see below*
* wet dressings (hydrophilic gels, hydrocolloid) or allogenic skin substitutes (e.g. Apligraf).

Ensure that wound stays clean and moist!!!

* many dressings and topical agents (e.g. levomekolio tepalas) are available - no one is universally superior.
* synthetic dressings are more expensive than saline but are more effective - require fewer changes (less disruption of reepithelialization) and protect against contamination.
* bacterial colonization is universal & polymicrobial - swab cultures should not be performed and **topical treatment** only if ulcers have not healed after 2 weeks of therapy.

Stage 4 ulcers require **debridement** with forceps & scissors (or more extensive surgery) to healthy tissue.

* other forms of débridement (may débride without surgery):
1. physical débridement: ***dextranomer beads***, ***whirlpool baths***.
2. chemical-physical débridement: ***1.5% hydrogen peroxide***.
* if, at debridement end, *bone is exposed* → **plastic surgical closure**:
1. ***radical debridement*** - removal of every exposed contaminated part and any necrotic tissue.
2. ***remove bony prominence*** with osteotome to reduce recurrence risk.
3. ***flap*** is closure of choice (esp. over large bony prominences; if *linear closure* is attempted, it will place closure under tension immediately over bony prominence; *skin grafts* are not durable and do no heal on denuded bone); in sacral ulcers use:
	1. V-to-Y ***advancement skin flaps***.
	2. large ***fasciocutaneous rotation flap*** (usually based inferiorly).
	3. other flaps (musculofasciocutaneous, etc.) may be used.
4. at least two large ***suction*** ***drains***.
* for cellulitis, osteomyelitis, sepsis → systemic penicillinase-resistant penicillin or cephalosporin (after cultures of blood and wound border - by needle aspiration or biopsy).

*Panaudota literatūra*:

Merck Manual 1999

Sabiston Textbook of Surgery 2001