

Evidence Summary:

Prevention of pressure injuries in individuals with overweight or obesity

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QUESTION

What is the best available evidence on preventing pressure injuries (PIs) in individuals with overweight or obesity?

SUMMARY

Overweight and obesity are excessive fat accumulation that can impair health status. Individuals with a body mass index (BMI) 25 to 30kg/m² are classified as being overweight and those with a BMI of over 30 kg/m² are classified as having obesity. These individuals are more likely to exhibit factors significantly associated with an increase in PI risk. Conducting a structured risk assessment¹⁻²⁰ (Level 3b evidence) and implementing individualised preventive strategies, including nutrition management²¹ (Level 5b evidence), provision of a pressure redistribution support surface²² (Level 1b evidence), and attention to positioning^{21, 23, 24} (Level 5 evidence) and skin care^{21, 23, 24} (Level 5 evidence) are cornerstone principles in reducing the risk of PI in individuals with overweight and obesity.

CLINICAL PRACTICE RECOMMENDATIONS

- Conduct a structured risk assessment that considers factors that may increase the risk for PIs for an individual with overweight and obesity (Grade A).

- Refer individuals with overweight and obesity to an accredited practicing dietitian (APD) for a nutritional assessment and development of an appropriate nutrition management plan (Grade B).
- Assess skin and skin folds and perform preventive skin care (Grade B).
- Evaluate safety of equipment for bariatric use, select chairs and beds with adequate dimensions for safe repositioning and evaluate 'bottoming out' (Grade B).
- Provide a high specification pressure redistribution support surface (Grade A).
- Consider using a bed system with advanced microclimate technology (Grade B).
- Regularly reposition the individual using appropriate repositioning aids and encourage early mobilisation (Grade A).

EVIDENCE

Pressure injury risk

Evidence on the relationship between increased weight and the incidence of PI is mixed, with some studies showing increased risk, some showing lower risk and some showing

SOURCES OF EVIDENCE				
Level 1	Level 2	Level 3	Level 4	Level 5
Experimental designs	Quasi-experimental designs	Observational - analytic designs	Observational - descriptive studies	Expert opinion Bench research
2 Systematic reviews ^{9, 22}	None	Cohort with control group 1-8, 10-17, 19, 25 No control group 18, 20, 26	None	Bench research 23, 24, 27 Expert consensus ²¹

no significant influence of high BMI on PI risk²¹ (Level 5b evidence). The most recent evidence indicates that the risk of PI is significantly higher in individuals who are extremely obese compared to those of normal BMI (odds ratio 0.53, (95% confidence interval 0.33 to 0.85, p=0.009)⁴ (Level 3b evidence). However, all individuals with overweight and obesity are at increased risk of several factors associated with an increased risk of PI, including:

- Decreased mobility (particularly chair and bed mobility) resulting from difficulty distributing increased body weight. A majority of risk studies investigating the relationship show that reduced mobility is significantly associated with PIs^{1, 2, 10-12, 17, 25} (Level 3b evidence)
- Increased risk of friction and shear when repositioning due to restricted movement from increased body weight. Friction and shear are significantly associated with increased PI risk in about one third of studies exploring this relationship^{5, 6, 13, 16, 19} (Level 3.b evidence).
- Increased pressure load on skin and tissues due to increased tissue weight. Increased interface pressure is significantly associated with increased risk of PI in two studies.^{7, 18} (Level 3.b evidence).
- Increased risk for intertriginous dermatitis and other types of moisture-associated skin damage due to moisture from diaphoresis or incontinence accumulating in skin folds. Skin moisture is significantly associated with PI risk in about 60% of studies investigating the relationship^{3, 7, 15} (Level 3.b evidence).
- Increased risk of impairment of the vascular and lymphatic systems that support skin and tissues due to increased tissue weight. Reduced circulatory system function is associated with a significant increase in PI risk in about 50% of studies investigating the relationship^{2, 8, 14, 15, 17} (Level 3.b evidence).

Promoting nutrition

Promoting optimal nutritional status is associated with superior health outcomes, including preventing and healing PIs. There is no specific evidence on the efficacy of weight reduction in preventing or treating PIs. However, individuals with overweight and obesity are considered to be at increased nutritional risk that may require management²¹ (Level 5.b evidence).

Clinical guidelines recommend that individuals at risk of PIs who are assessed as having risk of malnutrition are provided with an individualised diet under the direction of an APD²¹

(Level 5.b evidence). An adequate energy intake, calculated using the Mifflin-St Jeor equation⁹ (Level 1.b evidence) and adjusted based on the level of overweight or obesity²¹ (Level 5.b evidence), is recommended to prevent PIs.

Promoting skin integrity

Individuals with overweight and obesity are at risk of PIs in unexpected locations due to the excess weight of tissues. A regular skin assessment that includes all skin folds (e.g. behind the neck, under the pannus and breasts, perineal, buttock and scrotal region) should be conducted on a regular basis to identify areas at risk of PI^{21, 23, 24} (Level 5 evidence).

Regular preventive skin care should include:

- Management of moisture with regular skin cleansing, gentle drying and application of moisturiser^{21, 23, 24} (Level 5 evidence).
- Implementation of a continence management plan when applicable.^{21, 23}
- Careful positioning and regular rotation (as applicable) of medical devices (e.g. tubes, catheters)^{21, 24} (Level 5 evidence).
- Identification and treatment of impairments to skin integrity from other causes (e.g. intertriginous dermatitis, fungal infection)^{21, 24} (Level 5 evidence).

Using appropriate equipment

Individuals with overweight and obesity may exceed the safe weight and dimensions for medical equipment. When selecting equipment including chairs, beds, wheelchairs, hoists and bathroom seats:

- Check that equipment is safe for bariatric use (e.g. any weight restrictions)^{21, 23} (Level 5 evidence).
- Assess the space between the individual and side rails/equipment features is sufficient for the individual to reposition. A recent observational study²⁶ found that a standard 91 cm wide hospital bed provided insufficient space for an individual with a BMI > 35kg/m² to turn without lateral repositioning. The study showed that for individuals who can turn independently, the minimum dimension for a hospital bed is 91 cm (up to BMI 45kg/m²), 102cm (up to BMI 55kg/m²) and 127cm (≥55kg/m²). Greater bed widths are required for safe repositioning of dependent individuals²⁶ (Level 3e evidence).
- Evaluate support surfaces for ‘bottoming out’, which occurs when the surface provides insufficient support

due to excessive immersion such that the individual is supported by the bed or chair base²¹ (Level 5b evidence).

There is no specific evidence on the efficacy of different support surfaces in preventing PI in individuals with overweight and obesity. A pressure redistribution support surface is associated with a decreased incidence of PI in a large range of patient demographics²² (Level 1b evidence), and is also recommended for individuals with overweight and obesity²¹ (Level 5b evidence).

In a small observational study (n=21) individuals with overweight or obesity (mean BMI 51.4 ± 10.3) used a low air-loss continuous rotation bariatric bed with advanced microclimate technology for an average of 4.8 days in a critical care unit. In these individuals, who were at high pressure injury risk, no new PIs occurred²⁰ (Level 3e evidence).

Repositioning

Individuals with overweight and obesity are at greater risk of damage to the skin and tissues from shear and friction during repositioning. Extra weight can make it harder for the individual to self-position or for health professionals to move the individual without drag. To reduce this risk:

- Regularly re-positioning the individual. Non-blanchable erythema may present later in individuals with overweight or obesity as damage occurs in deeper tissue without visible skin signs²⁷ (Level 5c evidence).
- Consider the 30 side-lying position with the pannus supported away from underlying tissue²⁴ (Level 5c evidence).
- Use appropriate equipment to assist in repositioning (e.g. bariatric hoist) or when unavailable, ensure sufficient health professionals assist in repositioning to prevent injury to staff and the individual^{21, 24} (Level 5 evidence).
- Provide appropriate aids to assist individuals to self-position (e.g. overhead or side rails)^{21, 24} (Level 5 evidence).
- Educate individuals about strategies to self-position and encourage early mobilisation.

METHODOLOGY

This evidence summary is based on a structured database search combining search terms that describe pressure injuries with search terms related to bariatric individuals. Searches were conducted in EMBASE, Pubmed, Medline, Scopus and the Cochrane Library. Evidence published up to November 2017 in English was considered for inclusion.

RELATED EVIDENCE SUMMARIES

JB1 18874 Pressure injuries: Preventing heel pressure injuries with positioning

JB1 18875 Pressure Injuries: Preventing heel pressure injuries with prophylactic dressings

JB1 18873 Pressure injuries: Preventing medical device related pressure injuries

JB1 19261 Pressure injuries: Alternating pressure support surfaces

JB1 19262 Pressure injuries: Skin care

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