

# Evidence Summary: Low friction fabric for preventing pressure injuries



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## CLINICAL QUESTION

What is the best available evidence for using low friction fabrics to prevent pressure injuries (PIs) in all populations?

## SUMMARY

Bench research provides *Level 5*<sup>1,2</sup> evidence that moisture, temperature and humidity influence the coefficient of friction between the skin and fabrics, and that performance differs between fabrics. Evidence from one randomized controlled trial (RCT),<sup>3</sup> provided *Level 1* evidence supporting use of a low friction fabric in conjunction with an incontinence product for older individuals to reduce the incidence of PIs. *Level 2*<sup>4-6</sup> and *Level 3*<sup>7,8</sup> evidence suggested that low friction fabrics can be used in a range of care settings (e.g. medical, surgical and intensive care) for individuals at high and lower risk of PIs to reduce the risk of developing a new PI. This evidence supported a *Grade B* recommendation (a weak recommendation).<sup>9</sup>

## CLINICAL PRACTICE RECOMMENDATIONS

All recommendations should be applied with consideration to the patient, the health professional and the clinical context.

**Low friction fabrics could be used to prevent pressure injuries in individuals with a moderate to high pressure injury risk (Grade B).**

## SOURCES OF EVIDENCE

This summary was conducted using methods published by the Joanna Briggs Institute.<sup>9-11</sup> The summary is based on a literature search combining search terms related to PIs and low friction fabric/linen. Searches were conducted in

CINAHL, Medline, the Cochrane Library and Google Scholar for evidence published up to December 2019 in English. Levels of evidence for intervention studies are reported in the table below.

## BACKGROUND

Any item placed close to the skin can influence the microclimate (particularly skin temperature and moisture).<sup>1,2,8</sup> This includes bedding, gowns, booties and other fabric products. Low friction fabrics (also referred to as synthetic fibre, silk-like fabric or specialty linen<sup>4</sup>) have a range of features that differ from standard hospital linen (cotton or cotton-polyester blend).<sup>4,5,7</sup> Features of low friction fabrics that might contribute to prevention of PIs include:

- Yarn material and weave designs that reduce friction and shear<sup>4,5</sup> by lowering the force required to overcome the grip (coefficient of friction) between the individual and the support surface.<sup>6,7</sup>
- Ability to dry faster and/or wick moisture away from skin, reducing the impact of moisture.<sup>4,5,8</sup>
- Ability to remain cooler for longer, reducing the impact of warmer temperature.<sup>4</sup>

## EVIDENCE

- An RCT at moderate risk of bias conducted in high level aged care (n = 46 participants) found a significantly lower incidence of PIs at 20 weeks associated with silk-like linen compared to cotton blend linen (hazard ratio[HR] = 0.31, 95% confidence interval [CI] 0.12 to 0.78). The results were also significant for Stage II or greater PIs (HR = 0.23, 95% CI 0.078 to 0.69, p=0.0084). Use of different incontinence products between the groups may have contributed to results<sup>3</sup> (*Level 1*).

Level 1 Evidence	Level 2 Evidence	Level 3 Evidence	Level 4 Evidence	Level 5 Evidence
Experimental Designs	Quasi-experimental Designs	Observational – Analytic Designs	Observational – Descriptive Studies	Expert Opinion/ Bench Research
1.c RCT <sup>3</sup>	2.d Pre-test – post-test or historic control study <sup>4-6</sup>	3.c Cohort study with control group <sup>7</sup> 3.e Observational study without a control group <sup>8</sup>	None	5.c Bench research <sup>1,2</sup>

- In a prospective study at moderate risk of bias, the incidence of new PIs was significantly lower for a group receiving low friction fabric gowns and bed linen compared with a group receiving cotton-blend fabrics (4.6% versus 12.3%,  $p = 0.01$ ). Participants were medical renal patients at high risk for PIs. The same study, repeated in surgical intensive care units (ICUs) with participants at high PI risk, also showed significant reduction in PI incidence associated with low friction fabric (0% versus 7.5%,  $p = 0.01$ )<sup>6</sup> (*Level 2*).
- In a retrospective before-after study at moderate risk of bias ( $n = 768$  participants), a group receiving low friction fabric gowns and bed linen experienced significantly a lower incidence of Stage I (5.6% versus 2.3%,  $p < 0.001$ ) and Stage II PIs (5.95% versus 0.8%,  $p < 0.001$ ) than a control group receiving regular clothing and bedding. Individuals were recruited from a range of clinical areas and likely represented people with both low and high risk of PIs<sup>5</sup> (*Level 2*).
- A prospective study at high risk of bias found that although the incidence of PIs was not different between two ICU cohorts (both 6.6%) there was significantly greater reduction in PI incidence over time in a cohort ( $n = 1,647$ ) receiving a low friction fabric on the bed compared to a cohort ( $n = 2,153$ ) receiving cotton blend linen (7.71% versus 5.26%,  $p = 0.002$ ). Both cohorts primarily included individuals with a low to moderate risk of pressure injuries<sup>4</sup> (*Level 2*).
- A multivariate analysis at high risk of bias ( $n = 71$  participants) showed that the type of sheet used (low friction fabric versus cotton) had an odds ratio of 0.11 (95% CI 0.012 to 1.032,  $p = 0.053$ ) for development of a PI. The only other statistically significant variable was the Braden Scale score. The study was conducted in an environment with very high average mean room temperature and humidity, which increased perspiration<sup>9</sup> (*Level 3*).
- A cohort study at high risk of bias reported a significant reduction in PI incidence in a cohort receiving low friction fabric undergarments and/or booties ( $n = 204$ ) compared to a cohort receiving regular garments ( $n = 165$ ; 25% versus 41%,  $p = 0.02$ ). Both cohorts primarily included individuals with a moderate-high risk of heel or sacral PIs<sup>7</sup> (*Level 3*).

## CONSIDERATIONS FOR USE

The following points should be considered when using low friction fabrics to prevent PIs:

- Raising the knee of the bed may prevent sliding. When seated on an ordinary chair without a support cushion, a towel can be placed between the low friction fabric and the chair surface to prevent sliding.<sup>4</sup>
- Education on use of low friction fabrics might increase acceptability of the product and promote correct use.<sup>4</sup>
- A cohort study conducted in ICUs in the US reported a low friction fabric was approximately 2.3 times more expensive to purchase than cotton blend fabric, but it lasted three times longer and was associated with almost \$4 million (USD in 2015) lower costs due to

reduction in hospital costs associated with facility-acquired PIs.<sup>4</sup>

- Low friction fabrics might require different laundering processes to standard hospital linen. The manufacturer's instructions should be followed.<sup>3</sup>

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