Document developed by the BC Provincial Interprofessional Skin & Wound Committee in collaboration with OTs/PTs/NSWOCs/WCs from

BC Provincial Support Surface Mattress Algorithm (Adult Populations)

Review the guiding principles for using this algorithm:

- This tool does not replace clinical judgement and is intended for pressure injury prevention/treatment only.
- Incorporate repositioning regardless of support surface.
- Choose a support surface that promotes and preserves client independence and mobility.
- Consider and manage heels and contractures involving at-risk bony prominences independently.
- Minimize layers between client and support surface (e.g. pads, bed alarms, and medical devices).
- Sites within the same health authority may have site-specific access to different support surfaces requiring product-specific knowledge.
- Assess and monitor support surface to ensure that it's working correctly and remains appropriate for the client.
- Collaborate with client and/or caregiver about previous pressure injuries and previous support surface experiences.

Identify current support surface that client has been using.

Complete a Braden Scale and a Head to Toe Skin Assessment. Ensure modifiable risk factors are being addressed (see Additional Resources).

Is there a pressure injury (PI) present that is not on the heel?

- No → **Prevention**: no PI present
- Yes → **Intervention**: PI identified

Prevention: no PI present

What level of assistance does the client require to reposition in bed?

- Independent to minimal assistance to reposition in bed
- Moderate to total assistance to reposition in bed

Can the client feel or understand when they need to reposition in bed?

- Yes → **Non-specialized support surface**

  This is a fillable box. Please replace this text with site-specific surfaces.

  Text will shrink to fit into the box as additional text is entered.

- No → **Can the client be effectively repositioned in bed?**

  - Yes → **Reactive support surface**

If moisture is not a concern (Braden Moisture Subscale: 3 or 4)	*If moisture is a concern (Braden Moisture Subscale: 1 or 2)*
This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.	This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.

  - No → **Reactive air support surface**

If moisture is not a concern (Braden Moisture Subscale: 3 or 4)	*If moisture is a concern (Braden Moisture Subscale: 1 or 2)*
This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.	This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.

Intervention: PI identified

What is the number of tolerated body turning surfaces with no PI?

- 2 turning surfaces tolerated or with no PI (i.e. ability to turn side-to-side or side-to-back)
- 0-1 turning surfaces tolerated or with no PI (i.e. can be positioned on only the back or only on one side)

What level of assistance does the client require to reposition in bed?

- Independent to minimal assistance to reposition in bed
- Moderate to total assistance to reposition in bed

Is their PI deteriorating?

- No or no evidence → **Can the client be effectively repositioned in bed?**
- Yes

Is pressure identified as a main contributing factor to the deterioration?

- No or no evidence → **Can the client be effectively repositioned in bed?**
- Yes → **Active air (alternating) support surface**

Ensure that the alternating feature is turned on. If not tolerated, not available, or not comfortable, consider a reactive air support surface instead.

If moisture is not a concern (Braden Moisture Subscale: 3 or 4)	*If moisture is a concern (Braden Moisture Subscale: 1 or 2)*
This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.	This is a fillable box. Please replace this text with site-specific surfaces. Text will shrink to fit into the box as additional text is entered.

Review **Considerations Table (Appendix A)** to guide the selection of the appropriate support surface for the client.

Ensure support surface is in suitable condition and calibrated for the client.

Ongoing reassessment: Please see **Appendix B** for a list of indicators for support surface reassessment and change.

Appendix A: Considerations Table

If the selected support surface conflicts with a feature identified after you've reviewed the Considerations Table, reevaluate your support surface choice.

PERSON	
Consideration	**Guidance**
Heel pressure injuries	Assess heels separately, as they may not align with surface heel zones. See "Additional Resources" on page 3.
Excessive moisture or heat	If skin is damp due to moisture (e.g. incontinence or perspiration), use a microclimate coverlet or a surface with microclimate management such as low air loss. Address wound exudate or incontinence with separate interventions. Reevaluate linen layers.
Spinal instability	Many active/reactive surfaces are contraindicated in spinal instability – ensure surface is not contraindicated for the client.
Tall body height	Ensure the bed and surface accommodate the client's full height so that the client's feet do not press against the footboard.
Higher body weight	Ensure the bed and surface weight capacity has been checked and is adequate to support the body weight.
Wide body width	Ensure the bed width is wide enough for the client to be repositioned onto their turning surfaces.
Underweight	Underweight clients may bottom out or not immerse appropriately on air-filled surfaces.
Shear	Consider shear on an individual basis. See "Additional Resources" on page 3.
Comfort / End-of-life care	Powered surfaces may cause discomfort, coldness, or confusion. Use them cautiously and prioritize client comfort.
MOBILITY & CLIENT CARE	
Consideration	**Guidance**
In-bed safety	Overlays or some air mattresses can increase height of bed relative to level of side rails leading to safety issues such as entrapment and falls. Use caution and assess for risks; ensure client is still able to use the bedrail to participate in bed care and bed mobility. Bed alarm pads can interfere with support surface performance.
Caregiver handling	Ensure safe repositioning without excessive caregiver reaching. Unless medically contraindicated, consider a repositioning sling and refer to safe patient-handling standards.
Edge-of-bed independence	Air surfaces may reduce a client's ability to sit or transfer independently. Choose surfaces with features like transfer borders, sit-inflate. Overlays can increase the seat to floor height and impact transfers.
ENVIRONMENT	
Consideration	**Guidance**
Power & space	Powered surfaces need reliable outlets and space for pumps or motors. Confirm power availability and create a backup plan for outages.
Hazards	Use caution with air or powered surfaces if sharp objects, pets, or hot equipment are frequently in the vicinity of the support surface. Power cords may be a tripping hazard. Consider selecting a non-powered and non-air surface instead.
Building structure	Ensure the bed and support surface fit through doorways and within the room.

Appendix B: Indicators for Support Surface Change

Regardless of if the pressure injury is improving or worsening, ongoing reassessment is critical. Indicators for reassessment and potential upgrade or downgrade of support surface include but are not limited to:

- Patient safety or comfort concerns
- Change in medical or nutritional status
- Change in function and mobility
- Wound healing goals have been met or have changed
- Response to surface is not as expected
- Change in number of tolerated turning surfaces or intact turning surfaces
- Change in body mass (e.g. weight loss/gain or limb amputation)
- Transition in care (i.e. transfer from one place to another)

Definitions for the algorithm:

Note: these definitions are related to the algorithm. For resources on support surface definitions, please refer to: https://www.clwk.ca/get-resource/support-surface-terms-definitions/

Deteriorating – for the purposes of this document only: signs of new tissue damage in the wound bed or to the periwound or increase of wound measurements outside of debridement.

Effectively repositioned – when a client can maintain a posture or position that promotes body alignment and sufficient pressure redistribution or off-loading on compromised or at-risk areas of the skin such as bony prominences.[1]

Level of assistance - adapted from the Functional Independence Measure (FIM©)

- **Independent assistance** – Performs the task independently and safely. The client completes 100% of the task.
- **Minimal assistance** – The client performs 75% or more of the task themselves. Clinician effort is 25%.
- **Moderate assistance** – The client performs more than half of the task themselves. Clinician effort is 50%.
- **Total assistance** – The client performs less than 25% of the task themselves or does not perform the task at all. Clinician effort is 75% or more.[2]

Tolerated – a body position that the client is agreeable to be positioned in and can be maintained for a clinically appropriate duration of time that does not further compromise the patient's skin and tissue tolerance (mechanical properties of the tissues).[1]

Turning Surface – for the purposes of this document only: there are three body turning surfaces: left side-lying, right side-lying, and supine. Prone is not included as prone is usually difficult for a client to maintain.

Additional resources:

Category	Resources
General guidelines	• *BC Guideline: Prevention of pressure injury in adults & children* • *Best practice recommendations the prevention and management of pressure injuries*
Skin assessments	• *Wound assessment and treatment flow sheet: documentation guide* • *Head-to-toe skin assessment*
Risk factors that affect pressure injuries	• List on Page 13 of *Best practice recommendations the prevention and management of pressure injuries* • *Nutrition screening for wound prevention & healing: guideline for nurses*
Shear & positioning	• *Avoiding shear when raising the head of bed* • *Sitting up in bed (video)* • *Small therapeutic devices for shear prevention & positioning*
Heel offloading	• *Quick reference guide* • *Heel offloading algorithm* • *Small therapeutic devices for heel offloading*
Safe patient handling	• *Patient handling*
Product information	• *Product information sheets*

Recommendations on using this algorithm:

- Use this algorithm upon client admission, when client condition changes, transfers between units and sites, and upon discharge of client care.
- Sites within the same health authority may have site-specific access to different support surfaces requiring product-specific knowledge.
- *Product information sheets* can be used to determine the category of the support surfaces that are available to you at your site.
- When completing the fillable support surface boxes, some surfaces may fall within two categories. Place the support surface in the category that best reflects the properties of the support surface. For example:
    - If the surface has a reactive air component, place it into the Reactive Air Support Surface box.
    - While all active air (alternating) support surfaces become reactive if the alternating setting is turned off, put these support surfaces into the Active Air (Alternating) Support Surface box.
- Each site is responsible for completing all fillable text boxes with site-specific resources and support surfaces available.
- Specialized patient populations or client-specific considerations may fall outside the scope of this algorithm. Use your clinical judgement and patient assessment when selecting a support surface.

Health-authority or site-specific resources: *(fillable box)*

This is a fillable box. Please replace this text with site-specific surfaces.

Text will shrink to fit into the box as additional text is entered.

References for the definitions:

1. Kuhnke J, Burrows C, Evans R, Orsted H, Rosenthal S. Best practice recommendations for skin health and wound management 2025 [Internet]. Toronto, Ontario: Wounds Canada; 2025 [cited 2025]. Available from: www.woundscanada.ca/health-care-professional/publications/bpr-new

2. Uniform Data System for Medical Rehabilitation. The AlphaFIM Instrument Guide, Version 4.03 [Internet]. Buffalo; 2012 [cited 2025]. Available from: https://www.udsmr.org/

References for the algorithm:

National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Alliance. Prevention and treatment of Pressure ulcers / injuries: Clinical practice guideline [Internet]. 2019 [cited 2025]. Available from: https://internationalguideline.com/

National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Alliance. Full Body Support Surfaces for Prevention of Pressure Injuries. In: Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline [internet]. The International Guideline: Fourth Edition. Emily Haesler (Ed.). 2025. [cited: May 20, 2025]. Available from: https://internationalguideline.com/

Shi C, Dumville JC, Cullum N, Rhodes S, McInnes E, Goh EL, et al. Beds, overlays and mattresses for preventing and treating pressure ulcers: An overview of Cochrane Reviews and network meta-analysis. Cochrane Database of Systematic Reviews. 2021 Aug 16;2021(8). doi:10.1002/14651858.cd013761.pub2

Wounds Canada. Integrated Therapeutic Support Surface Selection for Pressure Injury Prevention and Management. Wounds Canada; 2023. Available from: https://www.woundscanada.ca/docman/public/3092-wc-product-picker-surfaces-fillable-1/file