

Sept 3rd, 2019

Quart Low Air Loss Alternating Pressure Mattress Medical Justification Notes

This information provides general guidance. Quart recommends specialized sleep surfaces be selected under the direction of a qualified medical professional.

This information is best used with our Mattress Comparison Chart @ www.quarthealthcare.com or on our Google Drive page; <https://drive.google.com/open?id=1BX7iVbuPCf5IYySIRb2pEf9pYYZWAb2k>

This document is intended for use by equipment prescribers working to match client needs with available equipment capabilities. Information is organized so that when writing a letter of medical justification, the prescriber may include these four parts;

- an outline of how the recommended low air loss alternating pressure mattress works to reduce the risk of pressure injury and/or addresses needs relating to an existing injury.
- a list of specific patient observations with matching commentary about the recommended mattress feature/benefits addressing those patient observations
- In some cases, it may be helpful to include a doctors' prescription for the recommended mattress when seeking third party funding assistance
- a specific supplier recommendation, identifying a supplier who might best furnish the mattress and follow-up with the patient if maintenance or future sleep surface equipment needs arise.

These notes are a result of ongoing discussion intended to assist prescribers when assessing patient need for a low air loss alternating pressure mattress. If you would like to add to these notes, make corrections or recommendations that may add to the conversation, please send your thoughts to phil.mundy@quarthealthcarewest.com

Information outlining how the required support surface (mattress) operates and how deployment of this product will result in improved skin health, prevention of a pressure injury for a high-risk individual, or remediation of an open injury for and individual with an existing injury.

Comments relating to the Braden Scale for predicting Pressure Ulcer Risk in Adults & Children

Quart low air loss alternating pressure mattresses are defined as Active Support Surfaces - externally powered therapeutic support surface that can change its load – distribution properties with or without

applied load. These surfaces reduce the pressure against the client's skin regardless of whether they move. Examples include alternating pressure mattress and lateral rotation mattresses.

Topaz 8 Plus or Diamond 8 Plus - A Braden Scale score between 14 - 18 might be a candidate for either of these products. Both provide an active support surface. Both are considered micro low air loss, meaning air flow through the mattress is limited. If the clients' Braden Moisture Score is 1 or 2, there is reason to consider using the DynaLAL III since this product is an active support surface with a higher air flow leading to superior drying potential.

DynaLAL III or Elite Turn - A Braden Scale score of 13 or less might be a candidate for either of these products. Considering either option, the Elite Turn is used in cases where the clinician wishes to ensure the client is laterally rotated as part of their pressure redistribution routine.

While these notes provide overall suggestions, it is important to follow the complete Braden Scale assessment as there are sub-categories identifying risks that can and should influence therapeutic choices.

Why am I not recommending a passive mattress system?

Passive mattress systems typically include foam mattresses, passive air systems, or hybrid systems that might include both foam and air inserts, among others. I am not recommending a passive mattress system because;

- this option has been tried and has proven ineffective in reducing the risk of this patient acquiring a pressure injury
- this patient currently has a pressure injury or skin injury
- in my opinion the risk of injury for this patient is imminent. I recommend use of a powered support surface in managing this patient's needs.

What is a *Low Air Loss* mattress?

A Low Air Loss mattress surface includes controlled air outflow through a series of laser cut holes in the mattress surface, reducing surface moisture through air 'wicking'. Airflow helps remove moisture from the skin. Excess moisture due to incontinence or perspiration can reduce skin tensile strength, a potential source of skin tearing/shearing failure.

The Quart DynaLAL III and Elite Turn System mattresses provide air flow rates in excess of 1200 liters per minute (LPM). This level of air flow is considered high flow rate, sufficient to promote active skin drying. Active skin drying capability is considered especially important when the mattress is used with a patient who has an open injury.

The Quart Topaz 8 Plus and Diamond 8 Plus provide a flow rate just under 10 liters per minute (LPM) of air. This is considered a low flow rate, sufficient to promote active drying for a client exhibiting minimal moisture issues. These two products are most often selected primarily because their alternating pressure characteristics reduce the risk of pressure related tissue failures.

Low air loss mattresses using a lower air flow rate are generally powered by a compressor (similar to an aquarium air pump) and are much quieter compared to low air loss mattresses having a higher air flow rate and powered using a blower system.

What is Alternating Pressure?

Alternating pressure relief surfaces reduce pressure on load bearing areas of the body through controlled inflation/deflation of air cells within the mattress. When some air cells deflate, there will be localized pressure offloading, allowing capillary circulation within body tissues to return to those areas next to a deflated air cell. As air cells are sequentially inflated and deflated, this action encourages improved capillary flow.

The Quart Topaz 8 Plus, Diamond 8 Plus and DynaLAL III systems use alternating pressure to ensure regular offloading is achieved. The Topaz 8 Plus can be set between 10 - 30 minute cycle times. The Diamond 8 Plus has a preset cycle time of 21 minutes. The DynaLAL III system can be programmed between 10 to 20 minute cycle times.

The Quart Elite Turn System does not use alternating pressure to offload tissue. Instead, this mattress uses powered client turning from side to side to ensure pressure redistribution is achieved.

Is there a Difference between Quart and Other Alternating Pressure Mattresses?

Quart mattresses employ a 2/3 supported – 1/3 unsupported mode of operation. With 2/3 of the body always supported, lower peak pressures result compared to mattresses employing 50:50 inflation/deflation where every other cell is inflated at any time. If you remove the cover and look from the side of a Quart mattress you will see two cells inflated and the next cell deflated.



What is the difference between Alternating Pressure, Pulsation, and Constant Low Pressure (CLP)?

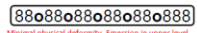
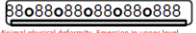
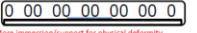
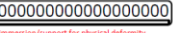
Pulsation technology, available with the DynaLAL III, attempts to change body surface loading by varying the inflation level of a support surface. The entire mattress inflates to varying levels for set time periods, increasing and decreasing skin surface pressure, never completely unloading any part of the body surface. Constant Low Pressure, available with the Topaz 8 Plus, allows the mattress to be maintained in a constant static state.

Alternating Pressure - In most cases, clinicians will prefer to use alternating pressure, cycling regularly to ensure 1/3 of the supported surface is always completely offloaded, thereby encouraging capillary flow into the offloaded areas.

Pulsation or Constant Low Pressure - The DynaLAL III mattress can be operated using either Alternating Pressure or Pulsation. The Topaz 8 Plus mattress can be used in a state of Constant Low Pressure. These functions are most often used when working with a patient who might be hypersensitive, unable to tolerate a mattress operating in alternating pressure mode.

Turning Mattress – The Elite Turn System does not employ alternating pressure or pulsation. Instead this mattress continually changes surface pressure by turning the patient from side to side at regular intervals.

Matching a Specific Client Profile with a recommended Quart Mattress– The following examples are intended to help identify a Quart surface that best matches the needs of a specific patient. Each example includes a list of potential patient descriptors, along with notes identifying why that recommended Quart mattress might be a good fit. Review the patient descriptors and determine which ‘best fit’ your situation.

TOPAZ 8 PLUS	DIAMOND 8 PLUS	DYNALAL III	ELITE TURN
ALTERNATING PRESSURE AND MICRO LOW AIR LOSS <i>Red Text - match client need with product features;</i>	ALTERNATING PRESSURE AND MICRO LOW AIR LOSS <i>Red Text - match client need with product features;</i>	ALTERNATING PRESSURE, TRUE LOW AIR LOSS <i>Red Text - match client need with product features;</i>	LATERAL ROTATION AND TRUE LOW AIR LOSS <i>Red Text - match client need with product features;</i>
Minimal moisture and/or cooling concerns Air Loss flow rate = 8 liters/min (lpm), Low flow rate ensures silent operation.	Minimal moisture and/or cooling concerns Air Loss flow rate = 9 liters/min (lpm), Low flow rate ensures silent operation.	Need to disperse moisture and/or provide cooling Air Loss flow rate = 1200 max liters/min (lpm) ensuring excellent drying when wetness is a concern	Need to disperse moisture and/or provide cooling Air Loss flow rate = 1200 max liters/min (lpm) ensuring excellent drying when wetness is a concern
Air cell notes 	Air cell notes 	Air cell notes 	Air cell notes 
Minimal physical deformity, Emersion in upper level Upper layer of cells (4" deep) provide alternating pressure. Lower layer provides static air, preventing bottoming-out and providing 'Always-on' Fowler function support.	Minimal physical deformity, Emersion in upper level Upper layer of cells (4" deep) provide alternating pressure. Lower layer provides static air, preventing bottoming-out and providing 'Always-on' Fowler function support.	More immersion/support for physical deformity 8" deep cells facilitate maximum offloading of pressure and maximize potential immersion. Heel section have 6" high profile to reduce heel pressure.	More immersion/support for physical deformity 8" deep cells facilitate maximum potential immersion. Pressure reduction is accomplished via turning. Do not leave in Static Mode indefinitely.
Less immersion compared to Dynalal or Turn System. Thinner 8" mattress thickness improves side rail fit.	Less immersion compared to Dynalal or Turn System. 1-1/2" soft foam base layer, 9-1/2" mattress thickness	Fowler -inflation increases when bed head is raised 1-1/2" soft foam base layer, 9-1/2" mattress thickness	1-1/2" soft foam base layer, 9-1/2" mattress thickness
Power outage? - Lower cells remain inflated for up to 12 hours following power failure.	Power outage? - Lower cells remain inflated for up to 72 hours following power failure. 2" flexible foam base - added safety if power is lost. 2 lower battery back-up ensures continuous operation during short term loss of power.	Power outage? - Mattress includes 2" foam underlay providing support during short term loss of power. 2" flexible foam base - added safety if power is lost.	Power outage? - Mattress includes 2" foam underlay providing support during short term loss of power. 2" flexible foam base - added safety if power is lost.
Alternating Pressure Cycle time = 10 - 30 min as selected for complete 3 stage cycle time	Alternating Pressure Cycle time = 21 min for complete 3 stage cycle time (7 min each stage)	Alternating Pressure Cycle time 5 - 20 min includes both 'alternation' or 'pulsation' functions	Facilitate postural drainage. Turning may help disperse fluid buildup in lungs or manage hypersensitivity Alternating L/R Rotation time 5 - 95 min Lateral rotation turns user. Choose 20° or 40° turn Auto Firm - Set to highest setting to provide a stable patient repositioning and/or transfer surface
Auto Firm - Returns to original settings after 20 min Auto Memory Reset - Returns to previously selected settings when powered on Lockout - Yes (prevents accidental tampering)	Auto Firm - Returns to original settings after 30 min Auto Memory Reset - Returns to previously selected settings when powered on Lockout - Yes (prevents accidental tampering)	Auto Firm - Returns to original settings after 30 min Auto Memory Reset - Returns to previously selected settings when powered on Lockout - Yes (prevents accidental tampering)	Auto Firm - Set to highest setting to provide a stable patient repositioning and/or transfer surface Static Mode - Maintains constant pressure as an alternative to Turn mode
Need a simple 'automated' system Auto Detection - Detects client weight and sets pressure for optimal performance. Auto Pressure Adjustment - checks and readjusts pressure every 10 minutes <i>softer surface - adjustable to lower pressure may be accepted by individuals with hypersensitivity</i> Constant Low Pressure function - low pressure support without alternating pressure	Need a simple system	Need either a warm or cool sleep surface Warm air exhaust can be directed to a sleeve at mattress foot or directed inside the mattress to provide warming. Leaving Bed Alarm - Helps monitor patient activity Bottoming-out Alarm - Alerts if bottoming-out when in Fowler position	Need either a warm or cool sleep surface Warm air exhaust can be directed to a sleeve at mattress foot (cooling) or directed inside the mattress (warming) Static Mode - Maintains constant pressure as an alternative to Turn mode
Sizes - 36" x 80" x 8" (grow to 39, 42, or 48") Weight Capacity 350 lb. Warranty - Includes 2 year warranty	Sizes - 36" x 80" x 9-1/2" (grow 39, 42, or 48") Higher weight rating. Weight Capacity 650 lb. Warranty - Includes 2 year warranty	Sizes - 36" or 48" x 80" x 9-1/2" (grow up to 60") Higher weight rating. Weight Capacity 1000 lb. Warranty - Includes 2 year warranty	Sizes - 36" x 80" x 9-1/2" Higher weight rating. Weight Capacity 1000 lb. Warranty - Includes 2 year warranty

Example 1 - My client is at risk of developing pressure ulcers due to decreased ability to move and reposition themselves. He/she does not exhibit excessive sweating or moisture related issues. He/she does not have significant fixed physical deformity or contractions that might suggest a need for a deep emersion surface. He/she may or may not exhibit hypersensitivity, making them very sensitive to touch and increasing discomfort when care providers reposition them in bed.

This individual might do well with a Topaz 8 Plus or Diamond 8 Plus mattress for the following reasons;

- My client exhibits minimal fixed deformities and/or minimal bony prominence. Since these two mattresses employ a baffle design with separate upper and lower chambers (each cell looks like a figure 8), the effective emersion potential is approximately 4". The lower half of the figure 8 cell remains inflated at all times when the mattress is in use. This feature ensures my patient cannot bottom-out when the head of the bed is raised, desirable when working with patients and/or care staff who may not always be attentive about potential skin care risks stemming from prolonged positioning with the head of the bed raised (Fowler position).
- This patient exhibits a significant risk of skin breakdown but does not currently have any open injury. Additionally, moisture, from either sweating or incontinence is not a concern at this time. Knowing this mattress is providing less air and has less emersion capability compared to a Dynalal III mattress or Elite Turn mattress, the Topaz 8 Plus or Diamond 8 Plus mattress can

provide an alternating pressure surface that will encourage improved capillary flow and thereby help to protect my patient from a future pressure injury.

- Patients prefer a mattress where the control unit is silent. With either the Topaz 8 Plus or Diamond 8 Plus, the air pump is a compressor, producing in the range of 8-9 liters per minute of air. This lower air-flow allows these mattresses to be very quiet.
- The Topaz 8 Plus and Diamond 8 Plus mattresses are similar but not identical Primary differences are as follows;
 - o Diamond 8 Plus has a 2 hour battery back-up built into the controller. If power is lost, it will keep running for 2 hours. The Topaz 8 does not have a built-in battery back-up.
 - o If power loss continues, the Diamond 8 will remain partially inflated (lower half of the figure 8 cells) for up to 72 hours. The Topaz 8 Plus will remain inflated for up to 12 hours.
 - o The Diamond 8 has a 650 lb weight limit. The Topaz 8 has a 350 lb weight limit.
 - o The Topaz 8 Plus mattress can be operated in 'Auto Detection' mode. When operating in this mode, the mattress will automatically detect how much air to supply the mattress for patient support, eliminating the need for a care-giver to determine the controller pressure setting.
- If this client exhibits hypersensitivity and is therefore unable to tolerate alternating pressure, the Topaz 8 Plus mattress can be set in CLP (Constant Low Pressure) mode. Keep in-mind this mode is used primarily to provide comfort. Active pressure reduction is only achieved when the mattress is set to Alternating Pressure settings. In practice, the CLP function is primarily used in palliative care applications where the priority is simply to provide optimal patient comfort.

Example 2 – My patient may have fixed deformities, contractures or bony prominences. This individual might also exhibit excess moisture (sweating and/or incontinence). He/she might currently have or previously has had pressure injuries and/or skin integrity problems. He/she may or may not exhibit hypersensitivity, making them very sensitive to touch and increasing discomfort when care providers reposition them in bed.

This individual might do well with a DynaLAL III system for the following reasons;

- Patients exhibiting significant deformities and/or contractures will require a surface designed to allow deeper immersion. With this in-mind, The Topaz 8 Plus or Diamond 8 Plus mattresses have limitations, providing up to approximately 4" of immersion. Having 8" deep 'O' shaped cells, the DynaLAL III mattress will accommodate significantly more immersion. It will be important for this client to use a mattress with more immersion capability, avoiding bottoming-out that could otherwise result in pressure on bony prominent areas such as heels, shoulder blades and elbows.
- This client may be exhibiting sweating and/or any other sources of skin wetness. The controller (air pump) used in the DynaLAL III system is a blower producing in excess of 1200 liters of air per minute. With higher air flow, the mattress will readily disburse excess moisture.
- This client has an open injury or a previously open injury that has now healed. With high air flow and high emersion capability the DynaLAL III mattress will provide more protection against the reoccurring risk of skin breakdown and/or pressure injury.
- Given this patient's increased risk of pressure injury and/or skin surface injury, I want to use a mattress with more adjustability, allowing care givers to adjust the mattress according to changing need. The DynaLAL III controller provides significantly more adjustability compared to the Topaz 8 Plus and Diamond 8 Plus;

- Highly adjustable mattress pressure determines how much emersion is achieved for higher-risk clients. Air pressure can be adjusted to meet the needs of very light individuals through to individuals weighing up to 1000 lb.
- Adjustable frequency of alternating pressure (5, 10, 15 or 20 min) cycling facilitates more frequent unloading of bony prominence areas if needed.
- The controller can be set to provide alternating pressure or pulsation. Pulsation may be better tolerated when working with a patient exhibiting hypersensitivity.
- While the Topaz 8 Plus and Diamond 8 Plus mattresses provide ‘always on’ fowler support, the DynaLAL III mattress includes an automatic ‘fowler position’ pressure sensing pad located under the head-section of the mattress. When the head of the bed is raised, the controller automatically increases mattress pressure, ensuring the user will not bottom-out under the mid-section of the mattress.
- This mattress system includes a warm air exhaust hose, normally located along the foot of the mattress. In applications where a patient finds the mattress low air loss function results in their feeling too cool, the warm air exhaust hose can be inserted into the body of the mattress, providing warm air flow within the mattress. Keep in-mind that a cool surface may be more beneficial for skin health.

Example 3 – My patient is generally unable to move independently in bed. He/she requires regular turning, possibly needed to keep the lungs clear and/or to facilitate postural drainage. This patient may have fixed deformities, contractures or bony prominences. They might also exhibit excess moisture (sweating and/or incontinence). He/she might currently have or previously has had pressure injuries and/or skin integrity problems. He/she may or may not exhibit hypersensitivity, making them very sensitive to touch and increasing discomfort when care providers reposition them in bed.

This individual might do well with an Elite Turn System mattress for the following reasons;

- This patient exhibits moderate to significant risk of pressure injury and/or skin breakdown. He/she may have a history of fluid build-up affecting respiration. Regular patient turning is needed to continually drain the lungs. Turning will also provide regular changes in pressure loading/off-loading, thereby reducing risk of pressure injury and/or skin breakdown.
- It is important to note that the Elite Turn System mattress does NOT provide alternating pressure. Pressure off-loading is accomplished via the patient turning action.
- Patients exhibiting significant deformities and/or contractures will require a surface designed to allow deeper immersion. Like the DynaLAL III mattress, the Elite Turn System will accommodate significantly more immersion. It will be important for this client to use a mattress with more immersion capability, avoiding bottoming-out that could otherwise result in pressure on bony prominent areas such as heels, shoulder blades and elbows.
- This client may be exhibiting sweating and/or any other sources of skin wetness. The controller (air pump) used in the Elite Turn System is a blower producing in excess of 1200 liters of air per minute. With higher air flow, the mattress will readily disburse excess moisture.
- This client has an open injury or a previously open injury that has now healed. With high air flow and high emersion capability the Elite Turn System mattress will provide more protection against the reoccurring risk of skin breakdown and/or pressure injury.
- Given this patient’s increased risk of pressure injury and/or skin surface injury, I want to use a mattress with more adjustability, allowing care givers to adjust the mattress according to

changing need. The Elite Turn System controller provides excellent adjustability to meet individual patient need;

- Adjustable frequency for turn cycles (turns cycle is variable from 5 – 95 minutes) facilitating more frequent unloading of bony prominence areas as needed.
- Turn angle can be set to either 20 or 40 degrees.
- Automated turning may be better tolerated compared to care-giver turning when working with a patient exhibiting hypersensitivity.
- Highly adjustable mattress pressure determines how much emersion is achieved for higher-risk clients. Air pressure can be adjusted to meet the needs of very light individuals through to individuals weighing up to 1000 lb.
- This mattress system includes a warm air exhaust hose, normally located along the foot of the mattress. In applications where a patient finds the mattress low air loss function results in their feeling too cool, the warm air exhaust hose can be inserted into the body of the mattress, providing warm air flow within the mattress. Keep in-mind that a cool surface may be more beneficial for skin health.

Your medical device justification will be strengthened when it is accompanied by a doctor's prescription. As the cost and complexity of your recommendation increases, it will be more likely that a doctor's prescription, confirming/complimenting your recommendations will be a vital step in obtaining 3rd party funding. Physician input should include information about past skin health problems such as skin flap repairs and any other interventions relative to skin health.

Your medical justification letter should include information about your recommended provider, indicating why you are recommending a specific supplier. This section of your letter will focus on the need to engage a knowledgeable provider who is able to quickly provide the required product and react quickly and efficiently in the event of problems or changes in patient condition.

Supplier Considerations

One important consideration in choosing a specialized mattress is to ensure the supplier will be able to deliver promptly, has equipment available for client trials, and is able to support local HME dealers and their clients if and when problems occur. Acceptable management of skin health is not something that can wait very long for suppliers to respond. With this requirement in-mind, Quart Healthcare has established products, protocols and clinical support materials in-place to ensure prescribers and providers understand which products to use and when. Service and replacement parts are available with rapid delivery options. This kind of support is a key factor when working to ensure positive client outcomes are achieved.

Product Selection and Configurations

Quart mattresses are constructed using a modular design, ensuring these products can achieve a long usable lifetime and any failed components can be quickly repaired and/or replaced.

Once a mattress has been selected, consideration might be given to attaining a second cover, sold separately. A second cover is an important part of meeting client need since covers will need to be laundered from time to time. If a patient requires use of their mattress while the cover is in the laundry, a second cover will be needed.

All Quart mattress systems include a two year warranty against manufacturer defects.

Additional Resources of interest

VCH and PHC clinical guidelines) here: <http://shop.healthcarebc.ca>
, <http://shop.healthcarebc.ca/PHCVCHDSTs/BD-00-12-40079.pdf>