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Device-Related
Pressure Ulcer/Injury Prevention — Respiratory Devices
Recommendations and Guidance

These recommendations are intended to provide guidance to improve the consistency of pressure injury prevention related to devices across Minnesota hospitals and to address issues identified through the reporting of pressure injury events. The recommendations are not intended to address all clinical and regulatory requirements related to wound prevention and care.

In reporting year 2018-2019, 43% of Stage III, IV and unstageable pressure injuries reported under Minnesota's Adverse Health Care Event Reporting Law were classified as device-related pressure injuries. The majority of the devices involved were respiratory devices. The purpose of this document is to provide guidance and recommendations to assist hospitals in implementing practices to decrease the likelihood of the development of pressure injuries related to respiratory devices.

Contents

General Recommendations **2**
Nasal Cannulas and Oxygen Face Masks **2**
Respiratory Assist Device Masks; Life-Sustaining CPAP and NPPV (i.e. BIPAP) **4**
Tracheostomy Straps/Ties, Flanges and Sutures **4**
Endotracheal Tubes (ETT) **5**
Special Populations (Neonatal, Pediatric and Bariatric) **6**
Role of the Respiratory Therapist **6**
References **7**

I. General Recommendations for all populations

A. Inspect the skin of the head and neck for pressure damage related to medical devices (1) specifically beneath and around respiratory devices (including skin folds) at admission (if applicable) and at least every 8-12 hours.
B. Mucosal pressure injuries are pressure injuries found on mucous membranes with a history of medical device in use at the location of the ulcer (e.g. bite block and endotracheal tube) (9).
C. Check strap tension and skin integrity beneath and around life sustaining Continuous Positive Airway Pressure (CPAP) and Non-invasive Positive Pressure Ventilation (NPPV) masks at least every 4 hours coordinating with oral intake and with oral cares.
D. It is critical to consider patient size and weight when selecting respiratory devices; see section III Special Populations (2-3).
E. Monitor edema and adjust straps and tubing as needed (6).
F. Consider the application of a protective dressing (e.g.., transparent film, silicone, thin foam or hydrocolloid) for prevention of friction/shear or management of skin damage (7-8). *Note:* protective *dressings do not reduce pressure; continue routine skin inspection without disrupting current interventions.*
G. Educate patient and caregivers on the importance of frequent skin inspection beneath and around the respiratory device as well as the importance of informing the staff if the patient experiences discomfort or pain beneath or around the device (6).
H. Clearly assign responsibility (to a specific clinical discipline) for inspection and documentation of skin integrity around and under oxygen administration devices.
I. Abnormal skin integrity findings, site cares and interventions should be documented in the patient's medical record in a location that is accessible to all relevant clinical disciplines. Physicians should be notified with new pressure injury findings. *Note: pressure injuries found on mucous membranes cannot be staged.* (9)
J. Develop and implement an interdisciplinary approach to preventing respiratory device-related pressure injuries.
K. Develop and communicate clear expectations, roles and hand-off communication processes related to the prevention and management of device-related pressure injuries.

II. Device-Specific Recommendations

A. **Nasal Cannulas and Oxygen Face Masks** *(see section IIB for recommendations specific to life-sustaining CPAP and NPPV, i.e., BIPAP, therapy)*

<u>General Recommendations</u>

a. Thoroughly inspect the skin beneath and around oxygen administration devices at least every 8-12 hours with close attention to the back of the ears, bridge of nose and nares if applicable.

<u>Masks</u>

Secure mask straps to minimal required pressure/tension to obtain adequate placement

a. Visually inspect masks on a regular basis and replace if soiled or defective. *Note: Replace masks with straps that have lost elasticity. Do not tie knots in the straps – this practice may increase the risk of pressure injury development.*

b. Consult with respiratory therapy for proper sizing and fitting at first sign of skin damage under the mask.

c. Consider the application of a protective dressing (e.g. transparent film, silicone, thin foam or hydrocolloid) over the nasal bridge for prevention of friction/shear and management of skin damage (7-8). *Note:* protective *dressings do not reduce pressure; continue routine skin inspection.*

   a. When selecting prophylactic dressings consider (1)
      i. Ability of the dressing to manage moisture and microclimate, especially when used with a medical device that may be in contact with bodily fluids/drainage
      ii. Ease of application and removal
      iii. Ability to regularly assess skin condition
      iv. Thickness of the dressing under tightly fitting devices
      v. Anatomical location of the medical device, and
      vi. Type/purpose of the medical device

d. Consider utilizing alternative masks, such as those that incorporate gel cushions (10), masks that incorporate gel or silicone based cushions, or full face masks, if standard equipment cannot be sized and adjusted to avoid skin breakdown (6).



<u>Nasal Cannulas</u>

a. Consider use of and facilitate easy access to commercially available soft flexible oxygen tubing.

b. Consider the use of and facilitate easy access to, commercially available ear protectors that can be attached to the oxygen tubing (e.g. stock near oxygen tubing) and pads for high flow oxygen.

c. Consider purchasing oxygen tubing with protectors pre-attached to tubing (11).

d. Some foam tracheostomy straps can be used to hold oxygen cannula in place and away from the ears (12). *Note: monitor for signs of inner nose breakdown.*



B. Respiratory Assist Device Masks; life-sustaining CPAP and NPPV (i.e. BIPAP) Therapy

a. Check strap tension and skin integrity beneath and around the mask (especially the nasal bridge) (7) minimally every 4 hours coordinating with oral intake, and oral cares.
b. Consult with respiratory therapy for proper initial sizing and fitting.
c. Re-consult with respiratory therapy for proper sizing and fitting at first sign of discomfort or skin damage under the device.
d. Secure mask straps to minimal required pressure/tension to obtain adequate seal or minimal air leak; allow one finger between the mask strap and the skin (8).
e. Visually inspect masks on a regular basis and replace if soiled or defective, including if the mask strap has lost elasticity. *Note: Masks straps should not be adjusted by tying a knot in the strap – this practice may increase the risk of pressure injury development.*
f. Consider using a prophylactic dressing for preventing medical device related pressure ulcers/injuries (PU/I), avoid excessive layering of prophylactic dressings that may increase pressure at the skin-device interface (1).
g. Consider utilizing alternative masks, such as those that incorporate gel cushions (10), masks that incorporate gel or silicone based cushions, or full face masks, if standard equipment cannot be sized and adjusted to avoid skin breakdown or if prolonged respiratory assist device is anticipated (13).

III. Tracheostomy Straps/Ties, Flanges and Sutures

<u>General Recommendations</u>

a. During routine tracheostomy site care (at least every 8-12 hours) assess skin integrity and tension under the straps/ties/twill tape, around and in back of the neck, around the stoma, and under the tracheostomy tube flange/faceplate (14).
b. Commercially available foam/collar-type adjustable straps (see example) are preferable to tape/twill ties for comfort, easy adjustment, and prevention of accidental tube displacement (12, 15, 16).



c. Manufacturers' instructions vary and should be followed for appropriate application and replacement of straps. For example; one foam strap brand is applied with enough tension to be secure without compressing the foam (14).
d. When using tape/twill ties, allow two fingers to fit between the product that secures the tube and the side of the patient's neck (17).
e. Replace products that secure the tubes when it is soiled, wet, or no longer able to hold the tube properly AND per manufacturer's instruction.

Tracheostomy Tube Flange/Faceplate

a. Collaborate with provider and respiratory therapist to determine if a commercially available silicone stoma pad (cushion between the flange and the tracheostomy site) is indicated to redistribute pressure (18).
b. Use appropriate methods to offload pressure from the drag of ventilator tubing such as a ventilator arm and a rolled towel to the chest (14)

Tracheostomy Sutures (if used for initial stabilization of the face plate/flange)

a. Collaborate with surgeons to create a standard procedure for management of tracheostomy sutures and foam dressing (i.e., number of days sutures must remain in place before converting from suture stabilization to other stabilization).
b. In the absence of a standard process/procedure for tracheostomy suture removal, contact the provider or surgeon after 7-10 days or sooner if skin irritation near the sutures occurs (14).
c. Consult respiratory therapist or wound specialist if skin integrity issues are noted.
d. During post-operative hand-offs (i.e. OR to PACU; PACU to floor), include instructions for converting from suture stabilization to other means (i.e., tracheostomy straps) for securing and stabilizing tracheostomy tube face plate/flange.

IV. Endotracheal tubes (ETT) (Orally intubated patients only)

a. Every 2 hours (during routine oral cares), check the tension and skin integrity under and around the ETT and straps, tape or ties with close attention to the neck, lips and mouth.
b.
c. Use appropriate methods, such as ventilator arm to offload pressure from the

drag of ventilator tubing.

d. Replace products that secure tubes when soiled, wet, or no longer able to hold the tube properly (9, 14) AND per manufacturer's instruction.
e. Consider using a commercial stabilizer for comfort, easy adjustment and prevention of accidental tube displacement (16).

V. Special Populations (Neonatal, Pediatric and Bariatric)

Neonatal and Pediatric - General Considerations

- Pediatric pressure injuries occur primarily on the head/occipital region (2).
- General Recommendations (Section I) can be applied to neonatal and pediatric patients.
- Specific interventions intended for adults may NOT be safe for neonatal and pediatric patients (i.e., rotating ETT); always follow pediatric specific recommendations and manufacturers' instructions when available.
- Consider size and weight when selecting respiratory devices (3); use commercially available pediatric products when available rather than adapting standard equipment.

Bariatric – General Considerations

- Pressure injuries from respiratory equipment can result from pressure within skin folds (4).
- Consider use a of silver textile product to wick away moisture from skin folds.
- Consider size and weight when selecting respiratory devices; instead of adapting standard equipment, use commercially available bariatric products such as longer tracheostomy tubes and bariatric tracheostomy collars (21).
- General and device specific recommendations in sections I and II can be applied to the bariatric patient population.

VI. Role of the Respiratory Therapist

Respiratory therapy should be represented on the organization's pressure injury prevention team. Sample activities include:

a. Development and implementation of organization-wide policy and process to prevent respiratory device-related pressure injuries;
b. Education and training of respiratory therapy staff in best practice respiratory device-related pressure injury prevention and documentation;
c. Auditing of respiratory therapy staff compliance with best practice respiratory device-related pressure injury prevention;

d. Involvement in review, discussion and action plan implementation of pressure injuries prevention practices related to respiratory devices;
e. Consideration of skin care in review of new respiratory device purchases; involvement of respiratory therapy in purchases of pressure injury prevention devices/materials related to respiratory cares;
f. Development of processes for shared documentation/collaboration during reports between nursing and respiratory therapy staff using common terminology;
g. Partnering wound care and respiratory staff during grand rounds to provide education on identification and prevention of pressure injuries.

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