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Rebecca Brooks
Childrens Health

Danielle Walker
Childrens Health

Stephen Chorney
Childrens Health

Christina Smith
Childrens Health

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Keeping the Trach Safe: Development and Validation of a Risk Assessment Scale

Rebecca Brooks, MSN, APRN, PCNS-BC; Danielle Walker PhD, RN, CNE; Stephen Chorney, MD, MPH; Romaine Johnson, MD, MPH; Yann-Fuu Kou, MD; Candice Bailey, BSN, RN; Cindy Whitney, RRT, NPS; Amy Acton, RRT, NPS; Ashley Sewell, BSN, RN, CPN; Christina Smith, BSN, RN
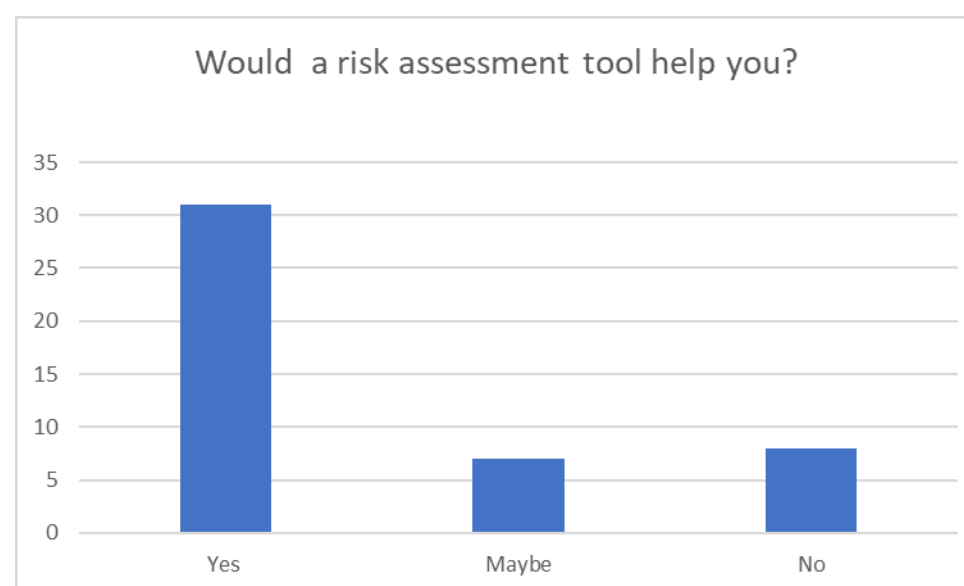
Background

- \>4,000 new tracheostomies are placed in children each year (Watters, 2017)
- 39% experience complications
- In 2022, 42 accidental decannulations occurred at CHST
    - Estimated cost to CHST was 270,000
- Severity and volume of accidental decannulations can be reduced

Purpose

- To develop, validate, and test an instrument to assess risk for accidental decannulation in children with a tracheostomy

Methods

- CHAMP developed the Children's Health Decannulation Risk Assessment Tool (CH-DRAT)
- Face validity was assessed with end users. Via a survey all participants:
    - Reviewed 1st version of CH-DRAT and provided comments
    - Answered three open ended questions
        1. What is your biggest concern when caring for a trach patient
        2. What behaviors/ assessment findings cause the most concern?
        3. Would a risk assessment tool help you?
- Content validity was determined by expert utilizing a Content Validity Index
- Inter Rater Reliability evaluated

Children's Health Decannulation Risk Assessment Tool

Instructions: Choose a number in each category that best reflects the patient's condition/assessment regarding risk of decannulation by circling or checking the box. Scores can range from 0-15.

Category	0	1	2	3
TIES 1. What can make the tie wet and/or loose?	Requires daily trach tie change	Requires trach tie change once per shift	Vomiting more than twice per shift; Excessive secretions or sweating	Erythema, wounds, and/or irritation present requiring loose ties; Requires trach tie change more than twice per shift
Respiratory Equipment 1. What style of trach 2. What is attached to the trach	Nonflex trach tube; HME, PMV or cap with no oxygen bleed in attached	Flextend trach tube; HME or PMV with oxygen bleed in attached to trach tube	Any style or type of trach tube attached to trach collar and or inline suction	Any style or type of trach tube attached to ventilator circuit
Activity/Behavior 1. How active is the patient? 2. How irritable and/or spastic is the patient?	Neurologically appropriate, normal sleep or sedated; Does not pull on trach tube; Neurodevastated; Sedated; Paralyzed	Irritable and/or spastic, but consolable; High activity but redirectable	Irritable and/or spastic, not consolable; High activity unable to be redirected; Weaning sedation	Irritable and/or spastic, not consolable requires pharmacological intervention; Pulls on trach tube
Trach Care 1. Is the care provider trained? 2. Is the patient cooperative?	Trach trained caregiver directed trach care; Calm and cooperative with trach care	Caregiver directed trach care by caregiver who is working on trach education, but has not completed; Calm and cooperative with trach care	Caregiver directed trach care by caregiver who is working on trach education, but has not completed; Agitated or uncooperative with trach care, swaddling to console	Agitated or uncooperative, not consolable, requires pharmacological intervention; Requires 3 or more people to complete trach care
History 1. If and when accidental decannulation has occurred? 2. If patient scores ≥2 automatically at risk for accidental decannulation	No known or unable to verify history of Accidental Decannulation	Known accidental decannulation in previous admission	Parent reports of accidental decannulation in the home or concerns for decannulation	Accidental decannulation during current admission

Total Score = _____ (Please score patient once per shift)

If a child has a total score of ≥ _____ consider these interventions to reduce the risk for Accidental Decannulation:

- Q 2 assessment for appropriate trach tie tightness
- Add ventilator circuit stabilizer
- Restraint such as NoNos
- Double trach ties
- CVO (constant visual observation, such as sitter) if available at bedside
- High risk for decannulation alert in chart and/or signage at bedside

Results: Face Validity

- N= 46 providers on D9 and ITU (RN= 29 RT= 17)
- Free responses about biggest concerns and behaviors/ assessment findings were analyzed and grouped into themes.
- Decannulation (n=24) was the biggest concern when caring for a trach patent
- Patient activity related factors were the biggest behavior or assessment concern (n=29)

Would a risk assessment tool help you?

Results: Content Validity Index

- Four pediatric tracheostomy experts from the US completed all rounds of CVI review of the CH-DRAT
- Each reviewer was asked to rate each item on 4 Likert scale; 1= Not Relevant to 4= Highly Relevant.
- After each round of review scale CVI and Item CVI calculated
- 1st round scale CVI was .89 and item CVI ranged from .33-1. All items below a.8 were reviewed and revised.
- Process repeated until minimum standards were met.
    - 9 assessment findings removed from CH-DRAT
    - For example: age was removed as an assessment finding because it was determined age was not the risk factor, the behavior of the patient was the concern (i.e. pulling)
- After 4th round of review scale CVI=.95 and all item CVI ranged from .75-1.

Results: Inter-Rater Reliability

- Three members of the CHAMP group and two nurses who worked in ENT conducted an inter rater reliability assessment
- The raters rounded on all admitted inpatients at CMC Dallas with a tracheostomy (n= 27). Each rater assessed the patient individually but that the same point in time as other raters
- Total score interrater reliability is high (ICC= .977 [.956-.990]).

Discussion and Implications

- Initial results indicate CH-DRAT is reliable and valid
- Study needed to determine risk threshold scores and determine effectiveness as a risk evaluation instrument
- A study is planned to evaluate utilization and application
- Currently the CH-DRAT is being incorporated into the EHR ahead of provider training and study implementation

References
Watters, K.F. (2017). Tracheostomy in infants and children. *Respiratory Care*, 62(6), 799–825. https://doi.org/10.4187/respcare.05366