Interdisciplinary Decision-Making
with Patients Requiring Tracheostomy and Mechanical Ventilation

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Where do we come from?

Welcome to Madonna Rehabilitation Hospital
Lincoln, Nebraska
Interdisciplinary Decision-Making with Patients Requiring Tracheostomy and Mechanical Ventilation

Madonna Rehabilitation Hospital is a Catholic organization that exists to provide medical and rehabilitation services to improve the lives of adults with physical disabilities throughout the nation and to create and share improved methods to reduce disability through research in rehabilitation science and engineering.

Madonna Rehabilitation Hospital Seeks to

- Rehabilitate those who have sustained injuries or disabling conditions to the highest level of independence possible.
- Lead research to improve rehabilitation outcomes and prevent physical disabilities through community programs.

Madonna Rehabilitation Hospital – Business Lines

- Hospital
- Outpatient
- ProActive
- Long Term Care
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Madonna Rehabilitation Hospital
- 96 Long Term Acute Care Hospital (LTACH) beds
- 72 Acute Rehabilitation Unit (ARU) beds
- 25 Subacute Rehabilitation (SAR) beds
- 14 Adolescent & Child Rehabilitation beds

Admissions from across the country

Brain Injury
- Approximately 200 inpatients and 225 outpatients per year
- Very severe to mild
- Mild TBI
- Comprehensive Assessment & concussion Study
- Follow-up
- CARF Accreditation
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### Spinal Cord Injury
- Approximately 100 inpatients and 50 outpatients per year
- All levels of injury
- Follow-up
- CARF Accreditation

### Stroke
- Approximately 300 inpatients and 225 outpatients per year
- Severe to very mild
- Follow-up
- First in Nebraska to be CARF Accredited

### Adolescent & Child Rehabilitation Program
- Birth through 18 years old
- Approximately 50 inpatients and new 175 outpatients per year
- Tech Tots
- Therapeutic Learning Center
- CARF Accreditation – Pediatric Family Centered
How did we get here?

- ASHA Leader publication, January, 2009
- Received several follow-up emails, contacts
  - Comments, questions about policies, protocol development
  - Passy-Muir®
- Presented at our state convention and ASHA

Course Objectives

- Demo understanding of anatomy and physiology for speech and swallow
- Describe the evaluation and treatment planning options for patients who require a tracheostomy tube and mechanical ventilation

Objectives Cont.

- Identify the five major steps involved in the Passy-Muir closed position one-way speaking valve assessment
- Describe the clinical benefits of the Passy-Muir closed position one-way speaking valve
Basic Anatomy Review

Tracheostomy Basics

- Tracheostomy Function:
  - Long term airway management (>7 days)
  - Used with or without ventilator
  - Without ventilator, tracheostomy used to deliver humidified oxygen or room air

Case Study

- 33 y.o. male
- Dx – TBI 2’ to MVA, resp failure, multiple fx’s
- Hx – DM on insulin
- Onset – 7/2/09
- PEG 7/10/09, Trach 7/9/09
- Admitted to MRH 7/20/09
- RLA level 3, opens eyes with stim, some visual tracking, inconsistent commands
- No speaking valve trialed up to this point
- Speech addressing oral stim – no PO trials
- 7/28/09 – initial one-way speaking valve assessment completed, trials of ice, puree
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Mechanical Ventilation

Ventilator Basics

- Mechanical Ventilation is used to treat hypoxemia, deliver positive airway pressure to decrease the work of breathing and provide ventilation for patients who can’t effectively ventilate themselves.

Two most common ventilators used at our facility

- Achieva Ventilator
- Espirit Ventilator
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Case Study

- 88 y.o. female
- Dx – Bowel resection, respiratory failure
- Ischemic small bowel
- Onset – 7/8/09
- PEG 7/28/09, Trach 7/22/09

Admitted to MRH 7/29/09
- Alert, decreased comprehension for multi-step commands, limited communication intent, responds inconsistently to y/n with head nods
- No speaking valve trialed up to this point
- Speech therapy had not evaluated
- 7/29/09 – initial one-way speaking valve assessment completed, trials of ice, puree, liquids – min silent aspiration

Background

- With the increased medical technology there has been a steady increase in the number of patients admitting to our 168 bed rehabilitation hospital with tracheostomy tube and mechanical ventilation.
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Patients Admitted to MRH on Ventilator

- 2001 17
- 2002 62
- 2003 86
- 2004 131
- 2005 137
- 2006 124
- 2007 116
- 2008 112
- 2009 117

Protocol Development

- Developed with a team approach involving the pulmonary medical director, respiratory therapy and communication disorders departments
- To establish a standardized method for the evaluation and safe weaning of tracheostomy tube support.
- Provides step-by-step process for each discipline to follow
Co-Evaluation and Treatment

• Initial Evaluation following physician order:
  “Speech Therapy and Respiratory Therapy to co-evaluate and trial speech devices within 48 hours.”

Contra-indications

• Contra-indications for use of a Passy-Muir closed position one-way speaking valve
  • Severe medical instability
  • Severe airway obstruction
  • Severe aspiration risk is a consideration
  • Use of foam filled trach tube cuffs

RT and SLP Evaluations

• RT Evaluation
  • Trach Tube Type
  • Status of Cuff
  • Stoma Pressure
  • Cuff Pressure and Volume
  • Vital Signs

• SLP Evaluation
  • Speech
  • Voice
  • Language
  • Cognition
  • Swallowing
  • Vital Signs
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Initial Evaluation Goals

- Identify a mode of communication
- Assess patient’s risk for aspiration
- Assess patient’s tolerance for trach cuff deflation
- Trial one-way valve if indicated
- Assess trach tube size/type for valve

AND EDUCATION!!!

Both disciplines are responsible for providing education to patient’s and families as the patient works through adjusting to the use of the Passy-Muir speaking valve

Stop Criteria

- HR ↑ > 20 BMP
- RR > 35
- SpO₂ < 90%
- FiO₂ ≥ 60%
- RPD > 6
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- HR and RR determined based on general cardiac guidelines
- MRH uses guideline of SpO₂ >90
- FiO₂ of 50 or > concerns for O₂ toxicity
- RPD – Rate of Perceived Dyspnea
  - Measure of shortness of breath
  - Rating of 6 – moderate SOB

Rate Perceived Dyspnea Scale

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Tracheostomy Tube Weaning Pathway

I. Tracheostomy tube cuff deflation (performed by LRCP)
- “Stop” Criteria Present:
  - YES: LRCP will re-inflate trach cuff. LRCP and SLP will reassess patient and/or consult physician before progressing
  - NO: Advance to One-Way Valve Trial.
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Now you can:

- Expect significant secretions to be present
- Be prepared for additional tracheal and/or oral suctioning
- Remember the definition of aspiration
  - "The passage of food or liquid through the vocal folds"

Now you can:

- Goal: decrease aspiration risk by helping the patient to improve secretion management.
- How: using Passy-Muir closed position one-way speaking valve

Now you can:

Tracheostomy Tube Weaning Pathway

II. One-way valve trial
- "Stop" Criteria Present:
  - YES: LRCP will remove valve. LRCP and SLP will consult with physician for possible downsizing of tracheostomy tube
  - NO: Advance to One-Way Valve as tolerates
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- Goal: SLP evaluate swallow, speech, voice
- How: assessing patient’s sensation of secretions with demonstration of reflexive cough/throat clear, reflexive swallow and patient’s ability to phonate and produce speech
- Why: appropriate treatment recommendations or referrals cannot be made until the Passy-Muir speaking valve assessment has been completed.

Tracheostomy Tube Weaning Pathway

- III. One-way Valve as tolerates
  - (patient increases use of closed position one-way speaking valve throughout day and evening hours)
  - “Stop” Criteria Present:
    - YES: Reassess patient to determine barriers
    - NO: Advance to Tracheostomy Tube Capping for appropriate patients

Treatment

- Voice exercises
- Speech/Ventilator timing
- Therapeutic PO trials
- Dysphagia swallowing exercises
Tracheostomy Tube Weaning Pathway

IV. Tracheostomy tube capping trials
- Appropriate patients include: non-ventilator dependent patients and patients on nocturnal ventilation and/or PRN mechanical ventilation that have met all previously noted criteria.
- Repeat steps III and IV using tracheostomy tube cap.

"Stop" Criteria Present:
- YES: Consider additional trach tube downsizing.
- NO: Once patient can tolerate trach cap without interruption for a minimum of 48 hours, LRCP may request physician order to decannulate.

Tracheostomy Tube Weaning Pathway

V. Trach Buttons
- A trach button may be used to maintain an open stoma.
- A physician order is required prior to trach button insertion

Case Study

- 57 y.o. male
- Dx - resp failure, pneumothorax on R - resolved
- Hx - ALS (dx 5 yrs ago), hernia repair, HTN, BiPap at night
- Onset: 6/24/09
- PEG and Trach placed 6/30/09
- Admitted to MRH on 7/2/09
- Alert, following commands, mouthing words - one way speaking valve assessed at acute hospital
- NPO, MBS completed 7/2 before transfer with recommendations to begin PO
- 7/3/09 - initial one-way speaking valve assessment completed
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Case Study

• 50 y.o. male
• Dx – trauma s/p fall, CHI, cervical spinal fx (C3-C4), halo support, quadriplegic, resp failure
• Hx – testicular CA, spinal fusion, COPD and emphysema
• Onset: 5/28/09
• PEG 6/4/09, Trach 6/5/09

• Admitted to MRH 7/14/09
• Alert, mouthing words, following commands – one-way speaking valve not assessed
• NPO – Swallow had not been assessed
• 7/15/09 trach downsized and initial one-way speaking valve assessment completed
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Clinical Benefits of the Passy-Muir Closed Position One-Way Speaking Valve

- Restore positive airway pressure
- Louder voice, stronger cough, improved secretion management, improved oxygenation
- Improve quality of life
- Communication, Eating/Drinking
- Expedites Weaning

Madonna Weaning Outcomes

- Protocol Success over past 2 years
  - Fiscal year 2007-2008
    - 58% wean for tracheostomy tubes
    - 57% wean for mechanical ventilators
  - Fiscal year 2008-2009
    - 60% wean for tracheostomy tubes
    - 62% wean for mechanical ventilators
  - Fiscal year 2009-2010
    - 62% wean for tracheostomy tubes
    - 64% wean for mechanical ventilators
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Summary

- Our protocol has provided us the ability to advocate for patients with tracheostomy tubes and mechanical ventilation by providing a consistent decision-making process with objective criteria.
- Team approach
  - Entire team working on same goals
  - Consistent message and approach

Thank You!

We would like to specifically thank Passy-Muir for inviting us to do this presentation and a special thanks to the Respiratory Therapy Department at Madonna Rehabilitation Hospital

Questions??
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References

- www.passy-muir.com, Online Continuing Education Courses, Passy-Muir Inc., PMB 273, 4521 Campus Drive, Irvine CA 92612