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RUSK REHABILITATION

DYSPHAGIA MANAGEMENT FOLLOWING TRAUMATIC BRAIN INJURY

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Objectives

- Review current evidence as it applies to management of dysphagia following traumatic brain injury across the continuum of care
- Discuss physiological and cognitive impairments observable on bedside evaluation that indicate increased risk of aspiration
- Discuss factors other than oropharyngeal dysphagia that increase the risk of development of aspiration pneumonia
- Discuss research based strategies implemented within the NYU network to help reduce development of aspiration pneumonia in individuals following traumatic brain injury
- Discuss strategies implemented within the NYU network to help increase safety and independence with self feeding

Dysphagia and TBI

- Documented incidence of dysphagia as high as 93% in patients admitted to brain injury rehab (Hansen et al., 2008)
- Up to 16% of those individuals continue to need assistance for eating one-year post injury (Duong et al., 2004)
- Post-discharge from rehabilitation, patients with TBI can be 79 times more likely to die from aspiration pneumonia compared to the general population (Howle et al., 2011)

Etiology of Dysphagia

- Oropharyngeal neuromuscular and sensory deficits – (bite reflex, trismus, fasciculations)
- Cognitive – communication impairments (arousal, attention)
- Behavioral impairments (impulsivity, perseveration)
- Physical injury to the head and neck regions (cervical collars, halo)
- Abnormal tone / posturing
- Pharmacology and Medications
- Concomitant injuries and prolonged endotracheal ventilation

Management of Dysphagia in the Acute Care Setting

What data do we have to support early decision making regarding need for PEG placement?

The Ranchos Los Amigos (RLA) scale is the most significant independent predictor of the time to return to full feeding

Risk of dysphagia is twice as likely in individuals who meet the below criteria:

- RLA Level II
- Glascow Coma Scale (GCS) 3-5
- CT scan findings of midline shift, brainstem pathology and injuries requiring operative procedures
- Patients requiring 8-14 days of mechanical ventilation

- Patient's meeting the above criteria also averaged twice as long to begin PO intake and to achieve total oral feeding

(Mackay et al., 1999)

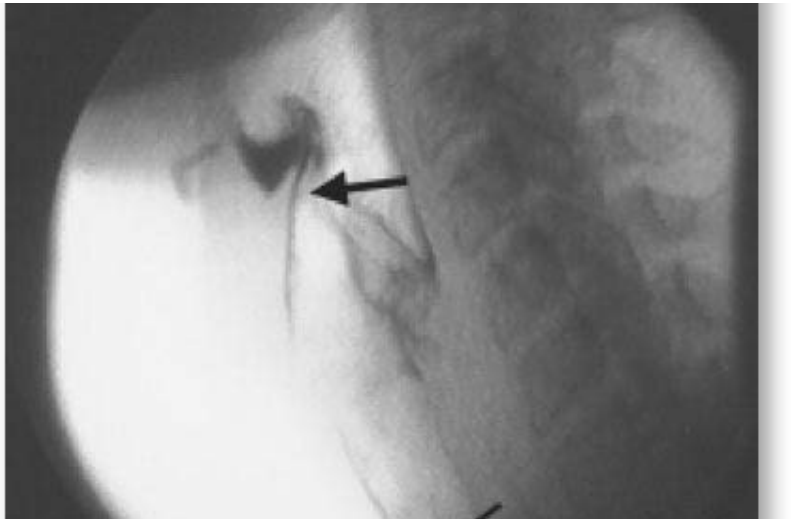
Impact of Cognitive Impairments on Swallow Safety

- Odds of aspiration of liquids were 31% greater if patients were not oriented to person, place and time
- When unable to follow one step directives :
  - Odds of liquid aspiration was 57% greater
  - Odds of puree aspiration was 48% greater
  - Odds of being unsafe for any oral intake was 69% greater

(Leder et al, 2009)

Dysphagia Management in the Inpatient Rehabilitation Setting

- Bedside swallow evaluation completed by SLP on admission for all patients admitted with a neurological diagnosis
- Video-fluoroscopic swallowing evaluation completed as needed:
  - Documented history of silent aspiration
  - Neurological etiology concerning for silent aspiration
  - To assess effectiveness of compensatory strategies and establish appropriate aspiration precautions
- Diet Consistency, aspiration precautions and level of supervision for meals recommended to the medical team by speech language pathologist



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Common Swallowing Abnormalities

Physiologic

- Impaired jaw opening
- Reduced lingual control
- Impaired lingual strength
- Facial asymmetry / reduced labial closure
- Delayed initiation of the pharyngeal swallow
- Reduced airway protection / impaired vocal cord closure
- Pharyngeal weakness resulting in residue

Cognitive / Behavioral

- Diminished arousal
- Fluctuating attention
- Confusion
- Impulsivity
- Perseverative chewing
- Expectoration of food and liquid

Rusk Diet Recommendations

- Goals:
  - Least restrictive diet without aspiration risk
  - Maximize level of independence for feeding
  - Maximize oral intake to reduce dependence on alternate means of nutrition and hydration

Liquids	Solids
Thin	Pureed
Nectar thick	Mechanically altered – ground
Honey Thick	Soft (chopped proteins and vegetables)
	Regular

Additional Considerations for Safe Recommendations

- Facial Fractures
  - Identify Recommendations from Oral and Maxillofacial team
  - May prevent advancement of solid textures

- Presence of tracheostomy
  - Ideal to be able to tolerate tracheal occlusion before advancement to PO intake (PMV vs cap)
  - Allows for a closed pressure system
    - Improved upper airway sensation for awareness of aspiration
    - Improved cough strength for airway projection / clearance

- Positioning
  - Coordination with PT/OT to establish a supported upright position safe for PO intake
  - Establishment of out of bed schedules to help encourage wheelchair positioning for meals
  - Monitoring blood pressure with positional changes to ensure safety

Interdisciplinary Team Communication

- Carryover of recommended aspiration precautions from evaluation to meals is challenging in the context of confounding cognitive impairments
  - Poor recall of strategies
  - Impulsivity with self feeding
  - Distractibility during meals in a dynamic environment
- Use of consistent signage for every patient documenting:
  - Diet recommendation
  - Aspiration precautions
  - Level of supervision required for safety
    - Distant Supervision
    - Direct Supervision
    - Direct Assistance
- Consistent use of rehab notebook and visual aids within room to support recall and carryover

This Patient Requires

DIRECT ASSISTANCE

During Meals

Caregiver must maintain continuous 1:1 contact with patient throughout the entire meal to ensure safe swallowing and/or to provide assistance with feeding.

*Patient must be seated in full upright position *

Solids: **Puree**

Liquids: **Nectar thick**

Other: **Minimize external distractions for meals**

Alternate Food And Drinks	Small Bites/Sips	Repeat Swallows	**Assist From Plate To Mouth**	Check Oral Cavity	No Straws

Dysphagia therapy

Compensatory

Modifications to allow safe initiation of a PO diet

- Diet Modifications
- Small bites and sips
- No straws
- Alternate bites and sips
- Chin tuck
- Repeat swallows
- Environmental Modifications

Restorative

Incorporates principles of motor learning to improve strength, timing and coordination

- Effortful Swallow
- Mendelsohn Maneuver
- Masako Maneuver
- Iowa Oral Performance Instrument

Challenges to Dysphagia Therapy

- Traditional dysphagia interventions can be abstract and challenging to complete as they are heavily impacted by cognitive – linguistic impairments

Individuals with TBI benefit from a combination of:

- A quiet therapy environment to reduce external distractions
- Written therapy schedule and direct goal setting
- Use of foods of preference
- Incorporating auditory and visual biofeedback when appropriate
  - Iowa Oral Performance Instrument (IOPI)
  - Surface EMG
  - Video feedback

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I can start to eat and drink. So now what?

- Transition from tube feeding to full PO intake can require increased time
- May be impacted by:
  - Fluctuation in arousal preventing intake of 3 meals a day
  - Increased time for meals, resulting in loss of attention within meals
  - Reduced intake when requiring a modified diet
  - Impaired initiation to communicate thirst and hunger
  - Decreased hunger drive

Supporting transition to full PO intake

- Initiation of calorie count to monitor
- Allow PO intake prior to tube feedings to increase hunger
- Use of small snacks throughout the day
- Use of oral nutritional supplements
  - Commercially available supplements (Ensure, Glucerna, Beneprotein, Benecalorie)
  - Milkshakes: 1 unit Ensure / Glucerna + ice cream + Benecalorie/ Beneprotein / Fiber
  - Nectar thick options : Ensure pudding, Milkshakes with thickener, Magic cup Ice Cream

Supporting Transition to Full PO Intake cont.

- Assess for constipation that may be reducing PO intake
- Evaluate for medications that may depress appetite (Keppra, Aricept, pain meds)
- Use of medication to stimulate appetite, as needed
  - Avoidance of steroid appetite stimulants due to side effects (Megace)
  - Remeron- used in conjunction for sleep
  - Marinol- monitor for potential confusion

IS PREVENTION OF ASPIRATION ENOUGH?

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Best Predictors of Aspiration PNA

- **Dependence on others for feeding**
- **Dependence for oral care**
- Number of decayed teeth
- Tube feeding

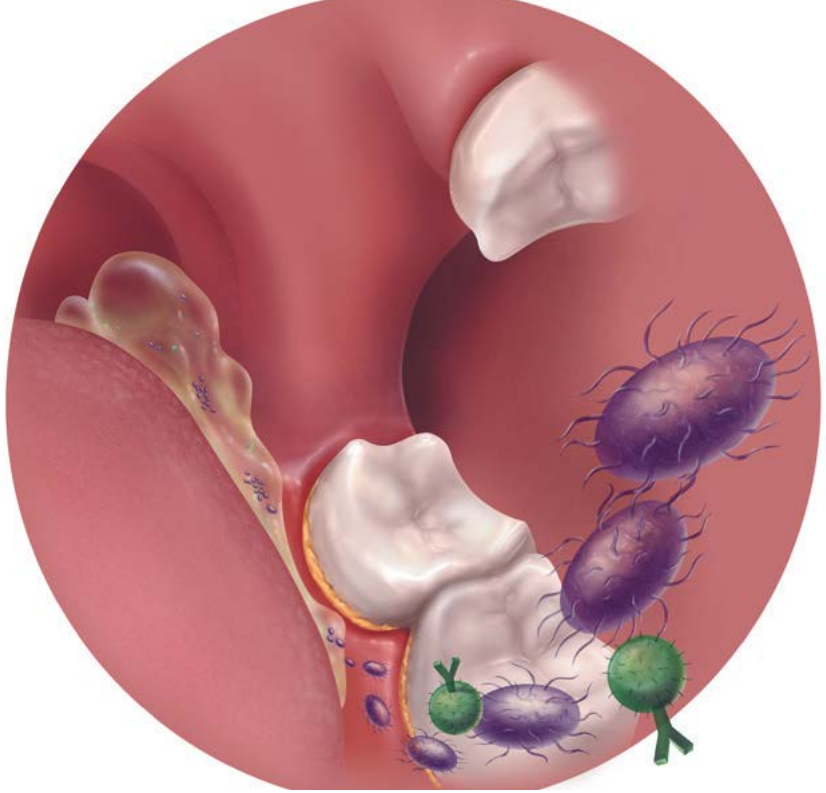
- Dysphagia and aspiration, although risk factors, were **NOT** the most predictive for development of aspiration PNA

(Langmore et al, 1998)

- Without routine brushing, harmful bacteria can rapidly multiply in the mouth within 48 hours of hospitalization.

- Dysphagia may result decreased salivary clearance which combined with poor oral hygiene results in increased aspiration of oral bacteria

- Oral care may be more challenging to complete in low level patients with oral defensiveness, bite reflex and/or aspiration of secretions



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Systematic Oral Care Protocol

- Established frequency for oral care written into order set
- Oral care completed with a suction toothbrush, swab and oropharyngeal suction catheter
  - Allows simultaneous removal of excess fluid from the oral cavity during oral care
- Utilize pre-established oral care kits (Q4, Q8) so all supplies are at bedside for ease

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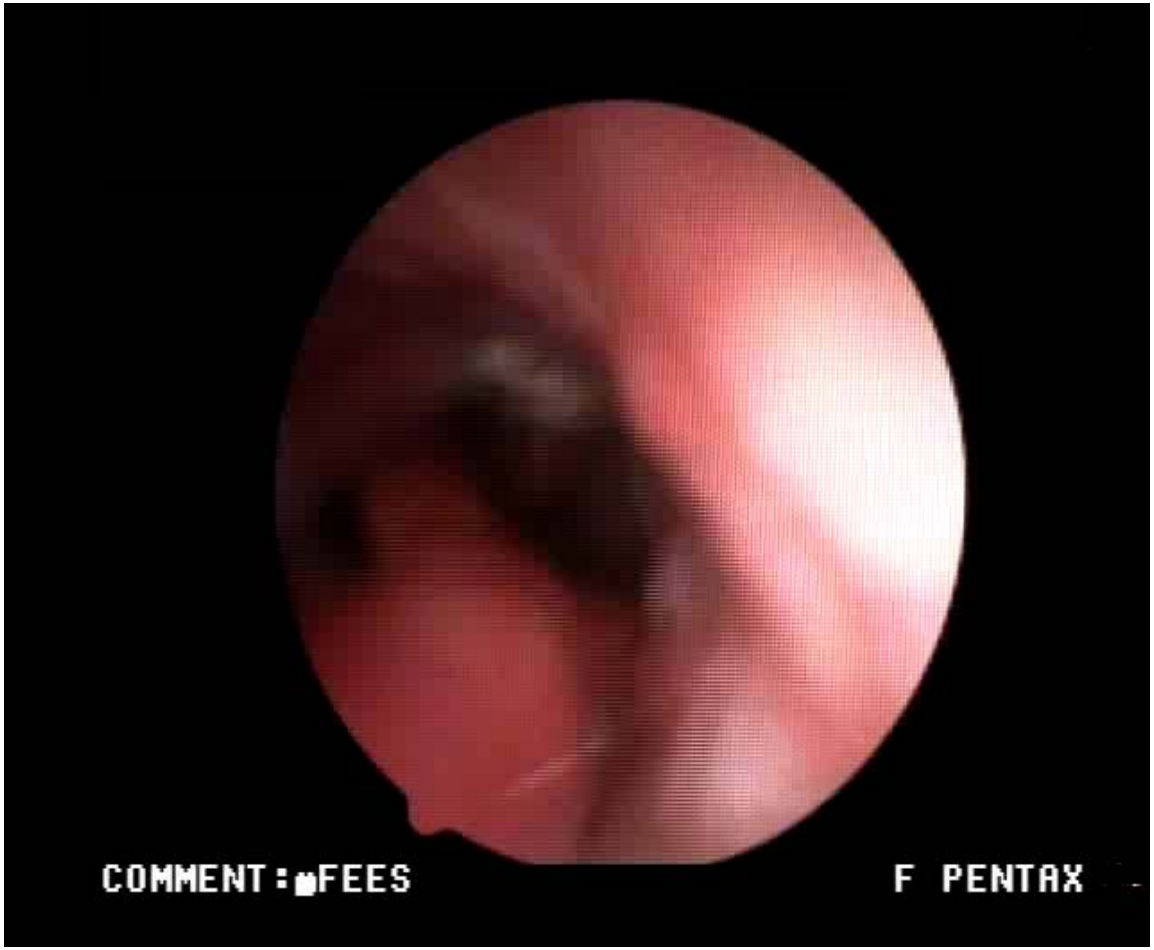
Result of absent oral care….



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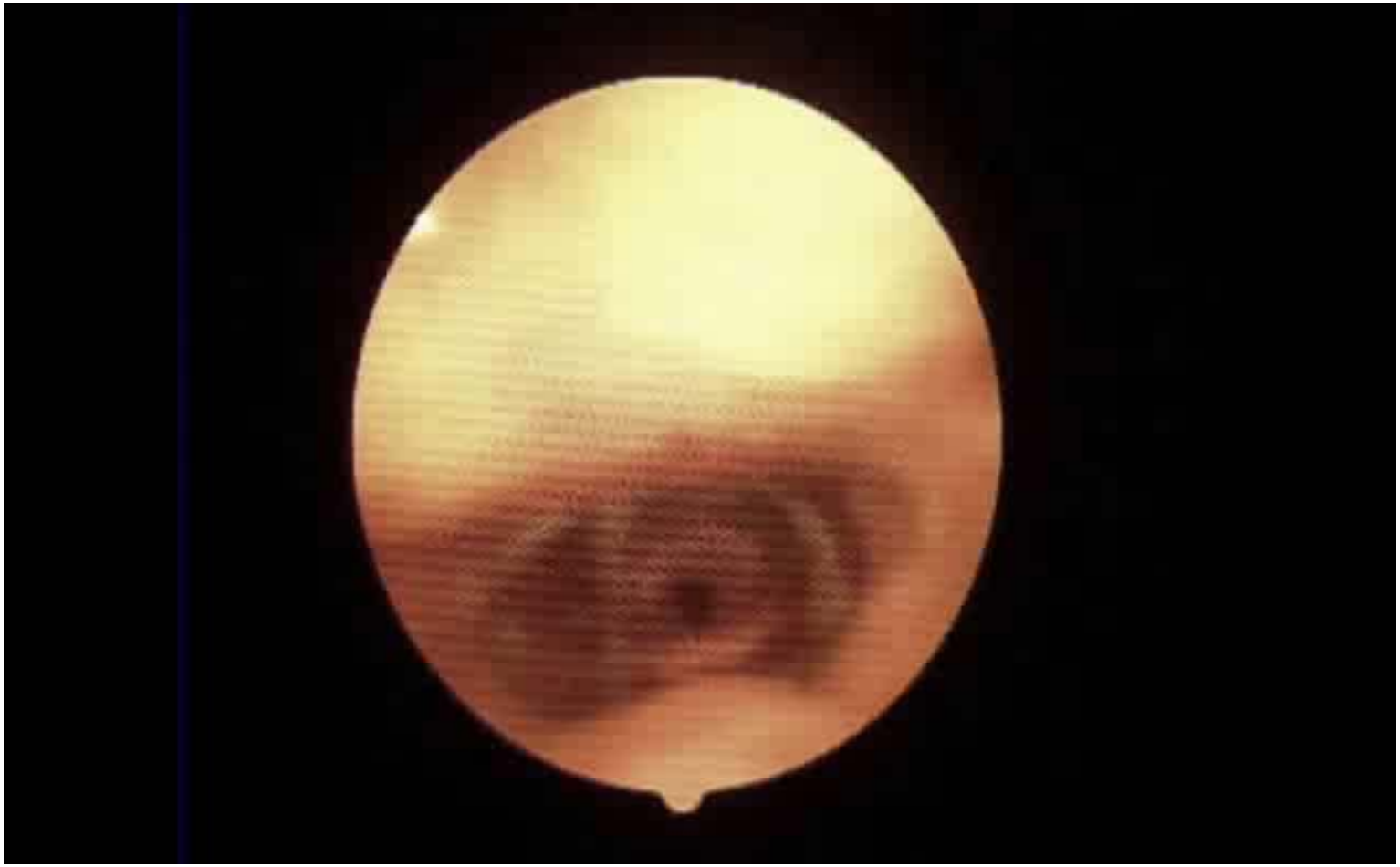
12 hours of oral care and humidification



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How can we support independence?

- Development of an interdisciplinary lunch group (max 4-5 patients)
- Patients selected by primary SLP and OT
- Enrolled for a 1 week session on a rolling basis
- Lead by SLP/OT in conjunction with PCT staff
- Group is in addition to individualized therapy sessions

- Goals:
  - Increase safety and independence with PO intake
  - Reduce the risk of aspiration
  - Improve recall and implementation of aspiration precautions
  - Incorporate visual scanning techniques
  - Incorporate use of the affected / hemi-paretic extremity for feeding

Lunch Group Hand Off Sheet

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Strategies to help me eat

Liquids I can drink safely: Nectar Thick

Solids I can eat safely: Soft- chopped

I take my medicine: Whole with puree

Items to avoid: Regular solids, large bites

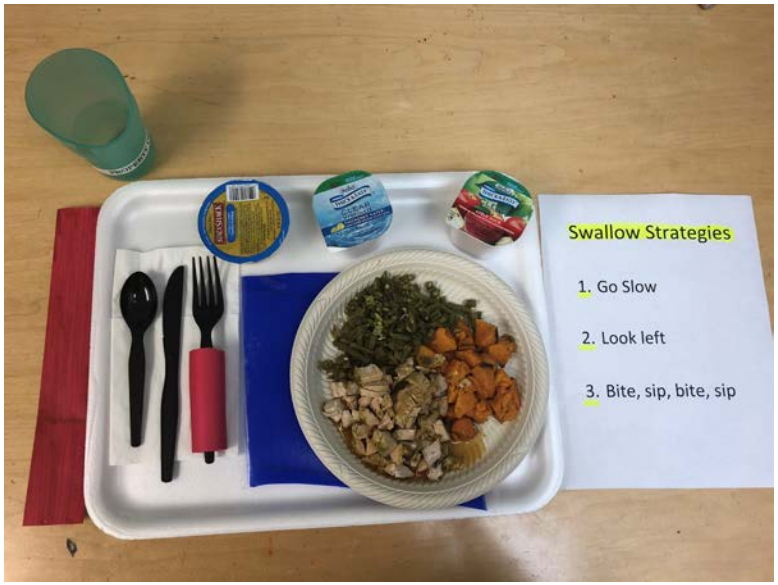
_____ I need to be fed by someone

__X__ I can feed myself with the following help Support at my elbow, verbal cues to slow my rate

When eating, please help me remember to:

1) Go slow; 2) use my left hand; 3) look left

Equipment I use to help eat: Dycem , built up utensils



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Outcome Measures

- All measurements were taken upon admission and discharge from the group:
  - A comparison of FIM eating scores
  - Self perceived satisfactory scale (Likert Scale- modified),
  - Functional Upper Extremity Levels (FUEL) (Sabari, Capasso and Feld-Glazman, 2014).
  - Functional Oral Intake Scale (FOIS) scores (Crary, Carnaby-Mann, Groher, 2005)
  - Diet changes

Lunch Group Results

- 78 patients tracked over a 2 year time frame
- Inconsistent enrollment due to multiple challenges :
  - Fatigue
  - Need for direct supervision for safety
  - Need for interpreter services
- Improvements shown in all targeted domains, however not compared vs a control group
- All patients subjectively reported improved independence and confidence

Family Education / Discharge Planning

- Review of MBS results when appropriate
- Incorporate family members into lunch group and therapy sessions for “hands on” training
- Education provided for appropriate diet modifications
- Return demonstration for thickening of liquids
- Review of safe oral care techniques when appropriate
- Written recommendations provided at discharge to ensure safe, smooth transition between settings

Summary

- There is a high incidence of dysphagia within the TBI population and they require management across the continuum of care
- Evaluation and treatment must be individualized to address both the physiological and cognitive needs of each patient
- Identification of oro-pharyngeal dysphagia is only one component to prevention of aspiration pneumonia and pulmonary complications in this high risk population. Regular oral care and consistent reinforcement of safe feeding techniques is equally as important for patient safety.
- Therapy goals within the TBI population need to target safe PO intake and diet advancement, but also target strategies to improve safety and independence with independent feeding while ensuring nutritional needs are being met to support neuroplasticity and recovery

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THANK YOU

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