• We have no relevant financial relationships to disclose
Polling Instructions

• Search for this session’s title in the mobile app using the search bar or in the agenda (by day & time).
• Select the session to open the session page and click Live Polls.
• Answer the question(s) under Live Polls by selecting your desired answer(s).
• Select Finish to submit your answer(s).

Goals and Objectives

• Identify the population of children with medical complexity and gain tools in their management and care planning
• Understand indications and complications of different feeding tubes
• Understand indications and complications of respiratory devices
Defining the Population

The Families of CMC

• Demographics
  – Trends as complexity increases
• Challenges
  – Unmet medical/ service needs
  – Out of pocket cost
  – Lost time from school/work
• Expectations
Hospitalization of CMC

• By the numbers
  – 10% of admissions
  – 25% of Hospital Days
  – 40% of charges
  – 72%-90% of technology procedures
  – 43% of deaths

Hospitalization of CMC- Chaos

• A graphic representation of the number of providers involved in the care of the medically-complex child
CMC Timeline

CMC Timeline – Medical Team
Transitions of Care

• Risks

• Best Practices
  – Family centered
  – Teach-back
  – Follow-up call

• Families Perspectives
  – Transition from team to parent

Care Plans as a Solution for Complex Patients

• Care plans have long been the backbones of nursing practice.

• They are now becoming essential components of medical home programs and being recognized as an essential part of comprehensive care management in all settings.

• Care plans are the solution to a multitude of issues that arise with children with medical complexity.
Care Plans Are a Solution for Providers

- What is this child’s history? Medical, surgical, social
- What is this child’s medication/treatment regime?
- Who is involved in this child’s care?
- What are this child’s “tells?” How do you know he’s in pain, happy, sick?
- What do the parents need from you?
- What is most important to this family?
- What are their strengths/struggles?

Care Plans Are A Solution for Families

- What medications am I supposed to give and when?
- Why is he on this medication/treatment?
- Who do I call when there is a problem with ___?
- When do I have to bring him to the hospital?
- What can I do to avoid a hospitalization?
- How do I get the medical team to listen to me?
- I am not ready to make advance directive decisions, but I have strong feelings about his quality of life. How do I talk to anyone about this?
Family input in care

- PARENTS KNOW THEIR KIDS BETTER THAN YOU!!!
- They want you to know their children and will go to great lengths to help you do that.
- They look to you for help when their child is ill. They also look to you to help them better care for their child when it’s time to go home.
- The things parents find important may not be what you think is most important and may change your approach to care.
Challenges with Transitions

– Home to hospital
  • Medication reconciliation
    • Missed medications in the ED
    • Issues with drug levels due to NPO status
  • Missed feeds
  • Hospital to home
    – Understanding of changes in medications/routines/disease management
    – Inability to get medications due to prior authorizations/pharmacy availability
  • Home to first primary visit
    – Is the family able to describe the hospital stay and how the plan for home is working
  • Between primary and specialties
    – How well does communication happen between

What Should Care Plans Look Like?
Care Plan Templates/Info

- [https://medicalhomes.aap.org/Pages/Coordinated-Care.aspx](https://medicalhomes.aap.org/Pages/Coordinated-Care.aspx)
- [http://medicalhome.nichq.org/resources/mh-care-planning-resources](http://medicalhome.nichq.org/resources/mh-care-planning-resources)

Essential Elements

- Medical history
- Current medications/Treatments
- Allergies
- Active providers (with best contact info for providers)
- Insurance information
- Involved supports such as DME providers & service coordinators
  - Goals
    - Family goals
    - Provider goals
- A physical binder
Physical Binder

What Is Important?

- A central person/team who is responsible for implementation and periodic review
- Input from a variety of care providers
  - Parent input is absolutely essential
- The parents understand how it can help them and they find it useful
  - Doesn’t require the parents to be in charge of creation/upkeep—they are busy enough caring for their child
What is important?

• It is accessible
  – Copies should be in the inpatient chart and available in EHR's
  – **The parents should have a paper copy in a binder with room for them to add other documents**
  – The primary and all specialists should have access to it
• It is reviewed and edited EVERY TIME there is a change
  – These changes can be done on the parent’s master copy in pen/pencil and then be changed in electronic document by the coordinating team

How Do We Get Our Patients One?

• Pick the group that makes the most sense to be in charge of it
  – Palliative Care
  – Complex Care
  – Primary Care
  – Hospitalist team?
  – Use the whole team
    • Nurses
    • Pharmacists
    • People who understand life at home
    • Outside providers/case managers
• Pick one or two patients to start with
  – Kids who really need them
    » Really think about WHY they need them and tailor them to the patient’s/family’s/provider’s needs
Enteral Devices

Enteral tubes and their discontents

- Nasoenteral
- Gastric (GT)
- Gastrojejunal (GJT)
- Jejunal (JT)
- Cecal (CT)

Leakage
Granulation tissue
Clogging
Dislodgement
Migration
Skin irritation/breakdown
Leakage

• As ubiquitous as problematic
  – Skin break down (irritation, pain, infection)
  – Nutrient loss
  – Drug loss

• Prevent the causes
  – Balloon/valve malfunction
  – Poor fit/type of balloon (?)
  – Stretched out stoma
  – Poor gastric emptying

Leakage

• Treatment
  – Check balloon
    • MIC-Key: 12Fr = 3ml, ≥ 14Fr =5ml
    • Mini-ONE: variable, printed on port
  – Allow stoma to shrink
    • Foley 2 Fr smaller than tube
  – Treat granulation tissue
  – ? Non-balloon type
  – Slow rate
  – Promotility vs jejunal feeds
Leakage & Skin Treatment

- Foam Dressings
- Hydrocolloids
- Alginites
- Aluminum Hydroxide
- Cholestyramine
- Petroleum-based ointments
- Zinc-oxide ointments
- Absorbent wafers
- Silver, topical abx
- Antifungals
- Debridement (Sany®, Medihoney ®)

Absorb
Neutralize
Protect
Heal

Granulation Tissue

- Excess tissue production from impaired healing
- Caused by friction/tube movement, moisture
- ½ to ⅔ of patients

Prevention
- Ensure tube is correct length and stable
  - Tape, binders, covers
  - Polyurethane foams to absorb/protect
Granulation Tissue Treatment

- Indications
  - Silver Nitrate (lidocain gel pre-tx)
  - 1% Triamcinolone
  - NaCl (table salt, Curasalt®, Mesalt®)
  - Granulotion®
  - Stomahesive Powder
  - Foam Dressings
  - *U of MN clinical trial: Ag vs Kenalog vs abrasion*

Which of the following is a safe and effective solvent for a clogged tube?

A. Cola  
B. Fruit Juice  
C. Meat Tenderizer  
D. Warm Water  
E. None of the above
Clogs

- Longer tubes = more clogs
- Prevent
  - Flush before and after EVERYTHING
    - BETWEEN meds
  - Flush intermittently (q4-8h) continuous feeds
  - Liquid meds wherever possible
  - Least concentrated formula
  - Avoid “checking residuals”
Clog Treatment

1. Gently push-pull with warm H₂O in large volume syringe
   – May instill H₂O for 10-20min at a time

2. Enzymes (tortoise)
   – 1 tab Viokace + 1/8tsp NaHCO₃ + 5ml H₂O
   – ClogZapper ®

3. Devices (hare)
   – Bard Brush (prevention)
   – Bionix (not for home use)
   – TubeClear ® (not for home use)

Ineffective Clog Treatment

• Don’t do this:
  – Carbonated beverages
  – Juice
  – Meat Tenderizer

• Not effective
• May degrade tube
• May precipitate formula
Abdominal Emergencies

• Volvulus
  – Any foreign body can become a fixed point for a moving gut
  – Feed intolerance, abdominal pain

• Peritonitis
  – Occurs when stoma not mature or breaks down
  – Feeds and meds infused to peritoneum

Respiratory Devices
Key Points

- Tracheostomy
  - “Go Bag”
  - Evaluation of plugged/dislodged tube
  - Management of tracheitis

- Airway Clearance
- Demonstration

MOC 2 Question

To diagnose bacterial tracheitis in a patient with an established tracheostomy, the MOST USEFUL lab finding is:

A. Elevated CRP
B. CBC with elevated WBC
C. 4+ PMNs on gram stain of trach aspirate
D. Trach aspirate culture positive for pseudomonas
Tracheostomy
Types of trachs

- **Bivona**
  - Uncuffed
  - TTS (tight to shaft)

- **Shiley**
  - Uncuffed
  - Low pressure cuff

Trach safety

- At bedside: “go bag” = same size trach, ½ size smaller, obdurator, extra ties, scissors, lube, syringe (if cuffed trach)
- Additional equipment: pulse oximeter, oxygen, ambu bag, suction machine and suction catheters
Airway intact/patent?

- Accidental decannulation
  - Replace ASAP, preferably with clean trach
  - If difficult, reposition neck and try again
  - If still difficult, try smaller size

- Mucus plug
  - Change trach more frequently
  - Increase suction frequency
  - Increase humidification
  - Tracheitis?

Bleeding from trach

- Suction trauma
- Irritation from end of trach tube
- Granulation tissue
- Infection
- Aspirated from upper airway
Infection

• Cellulitis at stoma site

• Lower respiratory tract
  – Tracheitis
  – Pneumonia

Tracheitis

• Colonization vs infection
  – Staph aureus, Strep pneumoniae, H influenzae, M catarrhalis, Acinetobacter species, Pseudomonas aeruginosa, Klebsiella pneumoniae, E coli, Serratia marcescens, Enterobacter species, Stenotrophomonas maltophilia, MRSA, and ESBL organisms.

• How do I make the diagnosis of tracheitis vs bacterial colonization vs pneumonia (vs sinusitis, viral bronchiolitis, flu….)?
Case

- 16 yo female with profound intellectual disability and spastic quadriplegia secondary to anoxic brain injury, epilepsy, tracheostomy dependence, g-tube dependence

- Thicker, yellow trach secretions, increased suctioning need for 2-3 days, fever to 101.5 for 1 day, increased O2 requirement today.
Labs

- RVP negative
- Trach aspirate gram stain:
  - 4+ PMNs
  - 3+ GPC
Airway clearance

Indications

• Neuromuscular disease
• Respiratory muscle weakness
• Impaired cough
• Chronic infection/inflammation, bronchiectasis, atelectasis
Airway clearance

- Chest PT
- Pneumatic percussor

Airway clearance

- Vest or wrap
- Cough assist device
Thank You!

Please join us for Hands On experience

Dickr1@mail.amc.edu
HopkinP@mail.amc.edu
KnuthE1@mail.amc.edu
Larrabe@mail.amc.edu
MaudeKayeNP@gmail.com

Implantable Neurologic Devices

• CSF Shunts
• Baclofen Pumps
Ventricular shunting systems

- Indications
- Types
- Locations
- Valves

CSF Shunts

- Complications
  - Obstruction
  - Infection
  - Dislodgement
  - Pseudocyst
  - Abdominal Pain
CSF Shunt Complications - Obstruction

• Symptoms
  – Infants
  – Older children

• Evaluation
  – CT
  – MRI
  – Shunt series

• Management

CSF Shunt Complications - Infection

• Symptoms

• Evaluation

• Management
  – Common organisms
CSF Shunt Complications - Dislodgement

• Symptoms
• Evaluation
• Management

CSF Complications - Abdominal

• Pseudocyst
Baclofen Pumps

• Indications

Baclofen Pumps

• Complications
  – Mechanical
    • Catheter related
    • Pump related
  – Pharmacologic
    • Overdose
    • Withdrawal
  – Infectious

http://weillcornellbrainandspine.org/condition/spasticity/surgery
Acute Baclofen Withdrawal

• Symptoms
  – Increase spasticity
  – Hyperthemia
  – Labile BP
  – seizures

• Management
  – Restoration of IT or po baclofen
  – Benzodiazepines

Thank You!

Please join us for Hands On experience

Dickr1@mail.amc.edu
HopkinP@mail.amc.edu
KnuthE1@mail.amc.edu
Larrabe@mail.amc.edu
MaudeKayeNP@gmail.com