The Aerodigestive Team

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Outline

• When
• Who
• Where
• Why
• What
• How
When Did Your Program Begin? With Whom?

Aerodigestive Clinic at Phoenix Children's Hospital

The Aerodigestive Clinic at Phoenix Children's Hospital is the only program in the Southwest to offer coordinated care from the Ear, Nose and Throat (ENT), Gastrointestinal (GI), and Pulmonary departments to those children with complex problems in swallowing, breathing and feeding. And because we're exclusively a children's hospital, we're focused on family-centered care.

Specialized diagnostic testing and access to pediatric specialists - in addition to the Hospital's family-centered focus - makes the pediatric specialists at Phoenix Children's Hospital uniquely qualified to treat pediatric patients with complex aerodigestive conditions. Patients receive coordinated care from several providers, fast test results and expert guidance.

A multidisciplinary team leads the way

Dr. Scott Schraff, a board-certified otolaryngologist who only treats children, co-leads the Aerodigestive Clinic. Dr. Schraff is the only fellowship-trained specialist dedicated to the management of complex airway diseases in children.

Dr. Dana Ursea, a board-certified gastroenterologist who only treats children, is a co-leader of the Aerodigestive Clinic. Dr. Ursea is the only fellowship-trained specialist dedicated to the management of feeding and swallowing disturbances as well as gastrointestinal problems in children.

Dr. James Woodward, a board-certified pulmonologist who only treats children, also co-leads the Aerodigestive Clinic. Dr. Woodward is the only fellowship-trained specialist dedicated to the management of neuromuscular respiratory problems as well as aerodigestive disorders in children.
When Did Your Program Begin? With Whom?
When Did Your Program Begin? With Whom?
Where?

• Where is the clinic housed?
• Where does the block time come from?
• Where do SLP services operate? FEES clinic?
Search: [state name] + aerodigestive + children’s

Where Is Your Closest Competition?
Role of aerodigestive clinics in evaluation, care of children with chronic respiratory complaints

By Paul E. Moore, M.D., FAAP, and Christopher T. Woestjen, M.D.

Ryan is a 26-week premature infant with severe bronchopulmonary dysplasia who left the neonatal intensive care unit dependent on a tracheotomy tube and mechanical ventilation. At 3 years of age, he was made off mechanical ventilators, disposed of supplemental oxygen and was feeding orally.

In preparation for the decannulation, he was referred to Vanderbilt’s Complex Aerodigestive Evaluation Team (CADET). This multidisciplinary team assessed the tracheoesophageal fistula and was able to place him on negative pressure ventilation, allowing him to breathe spontaneously.

The complex nature of Ryan’s care resulted in a team of specialists who continued to work with him for more than a year to ensure his safe transition to room air.

Aerodigestive clinics have become an integral part of pediatric care over the past decade. Many children’s hospitals have formed aerodigestive clinics over the past decade to provide comprehensive, patient-focused diagnosis and care of children with chronic respiratory diseases, including those with chronic respiratory symptoms (see table).

**Complex syndromes**

The aerodigestive tract is the connection of the upper and lower airways, allowing for the exchange of gases and the passage of food. Aerodigestive disease refers to diseases that affect both the upper and lower airways, often resulting in symptoms such as difficulty breathing, swallowing, or speaking.

**Multiprofessional team**

The success of the aerodigestive clinic is dependent on the collaboration of many specialists, including but not limited to, pulmonologists, otolaryngologists, gastroenterologists, and rehabilitation specialists.

**10 most common diagnoses at referral to the Complex Aerodigestive Evaluation Team clinic at Vanderbilt over the last 5 years**

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Stridor</td>
<td>37%</td>
</tr>
<tr>
<td>Chronic cough</td>
<td>18%</td>
</tr>
<tr>
<td>Recurrent cough</td>
<td>12%</td>
</tr>
<tr>
<td>Recurrent pain</td>
<td>8%</td>
</tr>
<tr>
<td>Asphyxial stridor</td>
<td>6%</td>
</tr>
<tr>
<td>Tracheoesophageal fistula</td>
<td>5%</td>
</tr>
<tr>
<td>Laryngomalacia</td>
<td>4%</td>
</tr>
<tr>
<td>Hypopharyngeal swelling</td>
<td>3%</td>
</tr>
<tr>
<td>Hypertrophic larynx</td>
<td>3%</td>
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</tbody>
</table>

**Additional resources**

- American Academy of Pediatrics: https://www.aap.org
- Vanderbilt University Medical Center: https://www.vanderbiltmedicine.org

...more than 20 children’s hospitals have formed aerodigestive clinics over the past decade...
Why Do You Do It?
What Do You Do?

• What are the roles of SLP, ENT, GI, Pulmonology?
• What does the typical diagnostic battery entail?
• What are the top 5 diagnoses you see?
• What is the bane of your [aerodigestive team] existence?
How Does It All Happen?

• How do you exclude and include patients?
• An example from Mayo
Day 1 – 815-915

The Aerodigestive Team

R. Paul Boesch, DO, MS
Assistant Professor, Pulmonary Medicine
Mayo Clinic Children’s Center
Basic process

1. Aerodigestive referral, inpatient or outpatient
2. Intake done by PNP or RN
   1. Screening algorithm applied
3. If “Aero” by screen then presented at team conference (Fri noon)
   1. plan suggested based on best practice guidelines (we developed for internal use)
4. Plan modified by full team
5. Orders and itinerary
6. Mon-Thurs eval
   1. MON-Pediatrician, sleep med, PSG, VSS
   2. TUES- ENT, FEES, Pulm, GI, others
   3. WED- OR (Scopes/probe/CT/MRI etc) everything under one anesthetic, all present
   4. THURS- Other VSS, sleep, dietician, OT, PSG etc
7. Review all results at team meeting, noon Fri
8. Family meets with Pediatrician to go over results and team plan
# Aerodigestive “Criteria”

<table>
<thead>
<tr>
<th>Core Services</th>
<th>“Major” conditions</th>
<th>“Minor” Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 2 needed, plus:</td>
<td>Either 2 major, or 1 major and 2 minor</td>
<td>Developmental Delays</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feeding problems</td>
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<td></td>
<td></td>
<td>GERD</td>
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<td></td>
<td></td>
<td>Laryngomalacia</td>
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<td></td>
<td></td>
<td>Noisy breathing</td>
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<td></td>
<td></td>
<td>Recurrent chest infections</td>
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<tr>
<td></td>
<td></td>
<td>Tracheomalacia/Bronchomalacia</td>
</tr>
<tr>
<td>Otolaryngology</td>
<td>Airway stenosis¥</td>
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<tr>
<td>Pulmonology</td>
<td>Aspiration (known or suspected)</td>
<td></td>
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<tr>
<td>Gastroenterology</td>
<td>Chronic lung disease</td>
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<tr>
<td></td>
<td>Global CNS impairment</td>
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<tr>
<td></td>
<td>Chiari malformation</td>
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<tr>
<td></td>
<td>Esophageal dysmotility</td>
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<tr>
<td></td>
<td>Esophageal stricture</td>
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<tr>
<td></td>
<td>Genetic condition (listed)*</td>
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<tr>
<td></td>
<td>Laryngeal cleft (current or prior)</td>
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<td></td>
<td>Sleep disordered breathing</td>
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<tr>
<td></td>
<td>Tracheoesophageal fistula (current or prior)</td>
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<tr>
<td></td>
<td>Tracheostomy</td>
<td></td>
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<td></td>
<td>Vocal cord paralysis</td>
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<tr>
<td></td>
<td>¥ Subglottic stenosis, glottic stenosis, laryngeal web, laryngeal atresia,</td>
<td></td>
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<tr>
<td></td>
<td>tracheal stenosis, complete tracheal rings</td>
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<tr>
<td></td>
<td></td>
<td>* Trisomy 21, CHARGE, 22q11, VATER/VACTERL, Pfeiffer, Opitz, craniofacial syndromes, Cornelia deLange, Crit du Chat</td>
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RN role in Aero

• New Aero Intake
  • Phone intake interview
  • Screen for eligibility
  • Draft proposed plan based on best practice guidelines
  • Present at team meeting to revise plan

• New Aero Itineraries
  • Assist coordination of appointments
  • Shepherd patients through evaluation
  • Organize results at wrap-up

• Ongoing follow-up assistance
NP role in Aero

• Aero follow-up clinic
  • Primary care provider for follow-up patients
  • Return itineraries are either T/W or T/W/F, depending on whether OR procedure is pre-listed for Wed
  • Approximately ½ are pre-listed for repeat surgical procedure (e.g. LB, FFB, BAL)

• Inpatient consults
  • NP available for inpatient consults on T, W, F, 8-5pm
  • Presents to team to recommend and coordinate evaluation
  • Inpatients are rounded on weekly by Aero NP

• Support Aero RNs
Aerodigestive Clinic Flow Process

Start

External referral / parent
- Contact central appointment office or pediatric appointment office

Patient Appointment Coordinator
- Triage to Aerodigestive Clinic based on indications and requests for records. Questionnaire sent to patient

RN Care Coordinator
- Reviews completed questionnaire and calls patient or referring MD to gather additional history. Develop proposed itinerary (consults, tests, diagnostic procedures) based on practice guidelines, prior to patient arrival.

PAC
- Appointments are scheduled centrally across departments.

RN Care Coordinator
- Reviews patient’s history with pediatrician and confirms orders

RN Care Coordinator/NP/Pediatrician
- Patient history, physical and review of treatment goals, etc.

Clinicians
- Consults with clinicians, radiological exams, video swallow, lab tests, sleep study, OR diagnostic procedures

Multispecialty Conference
- RN Care Coordinator gathers multispecialty plan of care. Clinicians meet to decide:
  - Additional investigations
  - Treatment plan
  - Care coordination
  - Transition to PCP

Pediatrician
- Summarizes visit and discusses unified care plan and recommendations with patient/parents

Surgical Intervention
- Surgeon meets with patient to discuss plan

Subspecialty Care
- Primary responsibility is transitioned to a subspecialist

Aerodigestive Clinic Follow-up
- Continued care coordination by the Aerodigestive Clinic

PCP
- Pediatrician communicates with PCP to handoff relevant care plan

Wait times:
- Internal referral – several hours
- External referral – 1 day
- 1-2 weeks
- Wait times to 1st visit: <1 month (goal)
- 5 days
## Example of a new patient’s aerodigestive eval itinerary

### Patient-Centered Itinerary

<table>
<thead>
<tr>
<th>Appt Time</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>RN</td>
<td>Sleep report</td>
<td>CT with anes</td>
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<tr>
<td>9:00</td>
<td>Pediatrician</td>
<td>ENT &amp; SLP swallowing evaluation</td>
<td>Triple scopes in OR (ENT, GI, &amp; Pulm)</td>
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<td>Psych</td>
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<tr>
<td>10:00</td>
<td>Social Work</td>
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<tr>
<td>11:00</td>
<td>Sleep Med</td>
<td></td>
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<td>pH probe removal</td>
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<td>12:00</td>
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<td>Team Conf</td>
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<tr>
<td>1:00</td>
<td>GI</td>
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<td>Neuro</td>
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<tr>
<td>2:00</td>
<td>Pulm</td>
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<td>Ped &amp; RN</td>
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<tr>
<td>3:00</td>
<td>Dietician</td>
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<td>PMR</td>
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<td>4:00</td>
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<td>5:00</td>
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<td>6:00</td>
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<tr>
<td>7:00</td>
<td>Sleep Study</td>
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Best practice guidelines

- Aspiration known or suspected
- Feeding problem/Oral aversions/Weaning from GT
- Trach dependent with goal of decannulation
- Airway Symptoms
- Recurrent pneumonia
- Timing of PSG in itinerary
- Chest CT
- Swallow evaluations
The Pediatric Aerodigestive Clinic is part of the Mayo Clinic Children’s Center. The goal of the clinic is to provide an interdisciplinary team approach in the treatment of aerodigestive disorders. The collaboration of the team provides integrated multi-specialty care to assure quality and patient-centered care to children and their families. The Aerodigestive Clinic sees children with complex conditions of the upper airway, lungs, upper digestive tract, including problems with sleep and feeding. Patients usually require care from more than one specialist.

Examples of major aerodigestive conditions:
- Airway stenosis
- Aspiration
- Chronic lung disease
- Global central nervous system impairment
- Chiari malformation
- Esophageal dysmotility
- Esophageal strictures
- Genetic condition
- Laryngeal clefts
- Sleep disordered breathing
- Tracheoesophageal fistula
- Tracheotomy
- Vocal cord paralysis

Examples of minor aerodigestive conditions:
- Developmental delays
- Feeding problems
- Gastroesophageal reflux
- Laryngomalacia
- Noisy breathing
- Recurrent chest infections
- Tracheomalacia/bronchomalacia

Your Visit
The Aerodigestive team will complete an evaluation of the patient usually over a 5 day period. The child and family will meet with several specialists and will likely undergo a series of necessary procedures and tests. The team will meet to discuss their findings and formulate a recommended treatment plan specific to the child’s needs. Examples of recommended treatment may include surgical intervention, a feeding program or follow-up with the appropriate health care providers.

Our Aerodigestive Team
Patient Appointment Coordinator (507) 284-1881
- Schedules patient and family appointments

Clinical Nurse Coordinators
- Collects previous medical history and assists with previsit planning
- Provides education to the patient and family
- Assists the patient and family in understanding, coordinating and implementing the treatment plan

Pediatric & Adolescent Medicine (Pediatrician & Nurse Practitioner)
- Evaluates overall health and provides a holistic view of the patient’s needs and family goals
- Ensures appropriate referrals
- Advocates for the ideal treatment plan for each child
- Assists with care coordination of the team’s recommendations
- Facilitates transfer of care to other Mayo Clinic providers or the patient’s hometown providers, as appropriate

Otolaryngology (ENT)
- Assesses airway, breathing, swallowing and hearing
- Evaluates abnormalities of the voice box and throat
- May perform diagnostic procedures
- Provides appropriate planning and timing of surgical intervention, as needed

Gastroenterology (GI)
- Assesses for stomach complaints, reflux issues and nutritional problems
- Treats bleeding, swallowing problems, or other problems encountered in the digestive tract
- May perform diagnostic procedures

Pulmonology
- Diagnoses, treats and manages breathing and lung diseases
- May perform diagnostic procedures
- Recommends a treatment plan for lung hygiene

Medical Genetics
- Assesses the child for genetic disorders and recommends testing for diagnosis
- Promotes a better understanding of genetics related to the child’s condition

http://www.mayo.edu/pmts/mc4000-mc4099/mc4095-23.pdf
QUESTIONS?
The Aerodigestive Team

THANK YOU