How did it get there?
Aerodigestive Foreign Body in Children

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Pediatric Emergency Medicine
Disclosure

• None
• FDA registered product
• Eli is 12 mo boy woke up in severe respiratory distress
• Loud stridor and gasping for air
• P 190, RR 52, Sat 88%
• Ryan is 7 year old with Cerebral Palsy
• Respiratory distress after choking on a toy
• Severe stridor and drooling
• P 156, R 36, Sat 87%
• Severe retractions with moderate breath sounds
Objectives

• epidemiology of FB aspiration & ingestion
• assessment and interventions
• methods of prevention
Choking child

- https://youtu.be/kYncGJnhPYA
- https://youtu.be/4myVJSyHBbw
- https://youtu.be/kdsi6pvqe9w
epidemiology

- FB aspiration rate is 30 out of 100,000
- Mortality rate 0.7-1.8%
- 160 death in 2000
- 6th most common cause of accidental death
- 70% FBA in <3 YO
- Reasons
- Boys 1.7 X???
- Preventable?
Most commonly aspirated objects?
# Commonly aspirated objects

<table>
<thead>
<tr>
<th>Food elated FB</th>
<th>81 (%)</th>
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<tbody>
<tr>
<td>Peanuts</td>
<td>33</td>
</tr>
<tr>
<td>Seeds</td>
<td>31</td>
</tr>
<tr>
<td>Other nuts</td>
<td>13</td>
</tr>
<tr>
<td>Beans</td>
<td>8</td>
</tr>
<tr>
<td>Vegetables</td>
<td>3</td>
</tr>
<tr>
<td>Bones</td>
<td>2</td>
</tr>
<tr>
<td>Popcorn</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
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</table>

<table>
<thead>
<tr>
<th>Non food FB</th>
<th>14 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal</td>
<td>36</td>
</tr>
<tr>
<td>Plastic</td>
<td>21</td>
</tr>
<tr>
<td>Stationary</td>
<td>11</td>
</tr>
<tr>
<td>Toys</td>
<td>6</td>
</tr>
<tr>
<td>Crayons</td>
<td>1</td>
</tr>
<tr>
<td>Others</td>
<td>25</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>5</td>
</tr>
</tbody>
</table>
pathophysiology

- Mechanical obstruction
  - asphyxia
pathophysiology

- Mechanical obstruction
  - Asphyxia
- Partial obstruction
  - Laryngospasm
  - Stridor
Common s/s

• Depends on
  – Item: size, shape,
  – Location
  – Degree of obstruction
  – Time to presentation

• Suspect if
  – Choking/gagging
  – Sudden onset of cough

• Often no symptoms in 30%
Signs

- Older children
- Younger children
  - Can make a sound
  - Silent cough
Intervention
The choking child

Assess
Send for help

Effective
cough?

Yes

Encourage coughing

No

Conscious?

Yes

5 back blows

5 chest thrusts

Assess and repeat

No

Open airway

2 breaths

CPR 15:2
Check for FB

Support and assess continuously
Recognize choking
- Cannot breathe or make a sound
- Has a cough that has no sound

Remove object (support infant's head)
- Give up to 5 back slaps: hold the infant facedown and give slaps with the heel of your hand between the shoulder blades
  - If the object does not come out, turn the infant onto her back
- Give up to 5 chest thrusts: use 2 fingers to push on the chest
- Repeat giving up to 5 back slaps and up to 5 chest thrusts until the infant can breathe, cough, or cry or until she stops responding

If the infant stops responding
- Yell for help
- Check breathing
- Give sets of 30 compressions and 2 breaths, checking the mouth for objects after each set of compressions (remove object if seen)
- After 5 sets, phone 911
- Then continue CPR until the infant starts to respond or EMS takes over
Recognize choking
- Makes the choking sign
- Cannot breathe, cough, speak, or make sounds

Ask, “Are you choking?” If she nods yes, tell her you are going to help.

Give thrusts slightly above the belly button until
- Object is forced out
  - or
- Child can breathe and make sounds
  - or
- Child stops responding

If the child stops responding
- Yell for help
- Check breathing
- Give sets of 30 compressions and 2 breaths, checking the mouth for objects after each set of compressions (remove object if seen)
- After 5 sets, phone 911 and get an AED
- Then continue CPR until the child starts to respond or EMS takes over
If you see FB
Wisconsin EMS Medical Director Approves LifeVac as Rescue Option
Published: Mar 11, 2019 8:35 a.m. ET


https://www.bing.com/videos/search?q=lifevac&view=detail&mid=DCEC3B5E919E0A2D3A60DCEC3B5E919E0A2D3A60&FORM=VRDGAR
• Eli is 12 mo boy woke up in severe resp distress
• Loud stridor and gasping for air
• P 190, RR 52, Sat 88%
Transport/ED course

- Transported sitting up in car seat with O2
- ENT & Anesthesia stand by
- Emergency evaluation with concerns for upper airway obstruction
- P210, R48, sat 92% 10L/min
- Continued resp distress and getting lethargic
- Emergent OR for bronch
In the OR
• Ryan is 7 year old with Cerebral Palsy
• Respiratory distress after choking on a toy
• Severe stridor and drooling
• P 156, R 36, Sat 87%
• Severe retractions with moderate breath sounds
EMS

- Patient in prone position
- Unable to reposition
- Transferred in position of comfort
- Oxygen blow by
ED/OR

- ENT/Anesthesia standby
- Unable to roll supine for evaluation
- Minimal agitation with O2 blow by
- To OR for removal
Foreign Body ingestion

- Highest incidence in <6 years
- 9.5/10,000 in 1995 to 18/10,000 in 2015
- Boys more likely
- FB types
  - coins (61.7%)
  - toys (10.3%)
  - jewelry (7.0%)
  - batteries (6.8%)
Common s/s

• Depends on
  – Item: size, shape,
  – Location
  – Degree of obstruction
  – Time to presentation
  – Presence of complications

• Suspect if
  – History of choking
  – Sudden onset of cough

• Drooling / dysphagia
• Stridor
• Vomiting
• Irritability
• Asymptomatic
• Transport...
Concerning FB ingestion
Coins
Esophageal foreign body
Disc batteries
How much time?

a) 30 minutes
b) 3 hours
c) 12 hours
d) 24 hours
How much time?

a) 30 minutes
b) 3 hours
c) 12 hours
d) 24 hours
Magnets
Buckyballs & Buckycubes ARE NOT TOYS.

Buckyballs & Buckycubes are not manufactured, promoted, labeled, or intended for children.
Prevention

**WARN**

CHOKING HAZARD - Sr
Not for children under 3

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**Choking Prevention Tips**

1. **Childproof your house.** Don’t leave stuff on the floor.
   - Store small items (e.g., keys, coins, etc.) in a childproof container and place it out of reach (1.75m).
   - Check to ensure there is nothing hazardous or under reach/within reach of children or on carpets.
   - Keep all sharp/hazardous objects (e.g., knives, scissors) in drawers or kitchen cabinets.

2. **Pick the right toys.** Make sure they are also appropriate.
   - Sturdy – won’t break easily
   - Non-detachable, small, sharp parts
   - Stringless
   - Strings attached to toys must be <20 cm (long strings can wrap around child’s neck).

3. **Always supervise.** Always monitor interactions during mealtimes.
   - Sit during feeding.
   - Little size portions, <1.5cm.
   - Cook foods like carrots, broccoli until soft. No nuts, seeds & popcorn.
   - Give your child water between meals and not while eating.
   - Foods to avoid: hard, crunchy, whole nuts, chips, peanuts, hot dogs, popcorn, raisins, sesame seeds, peanut butter, raw vegetables and fruits (see table: AAI).

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**Positive Parenting**

Malaysia's Pioneer Expert-Driven Educational Programme

www.mypositiveparenting.org
**Infant Choking**

**Recognize choking**
- Cannot breathe or make a sound
- Has a cough that has no sound

**Remove object (support infant’s head)**
- Give up to 5 back slaps: hold the infant facedown and give slaps with the heel of your hand between the shoulder blades
  - If the object does not come out, turn the infant onto her back
- Give up to 5 chest thrusts: use 2 fingers to push on the chest
  - Repeat giving up to 5 back slaps and up to 5 chest thrusts until the infant can breathe, cough, or cry or until she stops responding

**If the infant stops responding**
- Yell for help
- Check breathing
  - Give sets of 30 compressions and 2 breaths, checking the mouth for objects after each set of compressions (remove object if seen)
  - After 5 sets, phone 911
- Then continue CPR until the infant starts to respond or EMS takes over

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**Child Choking**

**Recognize choking**
- Makes the choking sign
- Cannot breathe, cough, speak, or make sounds

**Ask, “Are you choking?” If she nods yes, tell her you are going to help**

**Give thrusts slightly above the belly button until**
- Object is forced out
  - Child can breathe and make sounds
  - Child stops responding

**If the child stops responding**
- Yell for help
- Check breathing
  - Give sets of 30 compressions and 2 breaths, checking the mouth for objects after each set of compressions (remove object if seen)
  - After 5 sets, phone 911 and get an AED
- Then continue CPR until the child starts to respond or EMS takes over
Key Take Away

• Sudden onset of cough/choking then... asymptomatic
• Know BLS choking interventions & CPR
• Supportive care if conscious
• Position of comfort
• Coins, Batteries and Magnets
• Teach prevention and CPR
cases

- Magnet
- Pacifier
- Coin
- Battery
- Food (nuts, steak, apple)

- Nose
- Oropharynx
- Trachea
- Esophagus
- Stomach
Foreign Body Aspiration (FBA)

- Life-threatening
- 80% of pediatric FBA episodes < 3 years of age
- Peak incidence 1-2 years
- Aspirated FBs in children: Peanuts, seeds, popcorn, food particles, hardware, and pieces of toys, coins, paper clips, pins, pen caps.
- Location:
  - Bronchial - common
  - Laryngotracheal
  - Tracheal
- Morbidity and mortality is high with L.T
Foreign Body Aspiration

- Highest risk between 1 - 3 yrs old
  - Immature dentition, poor food control
  - More common with food than toys
    - peanuts, grapes, hard candies, sliced hot dogs

- Acute respiratory distress (resolved or ongoing)
  - Witnessed choking
  - Cough, Stridor, Wheeze, Drooling
  - Uncommonly.... Cyanosis and resp arrest
A. $59.99
B. $2.77
C. $19.41
• Louie MC, Bradin S., Foreign Body Ingestion and Aspiration. Pediatrics in Review, August 2009, VOLUME 30 / ISSUE 8
• A 4 month old male infant is brought to the emergency department by a fire and rescue squad after responding to a 911 call for respiratory distress. He was sucking on a pacifier when his caretakers noticed that he had sucked the pacifier into his mouth. A home health nurse was present and unsuccessfully attempted to retrieve the pacifier using a blind finger sweep. 911 was called. At the scene, paramedics found the infant with a tracheostomy and a home ventilator (former 28 week twin with a stormy neonatal course).
• PAT
• ABC
• VS
• Chest exam
management

• If in mild distress
• In severe
Location and objects

- Oropharynx
- Esophagus
- Trachea
- Stomach
- Batteries
- Pins
- Coins
- Peanuts
Interactive Activities

• Please include at least one activity to engage the audience in the material you are teaching:
  – Battery in hotdog
  – New suction device

• Consider video, case studies with audience question and answer, small group work or other creative methods.
CHOKING FIRST AID for Children
AGES 1 TO 8 YEARS OLD

PERSONAL SAFETY

Wear personal protective equipment, if available, to protect against exposure to infectious diseases.

UNCONSCIOUS VICTIM

1. 5 Back Blows*
2. 5 Abdominal Thrusts

CRITICAL: If the child is breathing, but nervous, call 911.

CONSCIOUS VICTIM

3. Chest Compressions
4. Rescue Breaths
5. Foreign Object Clearing

CRITICAL: If the child is conscious, call 911.
Management of suspected FB

• Asymptomatic* • Symptomatic
  – Transport or
  – POV
  – Complete obstruction
    • PALS
      – Chest and back thrusts if <1
      – Heimlich if >1
      – If unsuccessful
        » Direct visualization and remove
        » Unable, advanced airway
  – Partial obstruction
    • Supportive care
      – position of comfort
      – oxygen
Conscious choking patients

1. Back Blows
   Lay baby face down on your forearm. Using heel of one hand, give firm back blows between the shoulder blades.

2. Chest Thrusts
   Lay baby face-up on your forearm. Place two fingers in the center of baby's chest and compress the breastbone 1.5 inches five times.
Case 1

- 12 month old Charlie
- Sudden onset cough/choke x 1 minute
- Awake and anxious
- P 140, RR 42, Pox 98%
- Fine wheezing on right
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- 12 month old Charlie
- Sudden onset cough/choke x 1 minute
- Awake and anxious
- P 140, RR 42, Pox 98%
- Fine wheezing on right
epidemiology

• 1. They have the tendencies to put smaller object into the mouth.
• 2. They have less – controlled coordination of swallowing and immature laryngeal movement.
• 3. Often cry, shout, run and play with objects in their mouth.
• 4. Do not have molars for adequate grinding of food.