

25th Annual
Update in Emergency Medicine
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Paediatric Insights into
Barking, Gasping & Going Blue!

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Goals & Objectives

1. Distinguish between different causes of paediatric airway obstruction
2. Develop an approach to acute upper airway obstruction in children
3. Manage severe croup

Causes of Upper Airway
Obstruction in Children

- Lumen
 - foreign body
- Wall
 - croup
 - epiglottitis (uvulitis, bact tracheitis)
 - anaphylaxis
- Outside the wall
 - retropharyngeal abscess

History

- ALWAYS ask about FB
- Age
- Season
- Circumstances
 - ingestions, contacts, foods
- Onset

History (2)

- Accompanying symptoms
- fever
 - coryza
 - myalgia
 - drooling
 - pain on swallowing
 - severe malaise
 - neck stiffness
 - etc

History (2)

- Character of breathing
 - upper → inspiratory (croup)
 - lower → expiratory (asthma)
- Character of cough
 - hoarseness

Examination

- Full set of vitals with CORRECT interpretation!
 - includes glucose, pain
- ABC = appearance, breathing, colour

Age	RESPIRATORY RATE (RR)			HEART RATE (HR)		
	+/- 2 SD	+/- 1 SD	Normal Range (NR)	+/- 2 SD	+/- 1 SD	Normal Range (NR)
Birth - 3 months	10 - 80	20 - 70	30 - 60	40 - 230	65 - 205	90 - 180
3 months - 6 months	10 - 80	20 - 70	30 - 60	40 - 210	63 - 180	80 - 160
6 months - 1 year	10 - 60	17 - 55	25 - 45	40 - 180	60 - 160	80 - 140
1 year - 3 years	10 - 40	15 - 35	20 - 30	40 - 165	58 - 145	75 - 130
6 years	8 - 32	12 - 28	16 - 24	40 - 140	55 - 125	70 - 110
10 years	8 - 26	10 - 24	14 - 20	30 - 120	45 - 105	60 - 90

Patient age level	Respiratory rate by CTAS levels, breaths/min						
	I	II	III	IV, V	III	II	I
0-3 mo	< 10	10-20	20-30	30-60	60-70	70-80	> 80
3-6 mo	< 10	10-20	20-30	30-60	60-70	70-80	> 80
6-12 mo	< 10	10-17	17-25	25-45	45-55	55-60	> 60
1-3 yr	< 10	10-15	15-20	20-30	30-35	35-40	> 40
6 yr	< 8	8-12	12-16	16-24	24-28	28-32	> 32
10 yr	< 8	8-10	10-14	14-20	20-24	24-26	> 26

CTAS = Canadian Emergency Department Triage and Acuity Scale.

Patient age level	Heart rate by CTAS levels, beats/min						
	I	II	III	IV, V	III	II	I
0-3 mo	< 40	40-65	65-90	90-180	180-205	205-230	> 230
3-6 mo	< 40	40-63	63-80	80-160	160-180	180-210	> 210
6-12 mo	< 40	40-60	60-80	80-140	140-160	160-180	> 180
1-3 yr	< 40	40-58	58-75	75-130	130-145	145-165	> 165
6 yr	< 40	40-55	55-70	70-110	110-125	125-140	> 140
10 yr	< 30	30-45	45-60	60-90	90-105	105-120	> 120

CTAS = Canadian Emergency Department Triage and Acuity Scale.

Examination (2)

- Character of breathing
 - upper → inspiratory (croup)
 - lower → expiratory (asthma)
- Character of cough
 - hoarseness, hot potato

Examination (3)

- Accompanying signs (as per history)
 - fever
 - coryza
 - myalgia
 - severe malaise
 - drooling
 - neck stiffness

Examination (4)

- Accompanying signs (as per history)
 - neck stiffness
 - skin
 - chest
 - etc

Imaging

- X-ray
 - lat neck: epiglottitis, retropharyngeal abscess
 - (AP steeple ↓)
 - CXR insp/exp: FB
- Fluoroscopy: FB
- CT: deep infection
- Beware!!

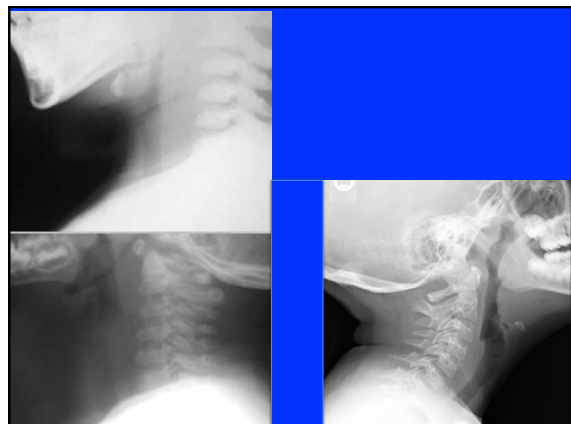
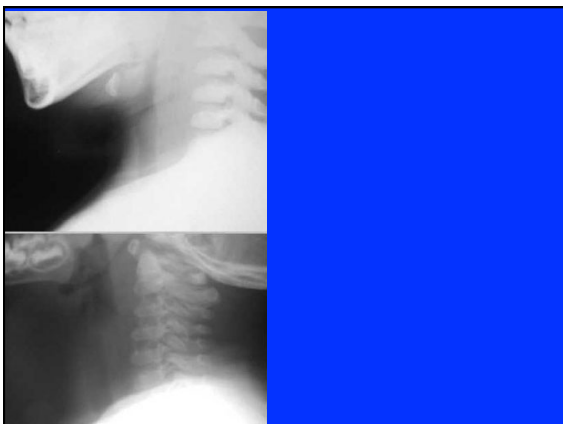


Lat C Spine

- $C2 < 7$ mm
 - < 5 mm anterior to $C3/C4$
- OR
- less than half the diameter of the vertebral bodies

Lab

- Bloods
 - CBC, diff, c/s
 - ? ESR, CRP





RPA

- Straightening
- Abnormal measurements

Retropharyngeal Abscess

- Suppuration lymph nodes pharynx, ear, sinuses
- Trauma
- < 6y

Complications RPA

- Jugular vein thrombosis
- Mediastinitis
- Carotid art rupture
 - exsanguination
 - ipsilateral Horner's
 - cranial nerve 9-12 palsies

Treatment RPA

- Antibiotics
 - Strep, Staph, anaerobes (bacteroides)
- Drainage
 - needle (EBI)
 - surgical
- Intubation

Treatment FB

- Back blows/abdominal thrusts (age)
- Cricothyrotomy
- Direct laryngoscopy & remove (McGill)
- Intubate
- Bronchoscopy

- Keep quiet
- Oxygen

FB

- Long term Mx

Anaphylaxis Treatment

- Epinephrine
 - 0.01 mg/kg = 0.01 mL of 1/1000 IM (>SC)
- 100% oxygen
- Nebulized salbutamol
 - 2.5-5 mg

Anaphylaxis Treatment (2)

- H₁ AND H₂ antihistamines IV
 - diphenhydramine 1.25 mg/kg
 - ranitidine 1 mg/kg
- Steroids IV
 - methyl prednisolone 1 mg/kg

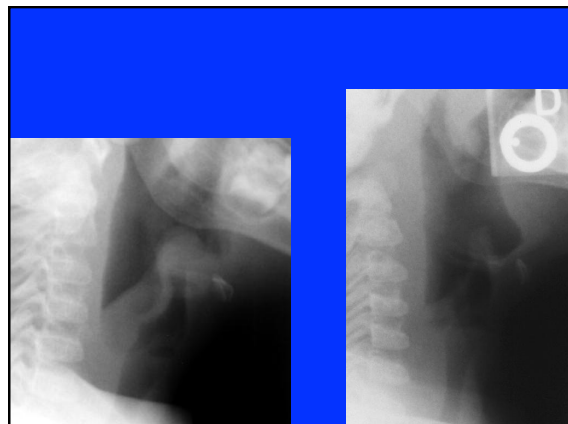
Anaphylaxis Treatment (3)

- Epinephrine infusion
 - 0.1-1 microgram/kg/min

Drug Calculation

(Wt in kg x 3) in mg of infusion drug
mixed in 50 mL (N/S)

1 mL/hr = 1 mcg/kg/min



Epiglottitis

- Rare post HiB vaccine
- Airway
 - level
 - O.R.
- Antibiotics

Croup

- Laryngotracheobronchitis
- Viral
 - Parainfl, influenza A & B
- Onset
 - Slow
 - Fast
- Age 6m-6y
 - Peak 2y
- Season

Croup Treatment

- Calm
- Oxygen
- Cold air?
- Epinephrine nebulized
 - 0.5 mg/kg to max of 5 mg
- Steroid
 - dexamethasone 0.6 mg/kg PO (IM)
 - (nebulized budesonide 2mg)

Croup Treatment (2)

- Admit/keep vs discharge
 - Timing (rebound)
 - Time of day/night
 - Parents
 - Proximity
 - Steroid

Needle Cricothyrotomy

- 3 ET to fit

Vital Signs

- 50th centile syst BP = $80 + (2 \times \text{age in years})$
- Weight = $8 + (2 \times \text{age in years})$
- Average weight gain in first 3-5 months = 30 g/day = 1 oz/day
 - double in 5 m, triple in 1 yr

Thank You

Questions??