Sick or Not Sick?!

Rapid Recognition of Acute Distress Patterns in Children

Benjamin Martin

Saturate

I messed up

Incubate

Ron Walls

Illuminate

Kids are Small Adults

Classical vs. Naturalistic

“In human factors analysis, failure to recognize a pattern is often precursor to medical error”

Incubate

Ron Walls

HPI: 62 YOM acute onset of chest pain while cutting grass

PMHX: Stents (3); Angina; Hypertension

PE: 66 pulse; skin is cool and clammy; BP 84/60; Arouses to voice

Impression?

Dose of ASA?

Incubate

Ron Walls

HPI: Pediatric Version

PMHX:

PE:

Impression?

Dose of ASA?

Incubate

Ron Walls

It is critical throughout the assessment, that EMS providers be cognizant of the emotional and physiological needs of the child, their family members, and themselves.

An Inconvenient Truth: They lied to you in EMT

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Kids are Small Adults

Kids are small adults: Just with fundamental anatomic and physiologic differences

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Kids are Small Adults

Tongue

Trachea-Pliable/Smaller

Heart-Stroke Volume (Inotropy vs Chronotropy in compensation)

Rib Cage-Position and Lung Volume

Abdominal Cavity

Body Surface Area and Compensation (Includes Muscle Tone)

Capillary Refill

Diaphragmatic Breathers

Crying

Growing Pains

RR > 60 or RR < 8

Distressed or Failed

Altered Mental Status

Nasal Flaring

Uncorrected noisy respiration*

Mottling, Pallor, or Cyanosis

60 > HR or HR > 180

Significant Trauma or Hemorrhage

Fever or Hx of with global rash

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Look Out!!!

What does MOM or Dad think? =

Experience

+

Mirror, Mirror, On the wall…

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Kids are Small Adults

Working of Breathing

Circulation to Skin

General Appearance

Or

What does MOM or Dad think?

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Aspetto	*normale*	*normale*	*anormale*	*normale*	*anormale*	*anormale*	*anormale*
Respiro	*normale*	*anormale*	*anormale*	*normale*	*normale/ anormale*	*normale*	*anormale*
Cute	*normale*	*normale*	*normale/ anormale*	*anormale*	*anormale*	*normale*	*anormale*
	Bambino stabile	**Distress respiratorio**	**Insufficienza respiratoria**	**Shock compensato**	**Shock scompensato**	**Disfunzione del SNC o metabolica**	**Insufficienza cardio-polmonare**

Appearance

Alertness
Consolability
Eye Contact
Speech/Cry
Spontaneous Motor Activity
Color

Or

What does MOM or Dad think?

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Kids are Small Adults

BREATHING

Abnormal Position
Abnormal Breath Sounds
Retractions
Lung Sounds
Nasal Flaring
Grunting or Wheezing

Or

What does MOM or Dad think?

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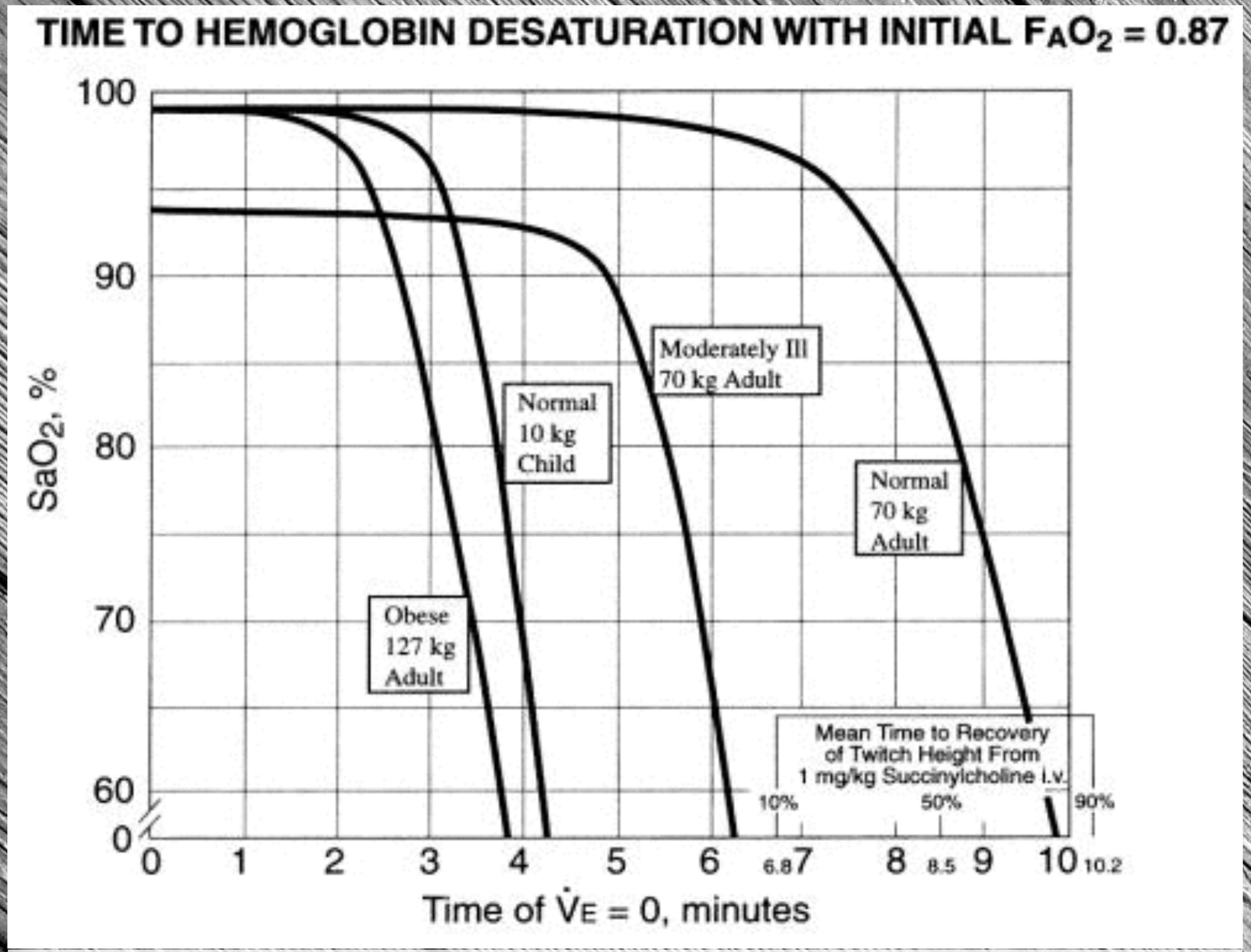
Kids are Small Adults


TIME TO HEMOGLOBIN DESATURATION WITH INITIAL F_AO_2 = 0.87
SaO_2, %
100
90
80
70
60
0
Obese 127 kg Adult
Normal 10 kg Child
Moderately Ill 70 kg Adult
Normal 70 kg Adult
Mean Time to Recovery of Twitch Height From 1 mg/kg Succinylcholine i.v.
10%
50%
90%
0
1
2
3
4
5
6
6.8
7
8
8.5
9
10
10.2
Time of $\dot{V}_E$ = 0, minutes

Circulation

Color
Temperature
Capillary Refill
Pulse Quality

Or

What does MOM or Dad think?

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Kids are Small Adults

What does Mom & Dad think?

ABC’s

Kids are Small Adults

Ages 1-5 months (Aww, it's a baby)

Characteristic

Can follow movements with their eyes

History from parents

Keys to Approach

Warm, with parent, pacifier or bottle as needed

Common Problems

(SIDS, Vomiting & Diarrhea aka dehydration, meningitis, abuse)

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Development Stages

Ages 6-12 months (I'm over diapers)

Characteristic

Not a fan of supine unless sleeping

Cling to Parents

Keys to Approach

Examine in parent's lap

Common Problems

(Same as before but add Febrile Seizures, Croup, FBAO)

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Development Stages

Ages 1-3 years (I'm a holy terror)

Characteristic

Language starting to develop—Parents will know how to translate

Accidents Prevail

Keys to Approach

Be honest with the child; cautious and creative approach

Common Problems

(Same as before but include trauma)

Illuminate

Development Stages

Ages 3-5 years (I'm a holy terror)

Characteristic

Tremendous increase in motor, language is almost perfect but shyness abounds. Afraid of monsters, strangers, and fear of mutilation

Keys to Approach

Be honest with the child; cautious and creative approach; utilize parents

Common Problems

(Same as before but include epiglottis, ingestions, and trauma—specifically drowning, and child abuse)

Ages 6-12 years (Enjoy this age, a teenager looms)

Characteristic

Confident, sometimes clumsy in motor, significant personality changes, active

Keys to Approach

Consider interviewing the child away from the parent to protect privacy. They may cover up information if they were misbehaving. Always circle back to include parents.

Common Problems

(Trauma: Bicycle & Auto accidents, fractures, falls, sporting injuries)

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Development Stages

Ages 12-15 years (The hormones have arrived)

Characteristic

Concerned with body image and very independent; easily embarrassed in front of peers or opposite sex

Keys to Approach

Protect privacy of patient during interview, then circle back to parent; Consider matching gender of care provider to patient if possible

Common Problems

(Mono, Asthma, Drug & Alcohol abuse, sexual abuse, suicide gestures, pregnancy)

Age Group	Resp	Heart Rate	SBP	Weight (kg)	Weight (lb)
Newborn	30 - 60	100 - 180	50 - 70	2 - 3	4.5 - 7
Infant 1-12 months	20 - 50	80 - 160	70 - 100	4 - 10	9 - 22
Toddler 1-3 yrs.	20 - 35	70 - 150	80 - 110	10 - 14	22 - 31
Preschooler 3-5 yrs.	20 - 30	60 - 120	80 - 110	14 - 18	31 - 40
School Age 6-12 yrs.	15 - 30	60 - 110	80 - 120	20 - 42	41 - 92
Adolescent 13+ yrs.	12 - 20	55 - 110	110 - 120	>50	>110

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Normal Vitals?

College Dating…Happy Wife…Happy Life

Strategic IV & IN; Cervical Precautions

Moms, Dads, & Pooh Bears oh My!

Trauma: Just Do It

Use Your Imagination

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Top 5 Tips

Patient Care Progression (EMT-B)

Scene Size-Up

[Safety, BSI, # of Patients, Additional Resources, NOI→CC, MOI→C-Spine]

▼

Initial Assessment

[Form General Impression→AVPU, ABCDEF, Make Initial Interventions (O_2), Decide Priority]

▼

Depending on AVPU or MOI...

[Significant or Unresponsive]

A. Rapid PE
B. Baseline Vitals
C. HPI/Sample
D. Transport

[Low Suspicion or AVP]

A. HPI/Sample
B. Focused PE
C. Baseline Vitals
D. Transport

▼

Ongoing Assessment

[Reassess Mental Status, Ensure ABC, Vitals, Focused Exam, Check Interventions, Trends]

Anytime the patient's condition changes, start again at Initial Assessment!

Rhonci (Sonorous Wheeze)

Crackles (Rales)

Wheezes

Stridor

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Lung Sounds

Q

Bronchiolitis (RSV)

- Basics
  - Respiratory infection of the bronchioles
  - Occurs in early childhood (younger than 1 yr)
  - Caused by viral infection

A

Illuminate
Common Illness

Q

Bronchiolitis (RSV)

- Acute respiratory distress
- Tachypnea
- May have intercostal and suprasternal retractions
- Cyanosis
- Fever & dry cough
- May have wheezes - inspiratory & expiratory
- Confused & anxious mental status
- Possible dehydration

A

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Common Illness

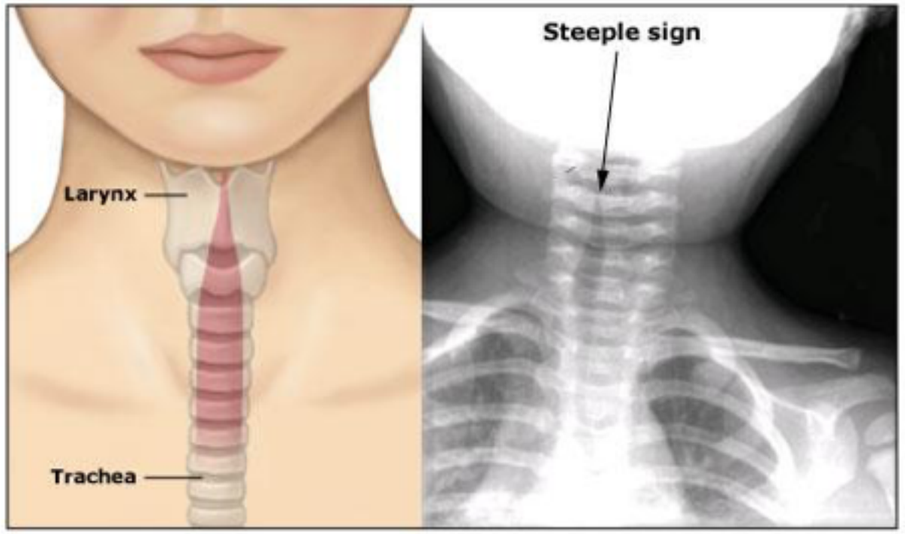
Q

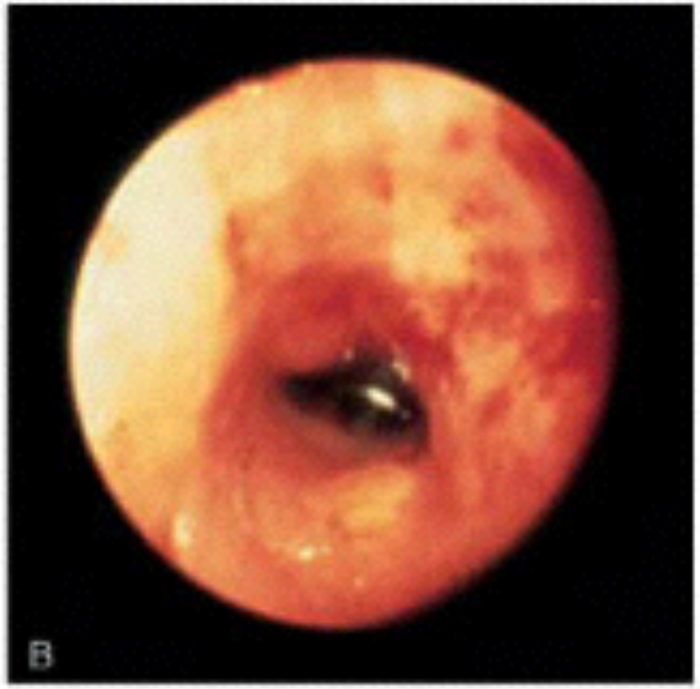
Croup

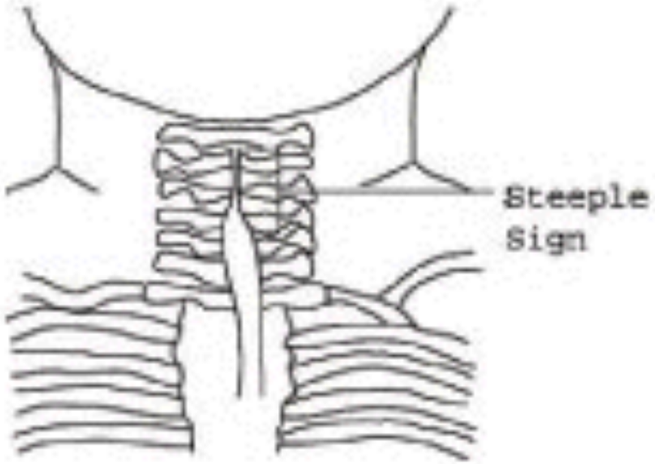
- Primarily Upper respiratory viral infection (Subglottic)
- Occurs mostly among ages 6 months to 3 years
- More prevalent in fall and spring
- Edema develops, narrowing the airway lumen
- Severe cases may result in complete obstruction

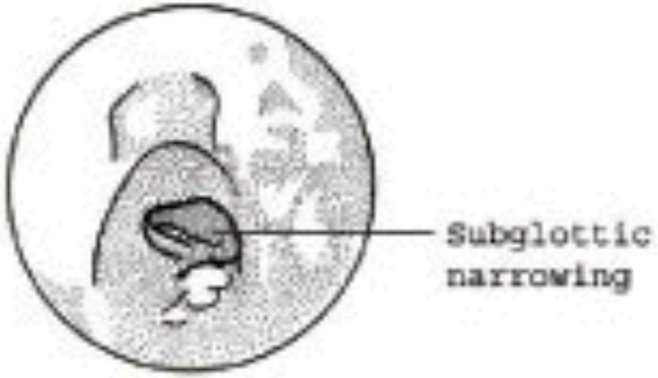
A

Illuminate
Common Illness









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Illuminate
Common Illness

Croup

Q

- Signs & Symptoms
  - Tachycardia, tachypnea
  - Skin color - pale, cyanotic, mottled
  - Decrease in activity or LOC
  - Fever
  - Breath sounds - wheezing, diminished breath sounds
  - Stridor, barking cough, hoarse cry or voice

A

Illuminate
Common Illness

Croup

Q

- Management
  - Assess & monitor ABC's
  - High flow humidified O2; blow by if child won't tolerate mask
  - Limit exam/handling to avoid agitation
  - Be prepared for respiratory arrest, assist ventilations and perform CPR as needed
  - Do not place instruments in mouth or throat
  - Rapid transport

A

Illuminate
Common Illness

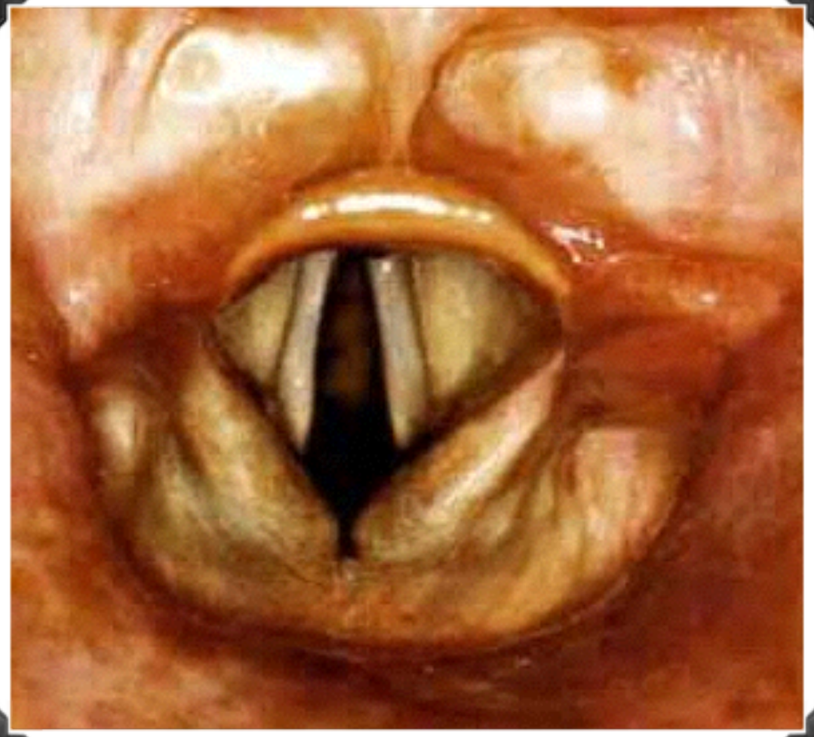
Q

Epiglottitis

- Bacterial Infection and/or inflammation
- Usually occurs in children 3-6 years of age
- Can occur in infants, older children, and adults
- Bad, x 32

A

Illuminate
Common Illness



Epiglottitis

- May be sitting in Tripod position
- May be holding mouth open, with tongue protruding
- Muffled or hoarse cry
- Inspiratory stridor
- Tachycardia, tachypnea
- Pale, mottled, cyanotic skin
- Anxious, focused on breathing, lethargic
- Very sore throat
- Nasal flaring
- Look very sick with high fever

Illuminate
Common Illness

Q

Febrile Seizures

- Result from a sudden increase in body temperature
- Most common between 6 months and 6 years
- Related to rate of increase, not degree of fever
- Recent onset of cold or fever often reported
- Patients must be transported to hospital

A

Illuminate
Common Illness

Q

Asthma

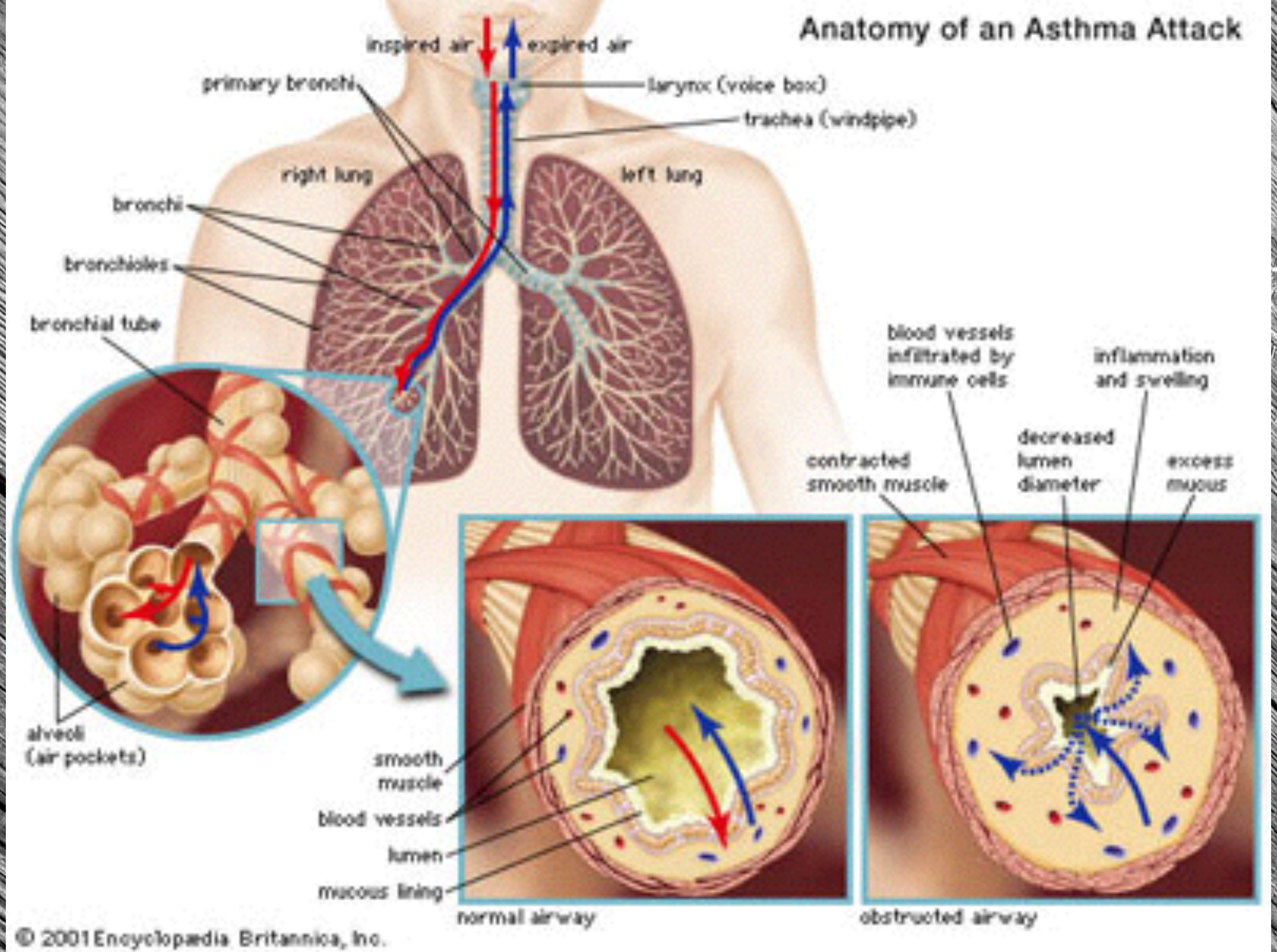
Chronic recurrent lower airway disease with episodic attacks of bronchial constriction

- exercise, psychological stress, respiratory infections, and changes in weather & temperature
- Occurs commonly during preschool years, but also presents as young as 1 year of age

Decrease size of child's airway due to edema & mucus leads to further compromise

A

Illuminate
Common Illness


Anatomy of an Asthma Attack
inspired air
expired air
primary bronchi
larynx (voice box)
trachea (windpipe)
right lung
left lung
bronchi
bronchioles
bronchial tube
alveoli
(air pockets)
smooth
muscle
blood vessels
lumen
mucous lining
normal airway
blood vessels
infiltrated by
immune cells
inflammation
and swelling
decreased
lumen
diameter
contracted
smooth muscle
excess
mucus
obstructed airway
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Q

Asthma

- SOB, shallow, irregular respirations, increased or decreased respiratory rate
- Pale, mottled, cyanotic, cherry red lips
- Restless & scared
- Inspiratory & expiratory wheezing, rhonchi
- Tripod position

A

Illuminate
Common Illness

Q

Meningitis

- History of recent illness
- Headache, stiff neck
- Child appears very ill
- Bulging fontanelles in infants
- Extreme discomfort in movement

A

Illuminate
Common Illness

Q

Epiglottitis

- Bacterial Infection and/or inflammation
- Usually occurs in children 3-6 years of age
- Can occur in infants, older children, and adults
- Bad, x 32

A

Illuminate
Common Illness

Role Conflict: Understand your bias, or lack thereof enters the scene with you

Engage, educate, and respect the parents

Creativity saves the day

Keep it simple

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Takeaways

Why Isn't Your Fire Truck Red?
Understanding the Difference Between Culture and Tradition

Expectations Exposed
The Trap of Setting & Realizing Expectations

Intoxicated Leadership: How To Avoid Leading Under the Influence of Your Emotions

The Genius in the Room: Promoting Resiliency & Recovery for Leaders

Trapped & Injured: What Extricating People From Wrecked Vehicles Taught Me About Dealing With Conflict