Who’s Afraid of the Big, Bad Kid?

Where to Begin!

- Must quickly reestablish a trusting relationship
- Focus your information gathering to most useful data
- Prioritize interventions
- Make timely transport decisions

Trust and Cooperation

- Understand how children think and communicate
- Understand a child's capabilities
- Act like a guardian
- Respect the child
- Understand parent's point of view

Family-Centered Care

- Family members and other caregivers must be considered as part of the healthcare team

- **If they don't work *with* you, they may work *against* you!!**

Understanding a Child's Capabilities

Talking to Kids

- Use child's preferred name
- Know gender of the child
- Talk to child in an age-appropriate manner
- Pay attention to your tone of voice
- Never lie, especially about pain
- Focus what's important to child
- What your nonverbal cues

Tips
0-12 mos

- Leave child in parent's arms
  Except during transport
- Keep covered for warmth
- Use warm equipment
- Examine toe to head
- Avoid IVs in "thumb sucking" hand

Tips for Toddlers 1 to 3

- Use simple age-appropriate language
- Allow them to check out your tools
- Keep parents close
- Go toe to head
- Talk about what's happening NOW
- Use discretion in displaying needles

Tips for Preschoolers 3 to 6

- Talk to child and ask questions
- Use simple language
- Explain next steps or actions
- Encourage child to help with care
- Can examine head to toe
- Use dressings/band-aids

School Age

6-12 yrs

- Often regress when stressed
- Can communicate well
- Inform child of painful procedures right before you hav to do them
- Allow choices when possible
- Expect delaying tactics
- Respect modesty
- Assess and treat pain appropriately

*

Adolescents
12-16 yrs

- Get information from the patient
- Address with respect
- Don’t condescend
- Allow them to make choices about care
- Respect their privacy/modesty
- Be nonjudgmental
- Don’t embarrass

Pediatric Assessment

- **Focus:** Most critical information
- **Identify & Prioritize:** Interventions
- **Direct:** Most appropriate facility for definitive care

Patient Assessment

SCENE SIZE-UP

↓

FIRST IMPRESSION:
THE PEDIATRIC ASSESSMENT TRIANGLE
"How sick?" "How quick?"

↓

PRIMARY ASSESSMENT AND TREATMENT
A, B, C, D, E
Immediately treat life threats then reassess
Make transport decisions

↓

FURTHER ASSESSMENT AND TREATMENT
Vital signs
Focused history and physical
Serial reassessments
Determine need for non-emergent treatment

First Impression

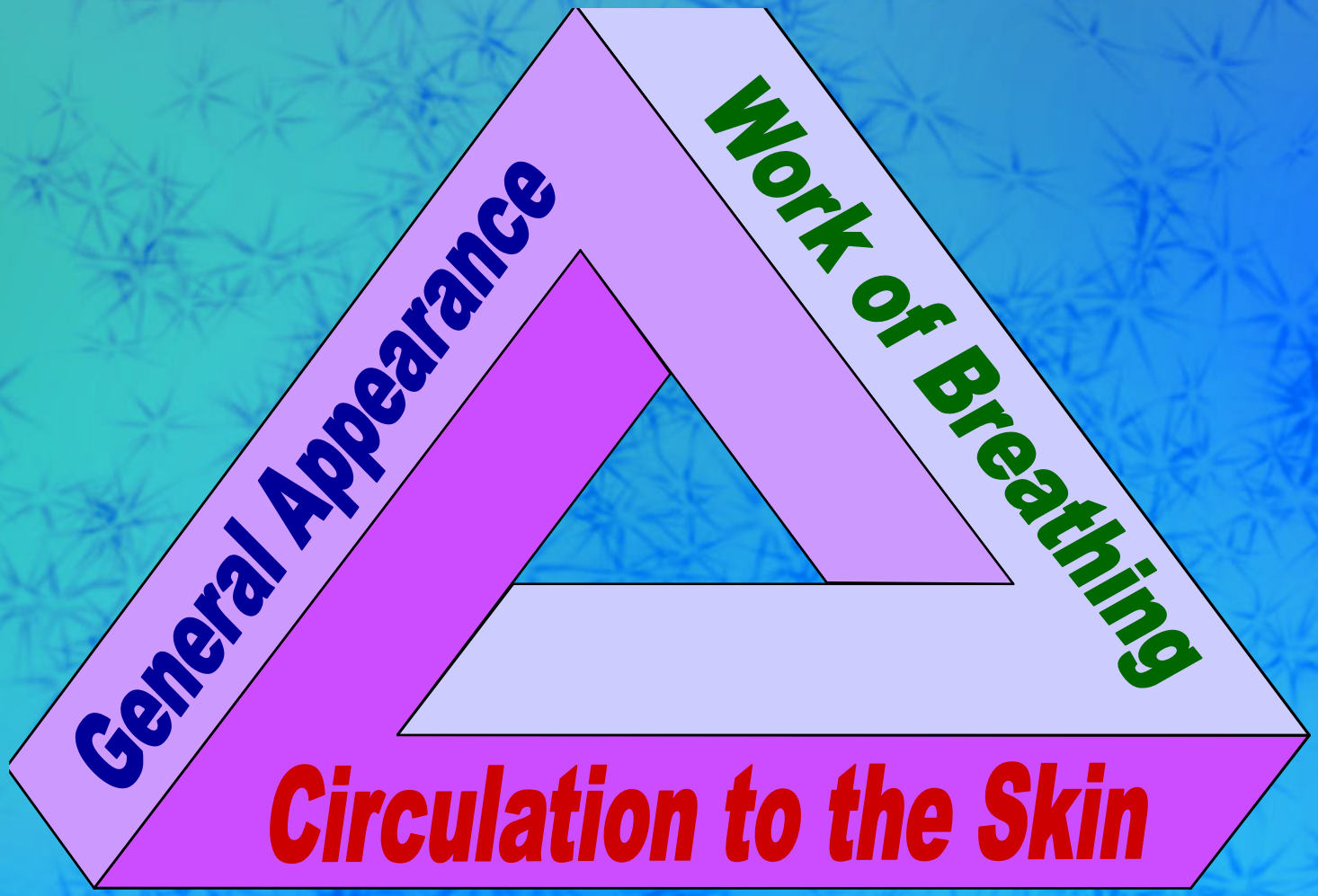
- Completed as you first approach child, even before making physical contact
- Takes < 30 seconds
- Done BEFORE primary assessment
- Determines physiologic status and urgency for prioritized intervention

First Impression

How sick?

How quick?

Pediatric Assessment Triangle



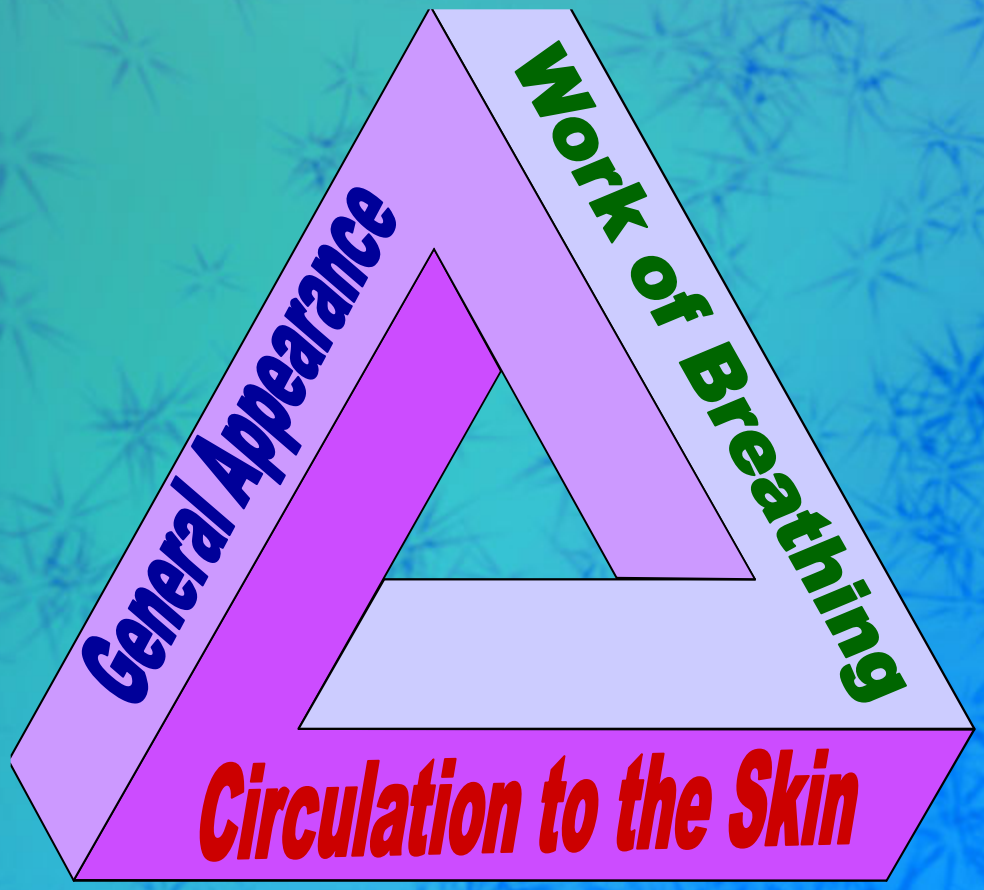
Adapted from the AAP's Pediatric Education for Prehospital Professionals (PEPP) course

First Impression

- First impression does NOT require numbers
- Most important: adequacy of child's physiologic compensation
- First impression: urgency and speed- reminder of assessment and interventions completed

- For urgent ("sick")
  - Rapid initial assessment, appropriate interventions, and prepare for transport
- For non-urgent ("not sick")
  - Full assessment at a moderate pace taking time to explain actions and plan

Pediatric Assessment Triangle



- General **A**ppearanc
- Work of **B**reathing
- **C**irculation to Skin

General Appearance

- Higher brain function
  - interaction with environment
  - good oxygenation, ventilation and perfusion to the brain
- Look beyond chronic deformities, dramatic rashes and smeared blood

General Appearance

Good General Appearance

↓

Normal to Well Compensated Physiology

↓

“Not Sick” and “Not Quick”

General Appearance

Poor General Appearance

↓

Inadequately Compensated Physiology

↓

"Sick" and "Quick"

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Pediatric Assessment Triangle

Work of Breathing

- More informative than respiratory rate
- Reflects resistance in small air passages
- Dependence on diaphragm and chest wall muscle weakness

Work of Breathing

Increased WOB

- Including Tachypnea
- Compensatory mechanism

Decreased WOB

- Poor effort/slow breathing
- Decompensation

Pediatric Assessment Triangle

Circulation to the Skin

- Decreased circulation to skin is an early sign of compensation for a circulatory problem in kids (not always true in adults)
- Capillary refill is a good measure in kids, especially in a normothermic environment

Circulation to the Skin

Primary Assessment

SCENE SIZE-UP

↓

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FURTHER ASSESSMENT AND TREATMENT
Vital signs
Focused history and physical
Serial reassessments
Determine need for non-emergent treatment

- **ABC's**
- **Builds on first impression**
- **TREAT AS YOU ASSESS**
- **Reassess as new priorities found**

Secondary/Ongoing Assessment

SCENE SIZE-UP

↓

FIRST IMPRESSION:
THE PEDIATRIC ASSESSMENT TRIANGLE
"How sick?" "How quick?"

↓

PRIMARY ASSESSMENT AND TREATMENT
A, B, C, D, E
Immediately treat life threats then reassess
Make transport decisions

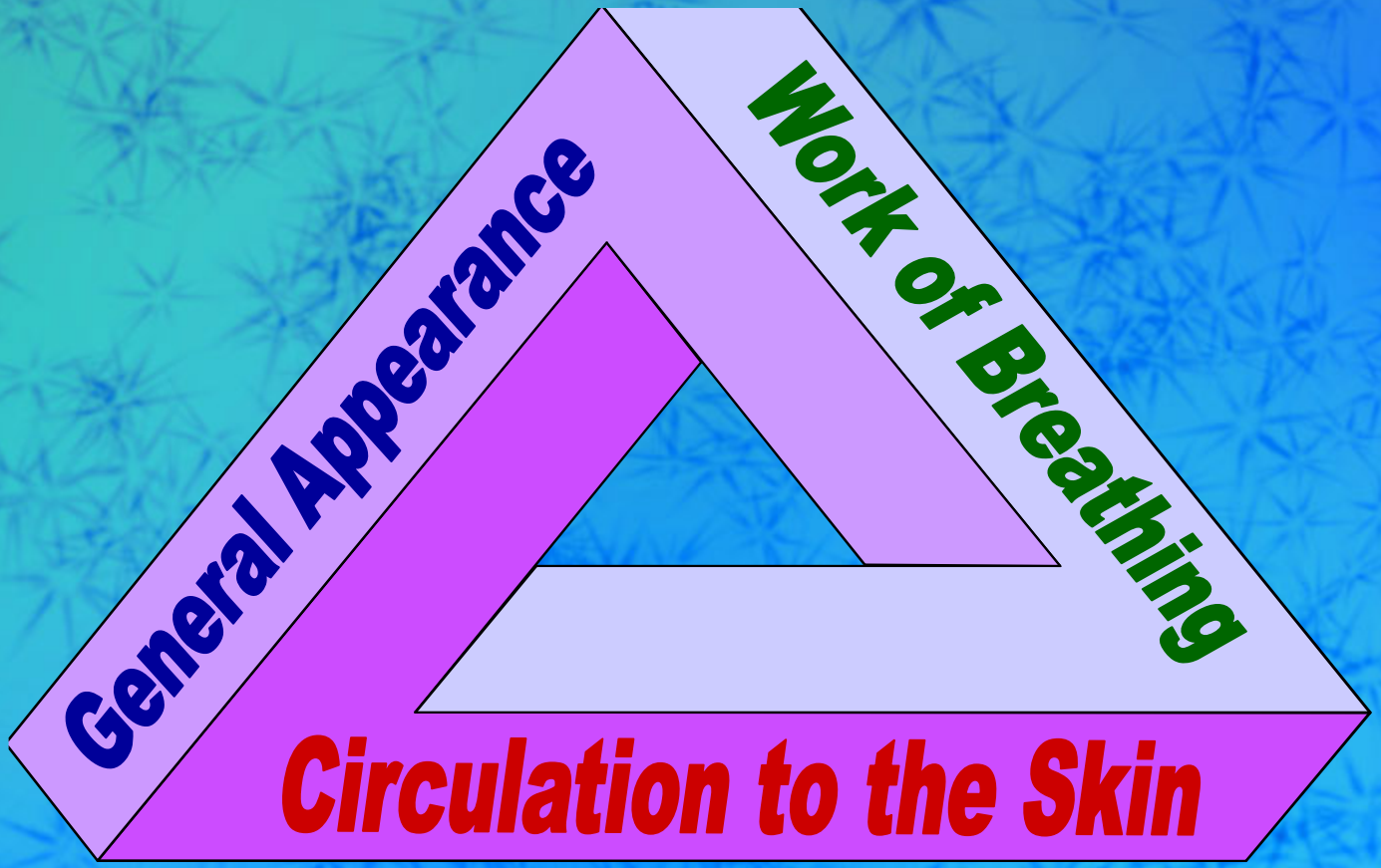
↓

FURTHER ASSESSMENT AND TREATMENT
Vital signs
Focused history and physical
Serial reassessments
Determine need for non-emergent treatment

- Urgent condition – priority is intervention and prompt transport
- Non-urgent condition – obtain a complete history
- Vital signs done late in initial assessment or in focused assessment
- Interpret vital signs in context of exam
- Be accurate!

Additional Tools

Altered Level of Consciousness



Case Presentation

Dispatched for a 4-year-old female, unresponsive.

You find the child lying motionless on the couch in a tidy apartment.

The mother tells you that her daughter was fine this morning, playing and talking normally

She found her asleep and minimally responsive. She does open her eyes when she hears her mother's voice.

General Assessment: PAT

Somnolent does not note your arrival

Unlabored

no abnormal airway sounds

Lips and nail beds pink

First Impression and Management Priorities

What is your general impression?

- Sick & Quick

Physiologic problem:

- primary central nervous system dysfunction

Immediate treatment

- Position the airway and provide supplemental oxygen while proceeding with further assessment.

Primary Assessment

- **A** — airway patent
- **B** — RR 30; clear lungs with good air entry; SaO_2 96% on room air
- **C** — HR 130; radial pulse strong, capillary refill 2 seconds; sweaty skin; BP 96/50
- **D** — AVPU; withdraws from pain
- **E** — no signs of injury or rashes

Management Priorities

- What is your overall assessment?
  - Stable cardiopulmonary status
  - Central nervous system dysfunction of unknown cause
- What are your management priorities?
  - Obtain a focused history.
  - BLS: transport.
  - ALS: Check blood glucose level.

Key Concept: AEIOUTIPS

- Alcohol
- Epilepsy, endocrine, electrolytes
- Insulin
- Opiates, overdose
- Uremia
- Trauma, temperature
- Infection
- Psychogenic, poison
- Shock, space occupying lesion, subarachnoid hemorrhage

Focused History

You ask the mother about past medical history or the possibility of an ingestion.

She tells you that her daughter “gets into everything” and goes to the bedroom to check her purse.

She returns with an open bottle of her “diabetes medicine” and tells you that there are pills spilled on the floor.

Key Concept: Hypoglycemia

- Hypoglycemia is a common metabolic cause of brain dysfunction.
  - May be due to inborn error, ingestion, poor intake, sepsis, or insulin or oral hypoglycemic overdose.
- Symptoms are related to the glucose level.
  - Tremor and agitation with mild hypoglycemia
  - Lethargy, pallor, sweating, tachycardia with moderate hypoglycemia
  - Coma and seizures with severe and persistent hypoglycemia

Documented Hypoglycemia

- Check blood glucose levels:
  - If < 60 mg % and child < 2 years old, give $D_{25}W$, 2-4 mL/kg bolus IV.
  - If < 60 mg% and child > 2 years old, give $D_{50}W$, 1-2 mL/kg bolus IV.
  - If IV not obtainable, give glucagon 1 mg IM.

Case Progression

En route: the child remains alert in transport. Glucose is 110 mg/dL at 15 minutes after the $D_{50}W$ bolus.

In the ED: blood sugar falls to 50 at 1 hour after arrival.

An IV glucose infusion is started, and the child admitted for observation.

Diagnosis: hypoglycemia via oral hypoglycemic overdose.

Outcome: Mom is educated on childproofing and home safety. The child is discharged after 36 hours with no sequelae.

Summary ALOC

- Bedside glucose should be checked in any child with ALOC.
- Thorough history of event to rule out Trauma or ingestion
- Undiagnosed disease
- Environment

Respiratory Emergencies

Case Presentation

A 9-month-old boy with rapid breathing and stridor.

The mother states that the boy has had a cold and fever fo
2 days.

He developed a loud cough, “wheezing,” and trouble
breathing today.

He has no history of foreign body ingestion or aspiration

General Assessment: PAT

Sleepy, but responds to parent

Audible stridor at rest; intercostal and subcostal retractions; no obvious drooling: prefers seated position

Pale

Initial Impression Management Priorities

- Initial impression:
  - Sick
  - Respiratory distress
- Physiologic problem:
  - Upper airway obstruction
- Immediate treatment:
  - Position of comfort.
  - Oxygen.

Primary Assessment

- Airway — stridor
- Breathing — RR 60; inspiratory stridor at rest, decreased breath sounds; SaO_2 96% on blow-by oxygen
- Circulation — HR 160; pulse strong and regular; BP 90/70
- Disability — alert
- Exposure — no signs of injury

Overview

- Key to pediatric airway management is less is more
- Remember BASIC LIFE SUPPORT
- Pediatric anatomical issues play a major role in managing the airway

Physiology of Breathing

- Able to compensate during respiratory distress
  - Increasing respiratory rate
  - Use of accessory muscles
- Fatigue easily

Anatomy of Breathing

- Small children are dependent upon diaphragm contraction to breathe
- Compression or obstruction of diaphragm's movement reduces tidal volume
- Infants are obligate nose breathers

Assessment
Breath Sounds

- Listen at mid-axillary
- Equality
- Expiration vs. inspiration
- Abnormal sounds

Primary Assessment

Abnormal Breath Sounds

- Diminished
- Stridor
- Gurgling
- Grunting
- Wheezing
- Rales
- Rhonchi

Respiratory Distress

- Physiologically
  - Hypoxia
  - Compensated
- Altered mental status
  - Alert, irritable, anxious
- Normal muscle tone

Respiratory Distress

- Cyanosis which improves with oxygenation
- Increased respiratory rate
- Mild tachycardia
- Accessory muscle usage
  - Retractions
  - Nasal flaring

Respiratory Failure (Pre-arrest)

- Physiologically
  - Hypoxia and hypercarbia
  - Beginning to decompensate
- Severely altered mental status
  - Sleepy intermittently agitated and combative
- Severe accessory muscle usage
  - Grunting, retractions

Respiratory Failure (Pre-arrest)

- Central cyanosis
- Poor peripheral perfusion
- Decreased muscle tone
- Marked tachycardia
- May begin slowing towards bradycardia

Respiratory Arrest

- Physiologically
  - Hypoxia and hypercarbia
  - Decompensated
- Bradycardia
- Respiratory muscle fatigue
  - Absent or shallow chest wall movement
  - Limp tone

Respiratory Arrest

- Poor perfusion
  - Weak to absent pulses
- Decreased mental status
  - Unresponsive
- Poor muscle tone
  - Limp muscle tone

Respiratory Interventions

- Supplemental O_2
- Treatment for bronchospasm
- Assisted ventilations
- NGT placement

Causes of Upper Airway Obstruction

- Croup
- Epiglottitis
- Foreign Body Aspiration
- Anaphylaxis
- Congenital
- Trauma
- Other infections

Croup

- Viral infection resulting in inflammation of larynx, trach and bronchi
- Most common upper airway disease
  - 1.5 cases/100 children < 6 years of age
- Seasonal — late fall and early winter

Respiratory Failure with Croup

- Agitation
- Lethargy
- Hypoxia/cyanosis
- Marked decrease in tidal volume
- Apnea

For each 1-mm edema — 50% reduction in cross-sectional area of trachea

Pathophysiology of Croup

- Virus transmitted through respiratory secretions.
- Inflammation of trachea, larynx, and bronchi
- Vocal cord and subglottic edema

Signs and Symptoms of Croup

- Cold symptoms for 1—3 days
  - All symptoms last about 4—7 days.
- Nasal congestion and hoarseness
- Barking or seal-like cough (94%)
- Stridor (58%)
- Tachypnea
- Low-grade fever

Management Priorities

- Alert — respiratory distress
  - Position of comfort
  - Supplemental oxygen/cool mist?
  - Nebulized epinephrine
- Not alert — respiratory failure
  - Bag-mask ventilation
  - ETI if apneic

Case Progression

En route: patient receives oxygen and nebulized epinephrine.

ED Course: the patient is given a corticosteroid orally.

Discharged home after 4 hours of observation with marked improvement in symptoms.

Summary Respiratory Emergency

- In certain cases pharmacologically assisted intubation may be beneficial to the patient
- Advanced Airway control is Gold Standard
- Basic airway control assures standard is met
- Always provide high concentration O2
- Do not further agitate child
- Aggressively treat respiratory distress before it progresses

Toxicological Emergency

Case Presentation

The patient is an 18-month-old boy who is found blue and poorly responsive by his grandmother.

On your arrival, you find the toddler on the couch in a cluttered, very warm, but tidy apartment.

The grandmother tells you that the boy was fine this morning.

General Assessment: PAT

Somnolent

Slow respiratory rate without retractions

Dusky

Management Priorities

- Initial impression
  - Sick: respiratory failure, shock
    - Altered mental status with hypoventilation and cyanosis
- Immediate treatment:
  - Position: provide 100% oxygen; bag-mask ventilation.

Primary Assessment

- Airway — open, no stridor
- Breathing — RR 10; clear breath sounds; SaO_2 82%
- Circulation — HR 60; pulses strong; capillary refill 2 seconds; BP 110/60
- Disability — AVPU ≡ P, moves with painful stimulus; pupils pinpoint
- Exposure — no signs of trauma

Primary Assessment "secondary"

A ≡ Airway

B ≡ Breathing

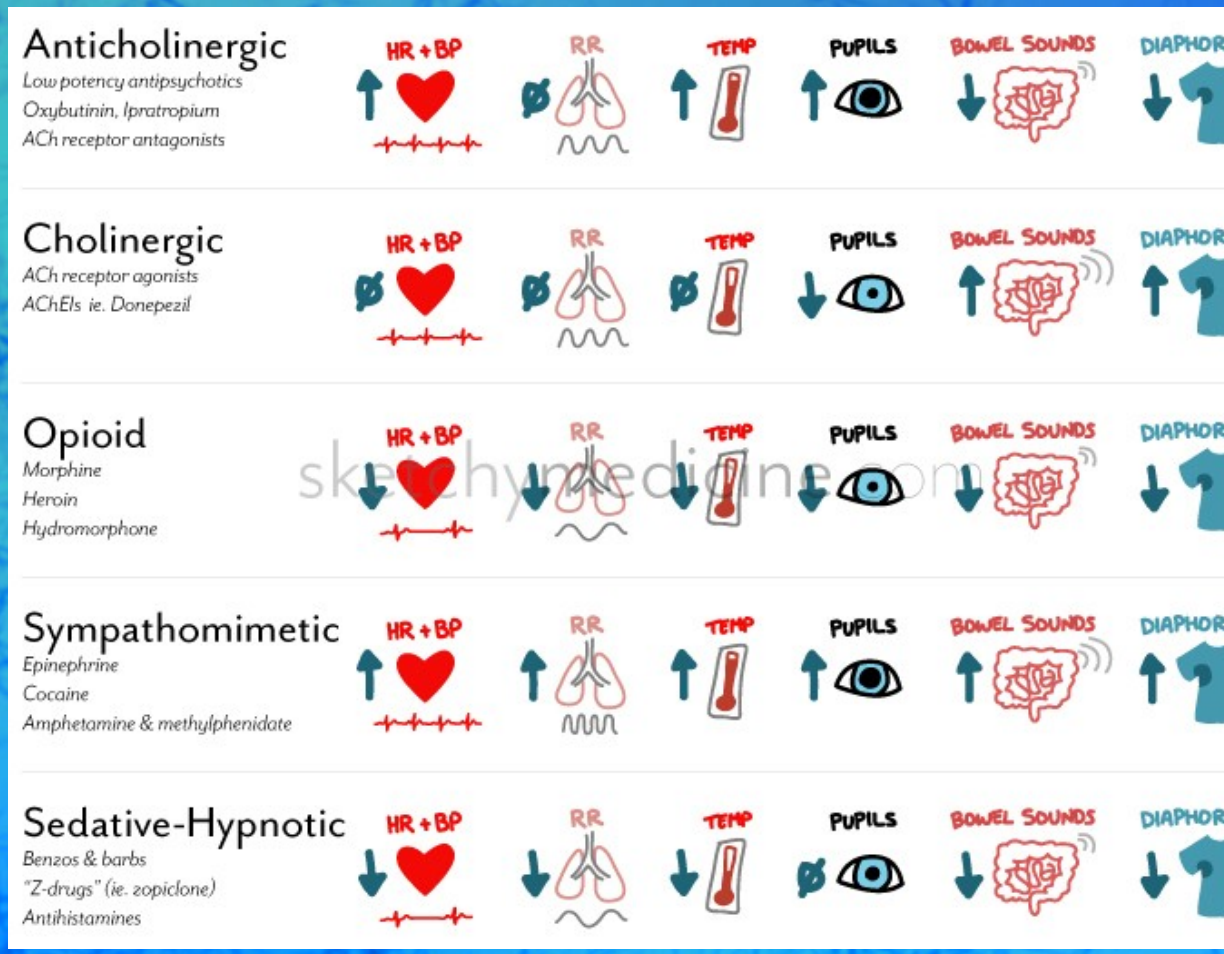
C ≡ Circulation

D ≡ Decontamination

S ≡ Sugar, seizure control, and supportive care

One-Pill/Teaspoon Killers

- Theophylline
- Tricyclic antidepressants
- Clonidine
- Verapamil
- Propanolol
- Camphor
- Methyl salicylate (oil of wintergreen)



Management Priorities

- **Cardiorespiratory failure; Stabilize for transport**
- **BLS:**
  - Consider airway adjunct.
  - Transport with bag-mask ventilation, 100% O_2.
- **ALS:**
  - Establish vascular access.
  - Check blood glucose; treat documented hypoglycemia.
  - Perform electronic monitoring.
  - Give naloxone for possible opiate poisoning.
  - Consider ETI for airway protection.
  - Transport.

Case Progression
Transport Decisions

While preparing the child for transport, you ask the grandmother about any chronic or acute illnesses, medications, recent trauma, or the possibility of ingestion.

She denies previous illnesses but suddenly remembers that she was counting her “blood pressure pills” this morning, and left the unopened bottle with three remaining tablets on the kitchen table.

She produces an empty bottle of Clonidine.

Case Progression

The child partially responds to naloxone, with RR 14 per min, HR 90 per min and improved tidal volume. He remains sleepy.

En route: you give a 20 mL/kg normal saline bolus IV and a second dose of naloxone.

You continue bag-mask ventilation and cardiorespiratory monitoring.

ED Course

In the ED: the child is intubated due to continued ALOC, respiratory depression, and recurrent bradycardia. Activated charcoal is administered by NG tube and a naloxone drip is started.

Diagnosis: Clonidine ingestion

Outcome: he is admitted to the pediatric intensive care unit for 2 days of supportive care. He is discharged home after 4 days, and education is provided to the grandmother on medication safety.

Poisoning

- If it is NOT a life threatening emergency
  - Call national poison control center **(800) 222-1222**
- Try to have this information ready
  - Victim's age and weight
  - Container or bottle of the poison if available
  - Time of the poison exposure
  - Address where the poisoning occurred

Toxicology Summary

- The treatment of toxic exposures is largely supportive.
  - Antidotes are rarely available.
- A small quantity of a potent medication may be lethal in a toddler.
- Consult the poison center or medical oversight to assess the risk of the ingestion.
- Avoid ipecac.
- If the child is alert and cooperative and has had serious ingestion, attempt treatment with activated charcoal.
- Bring all medication containers, plastic bags of drugs, and suspicious substances to the ED.

Summary
Kids are Different!

- Establish trust
- Remember family-centered care
- Use knowledge about how children change
- Focus on most important information
- Look for red flags
- Prioritize interventions
- Make timely transport decisions

Questions?

Thank you!!!

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