I HOPE IT NEVER HAPPENS AGAIN

DISASTER PREPAREDNESS AND CHILDREN

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EMS lecture

Dec 11,2020

A VERY BAD DAY

- A school bus crashes into a liquid transport semi truck on I-25 at I-70 interchange
- It was fully loaded with kindergarteners on their way to the Zoo.
- You get a call from dispatch – passersby have called in that there are many cars involved and at least 1 school bus
- You will be the first rig on scene……

YOU HAVE 5 MINUTES UNTIL YOU ARRIVE

What is your plan?

HURRICANE KATRINA

- The wealthiest nation in the world is hit with a predicted hurricane.
- Poor planning and lack of evacuation lead to chaos and horrific conditions
- 5000 children were separated from their families. It took 6 months to reunite the last child

BOSTON MARATHON BOMBING

- 30 red-tagged patients, all transported within 60 minutes
- 264 injured patients required hospital treatment
- 16 patients with traumatic amputations of at least one limb
- 3 deaths at the scene. None at hospitals

- A preparedness success

CLEVELAND, JUNE 2016

45 kids separated from their families

No fatalities.

But no plan either

LAS VEGAS – ROUTE 91 FESTIVAL OCTOBER 1, 2017

- > 851 injured
- 58 fatalities
- > 200 responding ambulances, 13 responding agencies, 3 separate ambulance companies
- >400 people transported to 13 hospitals
- No safe evacuation zone until 2 hours after start of incident
- EMS responded anyway.

OKAY, NOW WHAT…

Disaster preparedness overview

Why kids are different

How to care for kids in a disaster

(and next hour – much more to come)

THE SCOPE OF THE PROBLEM

- We don't know where or when the next MCI will occur
- 27% of the population is under 18 years old

- Planning for children has historically been under "special populations" and ignored as being too hard
- No one likes to think about mass casualties of children.

CHILDREN ARE AT HIGH RISK OF INJURY FROM

Hazardous material exposure

Bioterrorism

Chemical warfare

Mass Casualty incidents

Natural disasters

Mass shootings

BECAUSE THEY:

Are short.

Can't travel.

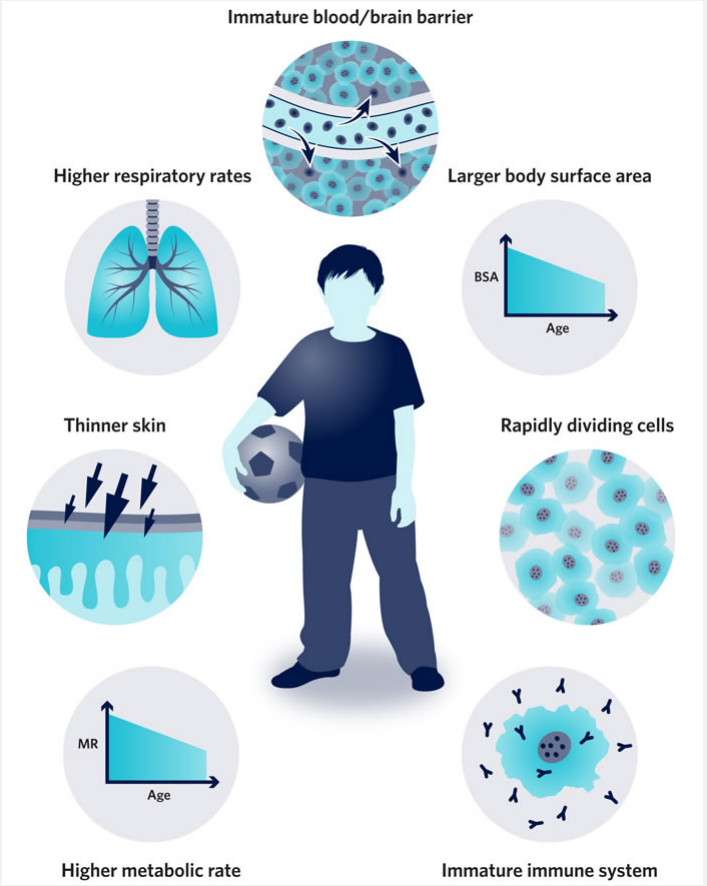
Are small (with fragile torsos).

Are thin skinned.

Breathe more.

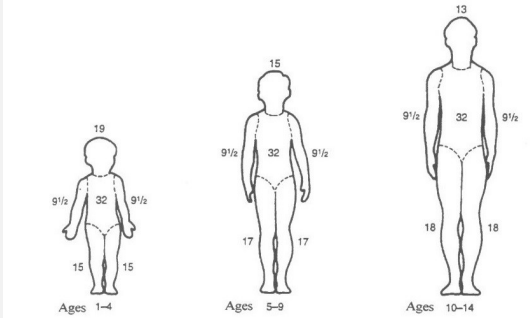
Use more energy.

Are found in groups.



KIDS ARE SHORT (WITH BIG HEADS)

- They are more prone to serious head injuries in both blunt and penetrating trauma
- Toxic gases tend to be heavier than air and accumulate at toddler height
- Small children pickup more particulate matter from the ground (radioactive or hazmat)
- More prone to multi-system trauma in explosions / gunfire due to small size



KIDS CAN'T TRAVEL (DEVELOPMENTAL STAGES COUNT)

- Infants and toddlers - may be completely dependent on adults to move them from danger
- Toddler/preschoolers - can't localize danger or move appropriately from it
- Older children - may have inappropriate response to danger
- Teenagers - can move but may still be very poorly equiped to deal with the psychological trauma

KIDS ARE SMALL

Increased body surface area for weight – lose heat, water quickly

Abdominal organs are close together and less protected by rib cage

Increased compliance of the chest wall makes injury to lung (and abdominal organs) more likely

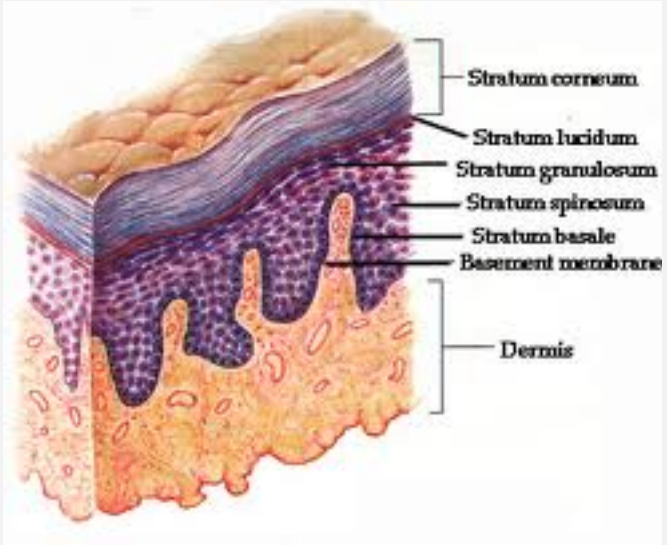
Hypovolemia occurs quickly – less blood volume

KIDS ARE SMALL

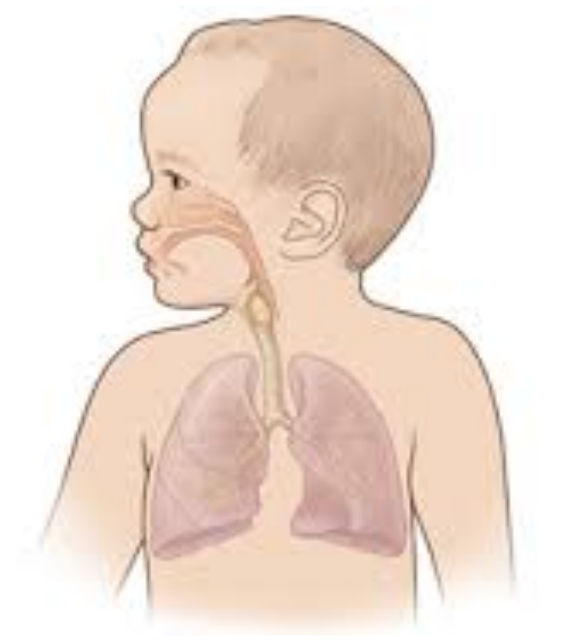
- Hazardous exposure
  - Increased dose/weight absorbed through skin or lungs
  - Small dose of toxin is more dangerous (a little goes a long way)
  - Dosing antidotes is tricky
- Trauma
  - Less protection provided by chest and abdominal wall
  - Increased multi-organ trauma
  - Increased abdominal / thoracic trauma
- Burns
  - Dehydration and hypovolemia occur fast

KIDS ARE THIN SKINNED

- Increased toxin absorption through the skin
- Increased heat loss due to burns, decontamination, exposure
- Caustic agents may cause more damage



KIDS BREATHE MORE (AND FASTER)



- Increased respiratory rate
  - Increased dose of aerosolized or vaporized material
  - More quickly affected by asphyxiants
- Smaller airways -
  - Increased caustic effects on respiratory mucosa
  - Edema or secretions cause obstruction quickly
- Difficult to determine child with "SLUDGE" induced salivation/lacrimation from crying toddler with nasal discharge

KIDS USE MORE ENERGY

- Higher metabolic rates – increased respiratory rate, higher heart rate
- Asphyxiants cause damage faster
- May cause more potent changes with toxins
- Hypovolemia can be missed in early stages

"Is her heart rate 150 because she is crying or is she hypovolemic?"

KIDS AND VITAL SIGNS

- Smaller kids have higher HR and RR at baseline
- BP will be normal until close to CV collapse
- Bradycardia is ominous

Age	HR	BP	RR
Premature	120-170	55-75/35-45	40-70
0-3mo	100-160	65-85/45-55	35-55
3-6mo	90-150	70-90/50-65	30-45
6-12mo	80-130	80-100/55-65	25-40
1-3 yr	70-125	90-105/55-70	20-30
3-6yr	65-115	90-110/60-50	20-25
6-12 yr	60-100	90-120/60-75	14-22
12-21 yr	55-100	95-120/65-85	12-18

KIDS ARE FOUND IN GROUPS

- Kids are at their most vulnerable (ie away from parents) when they are clustered:
  - Schools
  - Daycare
  - Buses
  - Museums
  - Water parks
  - Parks

PLANNING FOR PEDIATRIC DISASTERS

IN A DISASTER KIDS NEED:

- To be with their family (or caregiver)
- To be warm
- To be kept safe from further harm
- To have their injuries treated appropriately
- To be fed (and then poop)
- To return to normal as soon as possible

KEEP CHILDREN WITH THEIR FAMILIES

- Keeping kids with family/ parent/ caregiver
  - Makes physical exam and treatment of injuries easier
  - Decreases risk of secondary injury if not well supervised
  - Minimizes secondary psychological trauma
  - Decreases anxiety and hence pain
  - Prevents need for extensive re-unification
- If separation must occur – document or tag kid/parent together to allow reunification!

KIDS NEED TO BE WARM

- On scene – look for hypothermia and treat (even if the adults are ok)
- Decontamination poses huge risk of hypothermia
  - Use warm water and heaters if possible
  - Dry them off quickly, then get warm blankets
- Evaluate for presenting hypothermia (or heat illness in hot weather) – may have had prolonged exposure prior to arrival
- While waiting for evacuation – provide passive warming/blankets (or cooling if summer)

- Cold + Trauma = bad outcomes

KIDS NEED TO BE KEPT SAFE

- The incident scene likely isn't safe for kids –
  - Remove them from the scene quickly
  - Find a safe place for them to wait
- Keep them with an approved adult supervisor
  - Prevent secondary injury
  - Keep them from wandering
- Prevent abduction/exploitation
  - All adults aren't safe adults

  Kids are very vulnerable in disasters

KIDS NEED MEDICAL TREATMENT

- EMS should plan to use pediatric appropriate triage tools (JumpStart, SALT (with pediatric provisions) etc)
- Disaster medical plans must include provisions to evaluate, stabilize and possibly treat injured or ill children
- Non-pediatric facilities should
  - Identify pediatric experts in the area
  - Prepare plans for both transport and shelter in place
- Treat pain but also treat the injury

KIDS NEED INJURIES IDENTIFIED

- Use a triage system with pediatric indications (START/Jump START or SALT with pediatric modifications)
- Use the Pediatric Assessment Triangle
- Look for intrathoracic and abdominal trauma
- Don't be fooled by a stable blood pressure – look for shock if high HR and nl BP
- Ominous signs:
  - Bradycardia in injured kids
  - Lower respiratory rate than expected
  - Poor cap refill or skin perfusion
- Assume kids DO feel pain just like you would

KIDS NEED INJURIES TREATED

- Airway – positioning may help (remember the big head!)
- Breathing – Give O2 if appears ill or injured
- Circulation
  - Give fluids if shock exists – 20cc/kg/bolus
  - Tourniquet if needed
  - Watch cap refill and HR for signs of shock

- Treat pain
- Use Broslow/standardized tape/size/dose
- C-spine precautions if indicated (pad the board)
- Splint any obvious fractures
- Dry clean sheet over any burns

KEEP KIDS FED, RESTED AND CLEAN

- Plan for supplies needed for children
  - Diapers / wipes etc
  - Formula / clean water
  - Kid friendly foods
- Provide areas / supplies for safe care
  - Cribs
  - Low cots
  - Safe bedding

KIDS NEED TO RETURN TO "NORMAL"

- Reunification plans must be in place
- Plans to identify children who can't speak should be prepared
- As soon as possible after a disaster
  - Start schools / lessons
  - Schedules, structure and rules must be returned
  - Allow kids to play and provide comfort
- Avoid secondary medical trauma if possible

UNIDENTIFIED / MISSING KIDS

- Record all possible information – be creative
  - Location they were found
  - People with the child when found
  - Who transported the child
  - Any other information you get – siblings, pets, descriptions of home
- Designate an adult to care for each unaccompanied child
- Create a safe area to house unaccompanied / unidentified kids until transported to hospitals
- Use triage tags to identify parent/kid pairs

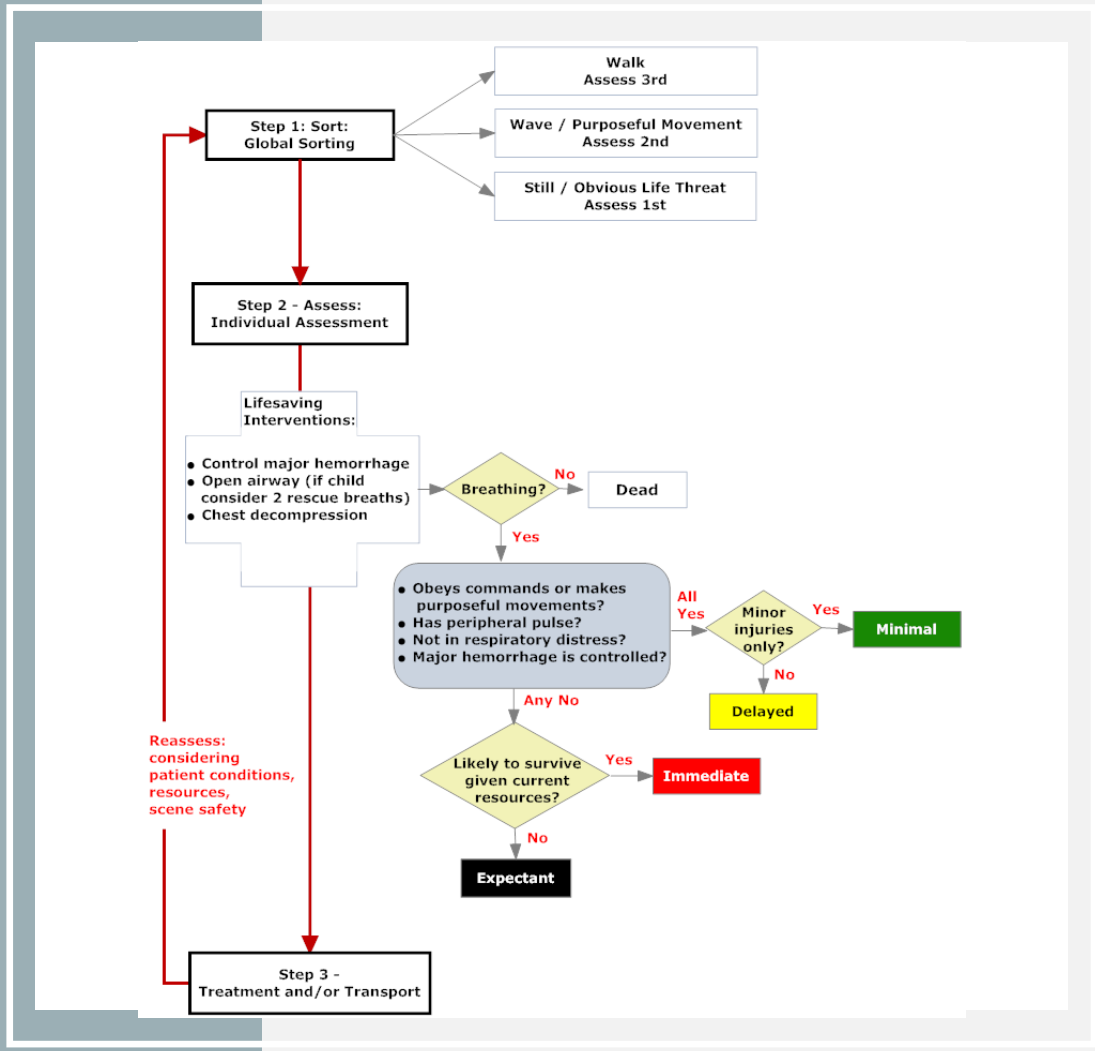
TRIAGE
COLOR = PRIORITY

- RED: Seriously injured, but likely to survive with immediate attention
- Yellow: Injured – requires URGENT treatment but will live with some delay
- GREEN: Minimal injury – will require treatment but can wait
- BLACK/BLUE: Seriously injured but unlikely to survive even with immediate attention

SALT TRIAGE

Pediatric key points:

- All non-ambulatory kids are likely Yellow
- Kids get 2 rescue breaths before declared dead
- Respiratory distress can be harder to identify



BLACKER CLOUD.

- You are just about to get to the scene and notice a large cloud of smoke near the area
- As you pull up Fire and Police are both coughing and seem to have watering eyes

- You and your partner need to decide what to do next….

THIS IS HAZMAT

- "Chemical or radioactive substances that when exposed to people produces harm to the patient, risk of harm to others and possibly risk to the environment"

SO IS THIS.

It's much more common.

THIS MIGHT BE.

THIS IS HAZMAT PLUS MASS CASUALTY TRAUMA

CHEMICAL / HAZMAT AND KIDS

- Basic principles still apply
  - Use toxidromes to identify / suspect exposure
  - Consider need for decontamination
  - Use PPE appropriately to protect staff (and other patients!)
- Keep children with their families during evaluation, decontamination and treatment if at all possible.

TOXIDROMES

- Irritant gas
- Asphyxiant
- Cholinergic
- Corrosive
- Hydrocarbon / Halogenated hydrocarbon

SUSPECT HAZMAT?

- Respiratory distress – cough, wheezing, tachypnea, ”grabbing at chest”
- Irritated mucus membranes – burning nose, eyes, mouth, tearing
- SLUDGE signs – Salivation, Lacrimation, Urination, Diarrhea, GI, Emesis – suggest cholinergic substance
- Skin irritation – pain, vesicules
- CNS effects – AMS, seizures
- Likely signs – known risk, odor, unusual numbers of patients

- Remember – GASOLINE (and other hydrocarbons) are hazardous materials and require decontamination too!

IRRITANT GASES

- Examples = ammonia, formaldehyde, chlorine, phosgene
- Symptoms = mucus membrane irritation, tearing, bronchospasm, pulmonary edema
- Pediatric issues = Hard to differentiate crying child from with URI / asthma vs. gas exposure
- Typically won't need decontamination if gas vapor exposure

ASPHYXIANTS

- Examples – CO, methemaglobin forming agents, Cyanides, sulfides, azides
- Symptoms – hypoxemia (may not register on pulse ox), CNS – seizures, coma, AMS; CV – cardiac arrest
- Pediatric differences – increased metabolism of kids can show increased effects at lower doses

CORROSIVES

- Examples – Acids, bases, drain cleaners
- Symptoms – chemical burns, necrosis, pain, respiratory distress
- Pediatrics – kids will drink crazy things….much more likely to ingest accidentally

HYDROCARBONS (AND HALOGENATED HYDROCARBONS)

- Examples – gasoline, methane, hexane, toluene, turpentine
- Symptoms – hypoxemia, chemical burns, cardiac arrhythmias, CNS – intoxication, seizures, coma
- Pediatrics – adolescents may use intentionally, younger kids are more likely to have both burns (chemical) and intoxication due to thinner skin

CHOLINERGIC

- Examples – insecticides, nerve agents, organophosphate
- Symptoms –
  - Muscarinic effects – DUMBELS (SLUDGE),
  - Nicotinic effects - Tachycardia, weakness, HTN, fasciculations
- Pediatrics –
  - difficult to determine SLUDGE vs crying child
  - tachycardia can be difficult to recognize
  - limited pediatric auto-injectors
  - 2PAM (20mg/kg) + atropine (0.05mg/kg)

Toxidrome	Symptoms	Examples
Irritant gas	Mucus membrane irritation Bronchospasm Pulmonary edema	Ammonia, Formaldehyde Chlorine Phosgene
Asphyxiant	Hypoxemia CNS & CVS effects	CO Methemaglobin forming Cyanides Sulfides Azides
Corrosives	Chemical burns Coag. Necrosis Liquif. Necrosis	Acids Bases
Hydrocarbon & Halogenated Hydrocarbons	Hypoxemia, skin burns CNS & CVS effects	Gasoline, Methane, Hexane Butane, Turpentine, Toluene
Cholinergic	Muscarinic Effects (DUMBELS) Nicotinic effects (Tachycardia, weakness, HTN, fasciculations)	Insecticides (Malathion, Parathion, Chloropyrifos)

Toxidrome	Symptoms	Pediatric specific issues
Irritant gas	Mucus membrane irritation Bronchospasm Pulmonary edema	Differentiate crying, red eyes with URI / asthma vs. conjunctival inflammation and bronchospasm?
Asphyxiant	Hypoxemia CNS & CVS effects	Increased metabolism → increased effects of smaller doses / exposures
Corrosives	Chemical burns Coag. Necrosis Liquif. Necrosis	Kids will drink the darnedest things
Hydrocarbon & Halogenated Hydrocarbons	Hypoxemia, skin burns CNS & CVS effects	Huffing is still a thing…
Cholinergic	Muscarinic Effects (DUMBELS) Nicotinic effects (Tachycardia, weakness, HTN, fasciculations)	SLUDGE vs. crying, drooling, snotty kid with cold? – Recognize tachycardia? BP often not obtained in kids? Lack of peds auto injectors

CHEMICAL EXPOSURES – KEY POINTS

- Fires:
  - Think Cyanide, CO, phosgene
  - Cyanide = Cyanokit
  - CO = 100% O2 consider hyperbaric
- Nerve gas/Organophosphates
  - Decon
  - SLUDGEM
  - 2PAM (20mg/kg) + Atropine (0.05mg/kg)
- Hydrocarbons
  - Even gasoline is dangerous
  - CNS, cardiotoxic, dermal chemical burns, respiratory sx

DOES THIS PATIENT NEED DECONTAMINATION?

DO THESE?

DOES THIS PATIENT NEED DECONTAMINATION?

3 Questions:

- Was there a hazmat exposure?
- Does it pose a risk to the Patient?
- Does it pose a risk to others?

If all 3 = Yes

Decontamination is the FIRST priority

BUT THE PATIENT IS REALLY, REALLY HURT!

If there is hazmat contamination that requires decontamination, this is the FIRST priority.

Really.

No, really.

DECONTAMINATION BASICS

- **Protect yourself first – don PPE if needed** (should be done by trained folks)
- Remove patient's clothes & brush off debris (80-90%)
- Copious water decontamination with washcloth and soap (last 10-20%)
- Eye decontamination? eyewash or morgan lens
- There are nuances if the contaminant is known

Dilution is the solution!

Grand rapids, MI –
fertilizer explosion

DECONTAMINATION AND KIDS

INFANT DECONTAMINATION

- Use warm water, low pressure
- Babies are slippery!
- Keep infants with their grownups – but grown ups might need help
- Use a basket to avoid injuries and drowning
- Warm them after decontamination – avoid hypothermia

WRONG

RIGHT

DECONTAMINATION – PRESCHOOL / EARLY SCHOOL (< 8 YRS)

- Allow child to assist with undressing
- Respect modesty –provide "before" gown
- Keep child with family or caregiver
- Shower standing with parent, use baby shampoo
- Immediately provide warm blanket/ towels to keep child warm
- Parent may need assistance with showering child

PANDEMIC ILLNESS AND KIDS

- Keep kids with families
- Vaccinate (kids really are just little vectors)
- Consider
  - Decreased native immunity
  - Increased respiratory distress due to small airways
  - Increased risk of dehydration from GI illness
- Need pediatric definition of disease
- Need pediatric appropriate triage criteria in resource poor

BIOLOGICAL WEAPONS

- CDC classifies infectious agents into priority for preparedness
- Highest priority concern are:
  - Anthrax (recent anthrax attacks in the US)
  - Smallpox (classic biological warfare)
  - Botulism
  - Plague
  - Tularemia
  - Viral hemorrhagic fevers

BIOLOGICAL WEAPONS

- Likely will not require decon as symptoms are delayed from exposure
- If there IS a known release – consider decon
- Symptom tracking – if suspected unusual presentations – notify public health
- Watch for:
  - Unusual severity of common symptoms (fevers, coughs)
  - Odd clusters of disease
  - Characteristic rash/signs (buboes, smallpox vesicles, hemorrhagic signs of purpura or bruising)

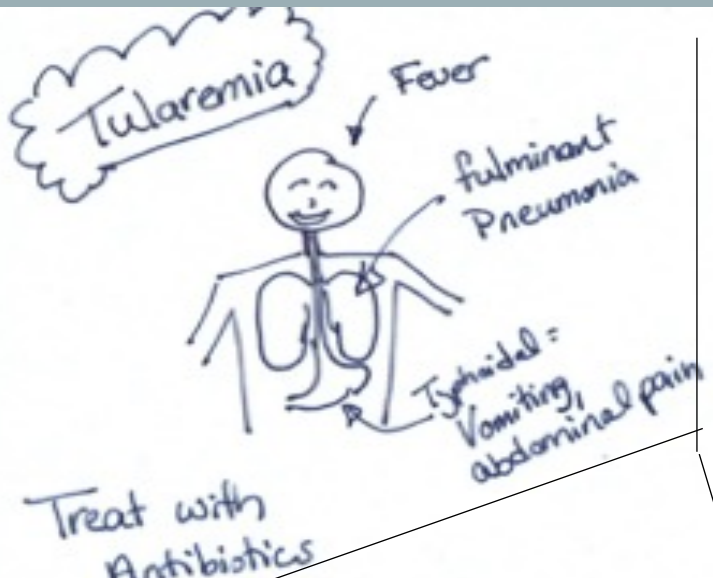
3 THINGS TO REMEMBER IN AN MCI WITH KIDS

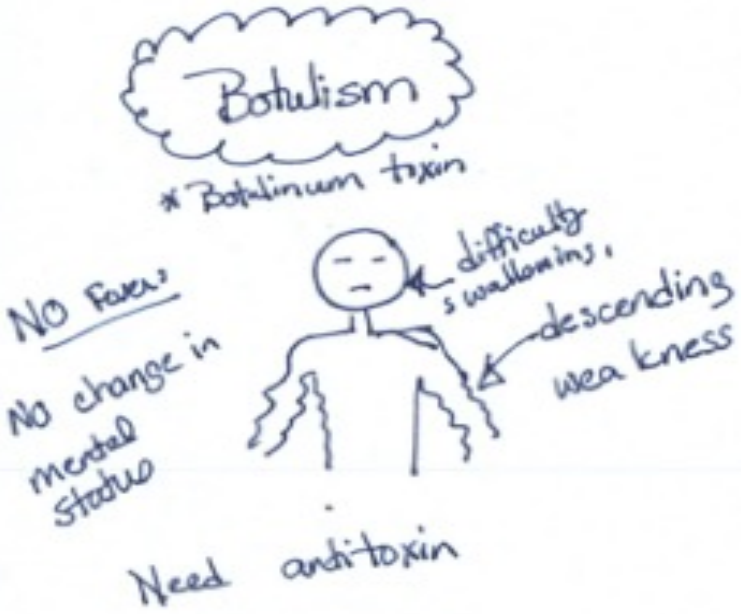
- **Keep kids with their grown-ups!**
- Kids have different injury patterns from adults and might not show injuries immediately
- Hypotension and / or bradycardia are ominous signs – don't wait for these to act

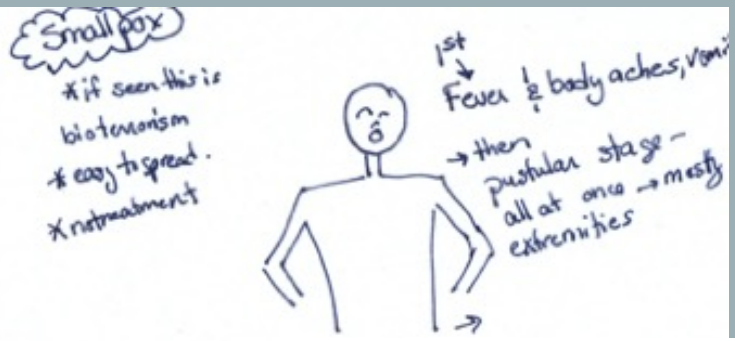
REUNIFICATION

- Hospitals must have plans to care for un-identified and/or children separated from parents
- Use "unidentified child" sheets to record as much info as possible
- Use photographs of child attached to charts as well as available as lists
- Have plan to identify caregivers as appropriate

Bonus material! My Bioterrorism sketches….







Chickenpox rash

Smallpox rash

More bonus material!

Disease	Symptoms	Incubation	Treatment
Anthrax	Inhalation – fever → mediastinitis, wide mediastinum, sepsis Cutaneous – papule → vesicle → ulcer → black eschar, edema	1-5d	Cipro 10-15mg/kg IV q12 (max 400mg) Doxy 2.2mg/kg IV q12h (max 100mg)
Plague	Febrile prodrome → fulminant pneumonia, bloody sputum, sepsis, DIC	2-3d	Gent 2.5mg/kg q8 Doxy 2.2mg/kg q12 Cipro 15mg/kg q12
Smallpox	Febrile prodrome → synchronous vesicopustular eruption, face and extremities	7-17d	Supportive (Vaccination for proph)
Tularemia	Pneumonic – fever, fulminant PNA, CXR – infiltrates with hilar adenopathy Typhoidal – fever, malaise abd pain	2-10d	Gent 2.5mg/kg q8 Doxy 2.2mg/kg q12 Cipro 15mg/kg
Botulism	Afebrile, descending flaccid paralysis, CN palsy, sensation and mentation intact	1-5d	CDC trivalent antitoxin, 1 vial
Viral hemorrhagic fevers	Febrile prodrome → rapid onset shock,DIC, purpura, bleeding	4-21d	(ribavirin 30mg/kg then 15mg/kg q6) Supportive

Children's Hospital Colorado, Disaster Preparedness

Children's Hospital Colorado
Here, it's different.™

Objectives

- Aware of CHCO decon capabilities per location
- Perform SALT Triage
- Increase understanding of the hospital MCI process
- Speak to the management of the expectant category
- Recognize signs of stress in your team and yourself

Children's Emergency Response Team (CERT)

CERT is a team of disaster preparedness subject matter experts with real world experiences, specifically trained to develop and implement disaster education through both didactic learning and practical application with drills and exercises. This team focuses on all areas and locations throughout the organization and adapts training needs for both clinical and nonclinical staff members.

Daniel Rice – Biopreparedness Manager
Decontamination, Hazmat, Highly Infectious Pathogen Program, Patient evacuation

Marcie Ludwig – Emergency Management Nurse Coordinator
Oversee MCI and low or on-notice patient influx preparedness and response

Tim Taft – Emergency Management Training Coordinator
Trainer for Decon/hazmat, HIPP, MCI, PPE, Code Silver, Fire response

CHCO Decon Capabilities

Anschutz Medical Campus

6 dedicated internal ambulatory decon shower stalls

Max output per hour – 72

4 dedicated internal non-ambulatory decon shower stalls

Max output per hour - 24

All ED staff trained in Decontamination and MCI triage annually

South Campus (Highlands Ranch)

Utilizes external Decon shower tent

Ability to separate ambulatory and non-ambulatory

Max patient output per hour – 12 ambulatory, 6 non-ambulatory

All ED staff trained in Decontamination, MCI triage and tent set up annually

North Campus (Broomfield)

Dedicated internal decon shower room

2 dedicated ambulatory decon shower stalls

- Max output per hour – 24

1 dedicated non-ambulatory decon shower

- Max output per hour – 6

All ED staff trained in Decontamination and MCI triage annually

Colorado Springs Hospital

Dedicated internal decon shower room

5 dedicated ambulatory decon shower stalls

- Max output per hour – 60

1 dedicated non-ambulatory showers

- Max output per hour – 12

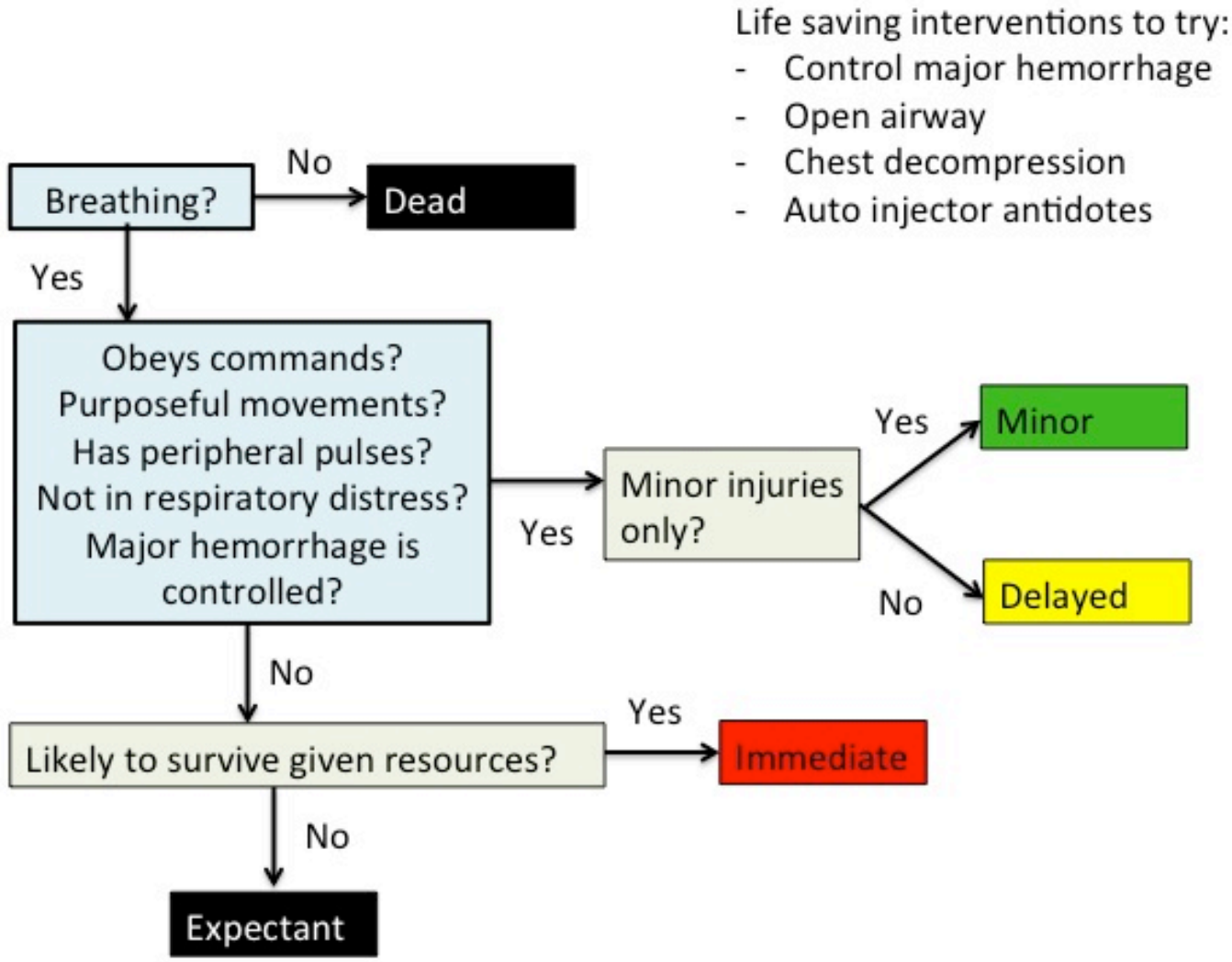
All ED staff trained in Decontamination and MCI triage annually

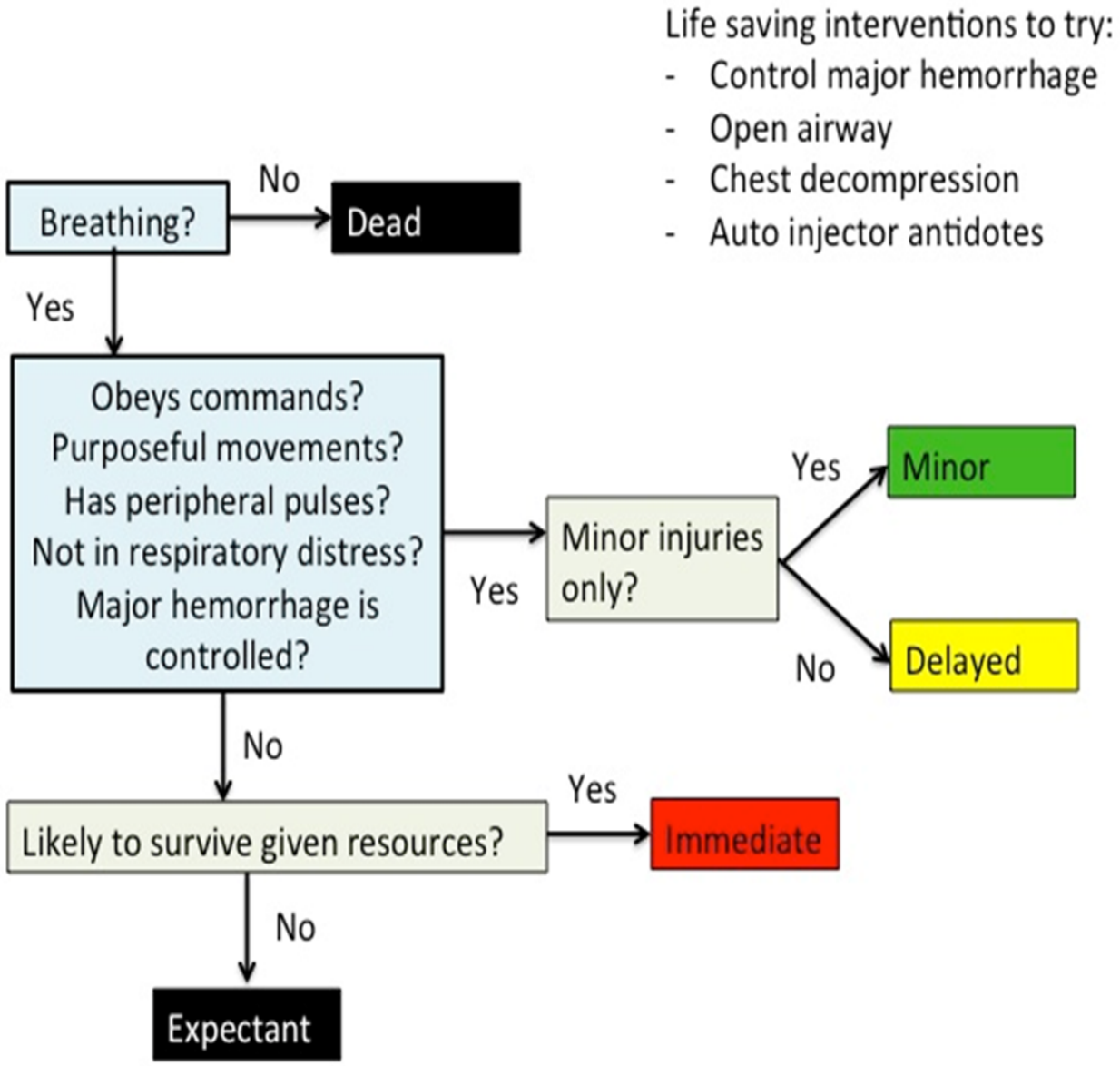
Disaster Triage Categories

Color	Acuity	Need for Treatment	Level of Care at Triage Area
Red	Emergency - Threat to life, limb or organ	Immediate	Critical Care, Advanced Cardiac Life Support (ACLS)/ Basic Life Support (BLS)
Yellow	Urgent - Significant injury or illness but can tolerate a delay in care	Delayed	ACLS if necessary, BLS, specialty experience if needed
Green	Non-Urgent - Can safety wait for treatment	Minimal/Non-Urgent	BLS, specialty care if needed
Black	Expired or expected to expire – palliative care	Care and Comfort Measures	Palliative/comfort care. Pain medication, hydration, psychological support, care of deceased

SALT

Sort
Assess
Life-Saving Interventions
Triage





Coughing, complaining of burning eyes

Gasping respirations, radial pulse not palpable

Leg laceration, ambulatory, no active bleeding

Crush injury to leg

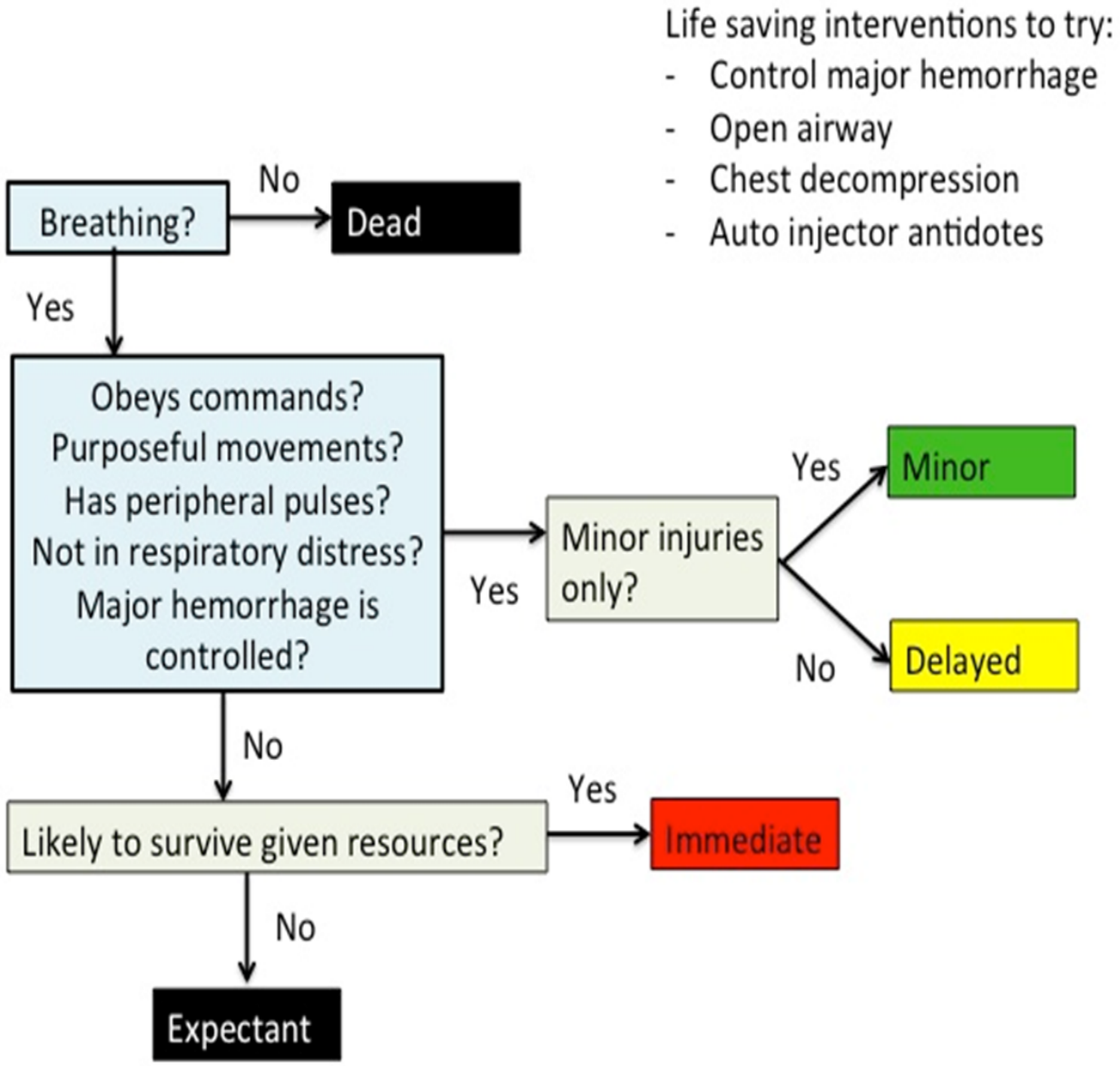
Scalp laceration, no active bleeding

Second Degree facial burns, no respiratory distress

Chest wound, no respiratory distress, no active bleeding, ambulatory

55- year-old man, coughing, wheezing, O2 sat 98%, RR 24

Found apneic, now breathing after reposition of airway, unconscious



Arm wound, no active bleeding

C/O head injury, calm, GCS 15

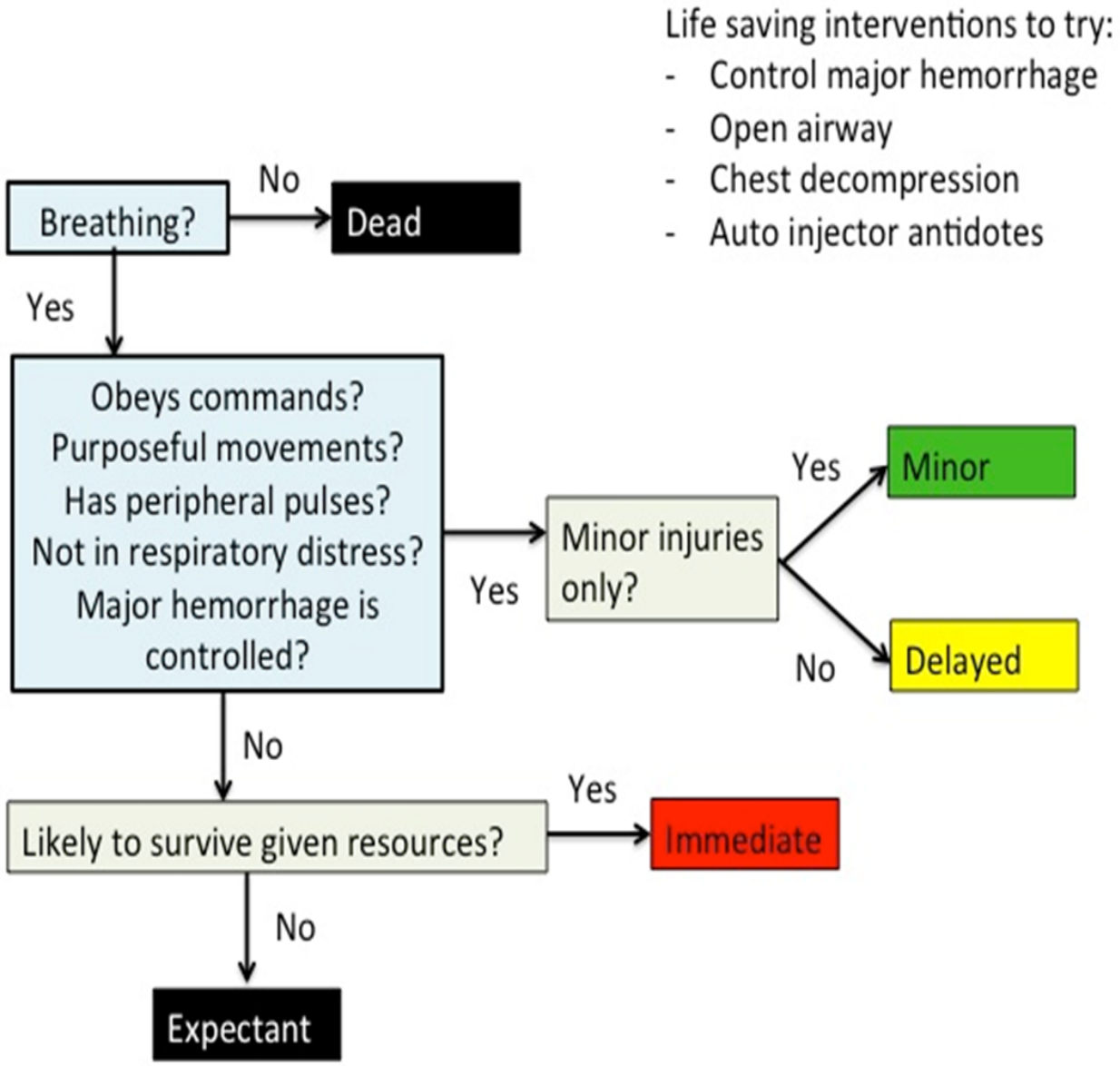
Bilateral ankle fractures, no other apparent injuries

Head contusion, obtunded

Covered in soot, ambulatory

C/O severe ongoing chest pain, pale, diaphoretic

Complaining of deafness



Moaning, not responding to questions, head trauma

Open leg fracture, bleeding controlled, BP 130/77

C/O thumb deformity

C/O second-degree forearm burn

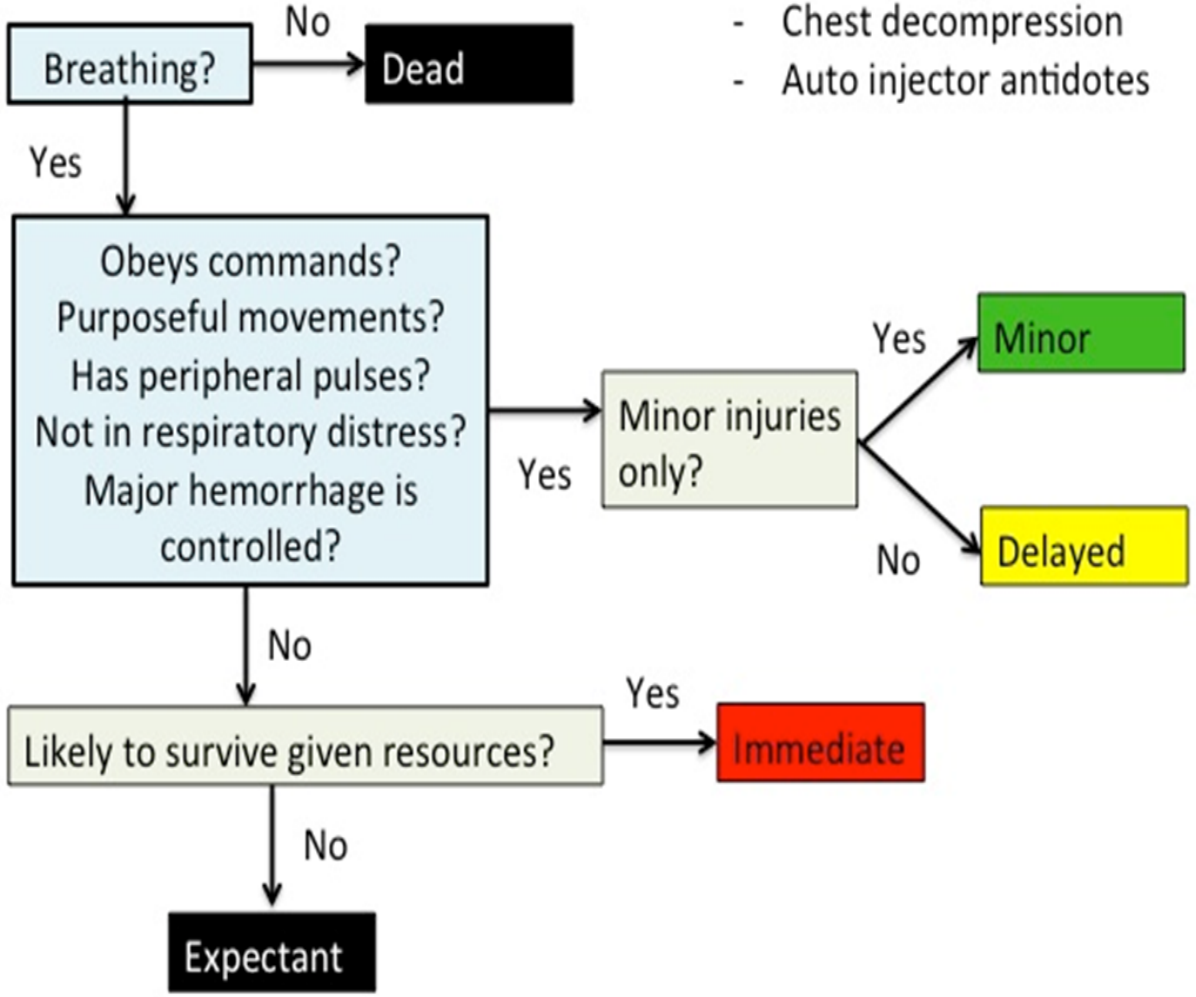
Second-degree burn on right forearm and dorsum of left wrist

Head injury, depressed skull fracture

Nasal deformity, arm laceration, no respiratory distress, no active bleeding

Second-degree burns covering ~25% of body

Life saving interventions to try:
- Control major hemorrhage
- Open airway
- Chest decompression
- Auto injector antidotes



Severe hip pain, can't walk, obvious leg deformity, cap refill < 1 sec

Open femur fracture, bleeding controlled, stable vitals

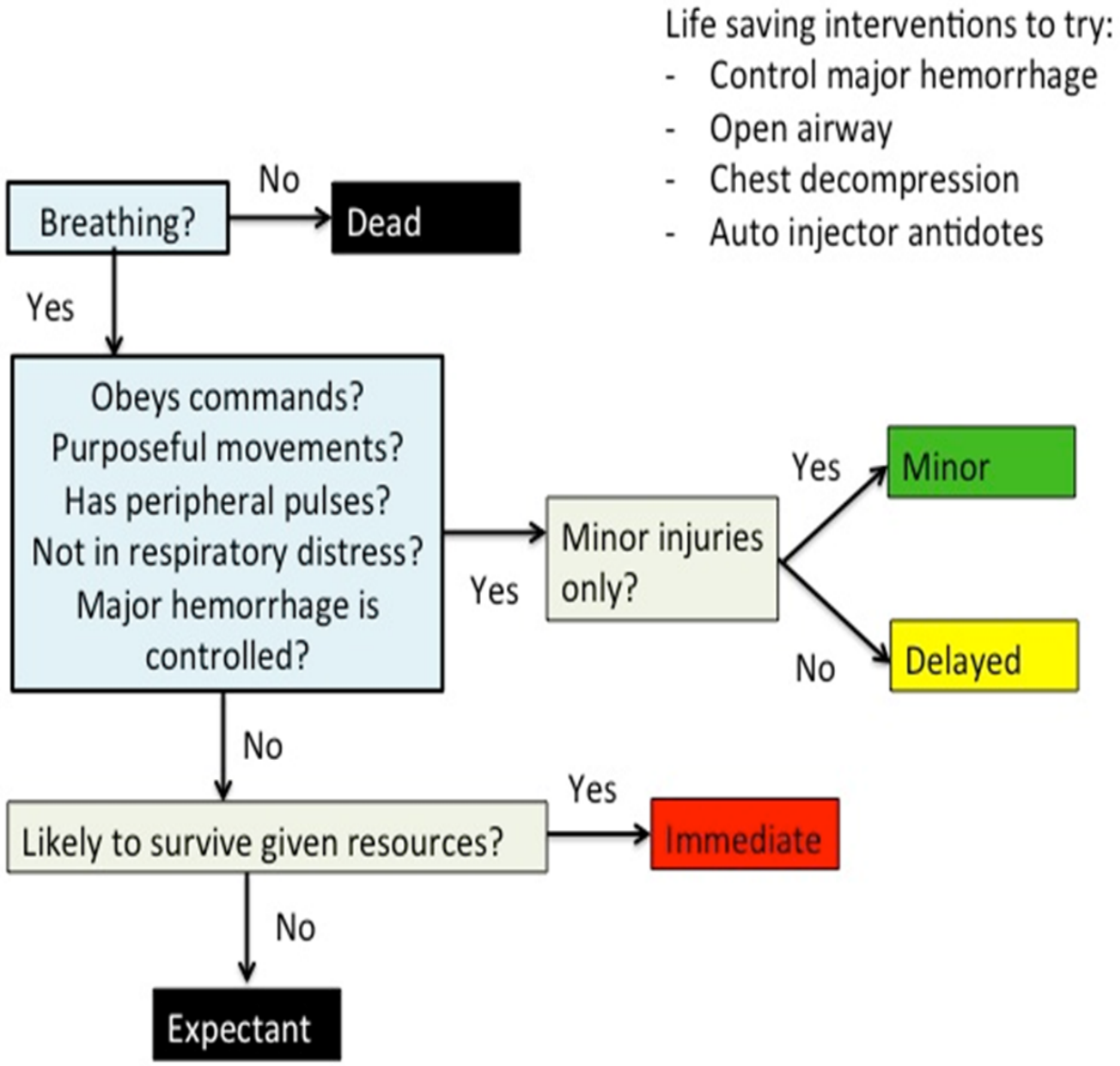
C/O crushing chest pain, hx previous MI, diaphoretic

Extensive second degree burns, severe pain

Femur deformity, in severe pain, strong radial pulse

C/O groin pain, can't bear weight

C/O debris in eyes, PERRL, vision grossly intact



Arm laceration, no active bleeding

Hip deformity, normal distal perfusion

Scalp hematoma, leg deformity, GCS 15

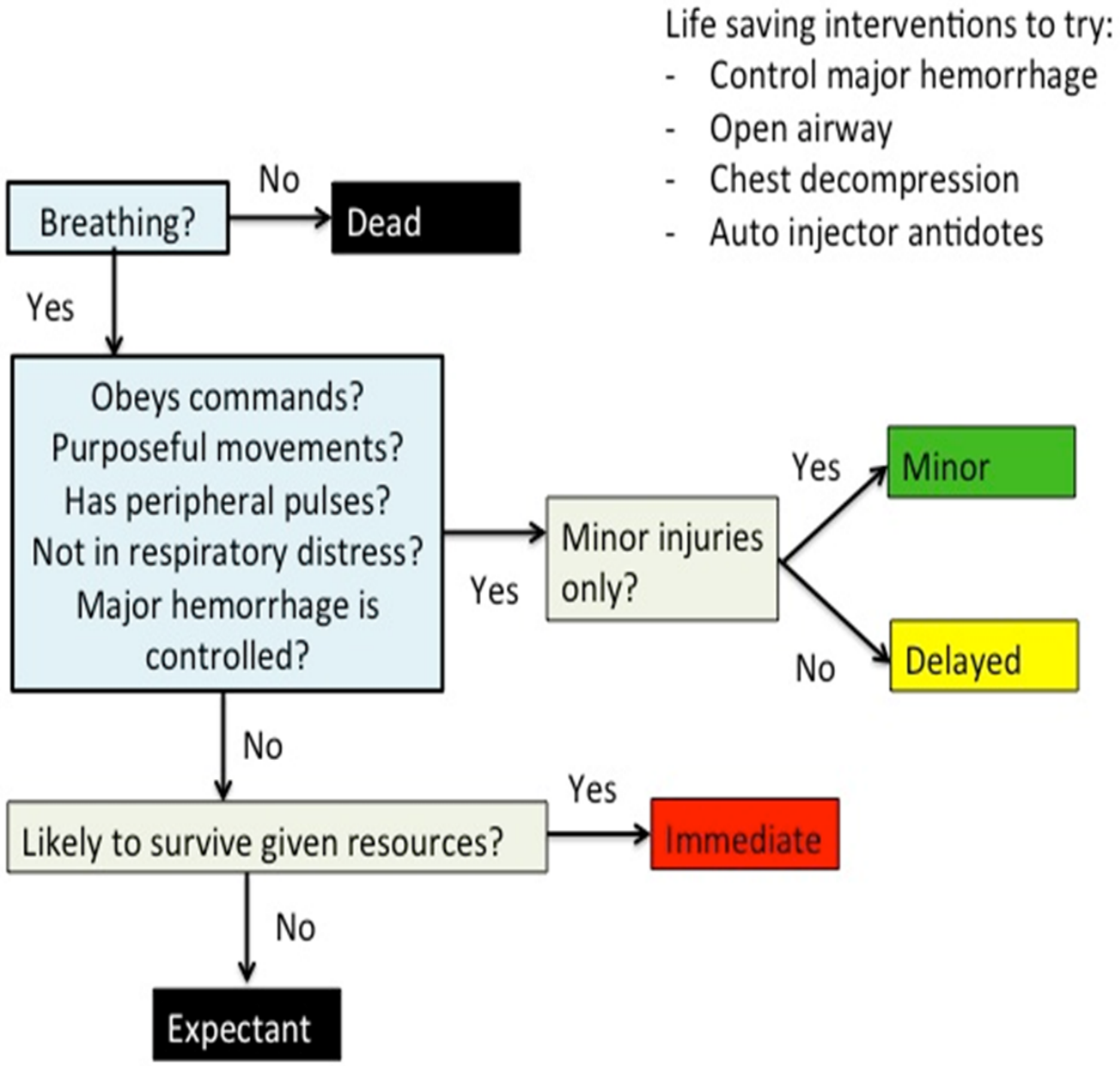
74-year-old, shortness of breath, O2 sat 99%, RR 12, BP 124/83, HR 105

Scattered second-degree burns, <15% of body surface

Coughing, able to speak in full sentences, ambulatory

Walking around, appears stunned

Crushed ankle, severe pain



Hip pain, ambulatory

C/O abdominal pain, BP 70/p, HR 124

Wrist deformity, neurovascularly intact

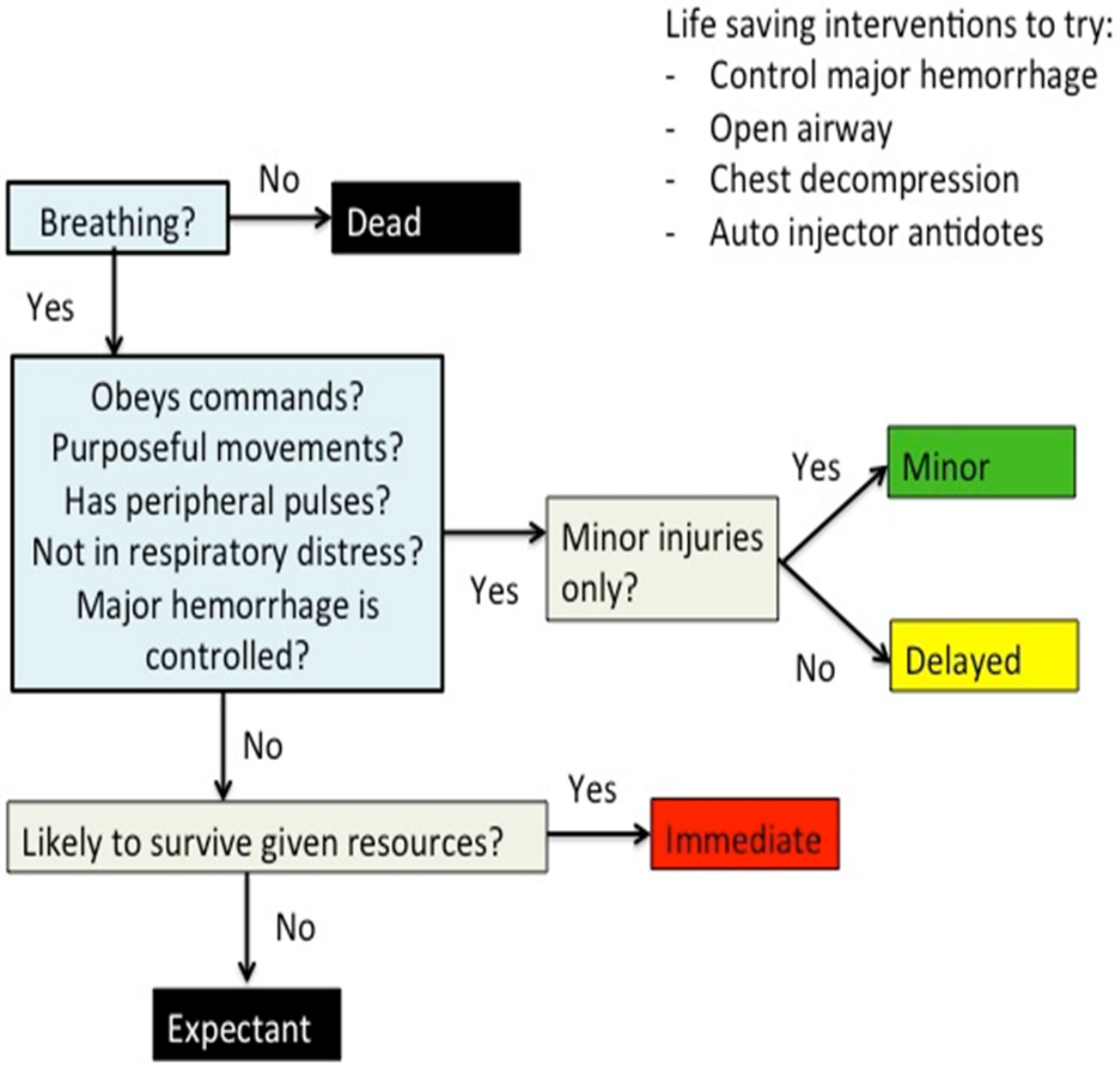
Walking around, C/O facial lacerations, no active bleeding

4cm leg laceration, no active bleeding

Diaphoretic, respiratory rate 6

Multiple contusions and abrasions, ambulatory

Scalp laceration with pressure dressing, GCS 15



Incoherent, Obvious head trauma

C/O ear pain and deafness

Mangled foot, bleeding controlled

Results

Green- 25

Yellow- 15

Red- 8

Black- 2

CHCO MCI Response

What We Think!

1. EMS providers arrive on the scene of an MCI
2. Implement triage, moving green patients to a single area and grouping red and yellow patients using triage tape or tags.
3. Patients are then transported to local hospitals according to their priority group.
4. Tagged patients arrive at the hospital and are assessed and treated according to their priority.

This model may not be feasible in today's world of mass violence incidents with time-critical injuries and ongoing threats to responders and patients.

Many hospitals have not trained or exercised triage of exceedingly large number of patients, nor practiced a formalized secondary assessment process to prioritize patients for operative intervention and transfer.

What the Real World Teaches Us

Experiences from past real-world incidents provide specific examples of the limitations of traditional triage processes:

- EMS may not be able to establish structured triage or treatment areas (due to the large number of patients, scope/size of the scene and safety issues).
- Up to 80% of disaster victims may seek hospital care without accessing EMS.
- Hospitals cannot rely solely on EMS to perform triage and decontamination.
- Bystander or self-care may be the primary means of initial medical care. Supplies may be need to effectively control bleeding.
- There is frequently a lack of communication from the scene to receiving hospitals.
- In numerous MCIs, initial notification of hospitals was made by the first arriving casualties or ambulances.

Characteristics of Mass Violence Events

Dynamic Incidents

Have multiple locations and high potential victims and bystanders to flee and seek medical care on their own.

The Scope and source may not be apparent upon patient arrivals.

How Response Changes

Coordinated EMS and hospital response

Provider Safety is Paramount

Rapid transport to the hospital is favored over on-scene triage

Every Hospital must be prepared for large numbers of privately transported and walk-in casualties, particularly from nearby events.

June 12th 2016, a gunman opened fire in the Orlando's Pulse nightclub, killing 49 people and wounding 66.

One Trauma Center, only a few blocks from the nightclub, received 38 pts in 45 mins.

Pts arrived by PD, pick-up trucks and EMS

9 patients in the first wave were pronounced dead on arrival.

At 2am, the ED had issues contacting staff. Many phones were on silent or in separate rooms.

They received an influx of calls at 8:30 the next morning

At the start of the event 2 ORs were running.

In 45 mins 4 ORs running

30 mins later 6 ORs were running

At one point it was believed that one of the shooters had been brought in as a victim.

3 times a code silver was called causing fear among staff, preventing patient movement stalling progress being made

The hospital switchboard received 6,000 phone calls between 2am and 6am.

Then another 5,000 the next morning

After the initial wave of 38 pts, there was an 11 min lull allowing the incident command staff to replenish the exhausted supply of chest tubes from the pediatric side of their hospital

Early in the event response incident command arraigned for over 100 units of blood.

In total 441 units were transfused in the first 24 hours.

It was 48 hours before all victims were identified

Upon Event Notification

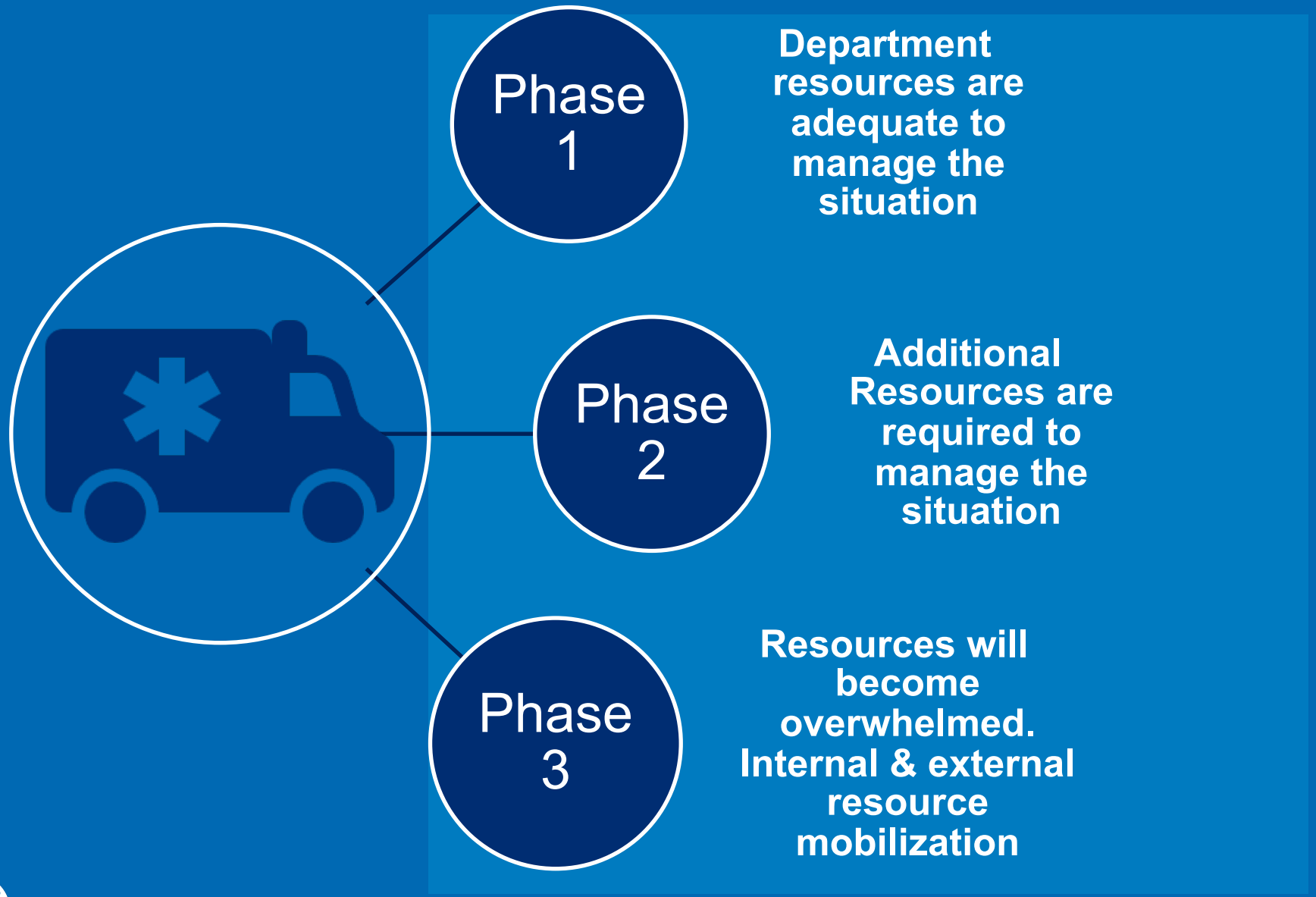
ED Charge RN

- Notifies Security
- Trauma Services Notification
- Consider CBRNE exposure
- Huddle with PEM and HS
- Determine MCI Phase
- Huddle with the team
- Assign IC roles
- Designate Triage Area & team
- Clear the Department

House Supervisor

- Meets with PEM and Charge RN
- Activates Conference Call with key leaders
- Notifies OR to hold cases
- Facilitates decompression of the ICU and IP units
- Allocation of resources

MCI Scale & Phase



Space

- Clear ED (MSE low acuity, admit, cohort)
- OR – Alter elective surgeries schedule
- ICU – Identify patients that can be moved out of ICU
- Acute Care – expedite movement of any pending admission from the ED, open beds for ICU pts

Staff

- Staff from ancillary departments reallocated to support the care and throughput of patients with buddy system.
- Mass notification to recruit staff no working

Supplies

- Obtain essential equipment to triage area
- Gather supplies based on event and notify Materials
- Set up alternative care areas as needed

Assessment Progression

Disaster Triage

Triage area is not a treatment area. Attempting to treat pts in this area causes a bottleneck of pts and jeopardize the system

Patient Assessment

After stabilizing interventions. *Initial triage is not reliable* Patients may need to be moved categories

Ongoing Re-assessment

Assessment of resources related to patient condition, until adequate resource are available

Triage Category – Expectant

While the primary goal of an MCI should be to maximize the number of lives saved

- a civil society and our natural instincts as care givers demands a secondary goal of minimizing the physical and psychological suffering of those impacted.

Those who have not survived or are likely to not to survive cannot simply be assigned to holding areas unmanned by clinical staff.

When resources are scarce, and the patient's condition is dire, palliative care offers a humane and medically appropriate treatment choice.

- Palliative care offers an alternative to "doing nothing" or utilizing need resource, when a poor outcome expected.

Recognizing Stressors and Supporting our Own

Recognize that we are experiencing a communal trauma

Fear of Basic Needs:
- Food
- Safety
- My family & loved ones

Uncertainty:
- How long will this continue
- Am I enough
- Will I be supported
- Will I be able to make difficult decisions

Processing:
- Grief and loss
- PTSD or post-traumatic growth
- Catching my breath
- Reflect on the impact while facing it

Resiliency

Traditionally, the impact of disasters on frontline worker mental health has not received much attention.

Over the past several years, however, as disasters increased in number and severity, we have learned that:

- Acknowledging stress
- Promoting and supporting resilience building
- Encouraging breaks
- Providing resources (e.g., buddy systems, wellness check-ins, information about stress responses and constructive strategies, and professional support when needed)

Before, during, and after an incident is critical to ensuring staff experience the least negative impacts possible.

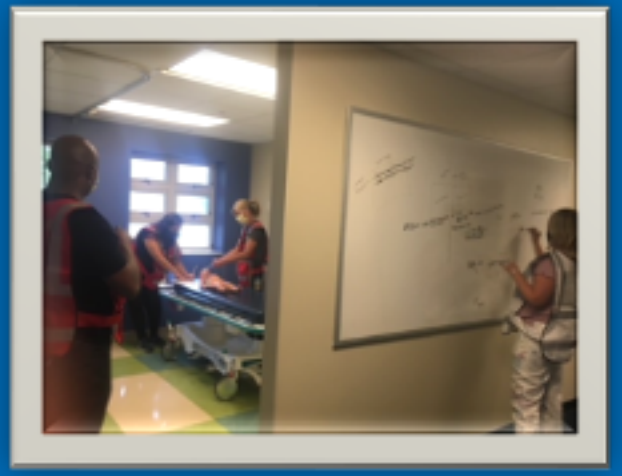
ASPR TRACIE,
Disaster Behavioral Health Self Care for Healthcare Workers Modules

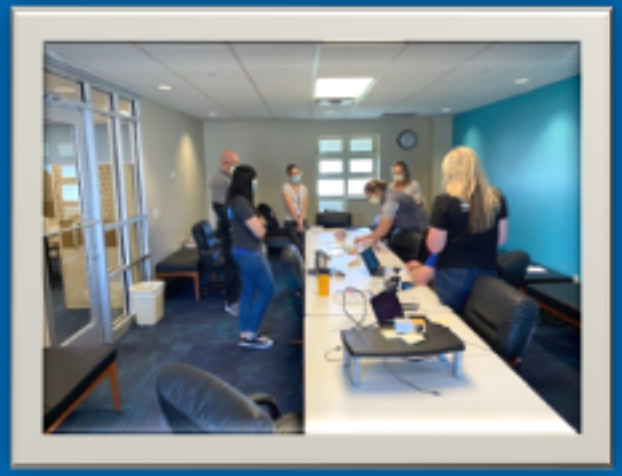
- *Module 1*: Compassion Fatigue and Secondary Traumatic Stress Identification for Healthcare Providers
- *Module 2*: Organizational Wellness from the Top: Stress Mitigation and Work Satisfaction for Healthcare Providers
- *Module 3*: Cognitive Tools for Mitigation Compassion Fatigue and Secondary Traumatic Stress

Children's Emergency Response Training Center (CERTC)

The CERTC is located on the Anschutz Medical Campus and is a 13 bed, simulated clinical care environment that houses training opportunities focused on functional practice of low frequency, high risk events which may cause concern if performed in clinical areas or public settings.

This CERTC is designed for use by both CHCO staff and our community partners, allowing for a wide variety of training opportunities.





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Thank You

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Children's Hospital Colorado
Here, it's different.™