EMS System for Metropolitan Oklahoma City & Tulsa

1,100 square miles
Population
  – 1.6 million day
  – 1.2 million night
209,029 calls (2012)
142,467 transports (2012)
68% transports
Difference Makers
Why Anaphylaxis?

Is there really anything new about an illness that’s so old?
Praxis

• Practice as distinguished from theory
• Accepted practice or custom
• Acts which shape and change the world
Take Away Goal

• Optimize anaphylaxis outcomes by EMS
  – Patient assessment
  – Clinical intervention
  – The right drug in the right hands at the right time
The face of anaphylaxis?
40 year old female AMS

- Called a friend mins earlier
- Felt funny
- Unresponsive
- BP < 60 mmHg sys
- No urticaria
- No angioedema
WAO Clinical Diagnosis of Anaphylaxis

• “Highly likely when any one of the following three criteria is fulfilled:”

1: Sudden onset of an illness (minutes to several hours), with involvement of the skin, mucosal tissue, or both (e.g. generalized hives, itching or flushing, swollen lips-tongue-uvula) AND at least one of these:

Sudden respiratory symptoms and signs
Sudden reduced BP or symptoms of end-organ dysfunction
WAO Clinical Diagnosis of Anaphylaxis

• “Highly likely when any one of the following three criteria is fulfilled:”

2: **Two or more** of the following that occur **suddenly after exposure** to a likely allergen or other trigger for that patient (mins to sev hrs):
- Sudden **skin or mucosal** symptoms and signs
- Sudden **respiratory** symptoms and signs
- Sudden **reduced BP** or symptoms of end-organ dysfunction
- Sudden **gastrointestinal** symptoms
WAO Clinical Diagnosis of Anaphylaxis

• “Highly likely when any one of the following three criteria is fulfilled:”

3: Reduced BP after exposure to a known allergen for that patient (mins to several hrs):
   Infants/children = age specific or >30% drop
   Adults = < 90mmHg sys or >30% drop baseline
WAO Definitions

• Not just theory or expert consensus
• Validated in retrospective cohort of ED pts
  – Sensitivity 96.7%, 95% CI 88.8 – 99.9
  – Specificity 82.4%, 95% CI 75.5 – 87.6
Key Definition Takeaway

Anaphylaxis can manifest solely as cardiovascular collapse.
Typical triggers

- **Food** – most common children/adolescents
  - Nut response can be particularly severe
- **Stinging insects** (hymenoptera envenomation)
  - Honey bees are the highest risk
  - Don’t forget fire ants are in this classification
- **Iatrogenic**
  - Neuromuscular blocking agents
  - Latex
  - Antibiotics
WAO Emergency Care Guidelines

- Have a written protocol – recognition/treat
- Remove exposure to the trigger
- Assess CABs, mental status, skin, and weight
- Inject epi 0.01 mg/kg of 1:1000 (1 mg/mL)
  - Up to 0.5 mg adult IM
  - Up to 0.3 mg child IM
  - Repeat if needed in 5-15 minutes
WAO Emergency Care Guidelines

• Oxygen for respiratory distress
• IV fluid resuscitation
  – 1-2 liters NS
  – 5-10 mL/kg in first 5-10 minutes adult
  – 10 mL/kg in first 5-10 minutes child
• Reassess frequently and regularly
Treatment that makes a difference

Are these on your BLS apparatus?
The Role of EMD Professionals in Anaphylaxis?

EMD

Advise to use epinephrine autoinjector if available and patient’s physician has prescribed to use for same symptoms.

Advise to avoid physical exertion or environmental stress (temp extremes). Do not move the patient unless in danger. Open airway if not alert and ineffective breathing.
The Role of BLS Professionals in Anaphylaxis?

EMR

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O₂ VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT’S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT

EMT OR HIGHER LICENSE:
FOR ANAPHYLAXIS ONLY

ADULT: **EPINEPHRINE 1:1000 0.3 mg (0.3 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS
PEDIATRIC: **EPINEPHRINE 1:1000 0.15 mg (0.15 mL) AUTOINJECTOR IM IN ANTERIOR/LATERAL THIGH. MAY REPEAT ONCE IN 5-15 MINS
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg
MEASURE END-TIDAL CO₂ & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE
ADULT & PEDIATRIC WEIGHT ≥15 kg: NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg
PEDIATRIC WEIGHT <15 kg: NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg
MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED
The Role of ILS Professionals in Anaphylaxis?

EMT- I85

ADULT: INTUBATE IF INDICATED
IV ACCESS

ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP < 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

AEMT OR HIGHER LICENSE:
FOR ANAPHYLAXIS ONLY
ADULT: **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg
The Role of ALS Professionals in Anaphylaxis?

<table>
<thead>
<tr>
<th>PARAMEDIC</th>
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<tbody>
<tr>
<td><strong>MILD REACTION (RASH, ITCH, HIVES) ANTIHISTAMINE</strong></td>
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<tr>
<td>ADULT: DIPHENHYDRAMINE 50 mg IM/IVP</td>
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<tr>
<td>PEDIATRIC: DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg</td>
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</tbody>
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| **MODERATE REACTION (SOB, WHEEZING) ANTIHISTAMINE + BRONCHODILATOR + STEROID**  |
| DIPHENHYDRAMINE ADMINISTRATION AS IN MILD REACTION & BRONCHODILATOR ADMINISTRATION AS IN EMT ABOVE |
| ADULT: METHYL PREDNISOLONE 125 mg IM/IVP                  |
| PEDIATRIC: METHYL PREDNISOLONE 2 mg/kg IM/IVP, MAX 125 mg |

| **SEVERE REACTION/ANAPHYLAXIS** (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC)  |
| VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID |
| ADULT: **EPINEPHRINE 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH** |
| PEDIATRIC: **EPINEPHRINE 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH** |
| DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE |
| IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000 |
| ADULT: **EPINEPHRINE 1:10,000 1 mg SLOW IV/IO (OVER 3 MINUTES)** |
| PEDIATRIC: **EPINEPHRINE 1:10,000, 0.01 mg/kg SLOW IV/IO (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg** |
| ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED |
| CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S) |
Do Patients Take Allergies Seriously?

• S. Clark et al.
• Weill Cornell Medical College in New York City
• Nearly 12,000 patients presenting to ED
  – 25% with severe anaphylaxis
  – Less likely to carry epi and see allergist in prior yr
Do Patients Know EpiPen Use?

- R. Chaudhry
- Univ of Medicine & Dentistry of New Jersey in Newark
- Most pts thought they had good knowledge (91%)
- None knew about rubbing injection site post injection
- Most had problem identifying injection side of the autoinjector!
- Less than 3 mos post-training 71-86% correct steps
- More than 3 mos post-training 29-57% correct steps
- N= 11
Do Paramedics Give Epi?

- N El Sanadi et al.
- Broward County, Florida EMS
- Retrospective review Oct 2010 – June 2012
  - 92 patients allergic reaction
  - 18 self medicated with epi
  - 52 with anaphylaxis
  - 8 (15%) given epi by medics
  - 25 (48%) oxygen; 6 (11%) IV fluids; 13 (25%) steroids
  - 10 (19%) albuterol; 42 (81%) diphenhydramine
Do Docs Do Better?

- M Zitt et al.
- Survey of 318 physicians – primary/emergency
- Approx 10% emergency didn’t give epi
- Approx 20% primary/peds didn’t give epi
- Nearly 50% leave the ED without epi Rx
- Few got referred to an allergist
5 Critical Events in EMS Anaphylaxis Care
1- System Activation
2 – Recognize Anaphylaxis
“It’s not always wheezing and hives”
3 – Early Epinephrine Administration
4 – Respiratory/Hemodynamic Support
5 – Destination Care
Protocol Resources
okctulomd.com
“Training & Protocols” tab

MCB Pre-Hospital Operational Standards

2013 State of Oklahoma EMS Protocols
Field & Reference Editions
OKLAHOMA CITY

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