Who You Gonna Call?

Pediatric Emergency Transport in Disasters
It is inevitable that all hospitals in a large-scale disaster involving pediatric patients will be overwhelmed.

# 198- March 24, 2010
Bus Video
Contra Costa’s First Pediatric Disaster

Worst Highway Disaster in US History

Yuba City Bus Crash, Martinez

May 21, 1976
First On Scene

Bystanders Matter
Contra Costa County
1976 Emergency Response
28 Deaths, Ages (12-18)
Recovery
What About Responders?

Rescue workers go about the grim task of removing bodies from bus and lining them up near the scene of accident.
40 Years Later

- “I still can’t talk about it to this day”
- “Could we have done more?”

Everyone involved affected

Stress Accumulates

Mobilized EMS System Change
Both Events
- Involve triage and resource allocation
- Situational and dynamic
- Involve patient distribution decisions
  - Protocols, Judgement, Experience, Situational Awareness and Practice

Disaster….NOT normal standards of care
- Maximum of Maximums
- Greatest good for greatest number of people

Mass Casualty part of the EMS System normal workflow
- All the rules are on
- Saving as many patients as possible
- May expand but typically does not
Children and Disaster

- Innocent, Immature, vulnerable population
- Tend to gather in large groups
- Natural curiosity
- May not be able to rescue themselves
- Extreme emotional reaction by rescuers and public
When Lee Malvo asked why he planned to attack children in schools and on buses, convicted sniper John Mohammed allegedly replied:

“For the sheer terror of it – the worst thing you can do to people is aim at their children.”

(From AP story 5/30/06)
Hartford consensus: Integrated response fire/rescue/EMS and law enforcement

\[ T = \text{Threat suppression} \]
\[ H = \text{Hemorrhage control} \]
\[ RE = \text{Rapid Extrication to safety} \]
\[ A = \text{Assessment by medical providers} \]
\[ T = \text{Transport to definitive care} \]

How Many? How Far Away? Who to Send Where?
<table>
<thead>
<tr>
<th>US Hospitals &amp; EMS</th>
<th>Pediatric Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-children’s hospitals ED</td>
<td>See 89% of all children in ED’s</td>
</tr>
<tr>
<td>75% Hospital see</td>
<td>&lt; 20 children/day</td>
</tr>
<tr>
<td>50% Hospitals see</td>
<td>&lt; 10 children/day</td>
</tr>
<tr>
<td>Remote Hospitals see</td>
<td>&lt; 2 children/day</td>
</tr>
<tr>
<td>Percent of total ED volume</td>
<td>18-27%</td>
</tr>
<tr>
<td>Pedi ED volume admitted</td>
<td>&lt;10% (90% treat and release)</td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>3.5 days (children’s hospital)</td>
</tr>
<tr>
<td>911 Calls and Transports</td>
<td>&lt; 5-10% of all calls</td>
</tr>
<tr>
<td>EMS Pediatric MCI Plan</td>
<td>13% report plan</td>
</tr>
</tbody>
</table>

Low Volume, High Risk… Really “sick” Kids Rare
Pediatric Centers Are “Regional”
with Dedicated Transport Privately Contracted Assets

EMS Largely NOT Pediatric Ready or Easily Coordinated

Pediatric Readiness (EMSC)
Every ED/Hospital Pediatric Ready
California Ambulance Industry
Private Ambulance Providers Serve Both EMS & Hospitals

- 715 public & private ambulance services
- 170 private sector ambulance services
- 3,600 licensed ambulances
- 74% ambulances operated by private providers
- 60,000 EMTs & 20,000 paramedics
- 20,000 people are employed by private ambulance services
- 220 out of the 337 emergency ambulance services areas (zones) are served by private contractors

KATRINA RECOMMENDATION
ESTABLISH A DATABASE OF COALITION PEDIATRIC CAPABILITIES

Source: California Ambulance Association Website www.the-caa.org
Ambulance Mutual Aid
May Take Over 24 to 72 hours to Get to You

“BE PREPARED TO BE ON YOUR OWN”
2016 California Air Medical Assets

Services
- 22 in State
- 1 Out of state
- 302 in US

Rotor
- 71 bases
- 98 aircraft
- 879 in US

Fixed Wing
- 13 bases
- 121 aircraft
- 360 in US

AASM: Association of Air Medical Services
www.airmed.org
A framework for patient movement, when a disaster creates the need for patient movement beyond the capabilities of California’s EMS systems.
5 Essential Functions of Patient Movement

1) Patient Evacuation

1) Regulation (Coordination of Transport Resources and Destinations)

1) En-Route Medical Care

1) Patient Tracking

1) Repatriation (aka Return or Re-Entry)
Federal support of patient movement includes:

1) National EMS Contract*
2) National Disaster Medical System (NDMS)
3) Defense Support of Civil Authorities (DSCA)

* most likely resource for pediatric transport
National EMS Contract (AMR)

- Ground ambulances, Air ambulances (fixed and rotary wing), Para-transit transportation

- EMS personnel (beyond those assigned to ambulances) to supplement the federal and military response to a disaster or public health emergency.
### DoD Contraindications
Air Medical Evacuation

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Contraindication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any medical condition not stabilized</td>
<td>Untreated pneumothorax</td>
</tr>
<tr>
<td>Pregnancy &gt; 34 weeks</td>
<td>Seizure within last 2 weeks</td>
</tr>
<tr>
<td>Hemorrhaging (Hgb &lt; 8.5)</td>
<td>New onset cardiac dysrhythmia</td>
</tr>
<tr>
<td>Post-op &lt; 72 hours</td>
<td>Unbivalved orthopedic cast</td>
</tr>
<tr>
<td>Acute Coronary Syndrome</td>
<td>Communicable disease</td>
</tr>
<tr>
<td>&lt; 7 Days: Open Heart Surgery</td>
<td>Respiratory isolation inc. possible TB</td>
</tr>
<tr>
<td>&lt; 7 Days: Craniotomy</td>
<td>Psychologically unstable</td>
</tr>
<tr>
<td>&lt; 7 Days: Spinal Surgery</td>
<td>Decompression sickness</td>
</tr>
<tr>
<td>Pneumocephalus</td>
<td>Agitation or other distracting behavior</td>
</tr>
<tr>
<td>Neonates/young pediatric patients</td>
<td></td>
</tr>
</tbody>
</table>
Optimal Pediatric Transport System
Day to Day & Disaster (?)

- Air & Ground Ambulances
  - Fixed Wing, Helicopter
  - Surface Ambulance

- Flexible & Coordinated
  - Internal & External Operational and Clinical Communications
  - Regional in Scope

Medically controlled Pediatric MD Specialist with Personnel experienced in Critical Pediatrics
(EMS, Nurses, Respiratory Therapists, Physicians)

Mode of Transport determined by patient’s clinical condition, carrier and personnel availability; region’s geography; weather & traffic

AAP Guidelines for Air and Ground Transportation for Pediatric Patients Pediatrics Nov 1986
“There are more safety standards for moving cattle than for moving patients”
All-Hazard Pediatric Disaster Preparedness Guidelines Apply to Pediatric Patient Movement

- **Right evacuation plan**
  - Surge Capacity

- **Right tools**
  - Equipment, Meds, Lab, Formula

- **Right training**
  - Providers (ED, EMS, Inpatient Staff)
  - Drills (local, regional, state)

- **Reduce parent child separation**
  - Decontamination (hands on)
  - Safe Areas (security)

- **Right access to care**
  - Trauma, Medical, Mental Health

Based on Guidelines for Care of Children in the ED Pediatrics 2009
Are Local EMS Providers Pediatric Disaster Ready?

Mutual Aid

93% of managers report their EMS agency has Mutual Aid Agreements in place. 7% don’t.

<table>
<thead>
<tr>
<th>Mutual Aid Capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Less than 24 hrs</td>
</tr>
<tr>
<td>Neighboring jurisdiction</td>
</tr>
<tr>
<td>Regional jurisdiction</td>
</tr>
<tr>
<td>In-state</td>
</tr>
<tr>
<td>Intra-state</td>
</tr>
</tbody>
</table>
Ambulance Strike Team Ready

Does your agency have the ability to support an ambulance strike team (5+ ambulances) for out-of-jurisdiction response?

- Yes: 32%
- No: 68%

Is your service part of a local or regional healthcare coalition?

- Yes: 60%
- No: 40%
Real World Experience

More than one in three EMS practitioners reported having responded to a disaster situation at some point during their career.

- 36% Responded to a disaster
- 64% Had not
Among managers, about half had served as a manager during a disaster response.
Most (63%) of respondents report having a household preparedness plan in place, but 37% didn’t.

Three in four (75%) report maintaining at least a three-day supply of food, water and prescription medications for all individuals and pets in their household. 25% don’t.
What We Know About Large Scale Pediatric Medical Transportation

Notice Events

Planned Moves

No Notice Events
First Known Description
Children’s Hospital Colorado
Pediatric-specific patient movement plan

- Transferred 111 patients 8.5 miles in 11.6 hours.
- 64 patients (32 infants). 24 vents, 3 inhaled nitric oxide, 30 continuous infusions, 4 external ventricular drain
- 5 ALS ambulance crews, 4 SUVs, 1 Hospital Van
- 13 critical care teams: 1 pediatric and 8 neonatal and 2 general care critical care transport team
- 1 ventilator failure and 1 cyanotic event requiring suctioning and bagging

“Mass Transfer of Pediatric Tertiary Care Hospital Inpatients to a New Location in Under 12 hours: Lessons Learned and Implications” Fuzak, J.K. et al., Journal of Pediatrics, July 2010
Patient movement
Planned, exercised and executed

- Planning for large scale controlled move (ICS)
  - Command and control
  - Mitigation steps
  - Cancellation of elective procedures
  - Implementation of planned discharges and transfers to selected satellite hospitals.

- Effectiveness of drills and simulation to estimate travel times (Exercise)

- Post-move: Evaluated incident action plans & contingency (AAR)
Pediatric Hospital Move

- Transferred 111 patients 8.5 miles in 11.6 hours. 64 patients (32 infants). 24 vents, 3 inhaled nitric oxide, 30 continuous infusions, 4 external ventricular drain

- 5 ALS ambulance crews, 4 SUVs, 1 Hospital Van

- 13 critical care teams: 1 pediatric and 8 neonatal and 2 general care critical care transport team

- 1 ventilator failure and 1 cyanotic event requiring suctioning and bagging
How to move a hospital

Children's Memorial will move to a new 23-story hospital in the Streeterville neighborhood on June 9. The new building will allow for expansion of hospital resources and a better connection with the hospital's academic partner, Northwestern University's Feinberg School of Medicine.

MOVING DAY: JUNE 9

Starting at 6 a.m., 160 to 200 critically ill or injured children will be moved via ambulance. One family member or guardian is allowed to ride along.

ROAD CLOSURES

Fullerton Avenue will be closed from Lincoln Avenue to Lake Shore Drive. Public traffic is allowed north and south on Clark Street, and Stockton and Cannon drives, but will be controlled by traffic aides and police. Chicago Avenue will remain open, but no parking will be allowed from the new hospital to Lake Shore Drive.

In between transporting patients, each ambulance will return to a staging ground on Orchard Street, between Lincoln and Fullerton, to be cleaned and refreshed with supplies.

While in transport, vehicles will have lights on, and Chicago police officers and traffic control aides will be set up at posts along the 3.5-mile stretch of city streets to manage traffic.

10-18 hours

The amount of time officials estimate it will take to move all patients. A 48-hour contingency plan has been created in case of emergency. Some patients will take no longer than 60 minutes to transport. Others could take more than four hours from door to door.
Planned Event – UCSF Mission Bay 2014 Maternal Child Hospital Move

- Planned Transfer of 131 Pediatric patients from UCSF Parnassus and UCSF Zion Campuses to new UCSF Mission Bay Campus.
- 41 Ambulances, 110 Ambulance personnel
- Several critical ECMO patients
- Several women in eminent labor
- Total Time - 8 ½ hours
Plenty of resources available to make the move.

NO patients died in the moving process.

Unlimited Hospital Staff Resources to assist

Extensive pre-planning by UCSF, City of San Francisco, and AMR led to a successful move.
Moves of this size eat up a lot of resources. An emergent hospital evacuation might not be as fast or successful.

- Heavy need for CCT-RN units and Isolette-capable ambulances. These are scarce resources in California.

- Efficiencies of moving ECMO babies and neonates are resource heavy and very time consuming. This is problematic in emergent circumstances.
HURRICANE KATRINA
AUGUST 23–31
2005

Costliest hurricane in the U.S.
Nearly 106 billion U.S. dollars.
Damage caused by Superstorm Sandy,
which struck in 2012, was approximately
71 billion U.S. dollars.

62 tornadoes in 8 states spawned from the storm.

lives lost 1,200

Aug. 23, 2:00 PM EDT
tropical depression forms

Aug. 24, 8:00 AM EDT
tropical storm, 40-mph winds

Aug. 24, 8:00 PM EDT
tropical storm, 50-mph winds

Aug. 25, 8:00 PM EDT
category 1, 80-mph winds

Aug. 26, 8:00 PM EDT
category 2, 105-mph winds

Aug. 27, 8:00 PM EDT
category 3, 115-mph winds

Aug. 28, 8:00 PM EDT
category 5, 160-mph winds

Aug. 29, 8:00 AM EDT
tropical storm, 60-mph winds

Aug. 29, 8:00 PM EDT
Category 3, 125-mph winds

Mississippi
Louisiana
Gulf of Mexico
CUBA
Florida
Alabama
Florida
Louisiana
Mississippi

maximum storm surge in Mississippi

26 ft (8 m)
Large Disaster Event: Katrina 2005
“Widespread chaos, desperation & inefficiency”

- Transport across 7 states within 3 days coordinated by ad hoc and private networks
- Few pediatric air and ground assets available. Critical PICU/NICU patients transported by paddle boat, cars and flat bed trucks
- 5 pediatric transport teams mobilized from 5 different children’s centers moved 40 med/surgical patients and 12 PICU during the hurricane
- 170 cancer treatment interrupted. Chronic & specialty care disrupted
Katrina Hospital Patient Evacuation

<table>
<thead>
<tr>
<th>Priority</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fairly good health Can sit up or walk NICU babies and pregnant mothers</td>
</tr>
<tr>
<td>2</td>
<td>Sicker Need more assistance</td>
</tr>
<tr>
<td>3</td>
<td>Very ill With DNR orders Last to go…</td>
</tr>
</tbody>
</table>

- Battlefield conditions
- Nearby Violence
- No fresh water
- 200 people trapped
- 5 days without power before everyone rescued
- Helipads: passing patients thru 3x3 hatch
- Hundreds sent to International Airport for evacuation staging handed off to understaffed FEMA teams
Existing Plans During Katrina Clearly Inadequate for Children

- Large Numbers of children w/ chronic issues managed without formal governmental relationships
- Regional Collaboration Infrastructure Solutions Required

Source: Dr. Romansky May 2016
Patient Movement Immediate Need
Containers of Premies

FIGURE 2 Newborns arriving in bassinets
Spedale, S. B. Pediatrics 2006;117:S389-S395

Copyright ©2006 American Academy of Pediatrics
HHC and Hurricane Sandy By the Numbers

9 Hospitals in full operation through the hurricane and post hurricane period

4 Nursing homes in full operation

7000 Patients in HHC hospitals and nursing homes during the storm

3 HHC mobile medical vans serving hard hit communities

900 Patients safely evacuated

8 Special Medical Needs Shelters staffed by HHC clinicians

2 Data Centers where electronic medical records are backed up

$300 Million Emergency Repair Funds for public hospitals made available by Mayor and City Council
Large Disaster: Hurricane Sandy 2012
NICU Evacuation 21 infants 6 hours
The timeline of the NYULMC NICU power outage and evacuation.

©2014 by American Academy of Pediatrics
Extra blankets, chemical mattress warmers and keeping infants in the arms of mothers and staff may be necessary.

Hospital staff required.

New York Superstorm Sandy: 5 staff for each infant to navigate flights of stairs

Source: Dr. Romansky Unique Vulnerabilities Pediatric Resiliency Presentation May 2016
Little change in over 60 years

Children’s National Washington DC Hospital Move 1950’s
Priorities to Move Patients are Situational

Assumes transportation is at the ready AND Regional models to scale are in place

**Acuity 1**
- Minimal Care
- Feeders growers

**Acuity 2**
- Moderate Care
- Nasal cannula, BCPAP

**Acuity 3**
- Intensive Care
- Ventilators, drips and chest tubes

Immediate Evacuation Order Given
- Acuity 1 then 2
- Acuity 3
- Evacuate to area of refuge or receiving facility

Planned Controlled Evacuation Order Given
- Acuity 3
- Acuity 2 then 1
- Evacuate to receiving facility

Requires Consensus

Source: Evelyn Lyons Illinois EMSC DPH June 2016 Integrated Healthcare System Preparedness Summit
# Situations for Transporting Children in Emergency Ground Ambulance (EGA)

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
<th>Option(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>For a child who is uninjured/not ill</td>
<td>Use vehicle other than EGA</td>
</tr>
<tr>
<td>2</td>
<td>For ill and/or injured child whose condition does not require continuous and/or intensive medical monitoring and/or interventions</td>
<td>Use BLS transport</td>
</tr>
<tr>
<td>3</td>
<td>For child whose condition requires continuous and/or intensive medical monitoring and/or interventions</td>
<td>Use ALS or CCT transport or BLS with Hospital RN</td>
</tr>
<tr>
<td>4</td>
<td>For a child or children who require transport as part of a multiple patient transport (newborn with mother, multiple children, family)</td>
<td>BLS or ALS transport per patient condition</td>
</tr>
</tbody>
</table>

Adapted from NHTSA Recommendations for Ground Ambulance Safety 2010
NICU Evacuation

Large NICUs in California with limited transportation assets
### Regional Centers

<table>
<thead>
<tr>
<th>Hospital</th>
<th>City</th>
<th>Neonatal</th>
<th>ECMO</th>
<th>High Risk Maternity</th>
<th>Last Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Pacific Medical Center</td>
<td>San Francisco</td>
<td>1</td>
<td>n/a</td>
<td>open</td>
<td>6/6/2017 12:15:55 AM</td>
</tr>
<tr>
<td>Children's Hospital, Oakland</td>
<td>Oakland</td>
<td>5 or more</td>
<td>open</td>
<td>n/a</td>
<td>6/6/2017 3:00:51 AM</td>
</tr>
<tr>
<td>Lucile Packard Children's Stanford</td>
<td>Palo Alto</td>
<td>4</td>
<td>open</td>
<td>open</td>
<td>6/6/2017 6:20:06 AM</td>
</tr>
<tr>
<td>Santa Clara Valley Medical Center</td>
<td>San Jose</td>
<td>5 or more</td>
<td>n/a</td>
<td>open</td>
<td>6/6/2017 1:18:16 AM</td>
</tr>
<tr>
<td>Sutter Med Center, Sacramento</td>
<td>Sacramento</td>
<td>2</td>
<td>open</td>
<td>open</td>
<td>6/6/2017 2:29:35 AM</td>
</tr>
<tr>
<td>UC Davis Medical Center</td>
<td>Sacramento</td>
<td>5 or more</td>
<td>open</td>
<td>open</td>
<td>6/6/2017 7:26:09 AM</td>
</tr>
<tr>
<td>UCSF Medical Center-Barnett Children's Hospital</td>
<td>San Francisco</td>
<td>2</td>
<td>open</td>
<td>open</td>
<td>6/6/2017 4:45:35 AM</td>
</tr>
<tr>
<td>Valley Children's Hospital</td>
<td>Madera</td>
<td>2</td>
<td>n/a</td>
<td>n/a</td>
<td>6/6/2017 5:26:05 AM</td>
</tr>
</tbody>
</table>

- **8 NorCal Regional Centers**
- **22 NorCal Community Centers**
- **7 NorCal Intermediate Centers**
- **14 SoCal Regional Centers**
- **38 SoCal Community Centers**
- **7 SoCal Intermediate Centers**
- **2 Regional Kaiser Hospitals**
  - LA and Oakland
- **13 Kaiser Community Centers**
- **4 Kaiser Intermediate Centers**
### Triage by Resource Allocation for IN-patients [TRAIN]®

<table>
<thead>
<tr>
<th>Transport</th>
<th>Car</th>
<th>BLS</th>
<th>ALS</th>
<th>CCT</th>
<th>Specialized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Support</td>
<td>Stable</td>
<td>Stable</td>
<td>Minimal</td>
<td>Moderate</td>
<td>Maximal</td>
</tr>
<tr>
<td>Mobility</td>
<td>Car/Carseat</td>
<td>Wheelchair or Stretcher</td>
<td>Wheelchair or Stretcher</td>
<td>Transport Rig</td>
<td>Immobile</td>
</tr>
<tr>
<td>Nutrition</td>
<td>All PO</td>
<td>Intermittent Enteral</td>
<td>Continuous Enteral or Partial Parenteral</td>
<td>TPN Dependent</td>
<td>TPN Dependent</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>PO Meds</td>
<td>IV Lock</td>
<td>IV Fluids</td>
<td>IV Drip x1</td>
<td>IV Drip x1</td>
</tr>
</tbody>
</table>

**Life Support**
- **Minimal** = Hood or Low Flow Cannula O2, chest tube, etc.
- **Moderate** = CPAP/BiPAP/Hi-Flow, Conventional Ventilator, Peritoneal Dialysis, Externally paced, continuous nebulizer treatments, etc.
- **Maximal** = Highly specialized equipt., e.g., HFOV, ECMO, iNO, CVVH, Berlin Heart, wt ≤ 1.5 kg, etc.

**Mobility**
- **Car/Carseat** = Able to ride in automobile with age-appropriate restraints
- **Transport rig** = Age-appropriate rig with equipment for connecting to ambulance
- **Immobile** = Unsafe to move without special equipment e.g., neurosurgical/bariatric

---

**Adopt Innovations**
- **Children’s Stanford NICU, Peds PICU, Perinatal**
- & coming soon Adult
No Notice Event – SFO Asiana Flight 214 Crash 2013
Asiana EMS Response

- 307 people on-board
- 181 TOTAL Transports
- Approximately 40 Pediatrics on board (under 14)
Pediatric Trauma Hospital Distribution

- Stanford Hospital/ Lucille Packard Children’s Hospital- 20+ Pediatrics received.
- San Francisco General Hospital- 12+ Pediatrics received.
- NOT all were critical trauma patients, but pediatrics were some of the most severely injured.
Early focus on getting critical kids off scene in the first 50 minutes

START triage works well for large numbers of patients because it is based on patient CONDITION, not age.

Stanford and SFG (both Comprehensive Level I Trauma) received all the critical Pedi traumas

NO under-triage was done
Lessons Learned

- Patient Tracking is very difficult in the chaos of an MCI.
  - Triage tag number with Hospital Destination might be the only clue you have to follow-up.

- In large MCI events, there is not time or resources to designate Pediatrics to specialty centers.
  - Seldom will responders know exact patient age.
  - In the BEST CASE, Pediatrics will end up at a Comprehensive Trauma Center and then receive follow-up transport and care if needed to a Pediatric specialty hospital.

- Keeping families together is challenging, especially with the 1\textsuperscript{st} wave critical patients.
  - Expect that there might be some family separation issues to work out.
69 million children are separated from their parents every work day¹

for an average of 9 hours

and an average 18 minute trip away

21 states and D.C. don't require all schools and child care providers to have basic emergency plans.²

¹ U.S. Census Bureau
² Save the Children's 2014 Disaster Report
³ National Center for Missing & Exploited Children
⁴ FEMA Report and Analysis of Appropriations

#GetReady

Children Separated From Parents and EMS
School Shootings
EMS High Risk High Frequency Event

Sandy Hook 2012
School Shootings and EMS
Children Killed or Injured

Shooting tolls since 2000, by type of school

- Elementary
  - KILLED
  - WOUNDED
- Middle
- High
- College / university
Only 57% of children in US live within 30 miles of a Pediatric Trauma Center

How Do We Get Them There?

Black Swan Events
No Notice & Catastrophic

Japan 2011
Earthquake (M8.9) Tsunami, Nuclear Melt Down
### Riverside County Pediatric Footprint

**How Many Children? What Do You Have to Work With?**

<table>
<thead>
<tr>
<th>Riverside County</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>0-2 Years</td>
<td>44,936</td>
</tr>
<tr>
<td>3-5 Years</td>
<td>44,741</td>
</tr>
<tr>
<td>6-10 Years</td>
<td>80,400</td>
</tr>
<tr>
<td>11-13 Years</td>
<td>50,235</td>
</tr>
<tr>
<td>14-17 Years</td>
<td>69,629</td>
</tr>
<tr>
<td>Total 0-17</td>
<td>289,941</td>
</tr>
</tbody>
</table>

**Bed Capacity:** 116 Acute Care Pediatric; 113 NICU, 321 Perinatal

**Ambulances Available:** 206 (RiVCo EMS System Plan)
Pediatric Assets and Earthquake Risk

California’s Black Swan Event
Feeling Overwhelmed?
Normal to feel this way

I could never…

I would never…

I couldn’t handle…

I can’t imagine…
So Where Do You Start?
A Personal Preparedness Plan

- Are You Prepared?
  - Family, Pets
  - Plan, Supplies, Food, H2O, medications
  - Meeting Place
  - How long?
**Daily Triage**
When abundant resources are available relative to patient demand

Do the best for each individual

Normal Standards of Care

**Disaster Triage**
When patient needs outstrip resources

Greatest good for greatest number of people

Altered Care Standards

Recognizes resuscitation attempts may be futile
Many Gaps to Fill

- IOM Report
  - Emergency Care for Children: Growing Pains
    - Only 6% have supplies to manage pediatrics
    - Only half have transfer agreements
    - Continuing pediatric training lacking
    - Protocols vary widely
    - Shortage of equip in rural areas
    - Disaster plans overlook the needs of children
“Change Begins with Champions”
Pediatric “EMS” Champions
Evidence shows best outcomes for critically ill children are achieved when treated at facilities most prepared to address their needs and are on the same page.

Interfacility Transfer and Regional agreements key to success.

https://emscimprovement.center/resources/toolboxes/interfacility-transfer-toolbox/

Make National Guidelines Better
The National Curriculum is Here!
Pediatric “Must Know” Differences
Exceptional Assessment Skills Matter

Early Recognition of the Pre-arrest State
Information is At Your Fingertips
So Get Connected
Plenty of Free Stuff to Prepare

http://hsc.unm.edu/emergmed/PED/education/onlineEd.shtml
Focus on the “Doing”
“Train To Retain” with Muscle Memory

Psychomotor, Realistic, Hands On, Simulation, Clinical Decision-making
Practice Leads to Capability
Raise the Bar For All Children
Especially Yours

“Winging It”
Is Not An Emergency Plan

Make a disaster plan with your kids.
More EMS Systems Pediatric Ready
Learn How that Happens in Your Operational Area
Participate in Patient Movement Exercises

A Multi-Sectoral Rescue Chain

- Search
- Rescue
- First Aid

- Triage
- Stabilization
- Evacuation

Traffic Control
Regulation of Evacuation

Command Post
Impact Zone

Hospital Disaster Response Plan
Accident & Emergency Department

PRE-HOSPITAL ORGANIZATION
HOSPITAL ORGANIZATION
“Less MacGyver Pediatric EMS”
Thank you
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