

# **EMSC Connects**

**VOLUME 7, ISSUE 1** 

January 2018

# **Emergency Medical Services for Children Utah Bureau of EMS and Preparedness**

## A Word From Our Program Manager

# Special points of interest:

- Pollution in Utah
- Respiratory illness in pediatrics
- Respiratory distress

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Well, 2017 is over and a new year is beginning. Personally, I usually make the same New Year resolutions each year, this year will be no different. However, I have been thinking about the past year especially as it pertains to the accomplishments of the EMS for Children's program. I am pleased to say that the program did much better with goals than I did personally. I think much of that success is attributable to the teamwork of the staff and the EMSC county

## The EMSC program had three major goals over the past five years:

- Improve pediatric prehospital care by increasing training and preparedness for prehospital providers.
- 2) Improve pediatric emergency care in Utah
- **3)** Improve pediatric care and pediatric preparedness in the prehospital setting.

Under each of the goals were the following objectives that were accomplished (and why we thought it was important):

- 1) Established a regulatory standard requiring ALS providers to be PEPP certified. (because 32 percent of Utah's population is children).
- 2) Established requirements for pediatric equipment on ambulances. (because children are not little adults)
- Maintained requirement for EMS agencies to submit NEMSIS data. (because we need to assess care to make improvements and to target injury prevention activities)
- 4) Acquired APSR funding to support the pediatric disaster coordinator and UHERT. (because children has special needs in the event of a disaster)
- 5) Regionalized PEPP training throughout the state. (because its efficient and effective to share training limited resources)
- 6) Recognized and trained 45 EMSC county coordinators to provide courses and injury prevention activities. (because training the trainers and having points of contacts for pediatric care in each county/region is an efficient and effective way to communicate and rollout training and undates)
- 7) Trained over 600 EMS personnel in PEPP. (because training is needed to improve skill proficiency)
- 8) Published 60 monthly newsletters. (because it was another way to communicate with EMS providers to provide updates and education)
- 9) Maintained an EMSC advisory committee to

look at various pediatric issues such as a pediatric facility recognition program. (because facilities meeting criteria for pediatric readiness are more capable of meeting the needs of pediatric patients)

- 10) Assessed the capabilities of all Utah hospitals to meet the needs of pediatric patients through the National Pediatric Readiness Assessment. (because it provides a baseline of the capabilities of hospitals to meet the medical and trauma pediatric needs)
- 11) Maintained pediatric representation on the state EMS Committee, Trauma System Advisory Committee and Licensure Subcommittee. (because system policies need to consider the needs of children)
- 11) Assessed the hospitals for their capabilities to treat children with sepsis, DKA, breathing problems, anaphylaxis or seizures. (because these are the medical conditions that adversely affect Utah Children, known as the Fatal Five)
- 12) Assessed the capabilities of EMS providers to take a full set of vital signs and saw marked improvements after statewide education. (because taking a full set of vital signs provides a more complete assessment of the patient's condition because kids can decompensate fast)
- 13) Released the official state pediatric treatment guidelines along with the adult guidelines. (because one set of protocols for reference is easier to maintain and update)
- 14) Increased enrollment in the CHIRP program. (because children with special healthcare needs have medical information that is now more readily available to EMS when needed)
- 15) Trained over 20,000 children through the bike rodeos. (because bike accidents are one of the leading causes of injury in younger children).
- 16) Provided Buckle Tough information to various communities. (because motor vehicle crashes are the leading cause of injury and death in older children).
- 17) Participated in the Utah Highway Safety Office Zero Fatalities Safety Summit (because traffic crashes and pedestrians hit be motor vehicles are leading causes of death in children)
- 18) Rolled out the Stop the Bleed training kits to the EMSC county coordinators. (because of school shootings, motor vehicle crashes, and sporting events, the public needs to be trained in how to stop the bleeding until EMS arrives)



- 19) Assessed the capabilities of our EMS agencies to be ready to treat children by participation in the national EMS assessment. (because having a pediatric emergency care coordinator available through each agency/county and region can improve the availability of training and ultimately pediatric care)
- 20) Conducted pediatric training and exercises and incorporated pediatric considerations into disaster planning. (because children have special needs in the event of a disaster).

So, these are some of the accomplishments of the EMSC program over the past five years. We look forward to sustaining and making improvements for another five years if federal funding for the program continues. Much of the success of the program has to be given to the outstanding staff: 45 EMSC county coordinators; Tia Dickson, RN, for pediatric care consultation and education; Hilary Hewes, MD, for medical direction, Chuck Cruz, RN, paramedic, for pediatric disaster preparedness; Bob Jex, RN for facility recognition; Yukiko Yoneoka, MS, for data analysis of patient care; Allan Liu, MBA, for coordination efforts, injury prevention and budget management; Janine Whaley, for administrative support; and last but certainly not least, Andy Ostler, Paramedic, for PEPP courses and bike rodeo coordination extraordinaire. It is with great sadness, that we announce Andy Ostler is leaving the EMSC program. He and his wife will be serving a two year mission for the LDS Church. We can't thank Andy enough for his leadership, expertise, organizational contributions and knowledge over the past 20 years. He will be missed.... but we are secretly hoping when he returns that he will get involved with the program again. We wish Andy well in his new endeavor, thank him for his dedication and commitment to the program and look forward to his return

As always, we would like to thank the EMS and hospital personnel who take care of the children of Utah. Your efforts are greatly appreciated. Best wishes for the New Year.

Jolene Whitney

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#### **Pedi Points** Tia Dickson RN, BSN

#### Children face special risks from air pollution because their lungs are growing and because they are so active.

The largest portion of a child's lungs, their air sacs (aveoli) are not fully grown until they become adults. A child's lungs are also at greater risk for infection because the body's defenses are still developing. Children have more respiratory infections than adults, which also seems to increase their susceptibility to air pollution.

Another consideration, children are outside for longer periods and are usually more active when outdoors than adults are. They inhale more polluted outdoor air than adults do. Children with underlying chronic lung diseases, particularly asthma

and cystic fibrosis, are especially vulnerable. 1

Our pollution has been in the news a lot lately. It is one of many triggers that will contribute to this "respiratory season". Are you ready for it?

1. Children and Air Pollution



# **Expert Input**

**Utah Environmental Public Health Tracking (EPHT) Network** 

ATR POLLUTION AFFECTS HEALTH IN A NUMBER OF WAYS. THEY RANGE FROM COUGHING AND SHORTNESS OF BREATH TO **EXACERBATING CONDITIONS** SUCH AS ASTHMA, AND BRONCHITIS.

AIR POLLUTION HAS ALSO BEEN LINKED TO HIGHER OCCURRENCE OF HEART ATTACKS AND STROKES AND LOW BIRTH WEIGHT IN INFANTS.

Taken from the Utah Environmental Public Health Tracking (EPHT) Network website

This network provides information and data about how the environment affects human health.

Air pollution refers to any biological, physical, or chemical particle that is in the air that should not be there. Pollutants come from many human activities such as factories, power plants, dry cleaners, cars, trains, airplanes, and buses. They can also come from environmental sources like volcanic eruptions, fires and windblown dust.

Air quality measures how much pollution is in the air. On average, adults breathe over 3,000 gallons of air each day; there is no way to avoid breathing. If that air is contaminated, there is no way to avoid exposure to those pollutants. Furthermore, it damages trees, crops, plants, animals, rivers, and lakes. This damages ecoystems and alters natural processes. Poor air quality affects everything around us.

Air pollution affects health in a number of ways. They range from coughing and shortness of breath to exacerbating conditions such as asthma, emphysema, and bronchitis. Air pollution has also been linked to higher occurrence of heart attacks and strokes and low birth weight in infants. Air pollution affects everyone, but certain people are more susceptible to

its effects. Sensitive populations include people with lung or heart issues, young children, and older adults. Two air pollutants of particular concern are ozone and PM2.5.

- Ozone: Ground-level ozone, not to be confused with the atmosphere's protective ozone layer, is created by reactions between environmental pollutants and light and heat. Ozone is the main component of smog and is dangerous to health and the environment. The creation of ozone is facilitated by warm weather and sunshine; therefore, ozone levels are usually higher in the summer and in the mid-afternoon.
- PM2.5: "PM" stands for "particulate matter," which is a mixture of extremely small particles and liquid droplets. PM has many different components like acids, organic chemicals, metals, and soil. PM is measured in micrometers, so PM10 refers to particulate matter that is 10 micrometers long and PM2.5, 2.5 micrometers long.

#### From Utah Appletree

Exposure to both 'fine' (PM2.5) and 'coarse' (PM10) particles is associated with a number of harmful health effects, particularly those involving the heart and lungs. In general, the size of the particles is directly linked to their potential for causing health problems. Smaller particles (PM2.5) are most dangerous as they can easily get deep into the lungs. They can enter the circulatory system or remain embedded for long periods.

#### Populations sensitive to particulate matter air pollution

People with preexisting heart conditions, including: Heart failure and Coronary artery disease (CAD)

People with preexisting lung conditions, including: Asthma, Chronic obstructive pulmonary disease (COPD)

Older adults, who may have undiagnosed heart or lung conditions

Children, whose hearts and lungs are still developing

## **Emergency Medical Services for Children**

Symptoms of exposure to particulate matter

People with heart conditions	People with lung conditions	Healthy people may experience temporary symptoms	
Chest pain	Coughing	Eye, nose, and throat irritation	
Irregular heartbeat	Shortness of breath	Coughing	
Shortness of breath	Decreased ability to breathe deeply or vigorously	Chest tightness	
Fatigue	Increased susceptibility to respiratory infections	Shortness of breath	
Heart attacks  Coronary artery disease (CAD) is the most common heart problem related to long term exposure to PM2.5 (CDC, 2013a)  However, CAD is largely linked to risky lifestyle habits like poor diet, smoking, and lack of exercise	Aggravation of existing lung conditions like asthma and chronic bronchitis		

These cardiovascular and respiratory health effects can increase doctor and emergency room visits, hospital stays, absences from school and work, and deaths. Nationwide, studies have shown a 15% decrease in the risk of heart disease deaths with every PM2.5 decrease of 10 micrograms per cubic meter of air (µg/m3). Particle pollution has also been associated with lung cancer and adverse birth outcomes, such as low birth weight and preterm birth (CDC, 2013; Shah et al., 2011; UDOH, 2014a).

#### Ways to Reduce Exposure

The likelihood of being affected by PM increases as more time is spent outdoors during periods with high PM levels, and as more strenuous activities are performed.

#### Protect your health when PM levels are high

- Monitor PM levels in your area
- Since exercise is good for health, it is important to both stay active as well as know when to make changes
  - Reduce the amount of time spent on high exertion activities
  - Substitute a less strenuous activity (e.g., take a walk instead of jogging or running)
- Plan outdoor activities for days when PM levels are low
- Spend less time in areas likely to have higher PM levels, such as near busy roads

#### Reduce indoor PM

- Do not smoke indoors
- Reduce the use of particle sources like candles, wood burning stoves, and fireplaces
- Certain air filters can help reduce indoor PM. See the EPA's Guide to Air Cleaners for more information.

Even though we may assume that our individual choices do not affect air quality, they do.

## Reducing air pollution and improving air quality is everybody's responsibility:

- Conserve energy by turning off lights and appliances when you're not using them
- Recycle paper, plastic, glass bottles, cardboard, and aluminium cans
- Avoid using paper and plastic bags
- Plan your trips with your automobile or use public transportation, ride a bike, or walk
- For more suggestions, please visit these websites for more ideas: <u>UCAIR</u> <u>Utah Clean Air Partnership, U.S. Environmental Protection Agency</u>



Here are some terms to help you better understand the AOI chart:

- Sensitive groups: People who have certain underlying diseases or health conditions may be more susceptible to the effects of air pollution. This includes people with heart disease, lung disease, children, and the ele
- Prolonged exertion: Any activity done intermittently for several hours and makes you breathe slightly harder than normal, such as working in the yard for part of the day.
- Heavy exertion: Any intense activity that makes you breathe hard.

Air Quality Conditions	AQI Range	Health Recommendations	
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.	
Moderate	51-100	People who are unusually sensitive to air pollution should consider limiting prolonged or heavy outdoor exposure.  The general public is not likely to be affected.	
Unhealthy for Sensitive Groups	101-150	People with respiratory disease (such as asthma), children, older adults, and people who are active outdoors should limit prolonged or heavy outdoor exertion.  The general public is not likely to be affected.	
Unhealthy	151-200	People with respiratory disease (such as asthma), children, older adults, and people who are active outdoors should avoid prolonged outdoor exertion.  Everyone else, especially children, should limit prolonged outdoor exertion.	
Very Unhealthy	201-300	People with respiratory disease (such as asthma), children, older adults, and people who are active outdoors should avoid all outdoor exertion.  Everyone else, especially children, should limit all outdoor exertion.	
Hazardous	301-500	Everyone should avoid all outdoor exertion.	

Source: Utah Department of Health. (2015, January 8). Air Quality Index (AQI). Retrieved on April 2: 2015 from http://bealth.utah.gov/utahair/401/

### **Emergency Medical Services for Children**

Winter has arrived and it's never a bad idea to brush up on your pediatric airway care. This time of year is branded *Respiratory Season* because the cold weather forces us indoor where we share warmth and illnesses. Children are especially susceptible to respiratory illness because of their underdeveloped immune system and their tiny airways. Pollution is only one of many triggers that may lead to increased pediatric call volumes and ER visits in the next few months. Brush up on your knowledge of pediatric airway anatomy. Remember that bagging well is a super power in pediatrics, practice your bagging technique. Intubation should come **only** if bagging is unsuccessful. Restock your suction supplies. BBGs, deep nasal suctioning... these are your weapons in battling the secretion season.

Condition	Onset of Symptoms	Signs and Symptoms	Important Points
Asthma  New Jones London Londo	Acute exacerbation Chronic condition Often related to respiratory infections, smoking or other inhaled irritants or environ- mental triggers Often known to have asthma or reactive airway disease (RAD)	Hx of exposures to triggers (like air pollution)  Expiratory wheeze on auscultation  Prolonged expiratory phase  Bronchospasm  Coughing spells both productive and non-productive  Shortness of breath/breathless with speech  Chest tightness/pain  hypoxia	About one in 20 children have asthma  At Primary Children's Hospital Emergency Department, we see about  1,000 children with asthma each year  500 children need to be hospitalized each year.  If you are suspicious that a child with difficulty breathing has asthma, do not hesitate to treat as though they have asthma  A few important points:  When the child is known to have asthma  The earlier they get steroids, the quicker they will recover and the less they will need hospital admission or more intense treatment  Albuterol should be given early and frequently to help open the lungs and improve respiratory distress  Supplemental oxygen should be given if the child is in distress or if oxygen saturation is < 90%  When a child has not been diagnosed with asthma  A dose of albuterol should be tried to see if it improves the child's work of breathing  If a child responds to albuterol, steroids should be given  Some children (especially infants) won't respond to albuterol because wheezing with viral illnesses may not be because of asthma
Croup  North bits  - branch -	Rapid or gradual Primarily in children ages 1-6 yrs.	Mild to severe nasal flaring and/or retractions Noisy breathing (stridor) Barky cough Hoarse voice Fever	The respiratory distress of croup usually starts suddenly and frequently at night  The noisy breathing in a croup patient should be loudest when you listen to the patients neck, not lungs  Croup patients who are in significant respiratory distress will have supraclavicular retractions, whereas asthmatics tend to have more subcostal and intercostal retractions (*a child who is ill enough with either disease could have retractions in all 3 locations)  Croup patients may have more trouble breathing in whereas asthma patients usually take longer to breathe out. A great way to evaluate this is to breathe with the patient, if you feels like you want to breathe in again and the patient is still breathing out, that is prolonged expiration and more likely asthma
Bronchiolitis  Healthy Bronchiole Inflamed Bronchiole  Tiny Airways in the Lungs	Gradual Often related to viral infections	Lots of secretions and nasal congestion  Coughing spells  Cyanosis  1-4 day history of congestion with a low-grade fever  Parents of infants will often report poor feeding, lethargy or agitation	Respiratory Syncytial Virus (RSV) is the most common viral cause of bronchiolitis, many parents and providers use the terms interchangeably, but RSV is not the only cause of bronchiolitis  Occurs most often in children, 0 to 24 months  This is one of the few viral infections that can cause serious illness in newborns  Treatment includes supportive care  Ensuring adequate hydration and oxygenation  Careful monitoring for complications  Clearing secretions (think deep suctioning)



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#### **Protocols in Practice**

#### RESPIRATORY DISTRESS

#### **ALL PROVIDERS**

- Focused history and physical exam:
  - Determine the need to treat under the Allergic Reaction/Anaphylaxis Guideline
  - . Determine the need to treat under the Congestive Heart Failure Guideline
  - Assess blood glucose, temperature and oxygen saturation
- Cardiac monitor, ETCO2, and pulse oximetry monitoring, when available
- □ Consider a 12 lead EKG
- □ Treatment Plan
  - · Remove any obvious obstructions to the airway
    - For choking infants apply a sequence of 5 back blows and 5 chest thrusts until the item is dislodged
    - For choking adults and children, use the abdominal thrust ("Heimlich) maneuver.
  - Maintain airway, administer 10-15 lpm of oxygen via NRB
- Key Considerations
  - Recall that infants and small children are primarily nose breathers, consider oral and nasal suctioning for copious secretions
  - Keep patient NPO for any respiratory distress and if children have a RR >60

**ADULT** 

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should
not exceed Adult dosing.

#### **EMT**

 Assist with administration of prescribed metered dose inhaler or nebulizer medication per dosing instructions. If MDI dosing instructions are not available, give second dose at 20 minutes if needed

#### **EMT**

- Assist with administration of prescribed metered dose inhaler or nebulizer medication per dosing instructions. If MDI dosing instructions are not available, give second dose at 20 minutes if needed
- Allow the patient to achieve and remain in a position of comfort (the parents arms if desired) and keep them as calm as possible.

#### **AEMT**

- Advanced airway, vascular access and fluid therapy per IV/IO Access and Fluid Therapy Guidelines
- □ For <u>ANAPHYLAXIS</u>:
  - See Anaphylaxis/Allergic Reaction Guideline
- □ For <u>WHEEZING</u>:
  - Albuterol 5 mg/2.5 cc NS nebulized
  - Repeat nebs as needed
  - Patient respiratory status must be reassessed after each dose to determine need for additional treatment
- □ For STRIDOR:
  - Epinephrine (1:1000) 2 ml (2mg) mixed with 3mL of normal saline nebulized

#### **AEMT**

- Advanced airway, vascular access and fluid therapy per IV/IO Access and Fluid Therapy Guidelines
- □ For <u>ANAPHYLAXIS</u>:
  - See Anaphylaxis/Allergic Reaction Guideline
- □ For WHEEZING:
  - Albuterol 5 mg/2.5 cc NS nebulized
  - For infants < 1yr: albuterol 2.5 mg/5cc NS nebulized if wheezing persists after nasal suctioning
- □ For STRIDOR (croup):
  - Epinephrine (1:1000) 2mL (2mg) added to 3mL of Normal Saline via nebulizer
- Patient respiratory status must be reassessed after each dose to determine need for additional treatment. Call OLMC for additional doses.

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#### Continued—

#### PARAMEDIC

- Magnesium sulfate 2gm IV over 15-30 minutes for severe wheezing unresponsive to albuterol
- CPAP/BiPAP Consider when the patient is awake but needs assistance with oxygenation and ventilation such as in a CHF/Pulmonary Edema patient or COPD patient.
  - Explain the procedure to the patient
  - Initially apply the mask and begin the CPAP or BiPAP according to training instructions.
  - CPAP Provide 10 L/min oxygen and PAP of 5 cm H2O to begin.
  - BiPAP Provide 10 L/min oxygen and IPAP at 15 cm H2O with EPAP at about 5 cm H2O
- Contact OLMC to discuss further settings and treatment above the initial setup
- Lidocaine 2% 40-60 mg (2-3 mL) added to Albuterol for adult patients with "cough variant asthma" with severe coughing inhibits respiratory function (with or without audible wheezes)

#### PARAMEDIC

- Magnesium sulfate 40 mg/kg IV over 15-30 minutes for severe wheezing unresponsive to albuterol
- BIPAP/CPAP ONLY use when the patient is on the machine at home. Maintain home settings and bring machine with the patient. If unable to adequately ventilate return to BVM or advance to intubation



## **Happenings**

Andy Ostler has served with EMSC since before it was Utah EMSC. He has served as our Lead Course Coordinator since 1993. Chances are good that if you have attended a PEPP class in this state he was one of your instructors. Andy has lead our army of coordinators. He travels all over the state teaching. He works behind the scenes to ensure excellent pediatric training and he teaches PALS for Intermountain. Andy is the cornerstone of our program and so it is with great sadness that we announce he will be leaving us for a new adventure.

Andy was born in Nephi Utah. He joined the Salt Lake City Fire Department in 1973 and served as an EMT and then a Paramedic for 33 years when he retired. Retirement blurrrrp.... That was when he began working full force with EMSC. He is a certified PEPP Coordinator, PALS/BLS instructor, ACLS provider, a team lead for Central 1 in the pediatric strike team, a member of Utah DMAT-1, Unit Commissioner in the Boy Scouts of America, the father of 4, and grandfather of 10.

While we are excited for Andy's new opportunity and grateful to his wife for letting us use (abuse) him for so long, we really don't know what we are going to do without him. Best wishes Andy, you will be missed!







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# January 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
				PGR		
7	8	9	10	11	12	13
				PGR		
14	15	16	17	18	19	20
				PGR		
21	22	23	24	25	26	27
				PGR	PEPP Spanish Fork →	
28	29	30	31			

#### **Pediatric Education Around the State**

Pediatric Grand Rounds (PGR) are educational/CME offerings webcast weekly (Sept-May) at 0800-0900 you can watch live or archived presentations. It is geared towards hospital personnel. But will qualify for BEMSP CME Access at https://

 $\underline{intermountainhealthcare.org/locations/primary-childrens-hospital/for-referring-number of the primary and t$ physicians/pediatric-grand-rounds/

- Tracking infectious disease activity in Utah: It's not "just a virus" anymore
- Jan 11 Twenty-five years of the bronchiolitis care process at Primary Children's Hospital Jan 18 Helping individuals with autism negotiate the healthcare system
- Jan 25 Gait abnormalities in children

EMS Grand Rounds (EGR) This offering alternates with Trauma Grand Rounds every other month, it is geared towards EMS. Live viewings qualify for CME credit.

There are 2 ways to watch

- receive CME for viewing this presentation live, email Zach Robinson (Zachary.robinson@hsc.utah.edu)
- Delayed viewing at your personal convenience, a week after the presentation at:

Peds EMS Lecture Series (PEL) Free monthly pediatric CME/CEU presentations from Primary Children's Emergency Department Attending Physicians to Utah's EMS. For more information contact Lynsey.Cooper@imail.org \*Currently on hold.

Project ECHO Burn and Soft Tissue Injury (ECHO) has a pediatric and adult component. CME/CEU and MD CME available https://crisisstandardsofcare.utah.edu click request access and follow instructions.

#### Upcoming Peds Classes, 2018

For PEPP and PALS classes throughout the state contact Andy Ostler <u>Aostler@utah.gov</u>

For PALS and ENPC classes in Filmore, Delta and MVH contact Kris Shields at shields57@gmail.com

#### Save the Date

February 16-17 Uintah Basin Emergency Care Conference www.2018UBECC.eventbrite.com There is no cost to attend but you must register!

February 22-23 40th annual Neonatal and Pediatric Transport Conference

April 11-12 Zero Fatalities Safety Summit

## **Emergency Medical Services for Children Utah Bureau of EMS and Preparedness**

Utah Department of Health Bureau of EMS and Preparedness Emergency Medical Services for Children 3760 S. Highland Drive, Room 133 Salt Lake City, UT 84106

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WE ARE ON THE WEB

HTTPS://BEMSP.UTAH.GOV/

The Emergency Medical Services for Children (EMSC) Program aims to ensure that emergency medical care for the ill and injured child or adolescent is well integrated into an emergency medical service system. We work to ensure that the system is backed by optimal resources and that the entire spectrum of emergency services (prevention, acute care, and rehabilitation) is provided to children and adolescents, no matter where they live, attend school or travel.

## Parting Shot ... Andy Ostler you are our hero!

