Pediatric Firearm Injury and Safety Symposium: Keeping Our Kids Safe

March 7, 2017 | 2:00 – 6:00 pm
Eric P. Newman Education Center, Medical Campus

Featuring:

- **Keynote Speaker, Ted Miller, PhD**  
  *Pacific Institute for Research & Evaluation*
- **Martin Keller, MD**  
  *Washington University School of Medicine and St. Louis Children’s Hospital*
- **Bo Kennedy, MD**  
  *Washington University School of Medicine and St. Louis Children’s Hospital*
- **Melissa Jonson-Reid, PhD, MSW**  
  *Washington University Brown School*

*Sponsored by the Gun Violence Prevention Initiative at the Institute for Public Health, Department of Pediatrics, Washington University School of Medicine and St. Louis Children’s Hospital.*
Stolen Youth: The Costs of Firearm Injury in America

Ted Miller, PhD
miller@pire.org, 240-441-2890

Americans Own More Guns Than Motor Vehicles

357 M
Guns

254 M
Motor Vehicles

Far More Households Own Motor Vehicles Than Guns

90%

40%

Guns
Motor Vehicles

Average # per Household That Owns

7.7

2.4

Guns
Motor Vehicles

Gun ownership is falling

% of households with guns, 1978-2010

Aims

- Number of firearm injuries
- Why we cost those injuries?
- Costs of firearm injuries
  - What’s in those costs
  - How to communicate those costs
Firearm Deaths

Surviving Inpatients

2014-2015 Deaths

% Male 2014-2015

Gunshot Deaths In St. Louis

Why Cost Firearm Injuries? Single Compact Metric

- Communication
- Problem size & risk assessment
- Advocacy
- Performance comparison
- Priority setting & resource allocation
- Program evaluation

Methods

Total cost = # cases * cost/case

Look at lifetime costs to society and costs paid by government due to incidents in 2014

3% discount rate to compute present value of future costs
Incidence: Gunshot Wounds

- National Vital Statistics Mortality
- National Electronic Injury Surveillance System All Injury Profile for hospital-admitted and ED-treated & released

Cost/Injury (2016 $)

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatality</td>
<td>$6,081,000</td>
</tr>
<tr>
<td>Hospital Admitted Survivor</td>
<td>$72,450</td>
</tr>
<tr>
<td>Treated in the ED &amp; Released</td>
<td>$6,370</td>
</tr>
</tbody>
</table>

Cost Categories

- Resource Costs
  - Medical
  - Mental health
  - Insurance claims processing
  - Employer
  - Police
  - Adjudication
  - Sanctioning

- Indirect & Intangible Costs
  - Wage & household work
  - Quality of life (including pain & suffering)

Which Is Largest for Firearm Incidents?

- Resource Costs (Medical, Adjudication & Sanctioning)
- Work Loss
- Quality of Life Loss

Gunshot Wounds Cost $251 B in 2014

- Medical: 2%
- Work: 17%
- Sanction: 3%
- Qual of Life: 78%

- Criminal Justice: 40%
- Medical: 30%
- Mental Health: 4%
- Public Services, Criminal: 2%

Perpetrator Work Loss: 11%
Employer: 4%

- Suicide 48%
- Assault 45%
- Police 3%
- Unintended 3%
- DK Intent 1%

How Can We Make $251 B Comprehensible?

USE A YARDSTICK
Firearm Incidents Cost 1.75 Times Alcohol-Impaired Driving in 2014

- $251B
- $142B

Firearms Impaired Driving

Divide by a Sensible Exposure Measure
- $785 per US Resident
- $5,370 per Household that Owns Guns
- People who live with a gun are much more likely to die from a gunshot wound

Cost per Gun

- $700

Gunshot Cost Per Resident (in 1990 US $)

- $490
- $180

US Canada
Gunshot Costs Per Gun

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>Canada</th>
</tr>
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<tbody>
<tr>
<td>$630</td>
<td></td>
<td>$840</td>
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Societal Injury Costs per Household that Owns a Device

<table>
<thead>
<tr>
<th></th>
<th>A Gun</th>
<th>A Car</th>
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<tr>
<td>$5,370</td>
<td></td>
<td>$5,520</td>
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Because Cars Were So Dangerous

- Registered the vehicles
- Licensed drivers after testing their skills
- Regulated vehicle design
- Some places now look at who sold the last drink in an impaired driving crash
- Started NHTSA in 1979

Did NHTSA Make a Difference?

- 51,000 people died in road crashes annually in 1978-1980
- 40,000 died in road crashes in 2016

Crash Deaths per 100 Million Vehicle Miles of Travel Dropped by 2/3s from 1979 to 2010

By Year, Motor Vehicle Deaths and the Deaths Averted by Selected Laws, 1990-2014: More Than 130K Deaths Averted
Firearm Injury Cost $6.3B in MO in 2012

Government, $344,831,000
Other Payers, $5,920,169,000

GSW Cost/Resident in 2012

How Do We Measure Lost Quality of Life?

How to Monetize

- Look at what people pay for safety
  10,000 people spend $650 on airbags
  Reduce risk of death by 1 in 10,000
  $650 x 10,000 = $6.5M

- Value of statistical life = work loss + QALY loss

For Homicide

- Extra wages for dangerous jobs
- Surveys re housing choice or policing levels
- The value per life that juries use in compensating assault victims

Costs of Firearm Injury by Age Group

0-14, 3.25 B
15-20, 24.4B
21 & Over, 223B
Gunshot Wounds Treated At St. Louis Children’s Hospital in 2014-2015 Cost $76 Million

Summary

- Firearm injuries largely occur after age 14
- Firearm injuries cost $250 B in 2014
- The cost was $700 per gun
- The total cost was 1.75 times as much as impaired driving
- We test & license drivers, register vehicles, and regulate vehicle safety
- Why should guns be treated differently than other products with strong hazard potential?
- Ask someone who lost a loved one to give the #s
Firearm Injuries in Children
A Tale of One City

Martin S. Keller, MD, FACS, FAAP
Associate Professor of Surgery
Trauma Medical Director
St. Louis Children’s Hospital
Washington University School of Medicine

Disclosure: Martin Keller, M.D.

No relevant financial interests to disclose.

Injury Mechanisms – SLCH 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Patients</th>
</tr>
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<tr>
<td>2008</td>
<td>84%</td>
</tr>
<tr>
<td>2009</td>
<td>16%</td>
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</table>

SLCH

- State designated Level 1 Pediatric Trauma Center since 1981
- American College of Surgeons verified Level 1 Pediatric Trauma Center since 2011
- ~1,500 patients / year into registry (~5-6% penetrating from GSW)

SLCH in Evolution 2008-Present

- Staffing:
  - Trauma Advanced Practice Nurse
  - 2 Trauma Registrars
  - Trauma PI Specialist
  - Partnership with Adolescent Medicine / SPOT
  - Dedicated Trauma Social Worker
  - Violence Intervention Program – EU

- System:
  - Simulation center
  - Innumerable lectures – on and off site
  - Massive Transfusion Protocol
"Gun Violence: The Real Epidemic"

- 1967-70 Detroit 130% increase
- 1982-87 Los Angeles 166% increase
- 1987-92 Alameda Co. 250% increase
- 1987-93 Chicago 148% increase

*J Trauma* 1995;39:487-491

**Gun Violence / Firearm Injuries: Background**

- 2013: St. Louis City ranked 2nd nationally in rate of youth killed by gun violence
- Larger metropolitan area ranked 9th

- Numerous local efforts in place:
  - Distribution of free gun locks
  - Outpatient violence intervention program SLCH 2011
  - Injury Free Coalition for Kids
  - Citywide involvement with other level 1 trauma centers
  - Media spots
  - Presentations to Legislature
  - Charities/Rallies
  - Midnight to 5am curfew for minor < 17 years in St Louis City

**Purpose**

- ….. to help improve preventative interventions by examining recent epidemiology and outcomes of pediatric gunshot wounds managed at our institutions.

**Methods**

- Retrospective review of children (age < 16 years) at region's Level-1 Pediatric Trauma Center from 2008-2013 injured by firearms
  - Both SLCH and CGCMC State designated Level-1 in Missouri and Illinois
  - SLCH American College of Surgeons Verified

- Demographics, timing and location of shooting, circumstances of shooting, type of firearm, mortality, injury severity, length of stay, and recidivism.
Results

- 398 children injured by firearms
  - 1 child every 9.2 days
    - Appendicitis – 1 child every 1.5 days
    - Pyloric stenosis – 1 child every 6 days
    - NEC – 1 child every 7 days
    - Short Gut Syndrome – 12 children per year
    - Wilm's tumors – 2-3 per year

- SLCH: 255 patients
- CGCMC: 143 patients

Where are Children in STL Getting Shot?

- 94 different zip codes
- 37% within a 7 zip code region

Pediatric GSW Victims per Year

Median income = "hot spots" < $25,000
Conclusions

- "Gun violence" is a misnomer
- Significant impact on child health
- All regions affected
- Intentional shootings have decreased in region - Maybe
- Accidental shootings have remained stable and a significant proportion of injuries
- Significant utilization of hospital resources
  - 54% Occurred between 6 PM to 12 AM
  - 50% Trauma stat activation
- Previous interventions may have limited return

Limitations of Study

- Retrospective, observational/epidemiologic study
- Multicenter?
  - Randomism - going to adult hospitals?
  - Data incomplete?

Conclusions/Future Directions

- Multifactorial etiology:
  - Intentional vs. accidental
  - Socioeconomics
  - Gun availability
  - Safety initiatives

- Concerning trends

Violence begets violence

February 2017 - SLCH
Where do we go from here?

- Better education to all at risk
- Gun safety initiatives within the home
- Gun lock programs
- Preventative health care
- Endorse national organizations position statements
- Legislation
- Collaboration
How Can Physicians Be Part of the Change?

Bo Kennedy, M.D.
Pediatric Emergency Medicine

Counseling Gun Safety: *How Can the Gulf Be Bridged?*

Focusing Guns Safety Counseling With Parents

Major areas of impact of gun violence

- **Suicide**
- **Accidental shooting**
- **Street violence**

Causes of Death: **1-24 yrs of age**

2014

- 6447 children & young people killed by guns
  - 1 out of 6 deaths
  - 1 of 4 Injury deaths
  - 18 deaths/day by gun

Gun-related deaths:

- 2X cancer
- 4X heart disease
- 6X respiratory ds


U.S. **Injury** Deaths: **10-14 yrs old**

2014

C.D.C.

1 of 4 Injury Deaths was by Firearm

Suicide: 2nd Leading Cause of Death in 10-24 year old youths 2014, C.D.C.

- Motor vehicle traffic injury
- Suicide
- Homicide

Firearm injuries in the pediatric population: A tale of one city
J Trauma Acute Care Surg. 2016

Cynthia M. Cred, MD, Charles Hong, MD, Sandeekha Balasubramaniam, MD, Angela Lamina-Brown, MD, Colonial M. Fitzpatrick, MD, and Marissa S. Krole, MD, St. Louis, Missouri

2008-2013: all pediatric firearm victims 16 years or younger (398)
Treated at St. Louis Children's or Cardinal Glennon Children's Hospitals

CDC National Ranking of pediatric (10–19 yrs) firearm-related mortality.
St. Louis City 2nd
St. Louis County & suburbs 9th

Firearm Suicide Rates by Age and Sex
(Rate per 100,000)

- 2/3 of deaths by firearms are suicides
- Firearms used in 44% of adolescent attempts.
- 90% effective vs 10% by other means.

Centers for Disease Control and Prevention (CDC), 2015

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“Despite a relative decrease in intentional firearm-related injuries, a constant rate of accidental shootings suggest an area for further intervention.”

A Gun in the Home Increases the Risk of Suicide
Brent, Am J Dis Child 1993

- 91 consecutive adolescent suicides, PA, 1986-1990
- Demographically matched controls
- 78% of suicides involved firearms

Method of Suicide and Availability of Firearms (n=67)

<table>
<thead>
<tr>
<th>Method of Suicide</th>
<th>Firearms in Home (%)</th>
<th>Other (n=20)</th>
<th>Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any gun</td>
<td>94%</td>
<td>32%</td>
<td>31.1</td>
</tr>
</tbody>
</table>
Who Owns Firearms Used in Adolescent Suicides?  
**Johnson, Sui & Life-Threat Behav 2010**

**63 Adolescent Firearm Suicides**
- CT, ME, UT, WI, San Francisco, Pittsburgh
- 92% non-Hispanic/white, 87% male, 75% age 15-17 yrs
- 52% used handguns
- 81% occurred in victim’s home
- 77% had received mental health care at some point
  - 19% in treat at time of death
- 75% of firearms owned by parents
  - 7% owned by relative
  - 18% owned by victim

Restricting Youth Suicide: Behavioral Health Patients in an Urban Pediatric ED.  

Chart review, random sample, 298 youths < 18 yrs of age –
evaluated in ED for a behavioral health or psychiatric complaint.
(n=2,294, Jan-Dec 2012) (Hartford, CT)
- 25% diagnosed Mood Disorder; 20% Depression
- 34% Suicidal Ideation; 22% had Suicide Plan
- 32% had documented Suicidal Behavior.
- 25% of patients reported having access to lethal means.
  - Only 4% counseled on Lethal Means Restriction.
  - Only 15% with access to lethal means counseled on LMR.

Are Household Firearms Stored Less Safely in Homes With Adolescents?  
**R. Johnson, Arch Pediatr Med 2006**

Survey of American College of Emerg Physicians. (n = 500)
- 59% did not own firearm.
- If physician owned firearm, kept it unlocked (34%), loaded (22%).
- 96% no formal firearm safety counseling training.

Most believed pts would not:
- View them as good source of info on firearm safety. (63%)
- Accept them providing firearm safety guidance (56%)
- Majority did not believe firearm safety counseling would impact firearm-related homicides (75%) or suicides (70%).

Lethal Means Access & Assessment Among Suicidal ED Patients.  
**Marion E. Betz, et al. Depression and Anxiety, 2016**

- 8 different EDs in 7 states across all 4 census regions.
- Pts > 18 yrs of age evaluated for suicidal ideation/attempt
- 1,358 participants; median age 36 yrs, 56% women.
Charts reviewed, patients interviewed separately by researchers.

- 11% overall had ≥ 1 gun in home
  [South: 26%; Midwest: 10-13%; West: 9-13%; Northeast: 6-7%]

- Only half of patients who reported a gun in the home had documented lethal means assessment.

Lethal Means Counseling for Parents of Youth Seeking Emergency Care for Suicidality.  

**QI Project:** Behavioral health clinicians who discharge plan for youth sent home after eval for suicidality in Denver Children’s Hospital ED:
1) 1.5 hr online training: www.sprc.org Suicide Prevention Resource Center: Counseling on Access to Lethal Means (CALM)
2) New EMR flow sheet prompted assessment of unlocked meds or guns in patient’s home.
3) 5 minute LMR counseling added as routine during regular discharge planning with parents.
4) Provided free lock box for medications
5) Urged temporary removal of guns from home

Results: 89% of 236 eligible families received Lethal Means Restriction counseling during ED discharge.

Follow-up phone call 2-3 weeks later:
- 76% reported all medications in home locked. (vs <10% at ED visit)
- All with guns in home at ED visit (24%) had guns locked. (vs 67% at ED visit).

Additional research is needed to determine if LMR lowers subsequent suicide attempts.

Focus on Guns Safety Counseling With Parents

Major areas of impact of gun violence
• Suicide
• Accidental shooting
• Street violence

SLCH Victims of Gun Violence
Younger Children Are More Frequent Victims


Changing Attitudes Towards Household Firearms

Do you think having a gun in the house makes it a safer place to be or a more dangerous place to be?

Source: Gallup
Parent Misperceptions: Their Children and Firearms

Baxley, Arch Pediatr Adolesc Med, 2006

201 parent-child dyads:
  – questioned separately about guns in their home.

Despite their parents believing otherwise;

Children < 10 years old:
  ● 73% knew where gun is stored
  ● 36% had handled the gun surreptitiously

Parents need to know these risks and effective ways to secure guns.

Children Find Guns, Play With Them, Pull the Trigger

Jackman, Pediatrics, July 2001

64 BOYS, 8-12 years old
  • In groups of 2 or 3 left in waiting room
  • .38 caliber handgun (disabled) concealed in desk drawer

72% discovered gun; 76% handled it
  ● 48% pulled trigger (73% from gun owning families)
    ● 47% thought it might be a toy
  ● 90% who handled gun / pulled trigger had prior gun safety instruction

Child Education Doesn’t Work

“Stop. Don’t touch. Run away. Tell a grown-up.”

• Learned gun avoidance message
• No effect on behavior
• Parental complacency
• Less supervision
• Unsafe storage


Young Children Can Fire Guns

Naureckas, Arch. of Ped Adolesc. Med. 1995

Able to pull trigger of 64 commercially available handguns:
  ● 25% of 3-4 year olds,
  ● 70% of 5-6 year olds,
  ● 90% of 7-8 year olds

What Are Parents Willing to Discuss With Their Pediatrician About Firearm Safety? A Parental Survey.

Jane Garbutt, J Pediatr 2016
Are Parents Willing to Discuss Firearm Safety With Their Pediatrician?

- 29-item self-report questionnaire, WU PAARC
  - Opinions regarding firearm safety counseling
  - Firearm ownership and storage habits
- Study Participants (N=1246, 91% answered)
  - 99% parent (81% mother, 18% father)
  - 84% at least some college education
  - 24% African American
  - 25% Medicaid Coverage
  - Median age child, 5 years (IQR 1-11)
  - Median number of children in home, 2 (IQR 1-3)

Pediatrician should: Ask about guns in the house?

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>66%</td>
<td>23%</td>
<td>11%</td>
</tr>
<tr>
<td>Gun Owners</td>
<td>58%</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>71%</td>
<td>18%</td>
<td></td>
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</tbody>
</table>

Pediatricians should: Advise about safe storage?

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Disagree</th>
<th>Don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>75%</td>
<td>17%</td>
<td>8%</td>
</tr>
<tr>
<td>Gun Owners</td>
<td>71%</td>
<td>22%</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>78%</td>
<td>13%</td>
<td></td>
</tr>
</tbody>
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Results

Firearm Owners = 36%
- 23% urban, 37% suburban; 59% rural
- 66% owned > 1 firearm

Unsafe storage
- 25% At least 1 firearm loaded
- 18% carried a firearm when leaving the house

52% parents reported their child is often in homes with a gun
- 38% pt’s own home
- 14% other home

Results (cont)

- 13% ask if guns at playmates’ homes
- 54% taught child firearm avoidance

Parent wanted to know:
- What age to discuss with child 48%
- How to discuss with child 47%
- How to discuss with friends’ parents 51%

If advised to not have firearms in the home for child safety, I would....

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<thead>
<tr>
<th></th>
<th>Total</th>
<th>Owners</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think it over</td>
<td>48%</td>
<td>49%</td>
<td>48%</td>
</tr>
<tr>
<td>Follow the advice*</td>
<td>35%</td>
<td>14%</td>
<td>47%</td>
</tr>
<tr>
<td>Ignore the advice*</td>
<td>11%</td>
<td>22%</td>
<td>4%</td>
</tr>
<tr>
<td>Be offended by the advice*</td>
<td>8%</td>
<td>14%</td>
<td>3%</td>
</tr>
</tbody>
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* p<0.001
Barriers to Discussion

- Lack of training
- Little time and competing priorities
- Low outcome expectancy
- Uncomfortable topic
- Physicians uncertain of what to say
- Don’t want to offend parents

Patient-centered care:
- guiding principle in medicine
- requires physician **cultural competence** for patient populations as defined by ethnic heritage, religious beliefs, sexual orientation, or other factors.

Physician’s attitude is important.
- Provide nonjudgmental firearm safety information empathetically,
- without explicit orders to do something,
- suggestions in line with shared decision making.

Respectfully educate patients about firearm safety
- Provide **statistics about risks of injury or death**;
- **Written educational materials** with resources may be seen as less judgmental.

To refine educational approaches:
- Physicians need to **collaborate with** a range of representatives from within the larger community of gun-owners to
- **Identify acceptable and effective strategies** for incorporating firearm safety counseling into clinical care.

**Test outcomes in large scale studies.**

Fundamental components of cultural competence include:
- **Respect for variation among cultures**, 
- Awareness of one’s own beliefs and practices,
- Interest in learning about other cultures and
- Developing skills to help cross-cultural communication,
- Acknowledgment that culturally competent practices support delivery of quality health care.

...firearm ownership can be seen as linked to membership in a particular culture.

Toddlers
- Want autonomy, intensely curious.
- Their “job” is to explore and test their environment

Preschool Children
- Fantasize and have magical thinking
- Often can’t differentiate real from toy

School-age Children
- Learning independence, attempt to make own decisions

Adolescents
- Frontal lobe executive functions developing but incomplete
- Impulsive behaviors
**Pediatric Healthcare Providers:**  
**Experts in Child Growth and Development**

**For Now:**

- Include gun safety counseling in your standard age-directed safety counseling.
  - Help parents realize gun safety programs for their children are important but do not reliably change children's behaviors.
  - Share potential for suicide.

- Provide materials with statistics on firearm injury, options for safe storage, links to additional resources.
EVERY DAY SURGEONS IN OUR TRAUMA CENTERS WITNESS THE DEATHS OF CHILDREN FROM FIREARM INJURIES. IN 2010, THERE WERE 2,711 CHILDREN (AGES 0 TO 19 YEARS) WHO DIED BY GUNSHOT, WITH ANOTHER 15,576 INJURED.

...BUT MANY MORE ARE IMPACTED

A recent national survey indicated that 8.5% of our children have witnessed a shooting and more experience indirect exposure...

Violence Becomes a Backdrop for Life

• Young people experience this trauma as impacting their everyday lives

We Need to Understand Trauma and Act

What is trauma?

• Trauma is defined in various ways but typically includes exposure to events or conditions like child abuse and neglect, domestic violence, community violence, war, etc. but may also include natural disasters, or accidents.

• Trauma can occur as a discrete event, can be repeated, or can be a cumulative experience across multiple forms of violence or negative events.

• Not all children that experience traumatic events will develop behavioral or mental health issues...but there is mounting evidence that accumulated trauma or recurring trauma tends to increase the risk.

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THE CRISIS WITHIN

Talking about the families of two girls who were shot and killed..."Poverty overwhelms their parents with debt, housing and transportation problems, and they struggle to keep the power on. Their family histories include sexual abuse, domestic violence, incarceration and foster care." Cambria, 2018

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One very prominent study, commonly referred to as ACES, found a “dose response” relationship between having had multiple adverse or traumatic experiences and long-term health consequences. Categories included: emotional, physical, and sexual abuse; emotional and physical neglect; witnessing domestic violence; growing up with mentally ill or substance abusing household members; loss of a parent; or having a household member incarcerated. The more categories endorsed the greater the risk of:

* Ischemic heart disease, cancer, sexually transmitted diseases, liver disease, headaches, premature mortality, smoking, alcohol abuse, obesity, illicit drug use, victimization or perpetration of domestic violence, unintended pregnancy, depressive disorders, anxiety, hallucinations, panic reactions, sleep disturbances, memory disturbances, poor anger control, and....

People are Finding Similar Things Even With Slightly Different Questions

This effect does not appear limited to different types of experiences:

- Other than direct physical injury, harm due to trauma is thought to occur through a variety of mechanisms: disrupted attachment (particularly following exposure among young children), overwhelming the stress reactivity response in the neural system, potentially creating structural deficits in the brain, interaction with hormonal changes in adolescence (fairly new in the literature), and through “allostatic load” which can include immune system and ultimately organ damage.

Our Bodies Are Wired to Respond to Stress

- First wave: Adrenaline gets released from the adrenal glands...which gives us that “fight or flight” capability - releases sugar, increases heart rate...
- After this first wave, cortisol may be released to continue to help us deal with stress by shutting down unnecessary functions, like reproduction and the immune system, in order to allow the body to direct all energies toward dealing with the stress at hand. It leaves sugar free in the blood to give us energy...

For limited stress this system activates and then returns to normal. Under continued assault the system malfunctions and may overproduce or underproduce the neurochemicals that are otherwise healthy. This can lead to a variety of negative emotional, behavioral and health outcomes.
Toxic Stress?

- Dr. Shonkoff and others popularized the term "toxic stress" to raise awareness of the detrimental effects of early stress on the developing brain.
- Debate exists as to both the relative importance of timing of trauma. For example, while the earliest years of brain development include critical milestones in many domains, there is emerging work on the adolescent brain that should lead us to be just as concerned with later trauma.
- It is important to understand both the important impact that gun violence may have on our children's development but also remember that the brain remains 'plastic' for a lot longer than we used to think and development is not just about time and experience...it's about the individual and the ongoing context.
- This also gives us hope in terms of response!

Things We Can See...
Pediatric Post-traumatic Stress Symptoms

- Some children and youth (estimates vary but usually under 25%) who experience trauma will develop PTSD which can manifest in problems sleeping, avoidance (emotional numbness), flashbacks, hyperarousal, and difficulty concentrating.
- Sometimes children and youth with problems of hyperarousal display aggressive or destructive behaviors. Younger children may regress to early stages (e.g., bedwetting), be very "clingy", etc.

Some Stress Responses May Have Other Consequences That Can Aggravate Trauma Outcomes...

- Sleep disturbance can be a consequence of exposure to trauma – which has significant associations with negative behaviors in research on adolescents.

Consequences of Insufficient Sleep in Adolescents (behavior & emotion)
- Difficulties with focused attention
- Irritability, Emotional lability
- Affect regulation & Cognitive Emotional Integration
- Direct effects on learning, memory consolidation

Impacts on Academic Achievement and Behaviors at School

- Exposure to violence, student fear, and low academic achievement: African-American males in the critical transition to high school

What Can We Do?

The Effects of Family and Community Violence Exposure Among Youth: Recommendations for Practice and Policy

Goal 2: We Have the Ability to Identify the Need

Table 1. Reported Maltreatment Incidents and Children, FY 2015 (Children's Division)
We Could Even Use Linked Data
Many Risk Factors (like ACES) = Likely CPS Reports


89.5% of children with seven risk factors (no PNC, medical, no father listed...) on birth record had a CPS report by age 5.

Goals 2 & 3: Building Trauma-informed Systems

- Although the research on outcomes is still scant, many are recommending this approach for child serving systems and it is consistent with theory and intervention research:
  1. Routinely screen for trauma exposure and related symptoms;
  2. Use culturally appropriate evidence-based assessment and treatment for traumatic stress and associated mental health symptoms;
  3. Make resources available to children, families, and providers on trauma exposure, its impact, and treatment;
  4. Engage in efforts to strengthen the resilience and protective factors of children and families impacted by and vulnerable to trauma;
  5. Address parent and caregiver trauma and its impact on the family system;
  6. Emphasize continuity of care and collaboration across child-service systems; and
  7. Maintain an environment of care for staff that addresses, minimizes, and treats secondary traumatic stress, and that increases staff resilience.

http://www.nctsn.org/resources/topics/creating-trauma-informed-systems

Goals 3: Build Protective Factors

Preventive
- Family, school support
- Strong parental coping mechanisms
- Attachment to supportive parent or significant adult
- Building on cultural strengths

We Have Things We Can Do!

"What is lacking is a general awareness that we have the tools available to us to address the impact of trauma in adults that lead to ACEs in children and poor health outcomes in adulthood," said Edward Machtinger, MD, a professor of medicine and director of the Women's HIV Program at UCSF. (Baker, 2016)

So What Are These Tools?

Goal 3: Build Protective Factors

Available Locally? Yes ... But Need More

Teen Outreach Program (TOP)

BOYS & GIRLS CLUBS OF GREAT ST LOUIS
Goal 3: Improving Access to Evidence-based Trauma Informed Intervention

Locally Available? Yes! ... But Need More

A few examples...

- Children’s Advocacy Services of Greater St Louis staff members are trained in multiple evidence-based treatment modalities including: Trauma-Focused Cognitive-Behavioral Therapy (TF-CBT), Parent-Child Interaction Therapy (PCIT), cognitive-behavioral treatment for children with sexual behavior problems. Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS), and Integrated Treatment for Complex Trauma. All of these treatment modalities have been identified as promising or established treatment options for traumatized children.

- Family Resource Center offers TF-CBT, PCIT, Eye Movement Desensitization and Reprocessing (EMDR) therapy and Cognitive Processing Therapy.

- St. Louis Center for Family Development provides trauma-informed mental health services to underserved individuals in St. Louis County and City, and offers training/consultation to other organizations in the region. Evidence-based approaches include Motivational Interviewing, Dialectical Behavior Therapy, TF-CBT, & Emotionally Focused Therapy.

- Washington University Physicians Trauma Response Program offers evidence-supported assessment and treatment for children who have experienced trauma and their families including TF-CBT

What Can We Do?

Social work, public health and others: University of Missouri St Louis’s Child Advocacy Studies (CAST) program prepares students across multiple disciplines to be trauma-informed professionals who respond appropriately to experiences of traumatic stress and maltreatment in children and adolescents.

Washington University’s Violence and Injury Prevention Concentration and Certificate Program. This package of courses, training opportunities and field experience focuses on violence and injury prevention in young families, youth, women and American Indian/Native Alaskan populations. For MPH students it is a concentration. For MSW students a certificate may be completed through elective credit courses and attendance at additional trainings.

Bringing Screening and Services Into the Community...

"The Healthy Kids Express program consists of three main express vans which provide free screenings and health services to populations that wouldn’t necessarily receive them."

We Can’t Forget About the Parents...

"If you want to interrupt ACEs, you have to help the adults heal," he [Machtinger] said. In recognition that parents who have unresolved ACEs will have their parenting skills affected... (Baker, 2016)
Coordination … The Role of Technology

- A role for “big data” – identification, coordination of care and monitoring outcomes
- It’s not science fiction, nor impossibly expensive....

At the Children’s Data Network, we use integrated administrative data to develop applied and actionable research projects, support cost-effective program evaluations, and attend to policy-relevant questions from partner agencies and other stakeholders. Our initial efforts have focused on the health and safety of children in Los Angeles County and throughout California.

Large and Small Scale Connections

- In the past, technology limited what could be done with systems that were not designed to talk to each other
- This is no longer the case. Data can be linked and shared from disparate systems and effectively managed for differing uses from case coordination to outcome monitoring to policy analyses. Effective data protection mechanisms exist...
- Does this replace human connections related to coordinating systems? No, but it does improve the speed and responsiveness of how we can support children and families who have experienced trauma. It also institutionalizes communication over time.

The Take Away Today

- The number of children physically injured by guns is alarming BUT...many of our children are exposed to trauma related to gun violence that have not been physically hurt themselves.
- Many of these same children experience multiple traumas in their lives that without effective intervention may lead to serious behavioral and health consequences.
- There are things we can and must do to support our children (and parents) WHILE we are also working to end the violence completely.
- There is work underway to improve our response but we need to continue to build these systems and improve them to assure that we have the ability to effectively meet the need. This means we have to track what we do and measure those outcomes and make sure what we are building is accessible, sufficient and effective.
- Bill Gates said “I am struck by how important measurement is to improving the human condition. You can achieve incredible progress if you set a clear goal and find a measure that will drive progress toward that goal” (2013).

They Need Us to Act on What We Know!

- Increase Public Awareness
- Improve Detection and Screening
- Increase Provision of Evidence-based Interventions
- Locate mental health in other service systems
- Coordinate and Collaborate (Voisin, 2007)
- Measure, Improve and Sustain....