Injuries in Indiana: Preventing Motor Vehicle Collisions

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Division of Trauma and Injury Prevention

Mission: To develop, implement and provide oversight of a statewide comprehensive trauma care system that

- Prevents injuries.
- Saves lives.
- Improves the care and outcomes of trauma victims.

Vision: Prevent Injuries in Indiana
Division of Trauma and Injury Prevention Staff

- Katie Gatz
  - Interim Director
- Camry Hess
  - Trauma Registry Data Analyst
- Murray Lawry
  - EMS Data Manager
- Jessica Skiba
  - Injury Prevention Epidemiologist
Objectives

- Identify the scope of motor vehicle collision (MVC) injuries in Indiana and U.S. in terms of:
  - Hospital Admissions
  - Emergency department (ED) Visits
  - Death

- Examine characteristics of MVC injuries

- Describe major risk and protective factors and demonstrate the ability to apply varied approaches to prevention
What is an Injury?

- Failure of tissue or a body part due to transfer of energy
  - Mechanical (majority)
  - Thermal
  - Electrical
  - Chemical
  - Ionizing radiation

- Injury results when energy load absorbed by body exceeds tolerance threshold

- Affect all regardless of age, race, or economic status
What is Injury?

- Injuries are **not** accidents!

- **Accident**: An unexpected occurrence, happening by chance

- **Injury**: A definable, correctable event, with specific risks for occurrence
Mechanism & Intent of Injury

**Mechanism:**
- Motor Vehicle Collisions
- Falls
- Firearms
- Fire/Burns/Scalds
- Poisoning
- Overexertion
- Struck By/Against

**Intent:**
- Unintentional
- Self-inflicted/Suicide
- Assault/Homicide
- Undetermined
- Other
Injury Pyramid

1) Adapted from Safe States Alliance (Formerly known as State and Territorial Injury Prevention Directors Association (STIPDA)): Safe States, 2003 Edition
Injuries in the United States

- More than 180,000 deaths per year
  - 1 person every 3 minutes
- 2.5 million people hospitalized each year
- 31.6 million treated in ED each year
- $406 billion in medical care and lost productivity each year


### 10 Leading Causes of Injury Deaths, US, 2010

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Number of Deaths</th>
<th>Percentage of All Deaths in Age Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Injury Deaths</td>
<td>183,301</td>
<td>100.0%</td>
</tr>
<tr>
<td>Unintentional MV Traffic</td>
<td>33,687</td>
<td>18.4%</td>
</tr>
<tr>
<td>Unintentional Poisoning</td>
<td>33,041</td>
<td>18.0%</td>
</tr>
<tr>
<td>Unintentional Fall</td>
<td>26,009</td>
<td>14.2%</td>
</tr>
<tr>
<td>Suicide Firearm</td>
<td>19,392</td>
<td>10.6%</td>
</tr>
<tr>
<td>Homicide Firearm</td>
<td>11,078</td>
<td>6.0%</td>
</tr>
<tr>
<td>Suicide Suffocation</td>
<td>9,493</td>
<td>5.2%</td>
</tr>
<tr>
<td>Suicide Poisoning</td>
<td>6,599</td>
<td>3.6%</td>
</tr>
<tr>
<td>Unintentional Suffocation</td>
<td>6,165</td>
<td>3.4%</td>
</tr>
<tr>
<td>Unintentional Unspecified</td>
<td>5,688</td>
<td>3.1%</td>
</tr>
<tr>
<td>Unintentional Drowning</td>
<td>3,782</td>
<td>2.1%</td>
</tr>
<tr>
<td>All Others</td>
<td>28,367</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

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Injuries in Indiana

- Number 1 killer of residents age 1-44 years
- More than 4,000 died from injuries in 2011
  - Fifth leading cause of death overall
  - Contributes to nearly 7% of all deaths in IN
- Nearly 34,500 hospitalizations for all injuries in 2011
- Unintentional injuries leading cause of Years of Potential Life Lost

4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
Definition of Motor Vehicle Traffic Collision

- Injury resulting from any vehicle incident known or assumed to be traveling on public roads, streets, or highways

- **Vehicle:**
  - Automobile
  - Vans
  - Bus
  - Trucks
  - Motorcycles
  - Other Motorized Vehicles
Definition of Motor Vehicle Traffic Collision

- Injury resulting from any vehicle *incident* known or assumed to be traveling on public roads, streets, or highways

- **Incident:**
  - Collision
  - Loss of Control
  - Crash
  - Other Event
MVT Injured Persons

- Injured person varies by event
  - Motorcyclist
  - Occupant
  - Pedal Cyclist
  - Pedestrian
  - Unspecified
Energy Transfers

- Three different collisions occur during an MVC event:
  - Vehicle Collision
  - Human Collision
  - Internal Organ Collision
- Energy is transferred at every stage of the crash
- Injury prevention goal to spread out energy transfer over time and space
MVC Injuries in the US

- Every 10 seconds someone in U.S. injured in MVC requiring treatment in an ED\(^5\)

- Every 12 minutes someone dies in MVC on U.S. road\(^5\)

- Nationally, MVC leading cause of death among ages 5-34\(^2\)

- Leading cause of death among children\(^2,6\)
  - A third of children who died in crashes in 2011 were not buckled up\(^6\)

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MVT Injuries in Indiana

- 3,166 hospitalizations in 2012 at an age-adjusted rate of 48.3 per 100,000\(^4\)
- 36,570 emergency department visits in 2012 at an age-adjusted rate of 568.9 per 100,000\(^4\)
- 777 total deaths from 703 crashes in 2013\(^7\)

\(^4\)Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
\(^7\)Indiana State Police, Fatality Analysis Reporting System (FARS).
Hospital Admissions for MVC by Injured Person, Indiana, 2011-2012

- Driver, 47.3%
- Passenger, 17.5%
- Motorcyclist, 18.5%
- Passenger on Motorcycle, 1.7%
- Rider of animal, 0.2%
- Pedal Cyclist, 2.0%
- Pedestrian, 7.2%
- Other spec. person, 0.8%
- Unspecified Person, 4.6%

4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
ED Visits for MVC by Injured Person, Indiana, 2011-2012

- Driver: 53.4%
- Passenger: 22.9%
- Unspecified: 11.5%
- Motorcyclist: 6.8%
- Pedestrian: 3.5%
- Pedal Cyclist: 1.3%
- Passenger on Motorcycle: 0.6%

4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
Risk and Protective Factors

Risk factors:
- Conditions or situations that increase the likelihood of future injury

Protective Factors
- Conditions or situations that decrease the likelihood of future injury
Risk Factors for Motor Vehicle Collisions

- Impaired Driving
  - Drunk Driving
  - Drugged Driving
- Speeding
- Risk Taking Behaviors
- Drowsy Driving

- Distracted Driving
  - Cell phones/ GPS
  - Passengers
  - Multitasking
- Inexperience
  - Inadequate Driving Skills
  - Poor Defensive Driving Skills
Risk Factors

- Risk factors that are modifiable
  - Safety belt use
  - Drinking and driving
  - Distracted Driving

- Risk factors that are not modifiable
  - Age
  - Gender
  - Weather
  - Time of day
Temporal Prevention Programs

- **Primary**: Prevents the occurrence of an injury
  - Pre-event phase: Speed limits, improved car engineering
  - Reduces level of exposure or risk factor

- **Secondary**: Identify & control injury process early
  - During event: Seat Belts, airbags, LATCH-system

- **Tertiary**: Strategy to prevent disability by restoring individuals to optimal level of functioning
  - Post-event: Rehabilitation
Injury Prevention: Proven Policy Solutions

- Reduce Alcohol-Impaired Driving
- Increase Safety Belt Use
- Improve Child Passenger Safety
- Improve Teen Driver Safety

Seatbelt Use

- Restrains a grown child or adult in crash
- Using seat belts reduces serious injuries and death in MVCs by ~50%\(^8,9\)
- Positioned over the strongest parts of the body\(^9\)
  - Lap belt across upper thighs
  - Shoulder belt across shoulder and chest
- Pregnant women recommended to wear seat belt


Indiana State Law requires use of a car seat or booster seat for children 7 years of age or younger.

Child restraint use is the most effective method for reducing MVC-related death in children\(^6\):
- Age & size appropriate
- Use every car trip, regardless of distance

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Child Passenger Safety

- Children $\leq 12$ safest when properly restrained in back seat\textsuperscript{10}
  - Middle of back seat is the safest for some vehicles
  - Airbags kill children riding in front seat

- Booster seats position seat belt to fit properly for smaller bodies

Use of Child Safety Seats Not Enough

- Must be installed correctly
  - 3 out of 4 car seats not used correctly

- Safety seat should not shift more than one inch side to side or front-to-back when pulled\(^ {11} \)
  - At or near the vehicle belt path
  - At path designated for the lower anchor straps

- Safety harness must fit child snugly
- Chest clip at armpit level

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Birth up to Age 2

- Buckle in rear-facing seat until
  - Age 2 OR
  - Reach weight limit of seat, OR
  - Reach height limit of seat

Age 2 to At Least Age 5

- Children should be buckled in forward-facing car seats when they outgrow rear-facing
  - Through at least age 5, OR
  - Reach weight limit of seat, OR
  - Reach height limit of seat

Age 5 up to Seat Belt Fits Properly

- When outgrow forward-facing seats, children should be buckled in booster seats
  - Age 5 through proper seat belt fit
  - Use seat belt when 57 inches tall

Seat Belt Use

- No need for booster once seat belt fits properly
  - Lap belt lays across the upper thigh, not stomach
  - Shoulder belt lays across chest, not neck
- Keep children ages 12 and under in the back seat
- Continue seat belt use for rest of life

Lower Anchors and Tethers for Children (LATCH)

- LATCH makes it easier to install child safety seats
  - Ensures child safety seat is installed correctly
  - Provides same level of protection as seat belt install
  - Lower attachments on child safety seats and set of tether anchors to hold seat in place
- Required in almost all cars and child safety seats manufactured after 9/2002

Lower Anchors and Tethers for Children (LATCH)

- **Tether Anchor** - Hardware in vehicle to connect to top tether strap hook

- **Top Tether Strap** - Strap on top rear of child restraint to connect to tether anchor

- **Lower Anchors** - Horizontal bar in vehicle seat bight to provide a secure anchor for the child restraint’s lower attachments

- **Lower Attachments** - Connects the child restraint to the lower anchor in vehicle

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ANGLE GUIDE FOR REAR-FACING INSTALLATIONS

Child seat is correctly installed when line above is parallel to ground while vehicle is parked on a level surface.

LATCH ≤ 40 lbs

Installation Information

LATCH ≤ 40 lbs

Lap Belt

Lap-Shoulder Belt
INSTALLATIONS

A child seat is correctly installed when the LATCH system is parallel to the ground while the vehicle is parked on a level surface.

LATCH ≤ 40 lbs

FORWARD-FACING BELT PATH

Lap Belt

Lap-Shoulder Belt

Installation Information

QR Code

[QR Code Image]
WARNING!

DEATH or SERIOUS INJURY can occur.

- Use only in a rear-facing position when using it with an infant weighing less than 20 lbs (9.1 kg).
- Use only with children who weigh between 5 and 65 lbs (2.3 and 29.4 kg) and whose height is 49 in. (124.5 cm) or less. Rear-facing for children who weigh between 5 and 40 lbs (2.3 and 18 kg) and forward-facing for children who weigh between 20 and 65 lbs (9.1 and 29.4 kg).
- Snugly adjust the belts provided with this child restraint around your child.
- Secure the top anchoring strap provided with this child restraint.
- Secure this child restraint with the vehicle's child restraint anchorage system if available or with a vehicle belt.
- Follow all instructions on this child restraint and in the written instructions located in the pocket behind the cover.
- Register your child restraint with the manufacturer.
- Do not use the lower anchors of the child restraint anchorage system (LATCH system) to attach this child restraint when restraining a child weighing more than 40 lbs (18 kg) with the internal harnesses of the child restraint.
- The provided infant positioning pillow must be used for children weighing 22 lbs (10 kg) or less in a rear-facing position.

Do not use over 22 lbs (10 kg) or in a forward-facing position.

This child restraint system conforms to all applicable Federal Motor Vehicle Safety Standards.

This Restraint is Certified for Use in Motor Vehicles and Aircraft.

Britax Child Safety, Inc. • www.BritaxUSA.com • 1-888-427-4829 • 1-704-409-1699

Patent/Patente: www.britaxusa.com/patents

Manufactured in Fort Mill, SC, USA
Automotive Safety Program has a network of 121 Child Safety Seat Inspection Stations across the state of Indiana
- Parents and caregivers can make an appointment
- Free child safety seat inspections by certified child passenger safety technician

1-800-KID-N-CAR
www.preventinjury.org

Safecar.gov App available
NHTSA’s toll free Auto Safety Hotline 1-888-327-4236
NHTSA Proposed Upgrades to Federal Motor Vehicle Safety Standards

- Include side impact test for car seats for children weighing up to 40 lbs
  - Sled Test to simulate “T-bone” crash
  - 12 month old & 3 year old child dummies to be used

- Three year timeframe for car-seat manufacturers to meet proposed requirements

- Proposed test estimate to save five lives and prevent 64 injuries per year

Teen Driving

- Per mile driven, teen drivers are four times more likely than adult drivers to crash

- Risk Factors:
  - Driver inexperience
  - Driving with teen passengers
  - Nighttime driving
  - Drowsy Driving
  - Not wearing seat belt
  - Distracted driving

5 to Drive: Teen Driving

- Rule 1: No Cell Phones
- Rule 2: No Extra Passengers
- Rule 3: No Speeding
- Rule 4: No Alcohol
- Rule 5: Always Buckle Up

Distracted Driving

- Cognitive Distraction: Take mind off the road
- Visual Distractions: Take eyes off the road
- Manual Distractions: Take hands off the wheel

- Not all three have to occur for a driver to be dangerously distracted
Behind the wheel there is no such thing as a small distraction.
GET THE MESSAGE.
TEXTING WHILE DRIVING IS A DEADLY DISTRACTION.

Join the conversation.
Visit DecideToDrive.org.

http://www.decidetodrive.org/
Decide to Drive Campaign

- Consciously make a decision each and every time you get behind the wheel to make driving your priority:

- Before you start your car:
  - Fasten your seat belt
  - Adjust seats, head rests, vehicle controls and mirrors
  - Put on any accessories you may need
  - Pre-select a radio station, CD, or playlist and adjust volume level to not mask emergency sirens
  - Enter an information in the navigation system before you depart or review maps and written directions before you drive

- Stop your vehicle in a safe area to deal with distraction

U Drive. U Text. U Pay

- U.S. Department of Transportation National Distracted Driving Enforcement and Advertising Campaign
April is Distracted Driving Awareness Month

Social Media contest with $5,000 scholarships
- Indiana high school & college students eligible
- Contest runs April 1-30, 2014

Keeping one’s hands on the wheel and eyes on the road is not just a safe driving practice – it’s the law.

www.txtl8r.in.gov
Collision Prevention

- Plan ahead. Allow yourself extra time.
- Use seat belts and car safety seats correctly and appropriately.
- Concentrate on driving
- Relax
- Get out of the way of aggressive drivers
- Drive the posted speed limit
- Identify alternative routes
- Use public transportation
- Accept being late
References

1) Adapted from Safe States Alliance (Formerly known as State and Territorial Injury Prevention Directors Association (STIPDA)): Safe States, 2003 Edition
4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
7) Indiana State Police, Fatality Analysis Reporting System (FARS).
Questions?

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