Motor Vehicle Collisions: Preventing Injuries & Distracted Driving

Jessica Skiba, MPH
Indiana State Department of Health

Lisa Hollister, RN, BSN
Parkview Trauma Center

Lisa Gray, RN, BSN
St. Mary's Medical Center

Indiana Emergency Response Conference
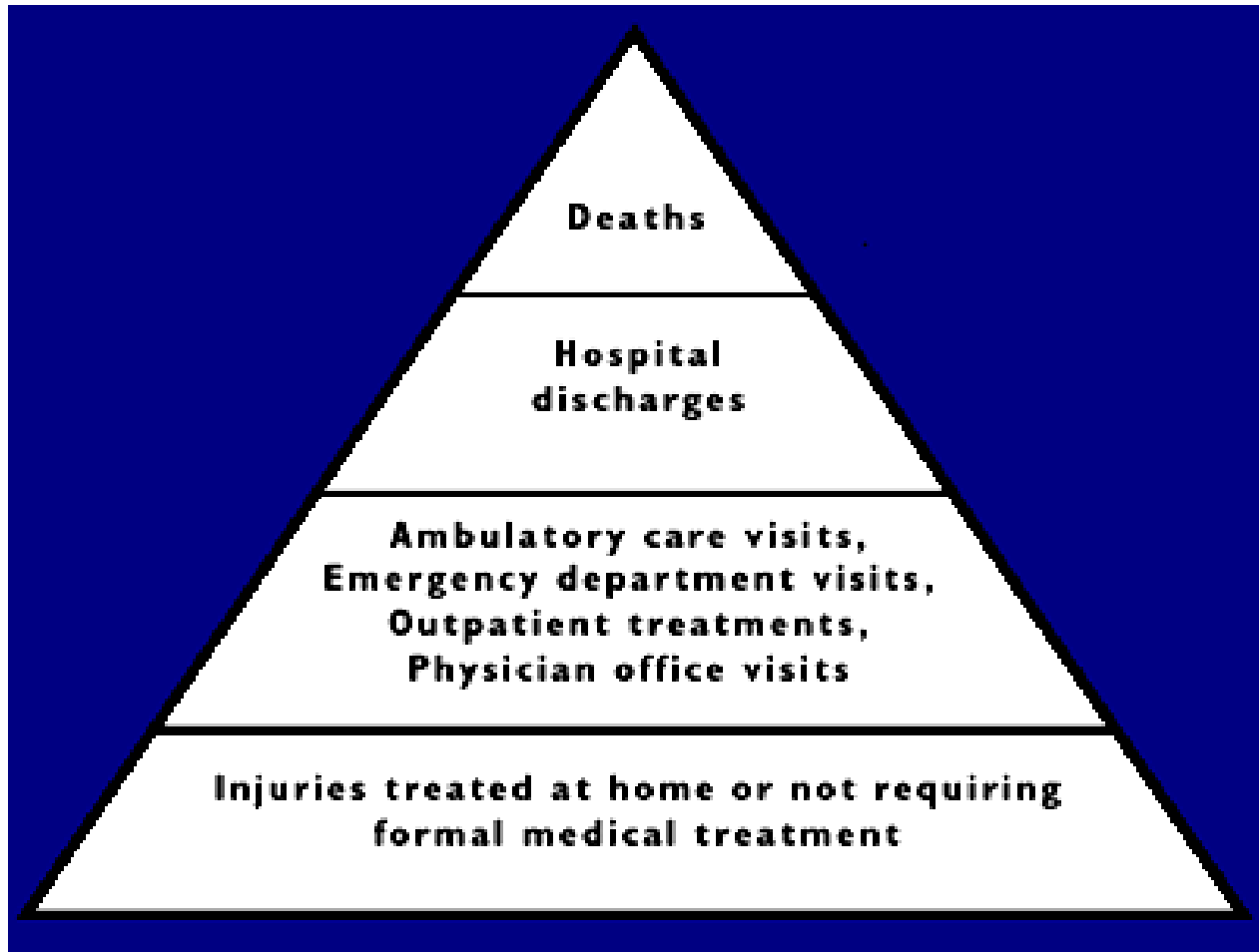Friday, July 22, 2014
Course: #2210

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

- Identify the scope and dangers of the texting and driving problem

- Apply the measures necessary to stop texting and driving and to spread awareness

What is an Injury?

▸ Not an Accident!

▸ 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 SES

Injury Pyramid

Deaths

Hospital discharges

Ambulatory care visits,
Emergency department visits,
Outpatient treatments,
Physician office visits

Injuries treated at home or not requiring
formal medical treatment

Injuries in the United States

- More than 180,000 deaths per year[2]
  - 1 person every 3 minutes[2]
- 2.5 million people hospitalized each year[2]
- 31.6 million treated in ED each year[2]
- $406 billion in medical care and lost productivity each year[3]
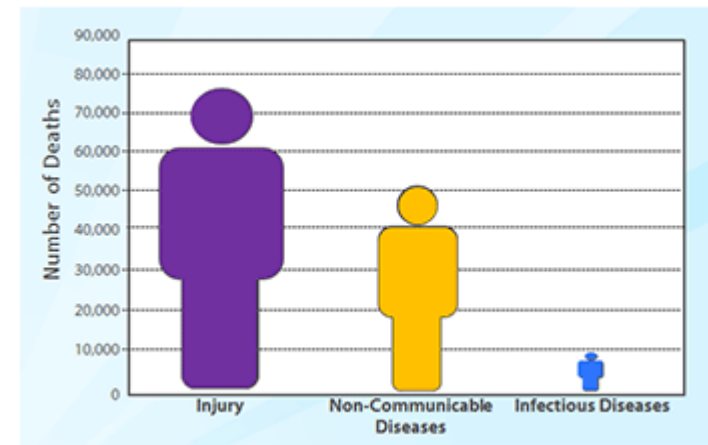
2) CDC. *Web-based Injury Statistics Query and Reporting System* (WISQARS) (Online) (2014). National Center for Injury Prevention and Control, CDC. Available from URL: http://www.cdc.gov/injury/wisqars/index.html.
3)Finkelstein EA, Corso PS, Miller TR, Associates. Incidence and Economic Burden of Injuries in the United States. New York, NY: Oxford University Press; 2006.

Injuries in Indiana

- Number 1 killer of residents age 1-44 years
- Nearly 4,200 died from injuries in 2012
  - Fifth leading cause of death overall
  - Contributes to nearly 7% of all deaths in IN
- Nearly 31,900 hospitalizations for injuries in 2013

- Unintentional injuries leading cause of Years of Potential Life Lost

4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team, 2014.

6

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

8

MVT Injured Persons

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

Energy Transfers

- Three different collisions occur during an MVC event at the same rate of speed
  ◦ Vehicle Collision
  ◦ Human Collision
  ◦ Internal Organ Collision

- Energy is transferred at every stage

- Most common form of rapid forward deceleration

Types of Collisions

- Head-On (drive into object)
- Lateral-Impact or T-Bone
- Rear-Impact
  - Double impact to front & rear
- Rollover
  - Occupants have greater chance of being ejected
  - 25 times more likely to die if ejected
  - Second impact may be more severe than initial impact

Vehicle Collision

- Initiates crash event
  - Vehicle crashes against object
  - Also called vehicle impact
  - Damage on front and/or back end, driver's or passenger's side, etc.

Human Collision

▸ Occupant collides with interior structures of vehicle

▸ Head-On
  ◦ Windshield spider web pattern
    · Hyperextension or flexion of C-spine; brain, scalp, face & neck injuries

  ◦ Steering Wheel
    · Soft tissue neck, larynx & tracheal, fractured sternum, myocardial contusion, pericardial tamponade, etc.

  ◦ Dashboard
    · Knee, femur, hip, pelvis injuries, head, face & C-spine injuries

Human Collision, continued

- Occupant collides with interior structures of vehicle

- Lateral
  - Intrusion of structure of car into occupant's space
    - Door, window, arm rest, etc.

- Rear-impact
  - Neck will end up hyperextended over top of headrest if headrest too low

Internal Organ Collision

▸ Internal organs continue to move until hit bony structures

▸ Head-On Collision
  ◦ Soft tissue injuries (lacerations, abrasions, bruising, contusions)
  ◦ Fractures to head, neck, chest and abdomen

▸ Lateral-Impact
  ◦ Head injury, C-spine injury, chest and abdomen injuries, upper arm, shoulder & clavicle injuries, pelvic, hip or femur injuries
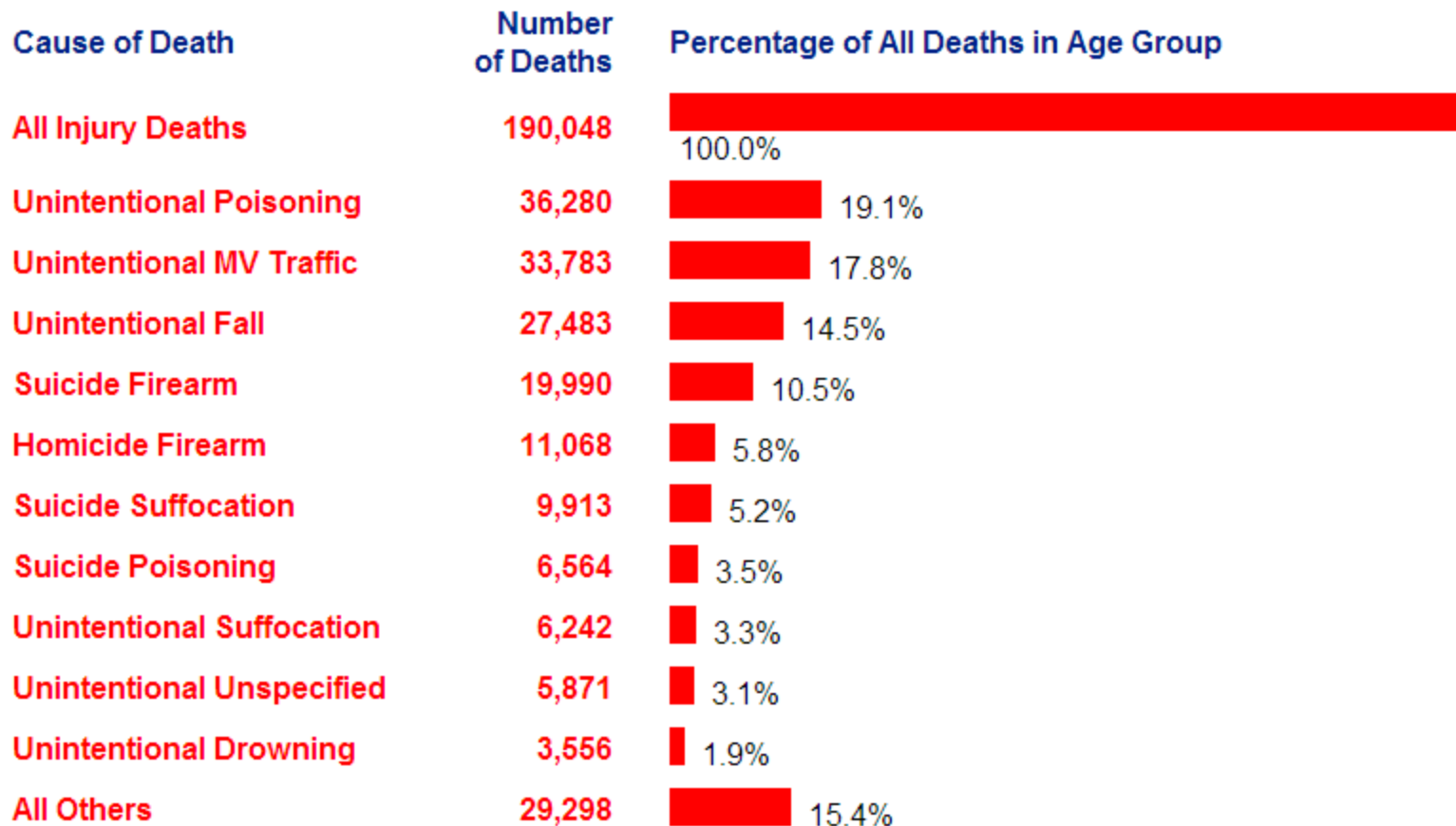
MVC Injuries in the US

- 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[6]

- Nationally, MVC leading cause of death among ages 5-34[2]

- Leading cause of death among children[2,7]
  - A third of children who died in crashes in 2011 were <u>not</u> buckled up[7]

2) CDC. *Web-based Injury Statistics Query and Reporting System* (WISQARS) (Online) (2012). National Center for Injury Prevention and Control, CDC. Available from URL: http://www.cdc.gov/injury/wisqars/index.html.
6) CDC. Save lives, save dollars. Prevent motor vehicle-related injuries.(2010). National Center for Injury Prevention and Control, CDC. Available from URL: http://www.cdc.gov/injury/pdfs/cost-MV-a.pdf
7) CDC. *Child passenger safety fact sheet*. U.S. Department of Health and Human Services, CDC. Available at http://www.cdc.gov/motorvehiclesafety/child_passenger_safety/cps-factsheet.html.

10 Leading Causes of Injury Deaths, US, 2011

Cause of Death	Number of Deaths	Percentage of All Deaths in Age Group
All Injury Deaths	190,048	100.0%
Unintentional Poisoning	36,280	19.1%
Unintentional MV Traffic	33,783	17.8%
Unintentional Fall	27,483	14.5%
Suicide Firearm	19,990	10.5%
Homicide Firearm	11,068	5.8%
Suicide Suffocation	9,913	5.2%
Suicide Poisoning	6,564	3.5%
Unintentional Suffocation	6,242	3.3%
Unintentional Unspecified	5,871	3.1%
Unintentional Drowning	3,556	1.9%
All Others	29,298	15.4%

2) CDC. *Web-based Injury Statistics Query and Reporting System* (WISQARS) (Online) (2014). National Center for Injury Prevention and Control, CDC. Available from URL: https://www.cdc.gov/injury/wisqars/index.html.

MVT Injuries in Indiana

- 34,182 emergency department visits in 2013 at an age-adjusted rate of 529.3 per 100,000[4]

- 2,631 hospital admissions in 2013 at an age-adjusted rate of 39.8 per 100,000[4]

- 783 total deaths from 709 crashes in 2013[8]
 - 781 total deaths from 720 crashes in 2012[8]

4)Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
8) Indiana State Police, Fatality Analysis Reporting System (FARS). Retrieved 7/25/2014
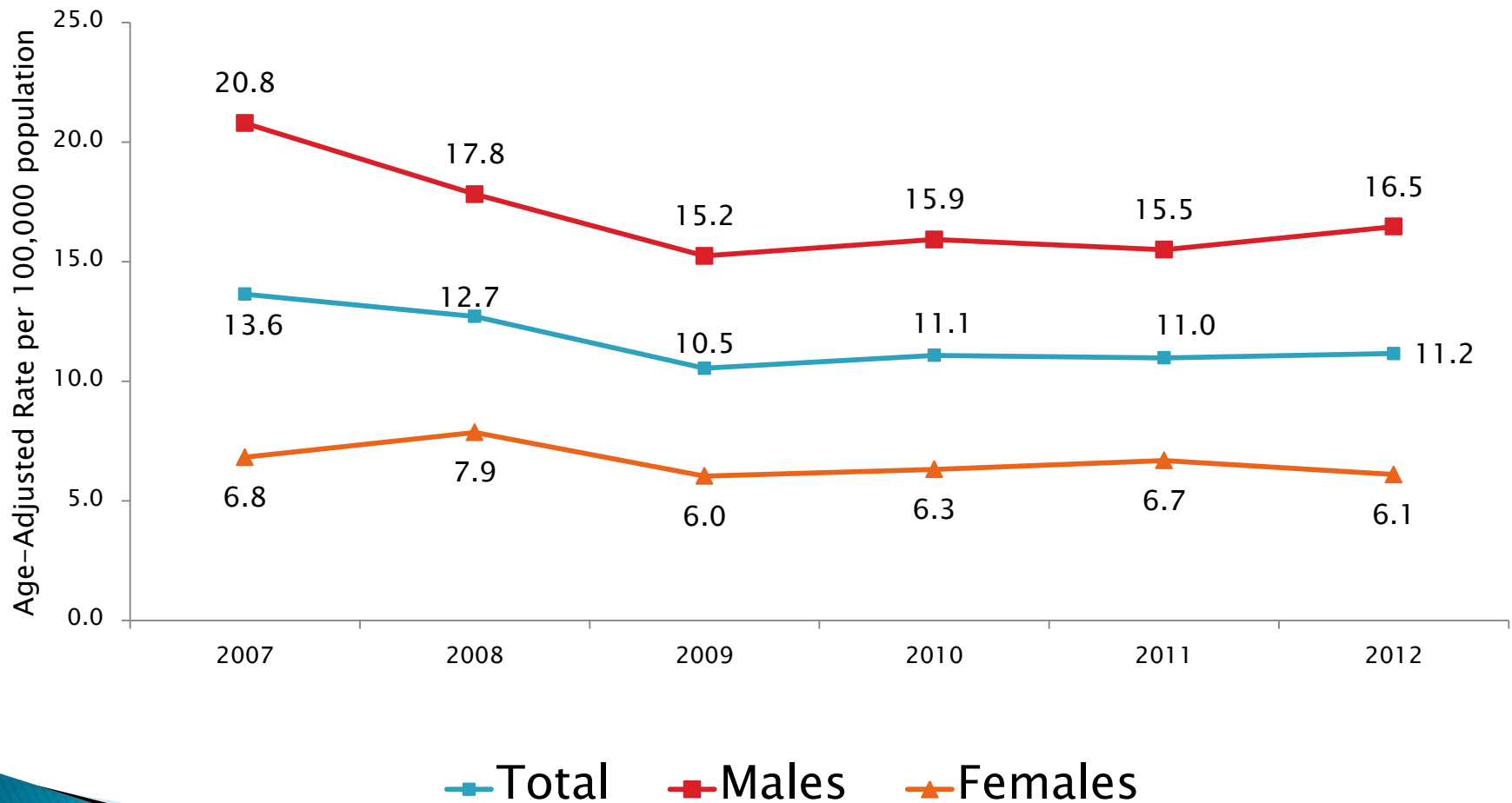
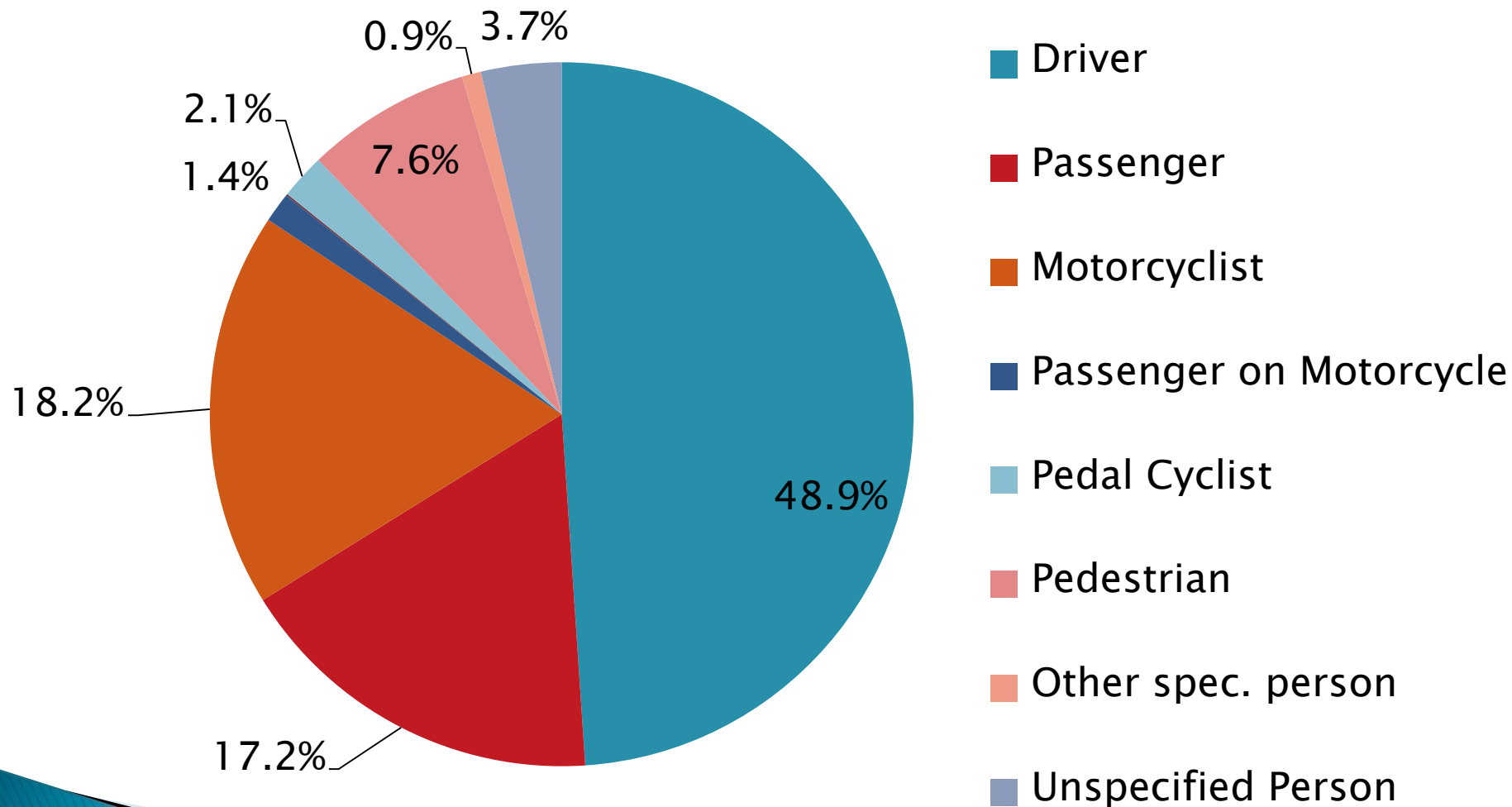# Age-Adjusted ED Visits, Indiana, 2007-2013

4)Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
Figure by Division of Trauma and Injury Prevention.

19
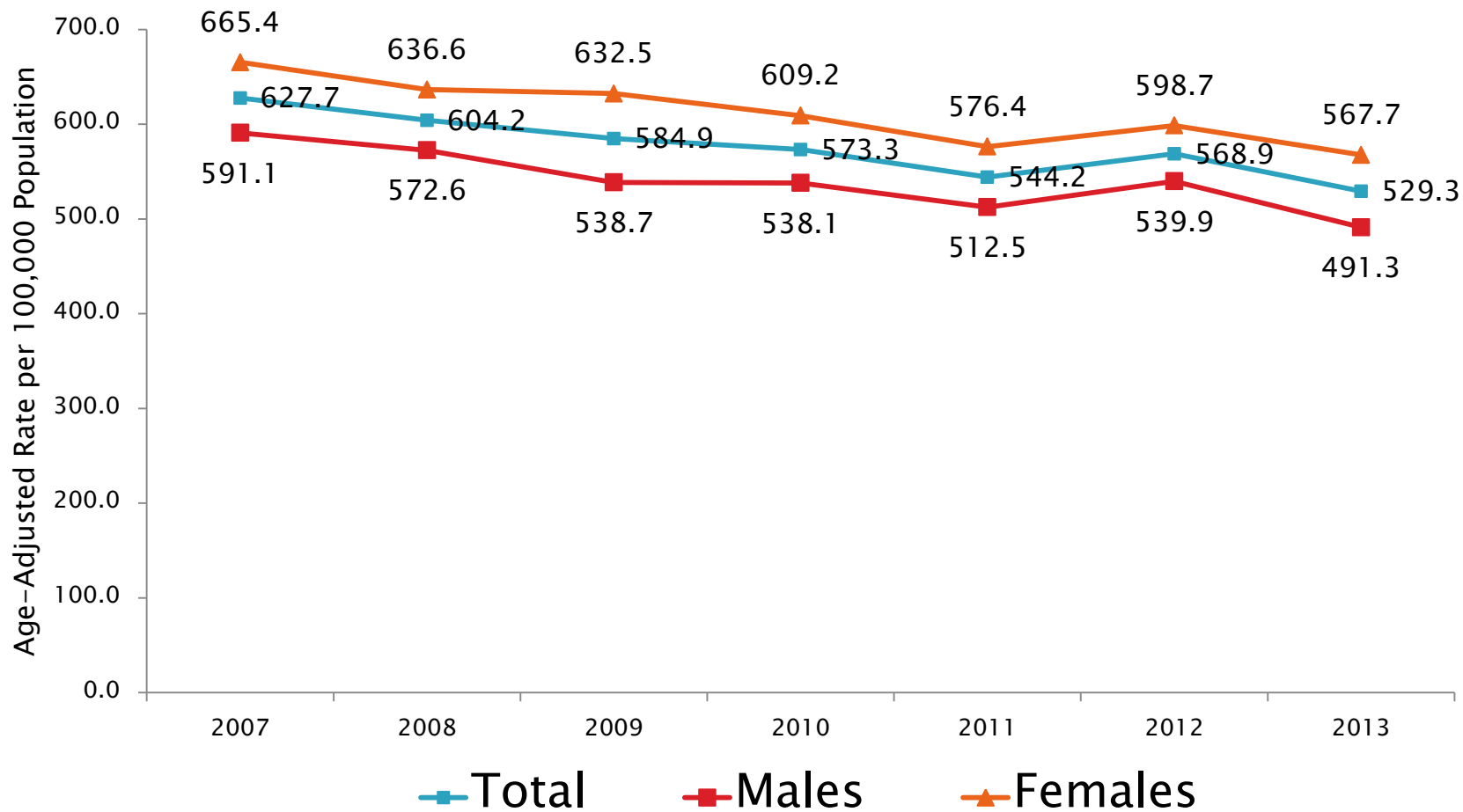
Age-Adjusted Hospital Admissions, Indiana, 2007-2013
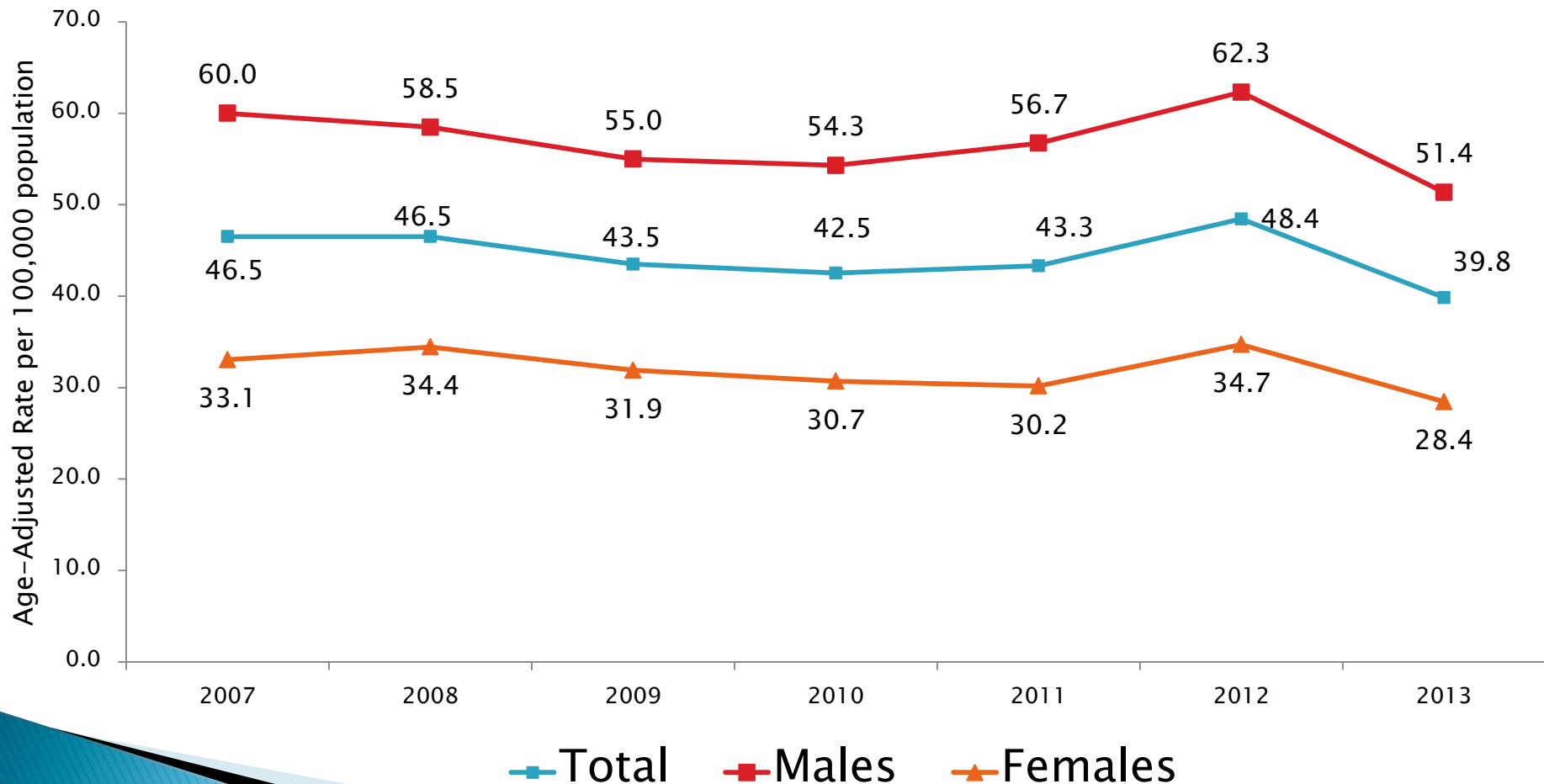
Age-Adjusted MVT Deaths, Indiana, 2007-2012

Age-Adjusted Rate per 100,000 population

Total — Males — Females

Hospital Admissions for MVC by Injured Person, Indiana, 2013

Legend:
- Driver
- Passenger
- Motorcyclist
- Passenger on Motorcycle
- Pedal Cyclist
- Pedestrian
- Other spec. person
- Unspecified Person

Values: 48.9%, 17.2%, 18.2%, 1.4%, 2.1%, 7.6%, 0.9%, 3.7%

4)Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team.
Figure by Division of Trauma and Injury Prevention.

ED Visits for MVC by Injured Person, Indiana, 2013

Pie chart legend:
- Driver — 53.6%
- Passenger — 22.6%
- Motorcyclist — 6.2%
- Passenger on Motorcycle — 0.5%
- Pedal Cyclist — 1.4%
- Pedestrian — 3.3%
- Other spec. person — 0.6%
- Unspecified Person — 11.8%
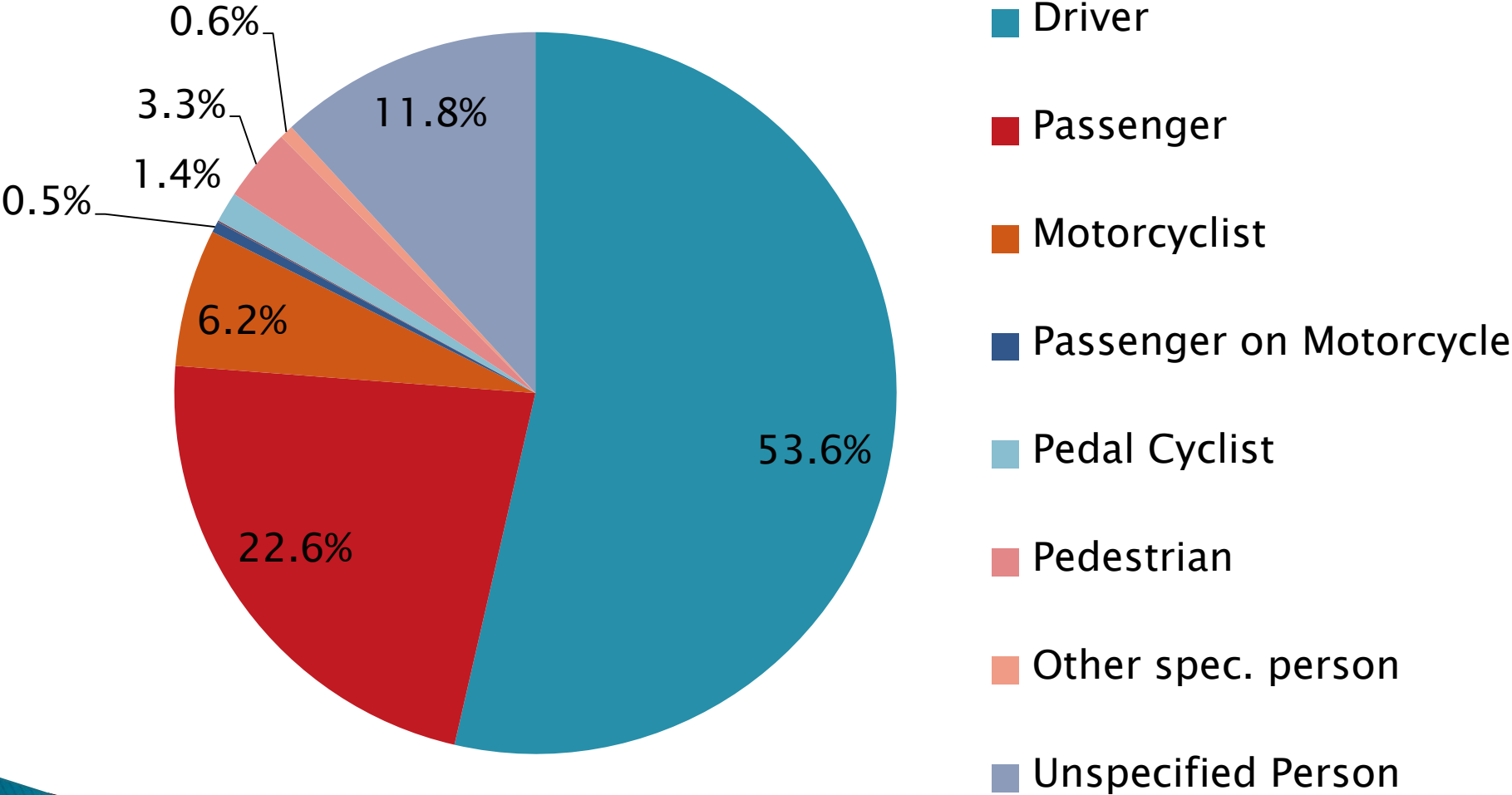
Risk Factors for Motor Vehicle Collisions

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

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

References

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

- 2) Centers for Disease Control and Prevention. *Web-based Injury Statistics Query and Reporting System* (WISQARS) (Online) (2014). National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Available from URL: http://www.cdc.gov/injury/wisqars/index.html.

- 3)Finkelstein EA, Corso PS, Miller TR, Associates. Incidence and Economic Burden of Injuries in the United States. New York, NY: Oxford University Press; 2006.

- 4) Indiana State Department of Health, Epidemiology Resource Center, Data Analysis Team, 2014.

- 5) LBFD EMS Education and Quality Management, http://www.lbfdtraining.com/emt.html.

- 6) Centers for Disease Control and Prevention. *Save lives, save dollars. Prevent motor vehicle-related injuries.*(2010). National Center for Injury Prevention and Control, Centers for Disease Control and Prevention. Available from URL: http://www.cdc.gov/injury/pdfs/cost-MV-a.pdf

- 7)Centers for Disease Control and Prevention. *Child passenger safety fact sheet.* U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Available at http://www.cdc.gov/motorvehiclesafety/child_passenger_safety/cps-factsheet.html.

- 8) Indiana State Police, Fatality Analysis Reporting System (FARS).

Questions?

Jessica Skiba, MPH
Injury Prevention Epidemiologist
Division of Trauma and Injury Prevention
Indiana State Department of Health

Email: JSkiba@isdh.in.gov
Phone: 317-233-7716

WHAT'S MORE IMPORTANT?
YOUR LIFE OR A MESSAGE.

DON'T TEXT & DRIVE.

...sa Hollister, RN, BSN, Parkview
...sa Gray, RN, BSN, St. Mary's

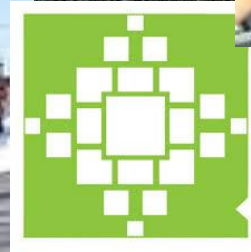PARKVIEW
TRAUMA CENTERS

DON'T TEXT & DRIVE.

Where did this begin?
Statistics: Jessica will give MVC stats

DON'T TEXT & DRIVE.

Who created:
Trauma Services, Marketing, and Community Health: A team

© 2010 Parkview Health Systems, Inc.
Used with permission.

DON'T TEXT & DRIVE.

Let's take this on the Road!
Evans Toyota
Billboards
Radio
St. Mary's
Universities
Parades
Seminar Events
Schools
Gas Stations
Simulators

PARKVIEW
TRAUMA CENTERS

DON'T TEXT & DRIVE.

Today:

St. Mary's Video

Parkview: Video or commercial

ST. MARY'S

PARKVIEW
TRAUMA CENTERS

DON'T TEXT & DRIVE.

What's next:

ST. MARY'S

PARKVIEW
TRAUMA CENTERS

Thank you!

ST. MARY'S

PARKVIEW
TRAUMA CENTERS