Distracted Driving

UNDERSTANDING THE DISTRACTED BRAIN

Sources - National Safety Council
U.S. Dept. of Transportation
City of Philadelphia
Pennsylvania Texting Ban Law March 8, 2012

Sponsored by Risk Management Division
Instructor: Keith Freeman
Course Topics

- Introductions
- Video
- Distraction related crashes and statistics
  - Texting while driving, Talking while driving, Distracted driving
- Driving Culture Change
  - Hands free devices, How Cell Phones Distracts, Cognitive Distraction
- Various Driving Distractions
  - Vehicle Related, Activities in Vehicles, Outside Vehicle, Other Distractions
- Multitasking – Myth or Possibility
  - Brain Drain, Inattention Blindness, Does Multitasking Impair Performance
- Prevention Steps & Tips
Pa Anti Texting Law Facts

- Pennsylvania’s anti-texting law, effective **March 8, 2012**, encourages motorists to put their full focus on driving.

- **What the Law Does**

- The law prohibits as a primary offense any driver from using an **Interactive Wireless Communication Device (IWCD)** to send, read or write a text-based communication while his or her vehicle is in motion.

- Defines an **IWCD** as a wireless phone, personal digital assistant, smart phone, portable or mobile computer or similar devices that can be used for texting, instant messaging, emailing or browsing the Internet.
Pa Anti Texting Law cont.

- Defines a text-based communication as a text message, instant message, email or other written communication composed or received on an IWCD.

- Institutes a $50 fine for convictions under this section.

- Makes clear that this law supersedes and preempts any local ordinances restricting the use of interactive wireless devices by drivers.

- The penalty is a summary offense with a $50 fine, plus court costs and other fees.
Pa Anti Texting Law cont.

- The violation carries no points as a penalty and will not be recorded on the driver record for non-commercial drivers. It will be recorded on commercial drivers’ records as a non-sanction violation.

- The texting ban does NOT include the use of a GPS device, a system or device that is physically or electronically integrated into the vehicle, or a communications device that is affixed to a mass transit vehicle, bus or school bus.

- The law does not authorize the seizure of an IWCD.
FACT

Motor Vehicle Accidents

- Number 1 cause of death
- An estimated **39,000 to 46,000 people are killed in crashes every year**
- More than 2.2 million injuries from crashes
- In 2010, there were **13,846** crashes in Pennsylvania where distracted driving played a role.
- There were **1,093** crashes statewide where at least one driver used a handheld phone, with 11 people losing their lives in those crashes.
FACT

Distractions now join alcohol & speeding as one of the leading factors in fatal & serious injury crashes

U.S. Department of Transportation reports:

- United States car accident deaths totaled (37,261)
  - Distracted driving related crashes claimed 5,474 lives.
  - Drunk driving deaths claimed 11,773 lives,

**There were 448,000 traffic injuries across the U.S.**

Distracted Driving

- Driver distractions are the leading factors in fatal and serious injury crashes

- 25 to 50% of vehicle crashes involve distracted driving

- Driver distractions are a factor in 4,000 to 8,000 crashes a day or 3 to 6 crashes a minute

- Cell phone users are 4 times more likely to crash

Millions of People are Talking on Cell Phones While Driving

- **11%** of drivers on the road at any point during the day are on cell phones

- **81%** of drivers admit to talking on cell phone while driving and of this percentage:
  
  ◦ **74%** of Boomers – 1946 to 1960’s
  ◦ **88%** of Gen X – 1960’s to 1980’s
  ◦ **89%** of Gen Y – 1980’s to 1990’s

  ◦ Source Data NHTA White Paper Report -2010
Millions of People are Texting While Driving

- **18%** of drivers admit to texting while driving and of this percentage:
  - 4% of Boomers
  - 15% of Gen X
  - 39% of Gen Y
  - 36% of Teen Drivers

Source Data: NHTA White Paper Report - 2010
What could have led to this?
Driving Culture Change

A century ago, Model T’s brought motoring to an emerging middle class.

A half century ago, teenagers cuddled in convertibles at drive-in movies.

A new generation of drivers see cars as an extension of their plugged-in lives, with iPods, DVD players and other gadgets.

USA Today, 2-17-2009
Driving Culture Change

- Webster’s Dictionary named “distracted driving” as its 2009 Word of the Year

- In 2009:
  - More than 200 state bills were introduced to ban cell phone use and texting while driving
  - U.S. DOT held a Distracted Driving Summit
  - President Obama signed an Executive Order to ban Federal employees from texting while driving
  - Favorable public opinion polls showed support to the efforts
Remember this accident?
How Cell Phones Distract

- Visual – Eyes off road
- Mechanical – Hands off wheel
- Cognitive – Mind off driving

Drivers don’t understand or realize that talking on a cell phone distracts the brain and takes the focus away from the primary task of driving.
What is a Hands-Free Device?

- Headset that communicates via wire or wireless connection to cell phone

- Factory-installed or aftermarket feature built into vehicle (voice recognition)
The Problem

• Hands-free is seen as the solution and mistakenly believed to be safer than handheld

• People recognize the risk of talking on handheld devices and texting more than the risk of hands-free

• Most legislation focuses on only handheld devices or texting

• All state laws and some employer policies allow hands-free devices

* Hands-free devices offer little safety benefits when driving
Cognitive Distraction

Your mind is not on the task

- Cognitive distraction still exists with hands-free
  - Mind focuses on conversation
  - Listen and respond to disembodied voice
  - Talking occurs on both handheld and hands-free cell phones

* Hands-free devices do not eliminate cognitive distraction
Cognitive Distraction?
Passenger Conversations While Driving

Isn’t that a distraction as well?

- Adult passengers share awareness of the driving situation, which is a safety benefit

- Front seat passengers reduce risk of crashing by 38% compared to cell phone conversations

- Adults with passengers have lower crash rates than adults without passengers
Driving Distractions

Only Cell Phones and Texting?

NO…. There are many other distractions:

• Vehicle-related
• Activities in Vehicles
• Outside the Vehicle
• Other Distractions
Driving Distractions

- **Vehicle-related**
  - GPS / Navigation
    - Eyes focused on display and not the road
    - Takes your mind off driving by listening to instructions
  - Radio/Music
    - Adjusting volume and stations
    - Manipulating CD’s & tapes
    - Controlling IPods / MP3’s
Driving Distractions

- **Vehicle-related (cont.)**
  - Climate Control
    - Adjusting Temperature Settings, Fan Speed
  - Dashboard Readouts
    - Speedometer / Tachometer (RPMs)
    - Trip Odometer / Fuel Efficiency
  - Mirrors
    - Checking All Mirrors and Adjusting
  - Gears / Shifting
    - One Hand Off the Wheel
Driving Distractions

- Activities in Vehicles
  - Eating & Drinking
  - Smoking
    - One hand off the wheel
    - The other holding the cigarette
  - Car Dancing
    - Dancing to the beat while driving
Driving Distractions

- Activities in Vehicles (cont.)
  - Daydreaming
    - Work or home related, children, vacation
  - Personal hygiene
    - Applying make-up
    - Grooming Hair
    - Shaving
Driving Distractions

- **Outside the Vehicle**
  - Traffic
    - Other vehicles, traffic lights, congestion
  - Billboards / Signs
    - Takes your mind off the road
  - Pedestrians
    - Crossing the street and against the light
    - Crossing in the middle of the block
    - Children playing
Driving Distractions

- Outside the Vehicle (cont.)
  - Construction
    - Oversized vehicles, unusual equipment
  - Emergency Vehicles
    - Fire, Police, EMS
  - Aggressive Drivers
    - Lane changing, speeding
  - Potholes / Street Defects
Driving Distractions

• Other Distractions
  ◦ Road Maps (paper type)
    • Unfolding the paper to read
  ◦ Driving Directions
    • MapQuest, Google Maps, Yahoo! Local Maps
  ◦ Reading (books, magazines, etc.)
    • Placing the book or paper on the steering wheel
  ◦ Lateness / Time Demands
Driving Distractions

Other Distractions (cont.)

◦ Children in Cars
  • Using rear view mirror to watch them
  • Talking to them while looking

◦ Loose Objects in Vehicle
  • Dropping a CD or phone.
  • Objects rolling around in the vehicle

◦ Lost / Trip Planning

◦ Stress
  • Home or work related, divorce, death or it may be financial related
Let’s take a break!

10 minutes
WHAT IS MULTI – TASKING?

Is it possible or is it a myth?
Multitasking: A Brain Drain

- Multitasking for the brain is a **myth**
- Human brains do not perform two tasks at same time
  - Brain handles tasks sequentially
  - Brain switches between one task and another

The four lobes of the brain.

Source: National Institutes of Health
Multitasking: A Brain Drain

Brain engages in a constant process to:

1. **Select** information brain will attend to
2. **Process** information
3. **Encode** to create memory
4. **Store** information

It must also:

5. **Retrieve**
6. **Execute** or act on information

*When brain is overloaded these steps are affected*
Multitasking: A Brain Drain

Encoding Stage

- Brain filters information due to overload
- Drivers not aware of information filtered out
- Information does not get into memory
- Drivers miss critical information on potential hazards

Inattention blindness and encoding.
Multitasking: A Brain Drain

- Brain juggles tasks, focus and attention
- Brain switches between primary and secondary tasks
- **Bottleneck**
  - Different regions of brain must pull from a shared and limited resource for unrelated tasks
Multitasking: Impairs Performance


MRI pictures of brain were taken while subject listened to sentences and used a driving simulator

Let’s see the results…
Inattention Blindness

Where drivers are not using a hands-free cell phone looked

Where drivers are using a hands-free cell phone looked
(1) Driving alone

(2) Driving with sentence listening

Functional magnetic resonance imaging images.

Source: Carnegie Mellon University
Multitasking: Impairs Performance

- Just listening to sentences on cell phones decreased activity by 37% in the brain’s parietal lobe which perceives movement, integrates sensory information and also has importance for language processing.

- Listening and language comprehension drew cognitive resources away from driving.

- Decreased activity in brain’s occipital lobe which processes visual information.
Inattention Blindness

- A type of cognitive distraction “looking” but not “seeing”
- Occurs when people do 2 cognitively complex tasks (driving and using a cell phone), causing brain to shift focus
- Hands-free drivers are less likely to see:
  - High and low relevant objects
  - Visual cues
  - Exits, red lights and stop signs
  - Navigational signage
  - Content of objects
ANOTHER TYPE OF DISTRACTION
What could have caused this?
Multitasking: Impairs Performance

- We can walk and chew gum safely because it is not a cognitively-demanding task
- But even cell phone-using pedestrians act unsafely. They are less likely to:
  - Look for traffic before stepping into street
  - Look at traffic while crossing street
  - Notice unusual objects placed along path

*Driving involves a more complex set of tasks than walking:*

- Visual, Manual, Cognitive, Auditory
Reminder!

More than 1.6 million crashes are caused by cell phone use while driving each year and countless lives have been lost as a result.

A driver’s job is to watch for hazards, but this cannot be done when brain is overloaded.
Reaction Time

- If your vehicle is traveling 40 mph and you have to brake, you will travel 120 feet before stopping.

- If you have a heated conversation with a passenger at 66 mph and looked away for 2 seconds you will travel 88 feet per second.

- Even if you pay attention and do everything right it still takes 1-2 seconds to recognize and another 1-2 seconds to react.
Prevention Steps

- Education and Awareness
- Company cell phone and texting bans
- Legislation
- Law enforcement
- Technology

“Keep your mind on the task of driving”
Prevention Tips

Tips to avoid or minimize distracted driving

1. Cell phones: Ignore it, place phone on silent, or turn it off when you get in the vehicle

2. Turn down the radio or have your music loaded before you go

3. Do your grooming before or after you drive

4. Don’t look at your passengers to have a conversation

5. Don’t stare at children in the back seat while driving

6. Tired? Don’t drive
7. No eating or drinking while driving
8. Leave for your destination on time
9. Plan for your trip to avoid getting lost
10. Don’t try to retrieve objects that fall while driving
11. Don’t read while driving (maps, newspapers etc)
12. GPS – you can listen to it, but you don’t have to look at it
13. Daydreaming – this happens in familiar areas
Help us save lives. 
Tell everyone you know.

On the Road, off the Phone