Disclosure Statement

Joseph O’Neil
Neither I nor my family have financial relationships or interests (currently or within the past 12 months) with any entity producing health care goods or services consumed by, or used on, patients related to the content of this CME activity.

Charles Vits
I work for IMMI, manufacturer of SafeGuard school bus seats with lap-shoulder belts, as discussed in this CME activity.
A Tragic Week in March

• Tragic 3 days in March
• 5 bus crashes in 3 days
• 1 driver fatality + 1 child fatality + 10 children injured
Objectives

• School bus-related injuries and fatalities
• Current school bus design
• Pros and cons of adding of seat belts to school bus
• Your role
Travel Facts

School-related travel

- 450,000 public school buses
- 4.3 billion miles transporting
- 23.5 million children
School transportation-related crashes

Average Fatalities Per Year

- Outside Bus: 13 (68%)
- Inside Bus: 6 (32%)

School bus or a non-school bus vehicle functioning as a school bus transporting children to or from school-related activities

NHTSA, DOT HS 811 396, 3-2011
17,000 Average Injuries* Per Year

- **7,200** (42%) Non-crash injuries
- **9,800** (58%) Involving crashes

*Injuries treated in emergency rooms

Are school buses safe?

• An estimated 17,000 injuries are treated US emergency departments each year of which 42.3% (7,200) are due to motor vehicle crashes
  – Head injuries observed in 31% children injured in motor vehicle crashes
  – 81% neck injuries treated due to school bus motor vehicle crash

Are school buses safe?

- School buses are nearly 7-times safer in protecting child passengers from motor vehicle related fatalities than other passenger vehicles
  - School bus occupant fatality rate is 0.2 fatalities per 100 million VMT*
  - Passenger motor vehicle fatality rate is 1.44 fatalities per 100 million VMT

*Vehicle miles traveled NHTSH 2006
How do school buses protect
How do school buses protect?

- 27 applicable FMVSS’s
- 5 unique to school buses
- Differences of mass, size, floor height, and color

FMVSS 220 School Bus Rollover Protection Body Structure

FMVSS 217 Emergency Exits

FMVSS 221 School Bus Body Joint Strength between body panels and supporting structure.

FMVSS 131 Traffic Controls Flashing lights Stop arm
Compartmentalization

- FMVSS 222
- Lap (Lap-shoulder since Oct, 2011) belts required in school buses ≤ 10,000 lbs GVWR
What is Compartmentalization?

Passive protection for **UNBELTED** passengers

Passengers remain in compartment between seats

Seat backs absorb passenger crash energy
What is Compartmentalization?

Passive protection for *UNBELTED* passengers
It’s Incomplete

• Kids must be in the “compartment”
• Designed for low-speed, frontal crashes

National Transportation Safety Board study of school bus crashworthiness found compartmentalization provided incomplete protection to passengers during rollover and lateral impact crashes (NTSB, 1999)
Inside Bus During Frontal Crash
Side Roll

Front Row: Lap-shoulder belts
Back Row: Unbelted
Ohio School Bus Rollover

Actual Rollover Crash Footage
Is compartmentalization enough protection?
Recent school bus crashes

- Tragic 3 days in March
- 5 bus crashes in 3 days
- 1 driver fatality + 1 child fatality
- 3 crashes were rollovers
Why seat belts on the school bus?

- Safety
- Driver satisfaction
- Student behavior
- Lifelong buckle-up habit
Non-Crash Injuries

Bartholomew County Consolidated Schools Indiana
Why seat belts on the school bus?

Buckled students equals less driver distraction and decreased behavior problems.

Driver satisfaction
Driver Satisfaction

Buffalo Public Schools
Buffalo, NY

Joanne Schmigiel
Bus Driver, Buffalo Public Schools
Why seat belts on the school bus?

student behavior

Keeping children seated greatly reduces unruly behavior and bullying

52% school bus drivers report bullying is a serious problem on the bus

Source: The Bully Project, 2012
Why seat belts on the school bus?

student behavior

1 in 3 school-aged children are bullied each year

Location of bullying:
1. Inside school building
2. Outside on school grounds
3. School bus

Bullying

Bartholomew County Consolidated Schools Indiana
Why seat belts on the school bus?

lifelong buckle-up habit

Safety education starts on the bus. Buckling up on every ride provides a consistent education.

Infants  Driving Teen
Why seat belts on the school bus?

85% parents want lap-shoulder belts in school buses

Many parents choose to transport children in personal vehicles

Source: 2007 American School Bus Council
Lap-shoulder belts for today’s school bus
School Bus Safety Leader

2002 First Lap-shoulder belts with SmartFrame
Lap-shoulder belts today
Lap-shoulder belts today

Adjustable shoulder belts
Locking Latch Plate
SmartFrame for unbelted protection
Lap-shoulder belts today

No Capacity Loss

Flexible seating

3 Smaller Students

2 Larger Students

SafeGuard® FlexSeat
Issues - Cost

5 Years Ago
$10,000 - $12,000 per bus

Today
$7,000 - $9,000 per bus

Potential Savings

Reduced driver distraction = Crash avoidance
Injury reduction in both crash and non-crash events

Preventing just one injury results in tremendous savings
Issues – Usage

States requiring belts on school buses

- Lap Belts
- Lap-Shoulder Belts
Issues – Usage

States requiring belts on school buses

- Lap Belts
- Lap-Shoulder Belts
Issues – Required Usage

States requiring belts on school buses

- Lap Belts
- Lap-Shoulder Belts

L/S Belts in Local Districts
Issues – Required Usage

Do you have to wear your seat belt on the bus?

New York: Up to school boards

New Jersey, Texas, California & Florida: State Requirement but enforcement up to local district. Employees are not responsible for requiring students to buckle up.

States requiring belts on school buses
- Lap Belts
- Lap-Shoulder Belts

L/S Belts in Local Districts
Issues – Resistance to change

• For over 35 years school bus transportation officials have stated:
  – Compartmentalization is adequate
  – Lap-shoulder belts are unnecessary

250,000+ children are protected daily with SafeGuard seats
Recommendations

NHTSA crash testing showed school bus passengers were better protected from head injury with a lap-shoulder belt compared with compartmentalization and lap belt only (NHTSA, 2002)

The AAP has had a long-standing position that new school buses should have safety restraints. (AAP, 2012)

National Transportation Safety Board study of school bus crashworthiness found compartmentalization provided incomplete protection to passengers during rollover and lateral impact crashes (NTSB, 1999)
What can you do?

- CPS goes beyond transporting children in car seats
- Local influence
- State influence

Children should be buckled in EVERY vehicle
School Buses and Seat Belts

Joseph O’Neil, MD, MPH
Riley Hospital for Children

Charlie Vits
IMMI