

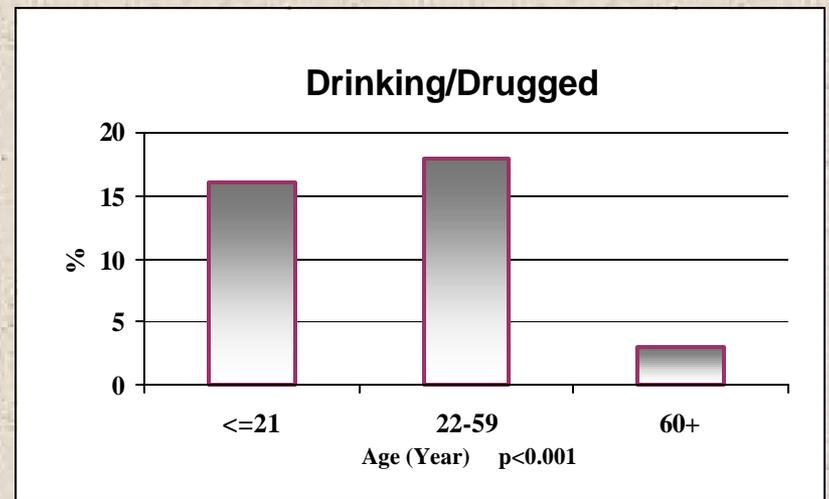
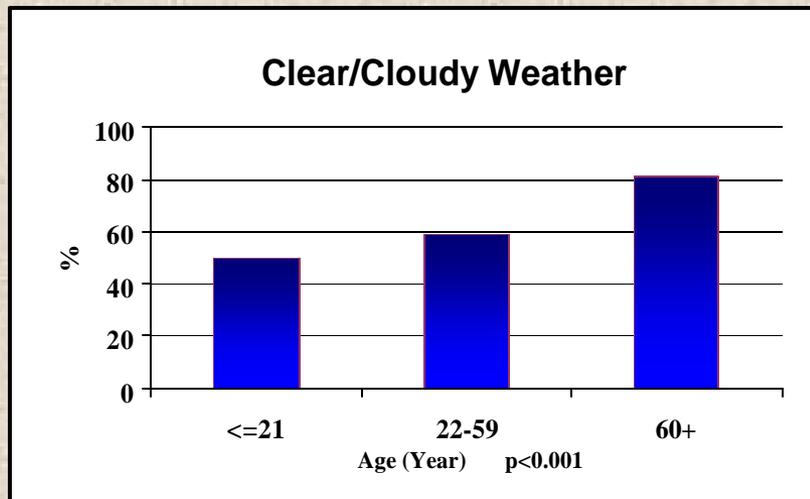
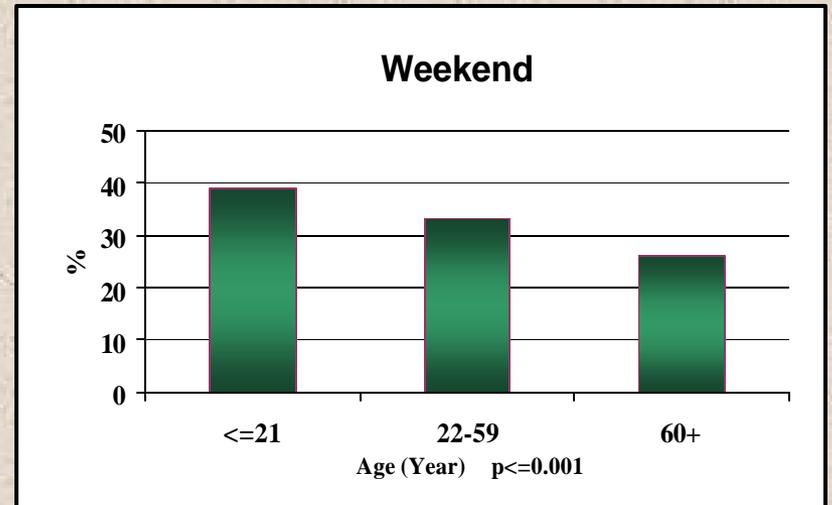
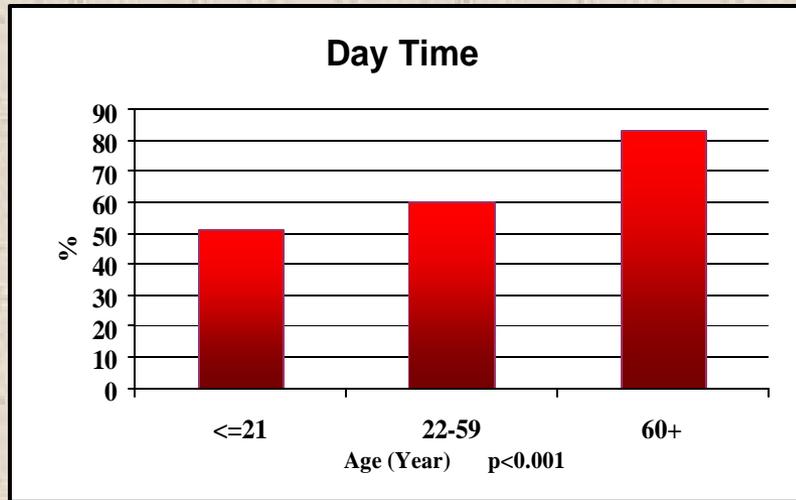
(

Maryland CIREN Team

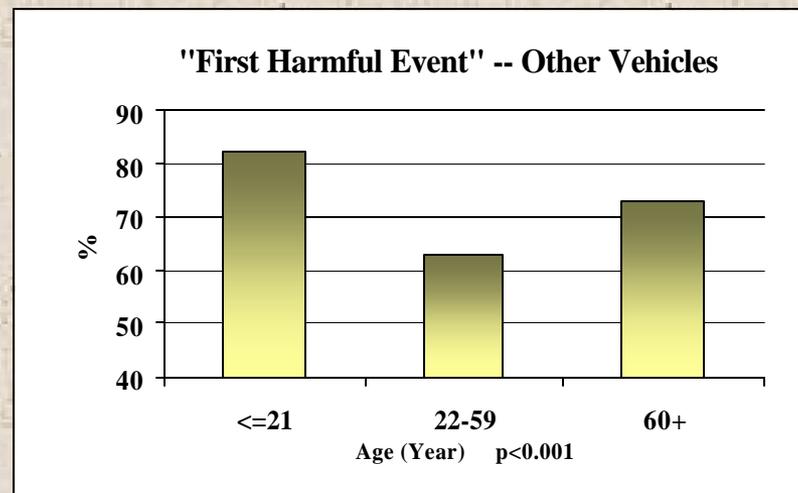
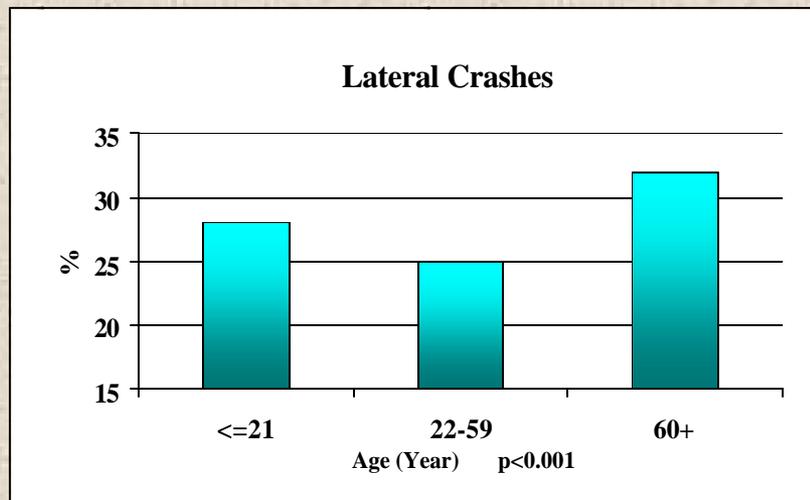
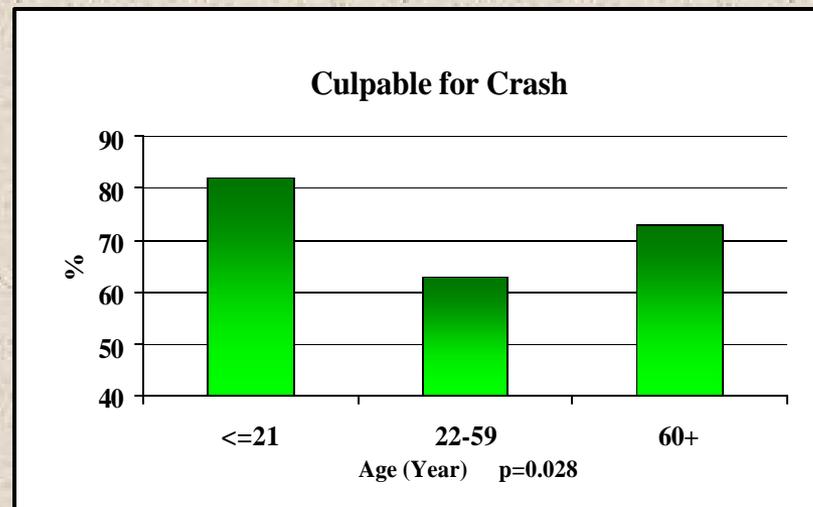
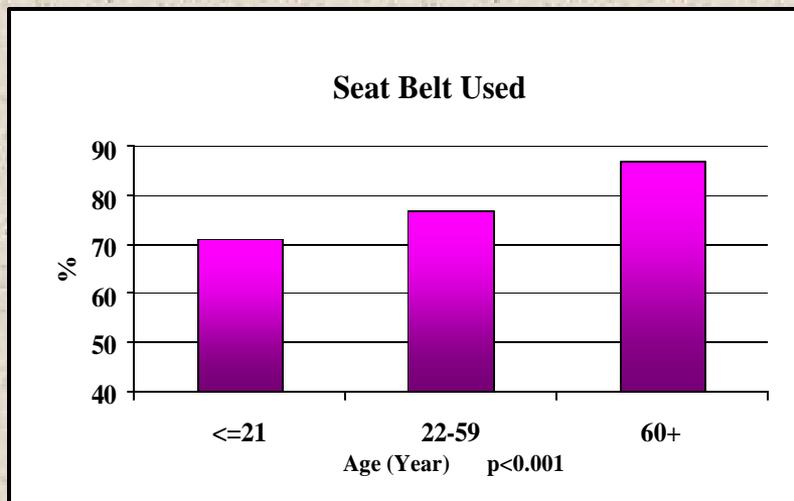
# Overview of Older Driver Crashes

- Maryland drivers 1994-1999 (n=15,323)
- Cars, vans, light trucks only

# Driver Characteristics



# Driver / Crash Characteristics



# Distribution of Culpability by Diseases

## % Culpable

<u>Diseases</u>	<u>&lt;=21 Years</u>	<u>22-59</u>	<u>60+</u>
<b>Mental Disorders</b>			
Yes	89.1	78.5	78.5
No	78.3	57.1	71.4
	p<0.001	p<0.001	p<=0.001
<b>Diabetes</b>			
Yes	78.3	68.5	74.5
No	80.6	63.1	71.9
	NS	p=0.03	NS
<b>Blood</b>			
Yes	82.4	65.9	77.8
No	80.5	63.0	71.2
	NS	NS	p=0.005

\*1994-1999 (n=15,323)

# Distribution of Culpability by Diseases

% Culpable

<b>Diseases</b>	<b>&lt;=21 Year</b>		<b>22-59</b>		<b>60+</b>	
<b>Respiratory System</b>						
Yes	81.6		68.7		75.2	
No	80.5	NS	62.5	p<0.001	71.3	p=0.05
<b>Cerebrovascular</b>						
Yes	90.0		61.5		80.8	
No	80.6	NS	63.3	NS	71.9	p=0.03
<b>Arterial</b>						
Yes	100.0		78.8		77.8	
No	80.6	NS	63.2	p=0.06	72.1	NS
<b>Neoplasms</b>						
Yes	50.0		73.2		82.1	
No	80.7	NS	63.2	NS	72.0	p=0.04

\*1994-1999 (n=15,323)

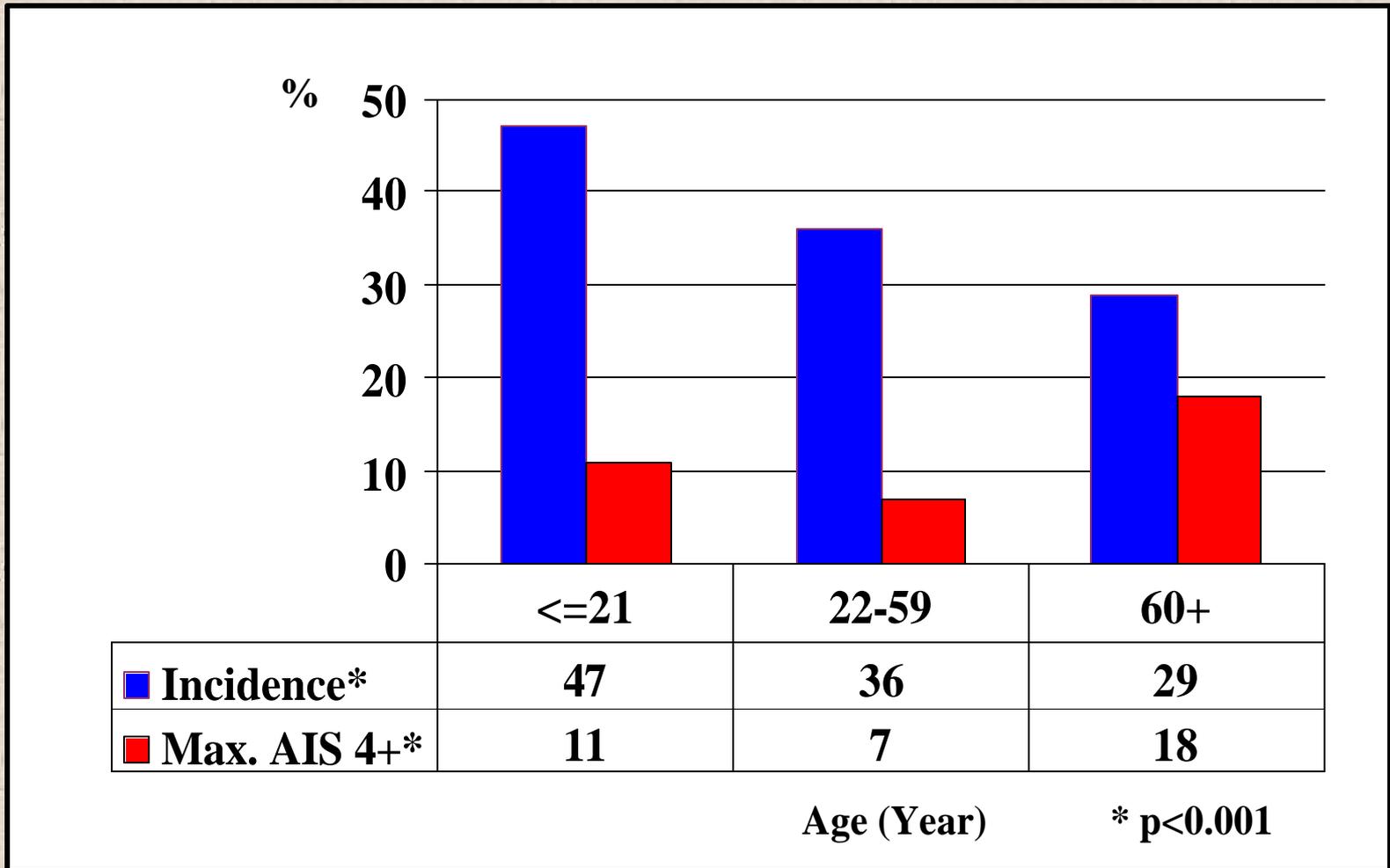
# Distribution of Culpability by Diseases

## % Culpable

<u>Diseases</u>	<u>&lt;=21 Year</u>	<u>22-59</u>	<u>60+</u>
<b>Syncope and Collapse</b>			
Yes	50.0	86.0	94.4
No	80.7 p=.05	63.0 p<0.001	71.2 p<0.001
<b>Alcohol dependence syndrome</b>			
Yes	93.7	84.1	93.2
No	80.2 p=0.002	62.0 p<0.001	72.0 p=0.002
<b>Alteration of consciousness</b>			
Yes	86.2	71.8	77.1
No	80.5 NS	63.1 p=0.01	72.2 NS

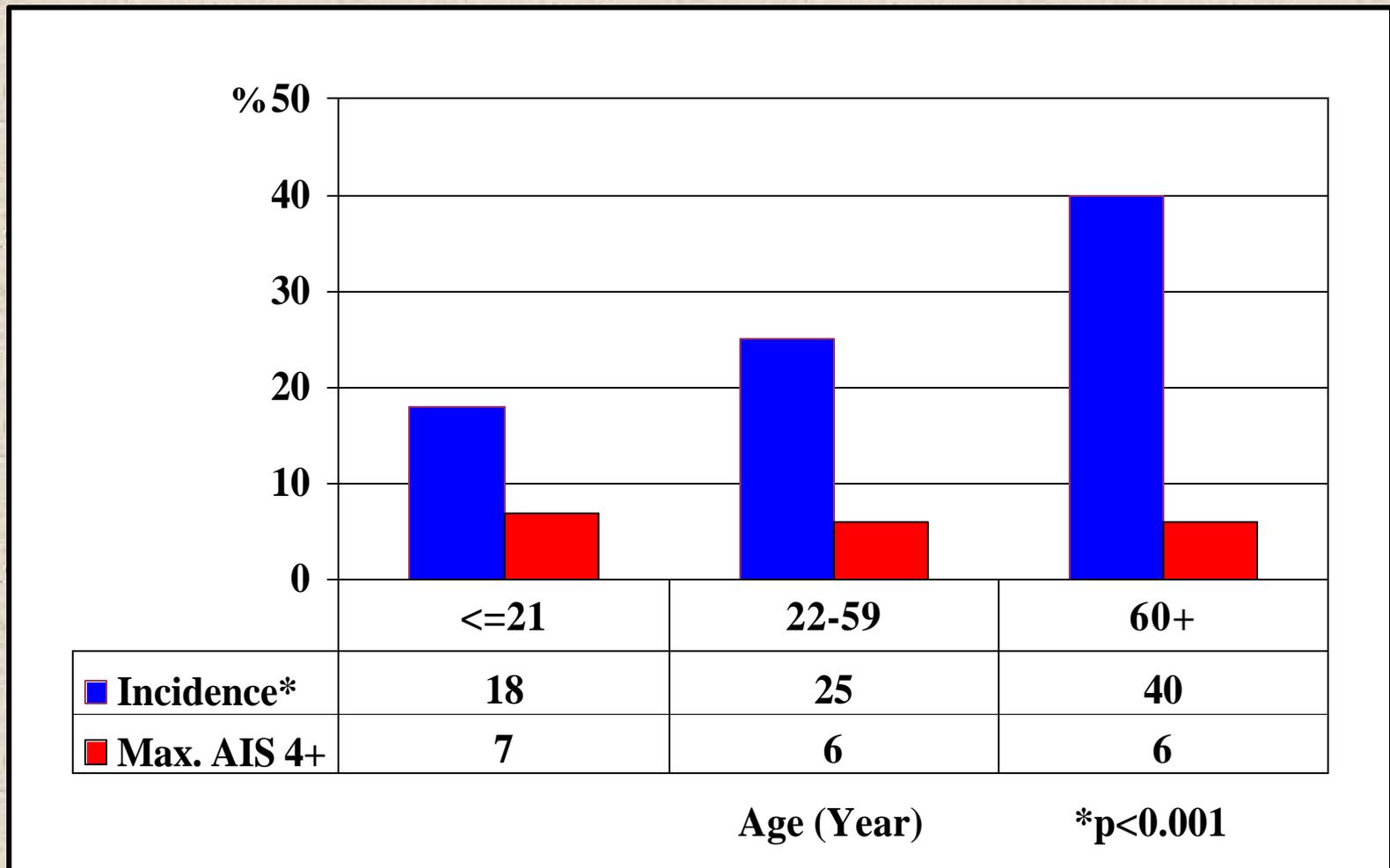
\*1994-1999 (n=15,323)

# Incidence and Severity of Brain Injury By Age



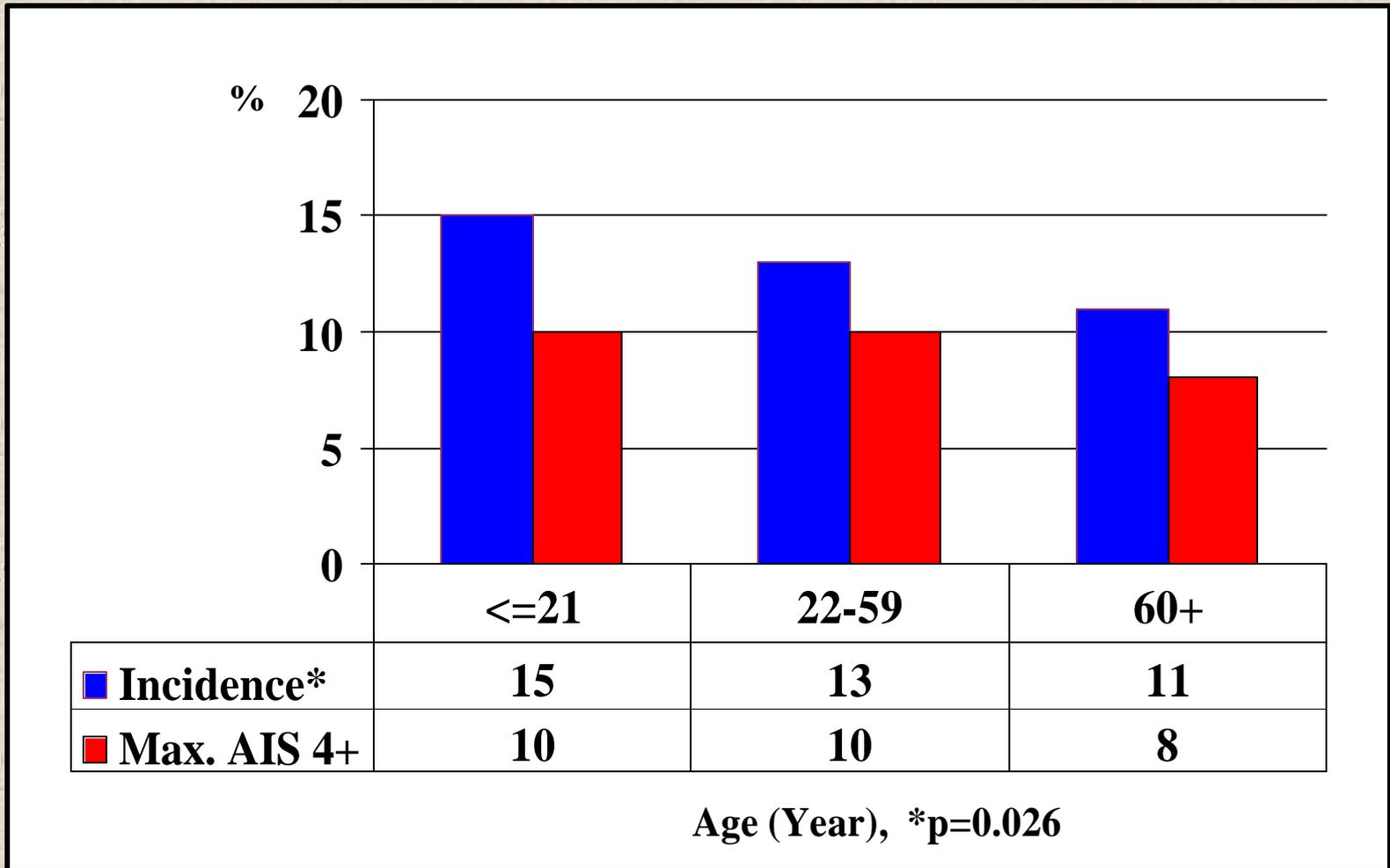
\*1997-1999 (n=7,573)

# Incidence and Severity of Thoracic Injury By Age



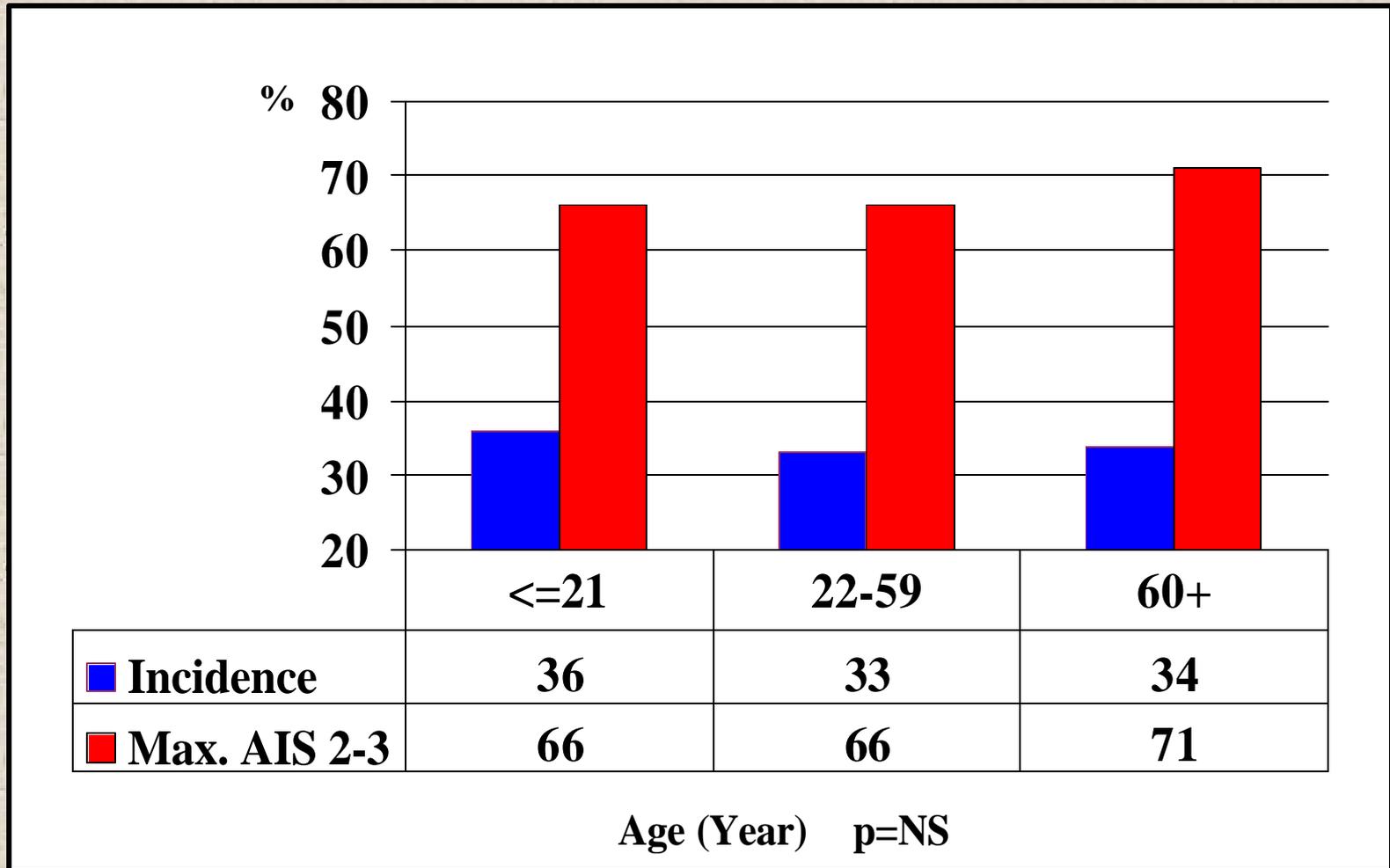
\*1997-1999 (n=7,573)

# Incidence and Severity of Abdominal Injury By Age



\*1997-1999 (n=7,573)

# Incidence and Severity of Lower Extremity Injury By Age



\*1997-1999 (n=7,573)

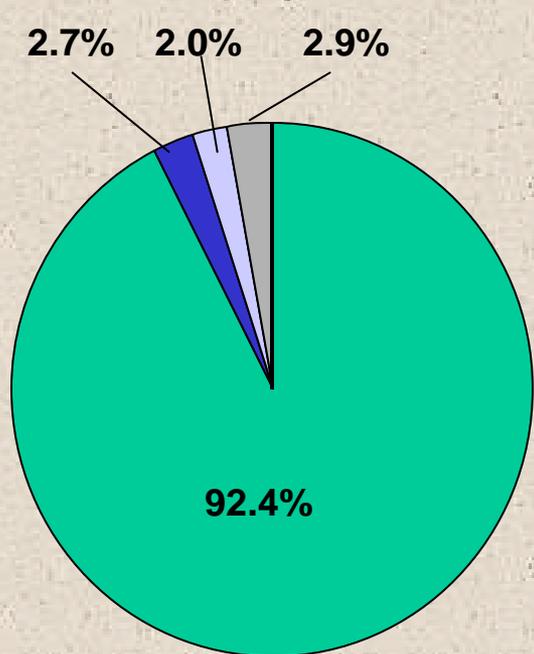
# ISS, LOS And Hospital Cost by Age

## Medians and 25<sup>th</sup>-75<sup>th</sup> Percentile Ranges

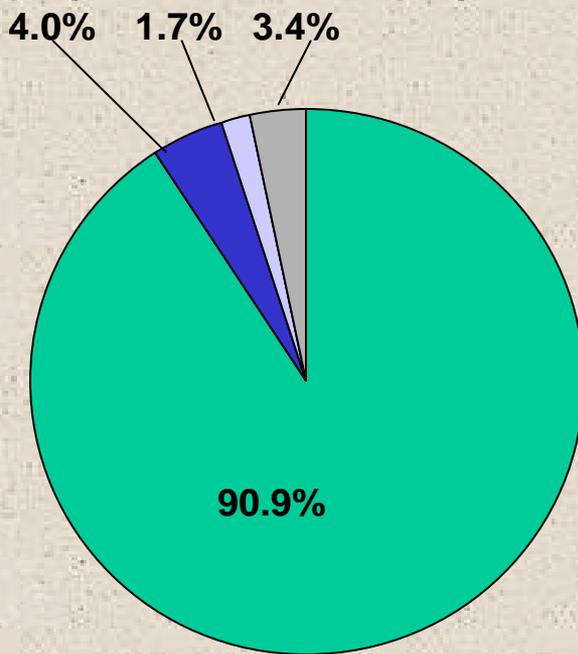
	Age Group			p
	<u>&lt;=21</u>	<u>22-59</u>	<u>60+</u>	
<b>ISS</b>	5 (2-10)	5 (1-9)	5 (2-10)	<0.001
<b>LOS</b>	1 (0-3)	1 (1-4)	3 (1-6)	<0.001
<b>Hospital Cost</b>	\$3,130 (2,040-8,287)	\$3,539 (2,353-8,166)	\$4,644 (2,640-11,303)	<0.001

\*1997-1999 (n=7,573)

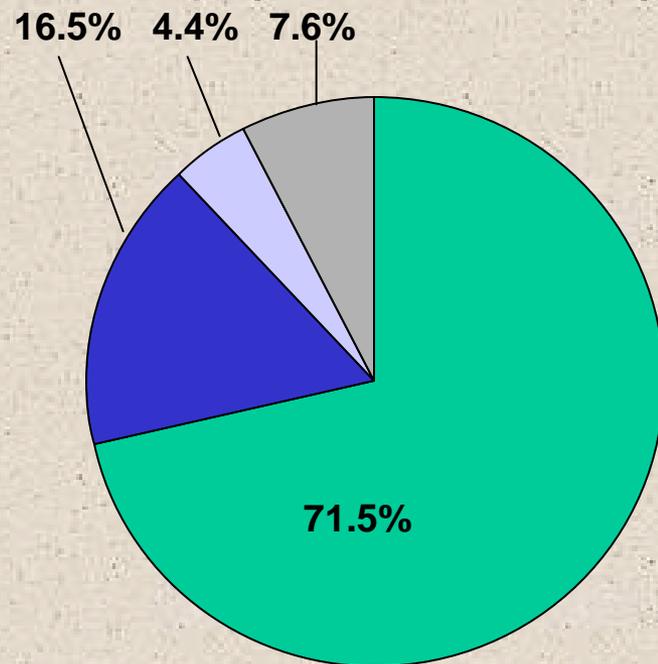
# Disposition by Age



<=21 Years



22-59  
( $p < 0.001$ )



60+

■ Home   ■ Other Health Facilities   ■ Died   ■ Rehab.

\*1997-1999 (n=7,573)

## ***Summary:***

**- Injury to  
drivers**

**is**

**- With the  
representative**

**'s will**

**- Preventing  
for this**

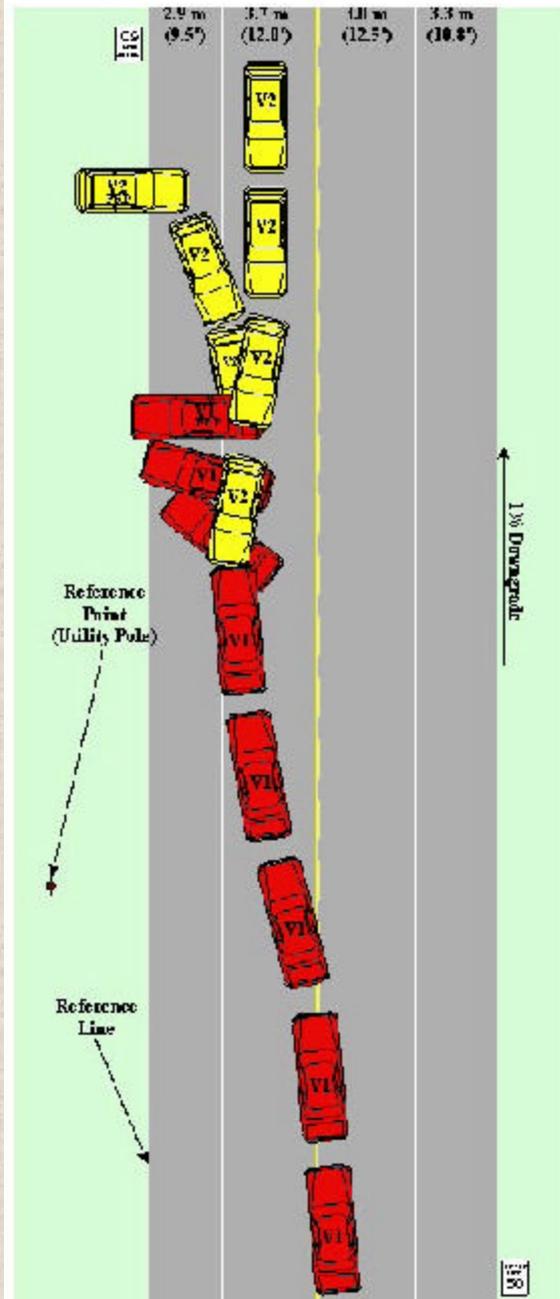
**specifically**

# University Of Maryland

## Medical System

# Case 1

- 56 year old male driver
- 5'8", 220 lbs
- Not belted, airbag deployed
- Major injuries
  - Right pneumothorax
  - Left femur fracture
  - Left tibial pilon fracture
- Bilateral hip replacements



Scale 1 cm = 2.4 m  
(1" = 20.0')



V1 - 2010 Pontiac  
Grand Am SE



V2 - 2000 Mitsubishi  
Eclipse GT



2000 Pontiac Grand Am  
CDC                    12FDEW3  
PDOF                    5 degrees  
Total Delta V    35 mph (high)  
Max Crush        27 inches @ C2



Interior contact points





Left distal femur fracture (OTA 33C2.2)



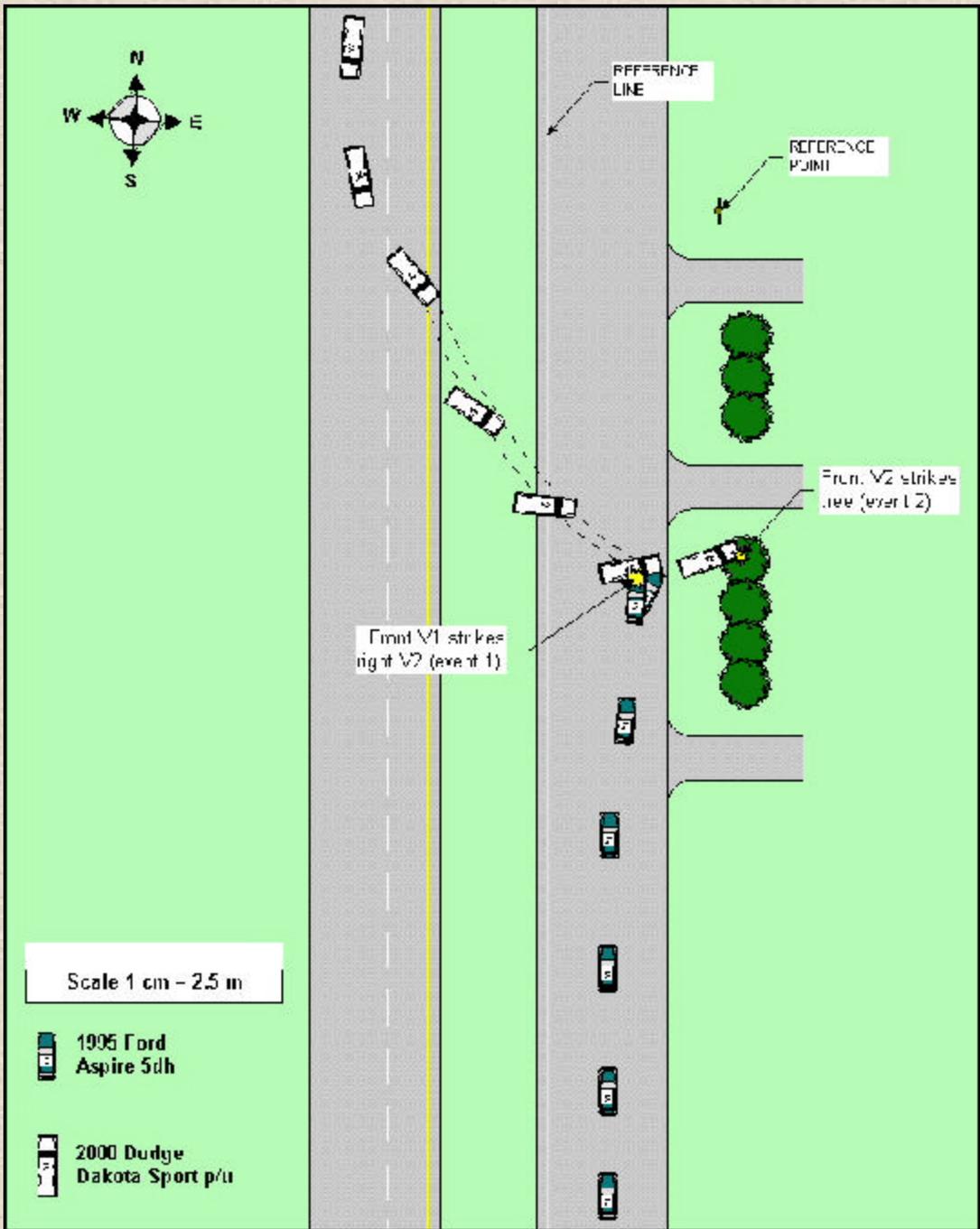


# University Of Maryland

## Medical System

# Case 2

- 64 year old female driver
- 59 inches, 185 lbs
- Belted/Airbag deployed
- Major injuries
  - Rib fractures
  - Right pulmonary contusion
  - Grade I liver laceration
  - Right talar neck fracture
  - Right bimalleolar fracture





Vehicle 1 - Travel path



Vehicle 1 - Travel path



Vehicle 1 – Strikes Vehicle 2



Vehicle 1 – Look back



Vehicle 2 – Travel path



Vehicle 2 – Travel path



Vehicle 2 – Crosses median



Vehicle 2 – Strikes Vehicle 1 (event 1)



Vehicle 2 – Strikes tree (event 2)



Vehicle 1 – 1995 Ford Aspire hatchback



Vehicle 1 – 1995 Ford Aspire



Delta V – 23 mph  
PDOF – 340 degrees  
CDC – 11FDEW2  
Direct damage width 27 inches



Vehicle 2 – 2000 Dodge Dakota Sport



Delta V      – 13 mph  
PDOF        – 100 degrees  
CDC         – 03RPEW4  
Direct damage width 66 inches



Vehicle 2 – Crush profile C1-C3



Vehicle 2 – Crush profile C4-C6



Vehicle 2 – Event 2 damage  
CDC                      01FREE1  
PDOF                    20 degrees



Vehicle 1 – 64 year old female driver  
4'11"/185 lbs



Vehic  
Toe pa  
Instrume

sions  
s long.  
rch long.



Vehicle 1 – Driver's air bag



Vehicle 1 – Evidence of belt use



Vehicle 1 – Contact point



Vehicle 1 – Contact point



Vehicle 1 – Contact point



Vehicle 1 – Contact point



Vehicle 1 – Contact point



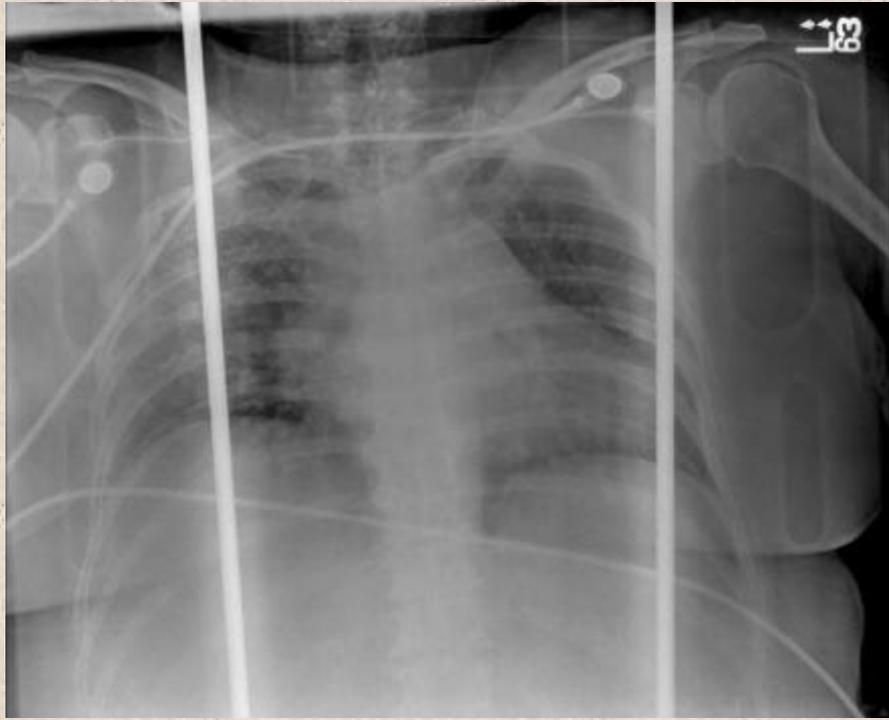
Vehicle 1 – Contact point

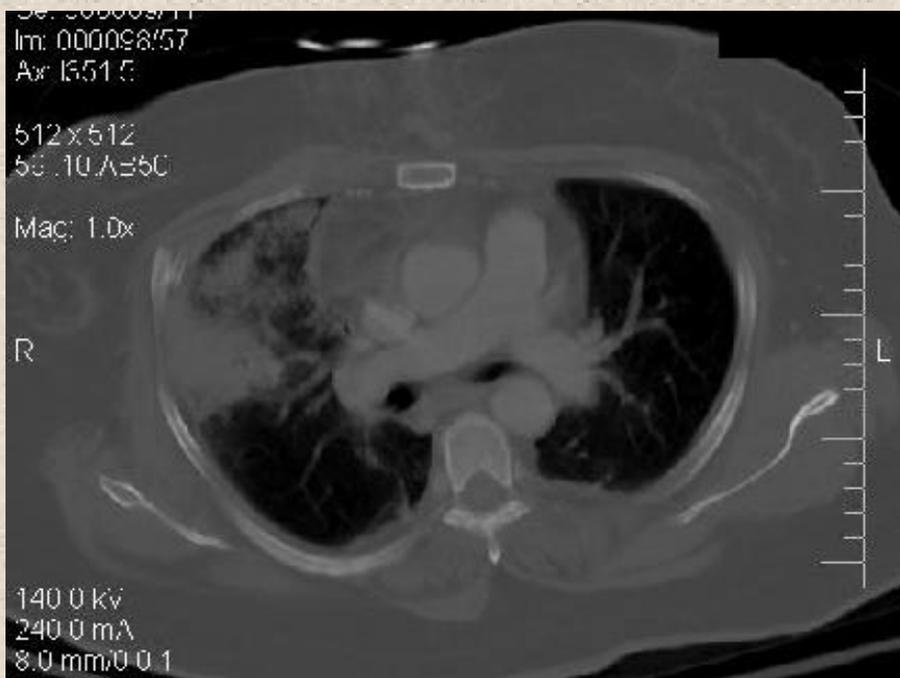


Seatbelt abrasions/contusions

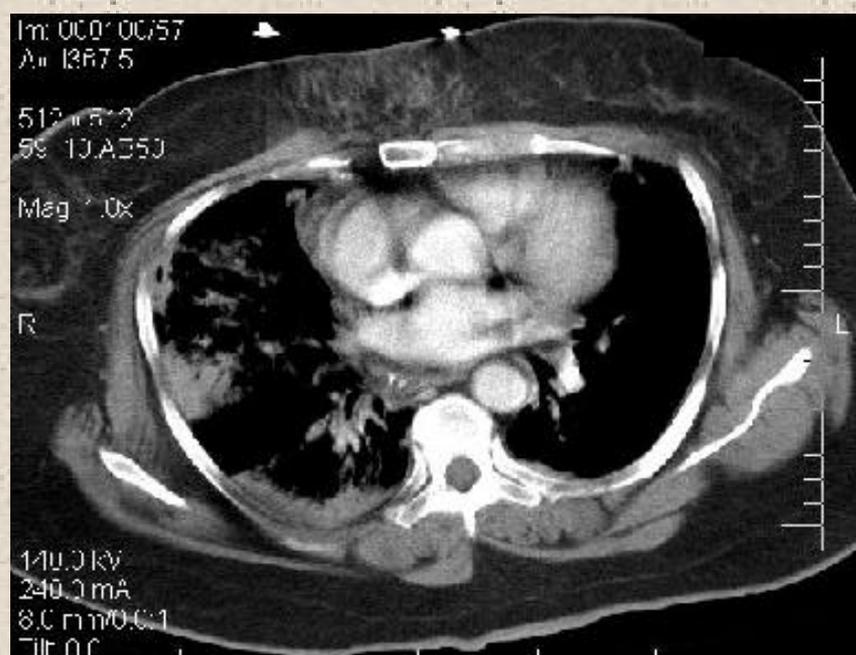
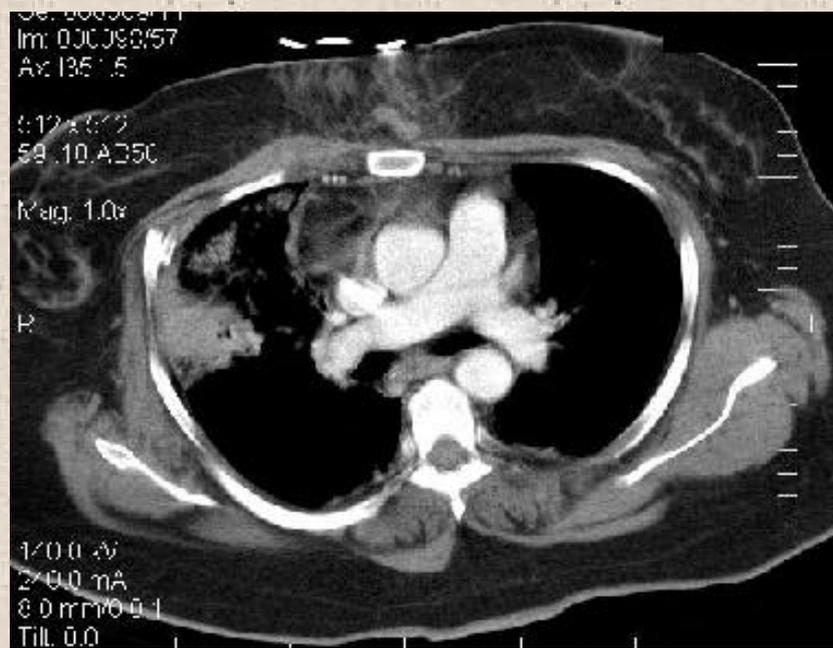
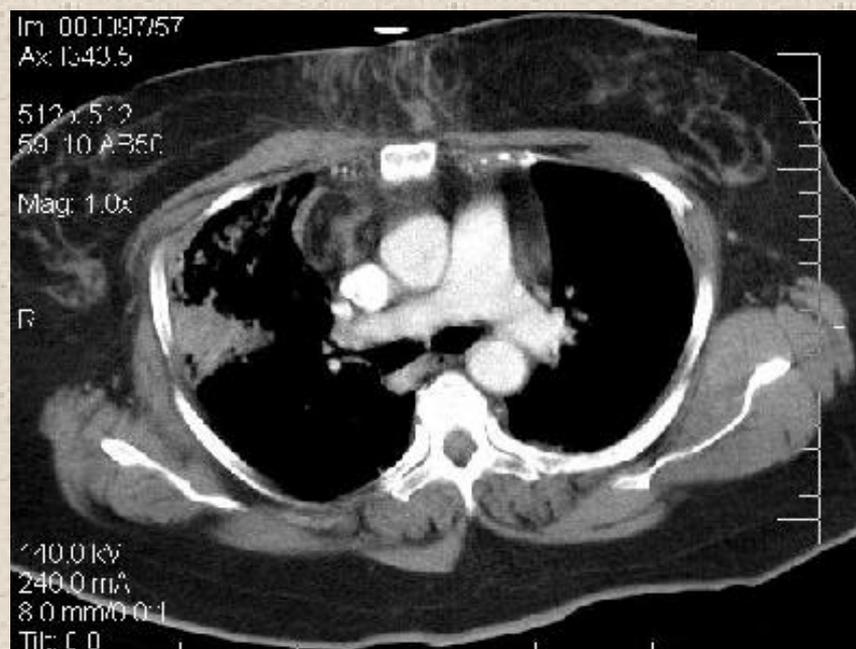
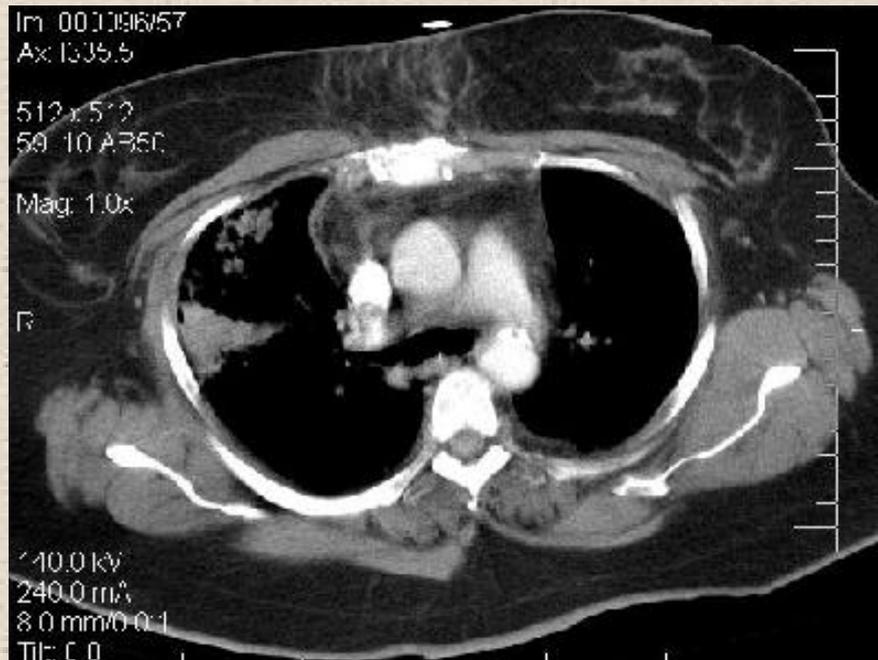


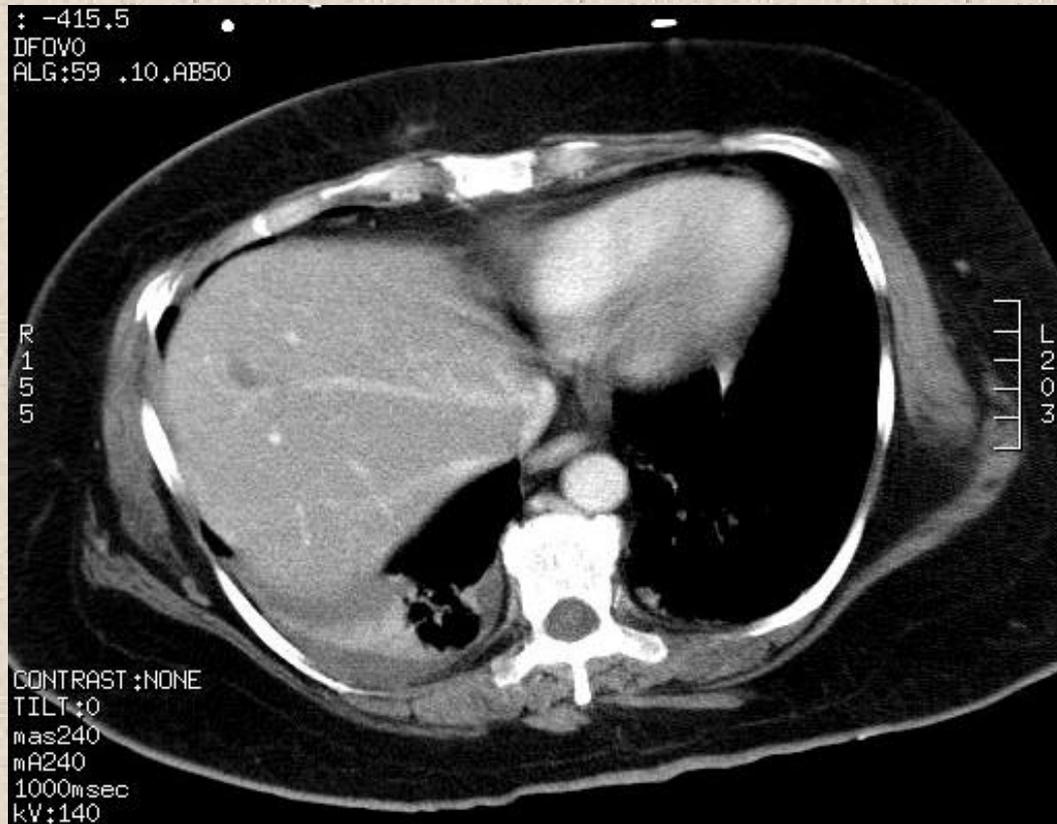






Right pulmonary contusion  
Right rib fracture



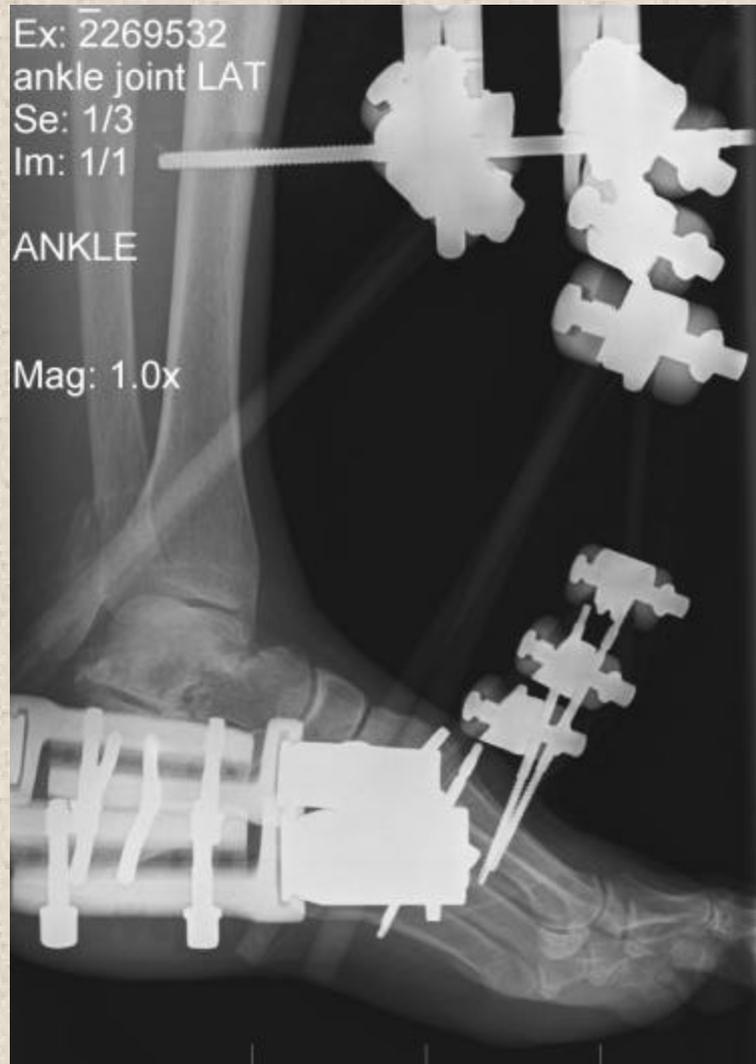


Grade I liver laceration



Right talar neck fracture (OTA 72A1)  
Comminuted bimalleolar fracture (OTA 44B2.3)







4 months post crash



9 months post crash

# CIREN Case 2

- Base  
– Er  
– W  
– PM  
– H  
– N
- rs

# CIREN Case 2

- Six 1
  - D<sub>1</sub>
  - R<sub>6</sub>
  - R<sub>6</sub>
  - D<sub>1</sub>
  - R<sub>6</sub>
  - A<sub>1</sub>
  - Ankle swelling and pain

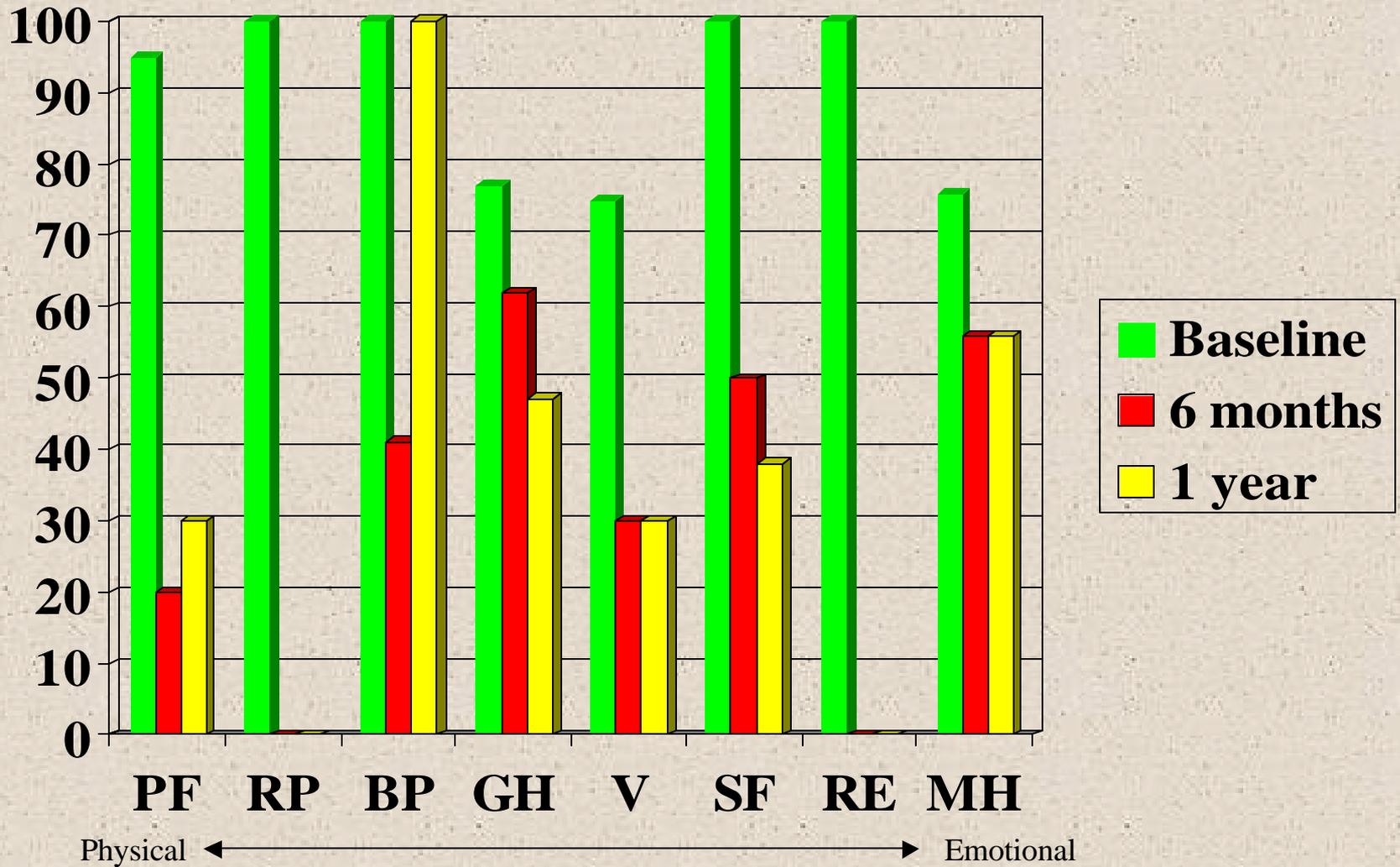
# CIREN Case 2

- Life altering

# CIREN Case 2

10001

ψ / 2, π / 2



Case 2

# Younger vs Older Driver Characteristics

	15-21 years (n=20)	60-80 years (n=15)
Culpability	75%	69%
Frontal crash	79	63
Lateral crash	21	37
Mean Delta V	30 mph	23 mph
Lower Extremity Injury	79	83
Closed Head Injury	22	16
Male	39	26

# Pre-injury factors

	15-21 years (n=28)	60-80 years (n=19)	P value
Pre-morbid history	44%	89%	<.01
History of depression	14	16	NS
Current depression	25	58	<.05
Prior Trauma	21	21	NS
MV Violations	57	16	<.01
Less than HS	33	16	NS
HS suspension	36	0	<.01
Smokers	50	5	<.01
AUDIT (Q.3)	44	21	NS
Recent life crisis	48	68	NS

# Risk Taking Behaviors

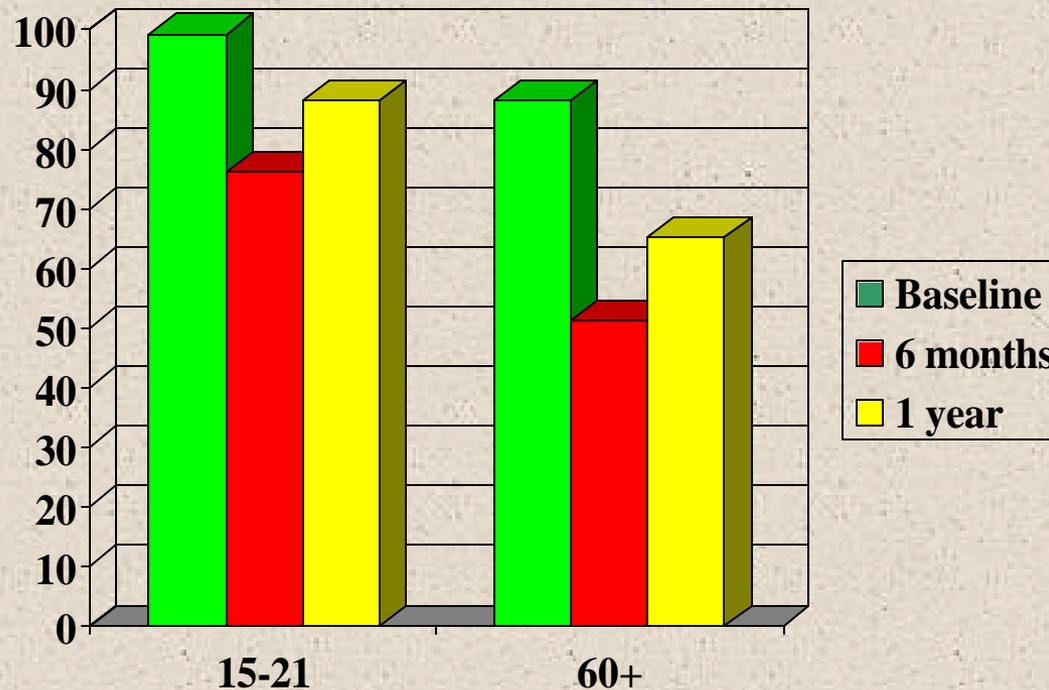
	15-21 years (n=21)	60-80 years (n=17)	P value
Driving over speed limit	85%	12%	<.01
Driving w/o belts	52	0	<.01
Acting on spur of moment w/o thinking	52	0	<.01
Testing self/chancy	43	6	<.01
Up for a new experience	90	18	<.01
Go for the thrills	76	0	<.01

# Median Costs

	15-21 yrs (n=20)	60-80 yrs (n=15)
Hospital	\$32,365	\$28,689
Professional	7,095	6,306
Subtotal	43,548	31,564
Rehab	12,830	18,000
TOTAL	\$61,706	\$76,851

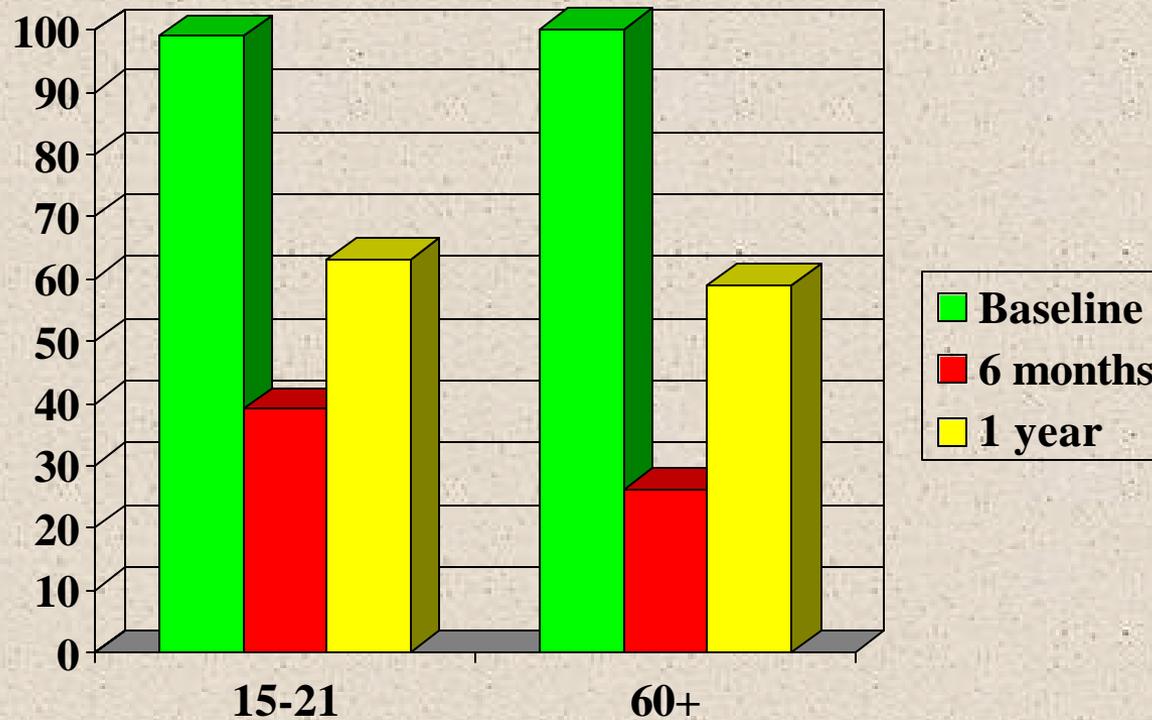
## PHYSICAL FUNCTIONING (PF)

- Measures any limitations in physical activities from bathing and dressing to the most vigorous activity.



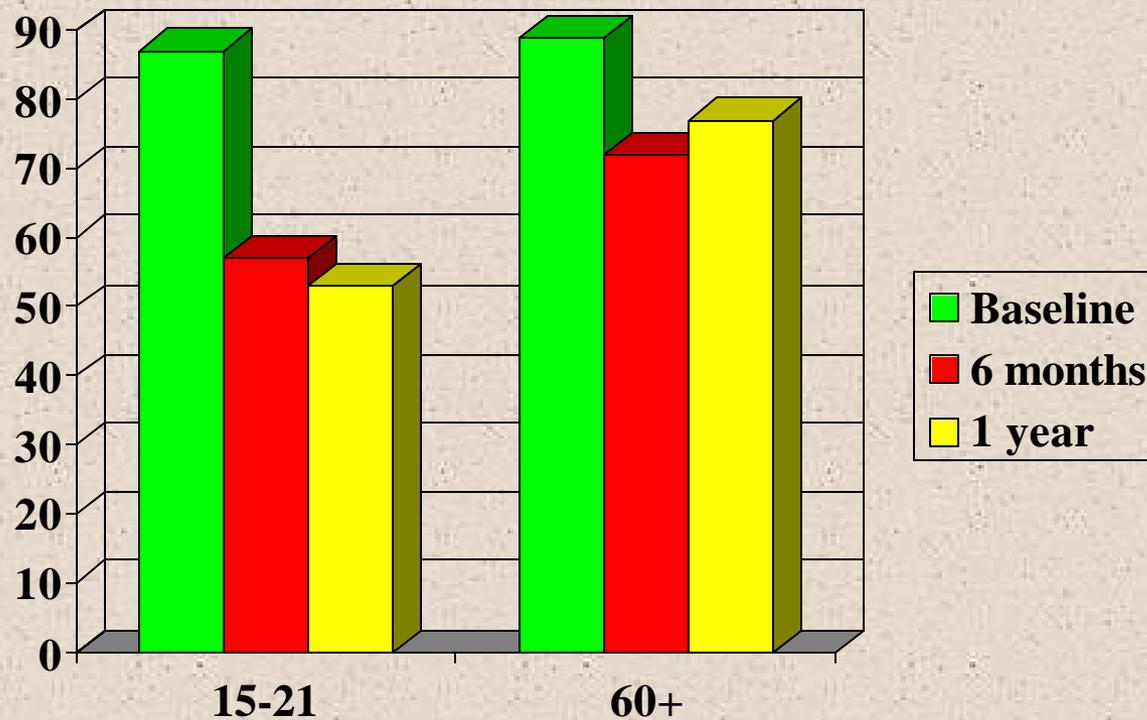
## ROLE-PHYSICAL (RP)

- Measures physical problems in performing work-related activities



## ROLE -- EMOTIONAL (RE)

- Extent emotional health interferes with work or daily activity



# Post-Trauma Outcomes

15-21 years

60-80 years

	6 months (n=33)	1 year (n=28)	6 months (n=33)	1 year (n=28)
Ambulation problems	45%	28%	46%	42%
Cognitive	40	28	23	10
Behavioral	60	33	15	17
Disrupting Pain	25	22	31	33
Depression	40	50	31	46
PTSD	35	28	15	25
Return to Driving	75	83	58	58
Spirituality	30	17	85	84