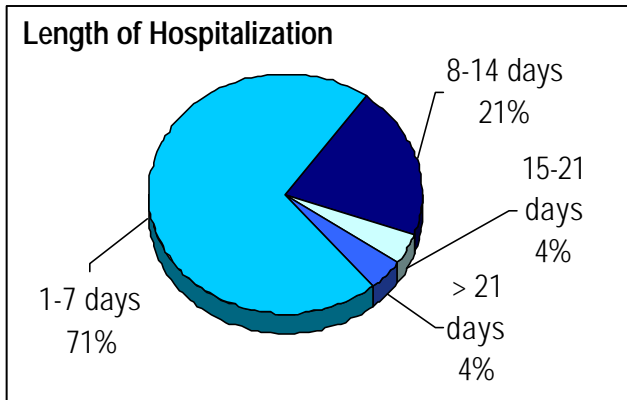








Hospitalizations of Drivers 14-20 involved in Motor Vehicle Crashes in Oklahoma, 1995-1997

Crash Outcome Data Evaluation System (CODES)

Motor vehicle crashes are the leading cause of death and disability among persons 14-20 years of age (National Center for Injury Prevention and Control, <http://www.cdc.gov/ncipc/wisqars/>). In Oklahoma, from 1995 through 1997, 80,733 drivers aged 14 to 20 were involved in motor vehicle crashes (Oklahoma Highway Safety Office). According to the investigating officers, 6% of these young drivers (4,688) were either fatally injured (N=609) or received incapacitating injuries (N=4,079). Probabilistic linkage was used to link data from crashes to inpatient hospitalization records so that types of injuries to drivers age 14-20 could be examined. This resulted in 442 linked crash and inpatient hospitalization records for young drivers.^f



The average length of hospitalization was nearly seven days, resulting in 2,966 inpatient days and total hospital charges of almost seven million dollars. Almost five percent died in-hospital.




-  71% were hospitalized for one to seven days
-  21% were hospitalized for eight to 14 days
-  4% were hospitalized for 15 to 21 days
-  4% were hospitalized for 22 to 60 days

Types of Injuries

Based on principal diagnosis (see Table 1), the most frequent reasons for hospitalization of young drivers were:

<p>22% Brain injuries (56% of which included coma)</p> <p>28 concussions</p> <p>21 brain bruising (contusion) or tearing (laceration)</p> <p>3 bleeding under the brain capsule with coma (subdural or subarachnoid hemorrhage)</p>	<p>18% Fracture of lower limb</p> <p>36 broken upper leg (Femur)</p> <p>5 broken knee cap (Patella)</p> <p>27 broken lower leg (Tibia or Fibula)</p> <p>11 broken ankle or foot</p>
<p>14% Crushing injury or internal injury</p> <p>15 collapsed lung (Pneumothorax)</p> <p>17 spleen injuries</p> <p>11 bruised lung (contusion)</p> <p>5 bruised or torn liver (contusion or laceration)</p> <p>3 kidney injuries</p>	<p>13% Other fractures</p> <p>23 broken back/neck (10 fracture C2-C6 vertebrae; 8 dorsal, 2 lumbar, 2 sacrum/coccyx)</p> <p>21 broken pelvis</p> <p>6 broken ribs or breast bone (sternum)</p> <p>7 broken hip socket (acetabulum)</p>
<p>7% Skull and face fractures (22% included coma)</p> <p>11 skull fractures</p> <p>21 face fractures</p>	<p>6% Fracture of upper limb</p> <p>12 upper arm</p> <p>10 lower arm</p>

Any Diagnosis (see Table 1)

-  35% of young drivers had brain injuries, one third of which were severe enough to produce coma.
-  30% of young drivers with a diagnosis of coma were discharged from the hospital **without** returning to their previous state of consciousness at discharge. This suggests permanent brain injury.
-  1% of young drivers were discharged with paralysis (2 quadriplegic, 1 paraplegic, 3 hemiplegic).

^f 1995 was the first year inpatient hospitalization data was collected from short-term acute care hospitals licensed by the state of Oklahoma—this dataset is highly incomplete for 1996 and 1997. Based on the number of incapacitating injuries reported by investigating officers, linked records for the three years represent approximately 10% of hospitalizations to young drivers.

Table 1
Drivers age 14-20
Oklahoma, 1995-1997
Linked Crash and Inpatient Hospitalizations
Crash Outcome Data Evaluation System (CODES)

	Number of Hospitalizations	Percent of Hospitalizations	Length (Days) of Hospitalization	Number of Inpatient Days	Average Charges per Hospitalization	Total Charges	Percent Who Died In-Hospital
All Linked Records	442		6.7	2,966	\$17,251	\$6,998,994	4.7%
Driver Sex							
Female	196	44%	6.4	1,261	\$14,209	\$2,534,978	3.7%
Male	246	56%	6.9	1,705	\$19,508	\$4,465,309	5.5%
Principal Diagnosis*							
Brain injury	97	22%	7.0	680	\$19,362	\$1,741,817	10.4%
Fracture of lower limb	79	18%	8.2	647	\$21,288	\$1,707,971	0.0%
Crushing injury or internal injury	61	14%	7.6	461	\$24,652	\$1,197,921	9.3%
Other fractures	59	13%	7.6	451	\$15,409	\$791,102	2.4%
Skull and face fractures	32	7%	5.5	175	\$14,975	\$411,410	4.5%
Fracture of upper limb	27	6%	4.9	131	\$11,885	\$310,065	0.0%
Open wounds of head, neck, and trunk	17	4%	3.9	66	\$8,742	\$153,882	0.0%
Superficial injury, contusion	14	3%	2.1	29	\$3,355	\$48,685	0.0%
Joint disorders/dislocations, trauma-related	9	2%	5.0	45	\$6,252	\$66,144	0.0%
Fracture of neck of femur (hip)	6	1%	7.5	45	\$20,927	\$124,989	0.0%
Sprains and strains	5	1%	1.6	8	\$2,600	\$12,200	0.0%
Open wounds of extremities	5	1%	2.8	14	\$4,041	\$29,545	0.0%
Spinal cord injury	4	1%	17.3	69	\$43,536	\$178,346	0.0%
Any Diagnosis*							
Brain injury	153	35%	7.4	1131	\$19,036	\$2,811,910	9.1%
Coma	53	12%	9.0	475	\$31,900	\$1,831,469	22.6%
< 1 hour	6	1%	5.0	30	\$10,418	\$72,534	0.0%
1-24 hours-returned to previous state of consciousness	10	2%	5.4	54	\$14,886	\$138,786	30.0%
> 24 hours-returned to previous state of consciousness	2	<1%	19.5	39	\$49,672	\$161,434	0.0%
> 24 hours-did NOT return to previous state of consciousness	16	4%	12.6	202	\$59,199	\$1,225,637	56.3%
Coma, duration not specified	19	4%	7.9	150	\$24,364	\$399,919	0.0%
Spinal cord injury	5	1%	15.4	77	\$43,536	\$199,024	0.0%
Paralysis	6	1%	23.5	141	\$60,990	\$480,621	0.0%
Broken bones							
Skull and face fractures	62	14%	8.0	494	\$21,708	\$1,465,297	6.4%
Upper limb fractures	102	23%	7.5	769	\$20,462	\$1,869,079	2.6%
Lower limb fractures	122	28%	8.5	1043	\$27,001	\$2,955,653	4.5%
Hip (Neck of femur) fractures	10	2%	10.3	103	\$21,412	\$275,600	0.0%
Other fractures	125	28%	8.3	1042	\$22,559	\$2,592,003	7.3%
Crushing injury or internal injury	118	27%	8.5	1004	\$25,810	\$2,975,391	14.0%
Open Wounds							
Extremities	72	16%	7.1	511	\$21,606	\$1,235,492	0.0%
Head, neck, and trunk	156	35%	7.3	1137	\$20,421	\$2,922,222	0.8%
Superficial injury, bruise (contusion)	157	36%	5.5	865	\$10,110	\$1,697,842	1.8%

Notes: * Includes selected diagnosis categories from Single-level Clinical Classification Software, Agency for Healthcare Research and Quality. Total charges include only hospital charges. Total charges and percent who died in-hospital should be interpreted with caution as 29% of records had missing data for those fields. Total charges were calculated from charges per patient day X inpatient days.