ALASKA LEGISLATURE COMMITTEE FILES 1985-1986 8072

3231 HHESS HB 661

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Figure 2-8
Work Injuries and Illnesses by Part of Body Affected
Alaska
1982

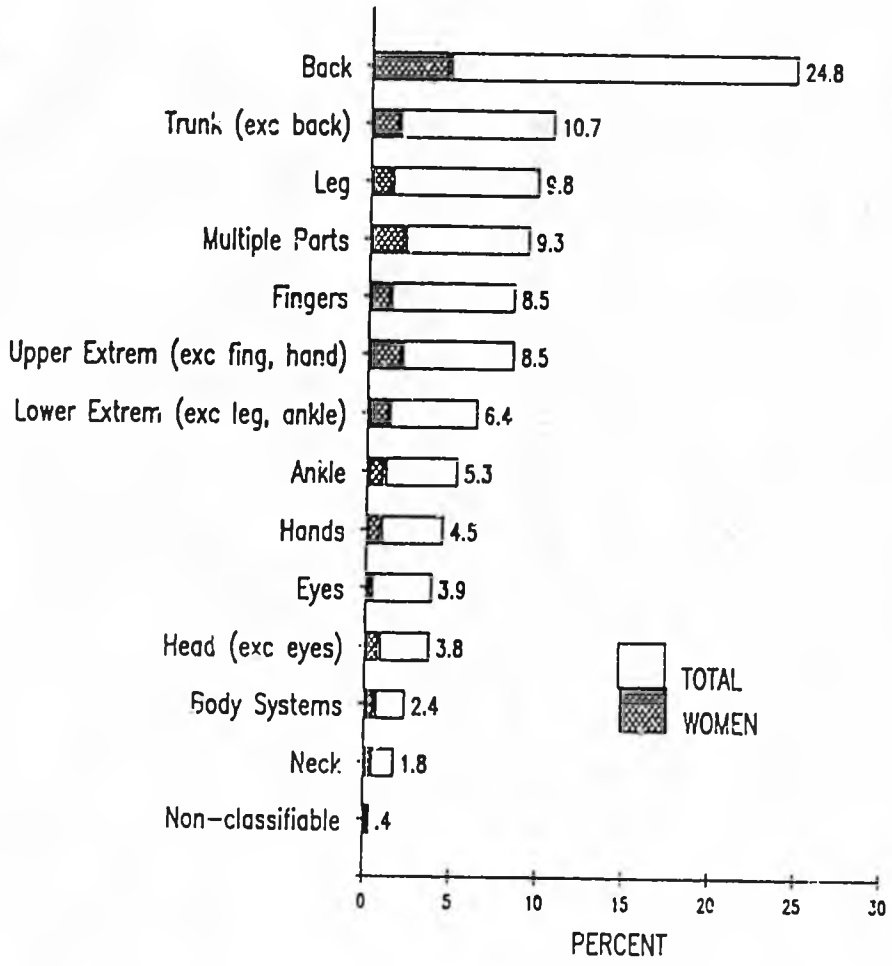

Table 2-1
Work Injuries and Illnesses
By Nature of Injury or Illness
Alaska 1982

SOS Code	Nature of Injury or Illness	Number of Cases	Percent
	Total	10125	100.0
100	Amputation or Enucleation	44	.4
110	Asphyxia, Strangulation, Drowning Suffocation	11	.1
120	Burn (Heat)	203	2.0
130	Burn (Chemical)	60	.6
140	Concussion	55	.5
	Infective or Parasitic Desese	15	.1
150	Infective or Parasitic Disease, UNS	1	.0
154	Conjunctivitis and Ophthalmia	10	.1
157	Tuberculosis	1	.0
159	Other Infective or Parasitic Disease	3	.0
160	Contusion, Crushing, Bruise	1459	14.4
170	Cut, Laceration, Puncture	938	9.3
	Dermatitis	42	.4
180	Dermatitis, UNS	12	.1
181	Contact Dermatitis	10	.1
182	Allergenic Dermatitis	10	.1
183	Primary Infections of the Skin	8	.1
184	Skin Conditions	1	.0
189	Skin Condition, not Specified	1	.0
190	Dislocation	110	1.1
200	Electric Shock, Electrocution	5	.0
210	Fracture	755	7.5
220	Effects of Exposure to Low Temp	35	.3
230	Hearing Loss, or Impairment	13	.1
250	Hernia, Rupture	164	1.6
260	Inflammation or Irritation of Joints, Tendons, or Muscles	166	1.6
	Poisoning, Systemic	75	.7
270	Poisoning, Systemic, UNS	7	.1
271	Due to Toxic Materials	48	.5
273	Upper Respiratory Conditions	3	.0
274	Influenza, Pneumonia, Etc.	14	.1
276	Other Diseases of the Gastrointestinal Tract	3	.0
	Radiation Effects	35	.3
290	Radiation Effects Uns.	1	.0
291	Non-Ionizing Radiation	4	.0
295	Welders Flash	30	.3
300	Scratches, Abrasions	290	2.9
310	Sprains, Strains	4677	46.2
320	Hemorrhoids	6	.1
330	Hepatitis (Serum and Infective)	17	.2
400	Multiple Injuries	655	6.5
500	Effects of Change in Atmospheric Pressure	6	.1
510	Cerebrovascular and Other Conditions of the Circulatory System	5	.0
530	Eye, Other Diseases of the Eye	4	.1
540	Mental Disorders	13	.1
	Nervous System, Conditions of	7	.1
560	Nervous System, Conditions of, Uns.	5	.0
562	Diseases of the Nerves and Peripheral Ganglia	2	.0
	Respiratory System, Conditions of	10	.1
570	Respiratory System, Conditions of, UNS	4	.0
571	Upper Respiratory	3	.0
572	Influenza, Pneumonia, Bronchitis, Asthsma	19	.2
580	Symptoms and Ill-Defined Conditions	45	.4
900	No Injury or Illness	2	.0
950	Damage to Prosthetic Devices	10	.1
991	Heart Conditions (Includes Heart Attack)	41	.4
995	Other Injury, Nec	12	.1
999	Non Classifiable	116	1.1

NOTE: Uns = Unspecified. Information not available to classify at a more detailed level.
Nec = Not elsewhere classified.
NOTE: Data includes only those reported cases which occurred during 1982 involving death or one or more lost workdays beyond the day of injury.
SOURCE: Alaska SOS Table 101.

Table 2-2
Work Injuries and Illnesses
by Part of Body Affected
Alaska 1982

SOS Code	Part of Body Affected	Number of Cases	Percent
	Total	10125	100.0
	Head	782	7.7
100	Head, Uns	68	.7
110	Brain	57	.6
	Ear(s)	32	.3
120	Ear(s), Uns.	1	.0
121	Ear(s), External	7	.1
124	Ear(s), Internal	24	.2
130	Eye(s)	397	3.9
	Face	156	1.5
140	Face, Uns	12	.1
141	Jaw	7	.1
144	Mouth	52	.5
146	Nose	17	.2
148	Face, Multiple Parts	13	.2
149	Face, Nec	41	.4
150	Scalp	16	.2
160	Skull	7	.1
198	Head, Multiple	37	.4
199	Head, Nec	12	.1
200	Neck	186	1.8
	Upper Extremities	2176	21.5
300	Upper Extremities, Uns	1	.0
	Arm(s)	401	4.0
310	Arm(s), Uns	100	1.0
311	Upper Arm	24	.2
313	Elbow	154	1.5
315	Forearm	112	1.1
318	Arm, Multiple	11	.1
320	Wrist	298	2.9
330	Hand	451	4.5
340	Finger	860	8.5
398	Upper Extremities, Multiple	165	1.6
	Trunk	3590	35.5
400	Trunk, Uns	2	.0
410	Abdomen	310	3.1
420	Back	2514	24.8
430	Chest	203	2.0
440	Hips	102	1.0
450	Shoulder(s)	323	3.2
498	Trunk, Multiple	134	1.3
499	Trunk, Nec	2	.0
	Lower Extremities	2172	21.5
500	Lower Extremities, Uns	2	.0
	Leg(s)	996	9.8
510	Leg(s), Uns	82	.8
511	Thigh	74	.7
513	Knee	685	6.8
515	Lower Leg	138	1.4
518	Leg, Multiple	16	.2
519	Leg, Nec	1	.0
520	Ankle	536	5.3
530	Foot	399	3.9
540	Toe(s)	147	1.5
598	Lower Extremities, Multiple	92	.9
599	Lower Extremities, Nec	2	.0
700	Multiple Parts	938	9.3
	Body System	242	2.4
800	Body System, Uns	45	.4
801	Circulatory System	44	.4
810	Digestive System	27	.3
820	Excretory System	3	.0
840	Nervous System	24	.2
850	Respiratory System	99	1.0
999	Nonclassifiable	39	.4

Note: Uns = Unspecified. Information not available to classify at a more detailed level.
Nec = Not elsewhere classified
Note: Data includes only those reported cases which occurred during 1982 involving death, or one or more lost workdays beyond the day of injury.
Source: Alaska SOS Table 102

TABLE 2-11
Work Injuries and Illnesses
Nature of Injury or Illness By Part of Body Affected
Alaska 1982

Nature of Injury or Illness	TOTAL	EYES	HEAD, NECK, EXCLUDING EYES	FINGERS	UPPER EXTREMITIES, EXCLUDING FINGERS	BACK	TRUNK-EXCEPT BACK	LOWER EXTREMITIES	MULTIPLE BODY PARTS	BODY SYSTEM	BODY, NEC	NONCLASSIFIABLE
TOTAL	10125	397	571	860	1316	2514	1076	2172	938	242	-	39
Amputation or Enucleation	44	-	-	41	2	-	-	1	-	-	-	-
Asphyxia, Strangulation, Etc.	11	-	-	-	-	-	-	-	-	11	-	-
Burn (Heat)	203	8	13	3	97	3	1	38	40	-	-	-
Burn (Chemical)	60	36	2	1	12	-	2	5	2	-	-	-
Concussion	55	-	55	-	-	-	-	-	-	-	-	-
Infective or Parasitic Diseases	15	11	1	-	-	-	-	1	-	2	-	-
Contusion, Crushing, Bruise	1459	11	94	153	331	82	189	524	74	-	-	1
Cut, Laceration, Puncture	938	15	71	411	245	-	14	176	3	-		3
Dermatitis	42	-	4	3	14	-	-	4	17	-		-
Dislocation	110	-	2	4	-	35	51	15	2	-	-	
Electric Shock, Electrocution	5	-	-	-		-	-	-	-	5	-	
Fracture	755	-	61	137	162	25	95	265	10	-	-	-
Effects of Exposure to Low Temp	35	-	3	11	4	-	-	9	6	1	-	1
Hearing Loss, or Impairment	13	-	13	-	-	-	-	-	-	-	-	-
Hernia, Rupture	164	-	-	-	-	-	164	-	-	-	-	-
Inflammation of Joints, Etc.	166	-	1	1	122	-	16	25	-	-	-	1
Poisoning, Systemic	75	-	-	-	-	-	-	-	-	75	-	-
Radiation Effects	35	35	-	-	-	-	-	-	-	-	-	-
Scratches, Abrasions	290	268	2	2	8	-	-	7	3	-	-	-
Sprains, Strains	4677	2	175	45	258	2356	489	1021	329	-	-	2
Hemorrhoids	6	-	-	-	-	-	6	-	-	-	-	-
Hepatitis	17	-	-	-	-	-	-	-	-	17	-	-
Multiple Injuries	655	5	38	44	39	11	31	52	434	1	-	-
Effects of Changes in Atmospheric Prs.	6	-	6	-	-	-	-	-	-	-	-	-
Cerebrovascular and Other Cond. of the Circulatory System	5	-	1	-	-	-	-	-	-	3	-	-
Complications Peculiar to Medical Care	2	-	-	-	-	-	-	-	-	1	-	1
Eye, Other Diseases of the Eye	4	4	-	-	-	-	-	-	-	-	-	-
Mental Disorders	13	-	-	-	-	-	-	-	-	13	-	-
Nervous System, Conditions of	7	-	-	-	-	-	-	-	-	7	-	-
Respiratory System, Conditions of	43	-	-	-	-	-	-	-	-	43	-	-
Symptoms and Ill-Defined Conditions	45	-	4	-	5	-	4	1	-	31	-	-
No Injury or Illness	2	-	-	-	-	-	-	-	-	-	-	2
Damage to Prosthetic Devices	10	1	5	-	-	-	-	1	-	-	-	3
Heart Conditions (Inc. Heart Attack)	41	-	-	-	-	-	-	1	-	41	-	-
Other Injury, Nec	12	-	1	-	-	-	3	6	-	2	-	-
Nonclassifiable	116	1	19	4	17	2	11	20	18	-	-	24

NOTE: Uns = Unspecified. Information not available to classify at a more detailed level.
Nec = Not elsewhere classified.
NOTE: Data includes only those reported cases which occurred during 1982 involving death, or one or more lost workdays beyond the day of injury.
Source: Alaska SOS Table 511.

1983 ANNUAL HOSPITAL SURVEY

ALASKA ACUTE AND LONG-TERM HEALTH CARE FACILITIES

STATE OF ALASKA

DEPARTMENT OF HEALTH AND SOCIAL SERVICES

DIVISION OF PLANNING, POLICY AND PROGRAM EVALUATION

SECTION OF HEALTH PLANNING

July 1983

AK/DHSS/PPPE-83/23

TABLE 15.
1983 ANNUAL HOSPITAL SURVEY
ACUTE CARE FACILITIES
DISCHARGES BY ICD-9 DIAGNOSTIC GROUP
RATE PER 10000 POPULATION (ADJUSTED)
HSA AND STATEWIDE

ICD-9 MAJOR CATEGORIES	ICD-9 DETAIL	RATE PER 10000 POPULATION SE HSA	RATE PER 10000 POPULATION SC HSA	RATE PER 10000 POPULATION N HSA	RATE PER 10000 POPULATION STATEWIDE
TOTAL		19.67	26.50	22.85	24.76
MUSCULOSKELETAL					
	MUSCULOSKEL-CONNECT.	47.04	92.59	80.24	83.54
TOTAL		47.04	92.59	80.24	83.54
CONGENITAL AN[illegible]LIES					
	CONGENITAL ANOMALIES	7.70	15.83	13.26	14.14
TOTAL		7.70	15.83	13.26	14.14
PERINATAL MORBIDITY					
	PERINATAL MORBIDITY	8.34	22.36	8.04	17.33
TOTAL		8.34	22.36	8.04	17.33
SYMPTOMS&ILL-DEFINED					
	SYMPTOMS&ILL-DEFINED	67.78	79.78	91.52	80.60
TOTAL		67.78	79.78	91.52	80.60
EXTERNAL CAUSES					
	FRACTURES	57.30	54.77	49.80	58.33
	DISLOCATIONS	4.92	8.90	18.61	10.41
	SPRAINS-STRAINS	12.19	16.91	17.35	16.34
	INTRACRANIAL INJURY	9.19	10.01	8.18	9.51
	INTERNAL INJURY	2.35	4.89	4.09	4.36
	OPEN WOUNDS OF HEAD, NECK, TRUNK	20.10	23.05	27.64	23.62
	BURNS	4.28	6.75	6.35	6.32
	POISONING	15.18	10.43	13.11	11.67
	TOXIC EFFECTS	2.99	2.65	3.38	2.86
	COMPLIC.OF MEDICAL C	4.28	11.55	14.24	11.10
	OTHER INJURIES	25.30	25.10	24.26	25.09
TOTAL		151.08	175.02	187.02	179.60

NOTE: EXPLANATORY NOTES TO ALL TABLES FOLLOW TABLE 94.

TABLE 14. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP

TABLE 15. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.
RATE PER 10,000 POPULATION (ADJUSTED):
POPULATION, SE HSA = 59201, ADJUSTED TO 46769.
POPULATION, SC HSA = 318477, ADJUSTED TO 214716.
POPULATION, N HSA = 83159, ADJUSTED TO 70912.
TOTAL POPULATION, STATE = 460837, ADJUSTED TO 332397.
ADJUSTMENTS WERE MADE TO THE DENOMINATORS FOR DIAGNOSTIC RATE CALCULATIONS IN ORDER TO REFLECT THE POPULATION FOR WHICH DATA WERE AVAILABLE. THIS MEANT, FOR NORTHERN HSA, EXCLUSION OF ALL MILITARY AND DEPENDENT POPULATION EXCEPT FOR THAT PROPORTION (ESTIMATED AT 20.4%) WHICH UTILIZED NON-FEDERAL FACILITIES. FOR SOUTHCENTRAL HSA, IT WAS NECESSARY TO EXCLUDE THE SERVICE POPULATIONS FOR BRISTOL BAY PHS, CENTRAL PENINSULA, HUMANA, NORTON SOUND, SOUTH PENINSULA AND USCG-KODIAK. FOR SOUTHEAST HSA, IT WAS NECESSARY TO EXCLUDE THE KETCHIKAN GENERAL HOSPITAL SERVICE POPULATION.

DUE TO CHANGES IN AVAILABILITY OF DIAGNOSTIC AND PAYMENT SOURCE DATA THIS YEAR FROM THE PREVIOUS YEARS' SURVEY, ANY CONCLUSIONS DRAWN FROM A COMPARISON OF RATES ARE NOT THOUGHT TO BE MEANINGFUL.

TABLE 16. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.
***** IN COMPUTER GENERATED OUTPUT INDICATE FACILITIES FAILURE TO REPORT ICD-9 DATA.

TABLE 17. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.
***** IN COMPUTER GENERATED OUTPUT INDICATE FACILITIES FAILURE TO REPORT ICD-9 DATA.
ANMC, YUKON-KUSKOKWIM REPORTED TOTAL DOES NOT INCLUDE SUPPLEMENTAL.

TABLE 18. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.
***** IN COMPUTER GENERATED OUTPUT INDICATE FACILITIES FAILURE TO REPORT ICD-9 DATA.
KOTZEBUE: REPORTED TOTAL DOES NOT INCLUDE SUPPLEMENTAL.

TABLE 19. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.

TABLE 20. SEE APPENDIX I FOR A LIST OF ICD-9 CODES INCLUDED IN EACH DIAGNOSTIC GROUP.
***** IN COMPUTER GENERATED OUTPUT INDICATE FACILITIES FAILURE TO REPORT ICD-9 DATA.
FAIRBANKS: PATIENT DAYS REPORTED BY PATIENTS DISCHARGED.

INTRACRANIAL INJURY	850-854
INTERNAL INJURY OF CHEST, ABDOMEN AND PELVIS	860-869
OPEN WOUND OF HEAD, NECK AND TRUCK	870-879
BURNS	940-949
POISONING BY DRUGS, MEDICAMENTS AND BIOLOGICAL SUBSTANCES	960-979
TOXIC EFFECT OF SUBSTANCES CHIEFLY NON-MEDICAL AS TO SOURCE	980-989
COMPLICATIONS OF SURGICAL AND MEDICAL CARE NOT ELSEWHERE CLASSIFIED	996-999
OTHER INJURIES AND OTHER UNSPECIFIED EFFECTS OF EXTERNAL CAUSES	880-939, 950-959, 990-995

[1]ALCOHOL ABUSE includes Alcoholic psychoses, Alcohol dependence syndrome, and non-dependent abuse of alcohol.

[2]DRUG ABUSE includes Drug psychoses, drug dependence, and non-dependent abuse of drugs.

Source: Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Volume 1, World Health Organization, Geneva, 1977.

ALASKAN MEDEVACS

DESCRIPTIVE STUDY, IDENTIFICATION OF PROBLEMS, AND POSSIBLE SOLUTIONS

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465-3027

May 1983

Year

The study year 1981 was selected for two reasons: (1) the contract period was scheduled to begin December 1, 1982 and most services and facilities could not have complete 1982 information; and (2) to effectively utilize the 1977 and 1979 Southern Region studies, the 2-year interval could provide better information for projections. In a number of instances (e.g., U.S. Coast Guard) 1981 data were not available or easily retrievable, and therefore 1982 statistics were collected. These cases are noted.

Definitions

The diagnoses (or suspected diagnoses in some cases) were categorized into the following:

Cardiac: includes all cardiac patients.
High Risk Infants: includes any emergency patient under 1 year of age.
High Risk Mothers: includes problem pregnancies, suspected problems with labor, and emergencies resulting from problem births.
Thermal: includes burn, frostbite, and hypothermia.
Head Injuries: includes all head injuries resulting from motor vehicle accidents, falls, other trauma.
Behavioral: includes suicide attempts, alcohol or drug related violent actions, depression, psychotic behavior.
Trauma: includes fractures, stabbings, amputations, gunshot wounds, multiple trauma. (Does not include head injuries or spinal cord injuries.)
Spinal Cord Injuries: includes back fractures, heel fractures, or back trauma. (Does not include back strain.)
Poison: includes intake of toxic substances.
Medical: includes such things as appendicitis, emphysema, gastro-intestinal bleeding, etc.

In addition to coding the type of illness/injury, the following variables were also retrieved and coded when available or applicable:

run number
date
age
sex
race
origin of incidence
transporting air service
escorts
insurance coverage
receiving hospital

"Severity" was also retrieved, but not used for analytical purposes. Because most patients were stabilized before transport, few "code reds" from the airfields were noted.

The definition of medevac also varied from location to location. The definition used for this study is "Any injury or illness requiring immediate air transport to more definitive care. These conditions had to be life-threatening, limb-threatening, a potential loss to sensory organs, and/or special or unusual circumstance". Because of the range of service capabilities within Alaska, determination of what constituted a medevac was made at the local level.

Table IV-2B

Patients Transported by Air into Anchorage
by EMS Region of Origin and by
Clinical Problem Category
1981

Dx Category	Southern Region	South-east	Interior	NANA	North Slope	Other/ Unknown	Total
High Risk Infants	54	6		1	4	1	66
High Risk Mothers	41	6	5	7	3	1	63
Cardiac	57	3	2	3	14	3	82
Poisonings	4				1	1	6
Trauma	155	6	21	14	24	17	237
Head Injuries	50		4	3	8	6	71
Spinal Cord Injuries	41	3	4	1	11	7	67
Thermal	11	2	2		3	6	24
Behavioral	10		1		4	3	18
General Medical	153	10	9	13	24	19	228
Unknown	3				3		6
TOTAL	579	36	48	42	99	64	868

Source: Anchorage Paramedic Run Reports

Table IV-2B shows the clinical category of medevac patients transported into Anchorage from each of the EMS regions. Trauma and general medical are major categories for all five regions. Southern and North Slope experienced a high proportion of cardiac patients. Seventy-four percent of all high risk infants and mothers originated within the Southern Region.

As Table IV-3 indicates, of the three referral hospitals in Anchorage, Providence Hospital received over 50% of the incoming patients. The number of emergency transports into Alaska Native Medical Center remained the same from 1979 to 1981. Humana Hospital Alaska's admissions increased from 72 in 1979 (then known as Alaska Hospital and Medical Center) to 106 in 1981, nearing its 1977 admissions. The most significant change in patient category is the continued increase in the transport of high risk infants to Providence Hospital. In 1981, the number increased to 42 over 27 in 1979. Other increases for Providence were in cardiac and head injuries. Decreases were noted in suspected spinal cord injuries and general medical. Other categories remained at about the same level.

TABLE IV-3

A COMPARISON OF AIR TRANSFERS OF PATIENTS
INTO ANCHORAGE BY CIVILIAN HOSPITAL AND BY PATIENT CATEGORY FOR 1977, 1979, 1981

PATIENT CATEGORY	Humana			Providence			ANMC		
	77	79	81	77	79	81	77	79	81
Cardiac	23	5	9	57	38	49	18	16	23
High Risk Infants	5	2	2	20	27	42	12	26	23
High Risk Mothers	1	1	9	10	27	26	13	33	25
Thermal	2	1	2	9	15	16	2	9	5
Poison	0	0	0	0	4	4	0	5	3
Head Injuries	10	11	7	32	35	46	17	16	19
Spinal Cord Injuries	16	3	7	24	47	37	8	5	18
Behavioral	2	1	1	13	6	9	2	11	4
Trauma	46	26	38	173	99	102	71	74	97
General Medical	23	17	31	61	122	111	54	123	96
Unknown			0			1			2
SUBTOTAL	128	72	106	399	420	443	197	318	315
TOTAL	128	72	106	399	420	503*	197	318	315

Source: 1977 Air Transfers into Anchorage Hospital by Location, Date and Patient Types
1979 study for SREMSC
Anchorage Paramedic Run Reports, 1981

*An additional estimated 60 patients/year are taken directly to Providence through their heliport.

Type of Transport

Most of the patients arrived in Anchorage via commercial airlines (Wien and Alaska Airlines primarily) and air taxi services. Approximately twenty percent arrived via air ambulance*, about ten percent arrived via military, coast guard, public safety, or other (including unidentified). It is believed that the percentage of arrivals via air ambulance is now higher as one service was starting up in 1981, the year for which data were collected.

Fairbanks Memorial Hospital

Using the same approach and definitions as described earlier in this chapter, research staff reviewed the 1981 Chena Goldstream Volunteer Fire Department EMS records. Interior Region EMS Council had already arranged the records involving medevacs by month. December information was not available, so the average from the other 11 months was used to estimate December statistics. Using this method, Fairbanks Memorial Hospital received approximately 145 medevac patients during 1981. (Please note, however, that the "Chena-Goldstream Volunteer Fire Department Progress Report on the Advanced Life Support Demonstration Project, April 1982" reported that 159 medevacs were received by Fairbanks Memorial Hospital in 1981. This discrepancy can most likely be attributed to a minor variation in methodology and/or an actual higher number of December transports than what was projected.)

As illustrated by Table IV-5, 35% of the medevacs into Fairbanks Memorial were general medical, while 34% were trauma cases. Nine percent of all medevacs involved head injuries. Other categories proved inconclusive because of the small numbers, but it is interesting to note that although 10 high risk mothers were transported, only 1 high risk infant was transported into Fairbanks Memorial Hospital. Other record sources show that the high risk infants were transported via the high risk infant transport team directly to Providence Hospital in Anchorage.

As with other emergency admissions, the number received at Fairbanks Memorial peaked during the summer months, although March showed an unusually high number of general medical cases.

Although severity indicators were noted (e.g., A/O, stable, etc.) most patients were stabilized prior to transport. Only eight records indicated a code red into Fairbanks Memorial.

*Information from air ambulance services.

Table IV-5

NUMBER OF EMERGENCY AIR TRANSPORTS
INTO FAIRBANKS MEMORIAL HOSPITAL VIA
CHENA-GOLDSTREAM VOLUNTEER FIRE DEPT.
BY MONTH & PATIENT CATEGORY
JANUARY 1 - NOVEMBER 30, 1981

month / Patient Category	J	F	M	A	M	J	J	A	S	O	N	SUBTOTAL
High Risk Infant				1								1
High Risk Mother			2	1		4			1	2		10
Burns				1								1
Trauma	1	1	5	5	5	5	8	1	4	5	5	45
Head Injuries	1		1		3	2		4		1		12
Spinal Cord Injuries				3				3	2			8
Poison		1							1			2
Behavioral												0
Cardiac		1	1	2	2							6
General Medical	5	6	8	3	5	5	6	3	2	2	2	47
Unknown								1				1
SUBTOTAL	7	9	17	16	15	16	14	12	10	10	7	133
TOTAL								(Est. for December : 12)				145

Source: Chena Goldstream Volunteer Fire Department EMS Records, 1981

Thirty-eight percent of the medevac patients were women and sixty-two percent were men. Only 12 cases involved children under the age of 14.

Seattle Hospitals

Most of the Alaskan medevac patients received by Seattle hospitals originate in Southeast Alaska and the Aleutian Chain (primarily Dutch Harbor). In addition, the Seattle facilities are most often the referral centers for the Anchorage and Fairbanks hospitals.

As illustrated by Table IV-6 most of the medevacs originating in Southeast are sent to Seattle facilities (Anchorage received 36 patients from Southeast). This is due primarily to established patient flow patterns and more recently because of Airlift Northwest serving Southeast communities. Data from the Aleutian Chain are incomplete, but during a one year period 45 patients were transferred to Seattle facilities from the Iliuliuk Clinic in Unalaska. Other major communities in the Aleutian Chain (including Adak*) transfer primarily to Anchorage facilities.

*Confirmed by conversation with Col. Lester Parker, Administrator, Elmendorf Hospital

Table IV-6
PATIENT EMERGENCY AIR TRANSPORTS TO SEATTLE HOSPITALS
BY PATIENT ORIGIN (EXCLUDING ANCHORAGE AND FAIRBANKS)
AND PATIENT TYPE FOR A 1 YEAR PERIOD

	S.E. Alaska Feb.1, 1982-Feb.28, 1983	Unalaska/ Dutch Harbor Oct.1, 1980-Sept.30, 1981
High Risk Infant	7	0
High Risk Mother	2	1
Trauma	15	12
Head Injury	9	1
Spinal Cord Injury	0	2
Thermal	3	0
Poisoning	0	0
Behavioral	0	3
Cardiac	14	0
General Medical	27	26
TOTAL	77	45

Sources: Airlift Northwest, Medevac Reports
Iliuliuk Clinic, Unalaska, Medical Evacuation Log

In 1981 at least 16 patients were air transferred to Seattle facilities from Anchorage and Fairbanks hospitals. These patients were transferred for specialized or extended care or by patient request. An additional 14 patients were transferred to other major referral centers as listed in Table IV-7. Most referrals were in the categories of general medical and spinal cord injuries.

Table IV-7

PATIENT AIR TRANSPORTS FROM FAIRBANKS
AND ANCHORAGE HOSPITALS TO MORE DEFINITIVE CARE
BY PATIENT TYPE AND LOCATION OF RECEIVING FACILITY
JANUARY 1, 1981 - DECEMBER 30, 1981*

		Receiving Location									
Hospital	Patient Type	Seattle	Portland	California	Texas	E. Coast	Colorado	Outside	Unknown	Anchorage	Sub Total
ANMC	High Risk Infant	1									1
	Spinal Cord Injury			1							1
Humana	High Risk Infant	1									1
	Spinal Cord Injury							1			1
	Medical	2									2
Providence	High Risk Infant	2									2
	Spinal Cord Injury	1	1	1			1	1			5
	Medical	1	1		1	1		1			5
	Trauma	3									3
	Cardiac							1			1
Fairbanks Memorial	High Risk Infant	3							1		4
	Spinal Cord Injury								2		2
	Medical								3	1	4
	Trauma	1							3	1	5
	Cardiac	1							2		3
	High Risk Mother									1	1
	Head Injury								1		1
Sub Totals By Receiving Location		16	2	2	1	1	1	4	12	3	-
									TOTAL		42

* December Information not available for Fairbanks

Source: Run Reports, Anchorage EMS
Run Reports, Chena-Goldstream
Vol. Ambulance Svc.

Table IV-8

AIR TRANSFERS FROM ANCHORAGE HOSPITALS
BY PATIENT TYPE FOR 1977, 1979 AND 1981

Category	Year 1977	1979	1981
Cardiac	22	3	1
High Risk Infant	10	6	4
High Risk Mother	N/A	N/A	0
Thermal	3	2	0
Head Injury	2	4	0
Spinal Cord Injury	6	5	7
Poisoning	0	0	0
Trauma	16	0	3
Medical	37	22	7
Total	96	42	22

The numbers of "outside" transfers has dramatically decreased as illustrated by Table IV-8. As Anchorage facilities increase their capabilities in critical and specialized care, fewer transfers result. Overall the transfers decreased by 48%. The only area showing no decrease in transfers is spinal cord injuries.

Summary

A summary of emergency medical transports into the tertiary or major referral centers of Anchorage, Fairbanks, and Seattle is shown in the table below.

Table IV-9

ESTIMATED NUMBER OF
EMERGENCY MEDICAL TRANSPORTS FROM ALASKAN COMMUNITIES
INTO MAJOR REFERRAL CENTERS
1981

Receiving Community	Number of Patients Transported In
Anchorage	928
Fairbanks	145
Seattle	138
TOTAL	1,211

C. Emergency Air Transports To and From Subregional Alaskan Hospitals and Clinics

Information on transfers into and from subarea Alaskan hospitals is seriously lacking. This section provides a brief analysis on the available data, but more detail is available in the regional reports. Primary data sources include service unit travel records, ambulance reports, clinic records and hospital survey data.

Transports into Subregional Alaskan Facilities

As shown by Table IV-10, fewer than half of the regional hospitals were able to provide statistics on transports into their facility. Of the ones able to provide data, many were not able to specify patient category. For those receiving facilities/communities reporting by patient category, the largest number of specified transports were in the trauma category (35%). Most of the patients in the "all other" category had a range of medical problems. Other categories that were represented by over 5% of the transports were high risk mothers and cardiac.

The available data were analyzed to determine whether any patterns emerged that would enable the researchers to estimate subregional transfers for those communities not supplying data. Different methods were reviewed such as incoming transfers/population ratios, incoming/outgoing transfer ratios. The methods were examined for use in groupings of similar hospitals.

Each method had substantial drawbacks. The major problem with each was that there was a great variation in the ratios, even within groupings of communities/facilities with similar characteristics. Any resulting estimates would be general. The reasons that there is such a variation could include:

- varying policies across and within communities as to when patients should be transported;
- availability of local transport;
- variation in reporting practices (such as reporting those air transports that were emergencies, versus reporting all patients transported by air);
- availability of payment for transport;
- availability of alternate means of transport (road system, etc.);
- capability of clinic in referring community to treat patient.

Table IV-10

AIR TRANSFERS INTO REGIONAL HOSPITAL CENTERS
AND TWO SUB-REGIONAL CENTERS BY CLINICAL CATEGORY
1981

CRITICAL CARE CATEGORY \ LOCATION	Ketchikan General	Mt. Edgecumbe	Sitka Community	Kotzebue PHS	Barrow	South Peninsula	Yukon-Kuskokwim PHS	Central Peninsula	Faith Hospital	McGrath Sub-Reg. Ctr. (FY '82)	Unalaska
Behavioral Health				3		11	2				
Spinal Cord Injury	1			2	1		11				
High Risk Infant	1			4	1	2	5				
Cardiac	9			6	6	14	12				
Burns/Thermal	3				5	1	11				
High Risk Mother	1			7	13		43				
Head Injury	1			9	1	1	14				1
Poisoning				1			12				
All Other Trauma	32			27	34	9	181		2	8	4
All Other	15			28	67	85	128		1	7	1
Total	63	51	Est. 16	87	128	123	419	53	3	15	6

Note Information not available from: Petersburg, Wrangell, Bartlett, Kodiak Island, Adak Naval, Bristol Bay.
No response from: Barrow PHS, Norton Sound, Seward General, USCG Kodiak, Valdez Community, Valley Hospital, Cordova Community.

Source: Individual hospital reports

Despite the major drawbacks in the available data, a ball-park estimate for number of air transfers into regional centers was arrived at for purposes of this report. In order to arrive at an overall total, estimates were derived by facility based on a review of data from similar facilities/communities. The estimates were tallied to give a ball-park figure for the civilian facilities in the state. The estimate is conservative.

Estimated Air Transfer Into Civilian Regional Alaskan Hospital Centers, 1981	
Patients Transported by Air	1,409

Transports Out of Subregional Facilities

Fifteen of twenty-one facilities, and two subregional centers, were able to provide data on emergency air transports from their facilities. Table IV-11 portrays the data available by facility. The majority of the transports were trauma patients. Another large number were patients with a variety of general medical problems, showing up in the "all other" category. Other categories representing over 5% of the transports included high risk mother, cardiac and head injury. Similar estimating procedures were employed as described above to supplement the information in Table IV-11. Estimates for outgoing air transports the 5 civilian facilities not supplying data are shown below:

Barrow	63
Norton Sound	97
Seward	7
Cordova	10
Valley	0

Table IV-11

AIR TRANSFERS OUT OF REGIONAL HOSPITAL CENTERS
AND TWO SUB-REGIONAL CENTERS BY CLINICAL CARE CATEGORY
1981

CLINICAL CARE CATEGORY \ LOCATION	Bartlett Memorial	Ketchikan General	Petersburg General	Sitka Community	Mt. Edgecumbe	Wrangell General	Kotzebue PHS	South Peninsula	Valdez Community	Yukon-Kuskokwim PHS	Bristol Bay PHS	Central Peninsula	Kodiak Island	Naval, Adak	Faith Hospital	McGrath Sub-Reg. Ctr. (FY '82)*	Unalaska Sub-Reg. Ctr.
Behavioral Health		2				4			1	2	9	1	12	33			7
Spinal Cord Injury						1	1		1	2						1	10
High Risk Infant		3	1	1			5	7		8	2		8		1		
Cardiac		8		6		1	3	11		8		1	2	2	1		13
Burns/Thermal			1	1				1		2	1	1					
High Risk Mother		1	4	3			5	10	1	15	13	3	2		3	4	6
Head Injury		1	1	4		1	3	7		9	5	6	1	3	2	2	5
Poisoning							1			1							
All Other Trauma		25	17	8		12	21	23	1	50	66	13	3	28	11	11	55
All Other		58	19	9		16	50**	31	3	53		11	3	258***	7	7	57
Total	108	98	43	32	25	35	89	90	7	150	96	36	33	324	25	25	153

* Data for FY 1982
** 14 DOA
*** Number of transports verified by Elmendorf
Note No Response from: Seward General, USCG, Kodiak; Valley Hospital; Cordova Community; Barrow, PHS; Norton Sound.
Source: Individual facility reports

A total estimate for air transports from subarea facilities including the 324 air transports from Adak (excluding the McGrath and Unalaska air transfers) are shown below.

Estimated Air Transfers Out of Regional Alaskan Hospitals, 1981	
Patients Transported	1,413

This estimate is approximately 200 higher than the information shown in the previous section on emergency medical transports into Anchorage, Fairbanks, and Seattle. There are at least two reasons for the discrepancy:

1) Not all transports reported as emergencies by subarea facilities may be perceived as emergencies by the receiving center. Alaska Native Medical Center sends a van to pick up non-emergency transfers; those transports would not show up in the paramedic reports. Friends or relatives may sometimes provide transport from airport to referral center.
2) Transports out of a subregional center can be to another subregional center.

Patients also are transported by air directly from communities without hospitals. Data for two such communities, McGrath and Unalaska, were collected to serve as prototypes and are shown in Table IV-11. Communities which have regular air connections with Anchorage or Fairbanks often refer patients directly to those large referral centers rather than transporting patients first to any subarea hospital that might serve the area.

McGrath transported 25 patients by air to Anchorage or Fairbnks during fiscal year 1982. Statistics collected from 1979 to 1982 indicate that nearly 85% of the patients are transported to Anchorage, the rest to Fairbanks. Fifteen patients were transported into McGrath by air, primarily from the surrounding communities of Nikolai, Takotna, Telida, and Lime Village.

Data were received for Unalaska from the Iliuliuk Family and Health Service for the September 1980 to November 1981 period. Statistics analyzed for the November, 1980 through October, 1981 show 153 air transports from Unalaska.

Twenty-one patients were transported to Seattle, all the rest were transported to Anchorage. Over one-third of the patients transported were trauma patients. Another large group had medical problems. Unalaska has a medevac rate that is very high in proportion to their population due to the large number of injured crew members brought into port for evacuation.

Summary

This section on transports into and out of subregional centers is limited because of the incompleteness of the data. Many hospitals don't keep the information on a regular basis. In addition, patients transported by commercial air carriers may or may not be met at the receiving airport by transport services run by the subregional facilities. Patients are then sometimes counted as residing in the subregional center who were nevertheless transported in from another area. Nevertheless, it appears that approximately the same number of emergency air transfers are transported into subregional Alaskan facilities (1400) as are transported out of them to the tertiary referral centers of Anchorage, Fairbanks, and Seattle (1200-1400).

D. Utilization of Air Ambulance Services

Three air ambulance services currently operate in Alaska: Airlift Northwest, Alaska Medivac Systems, Jet Alaska. Records for each of the three were reviewed for a one-year period. Data on numbers of transports are presented by diagnostic category, origin of transport, receiving facility, and response times. Summary information is reviewed at the end of this section.

Airlift Northwest

Airlift Northwest operates almost exclusively in Southeast Alaska. In 1982, they transported one patient from Anchorage to Seattle, however all other transports were from four towns in Southeast Alaska: Juneau, Sitka, Petersburg, Ketchikan. (Additional specific information can be found in the regional report.)

Table IV-12

Airlift Northwest
Medivacs into Seattle By Diagnostic Category
February, 1982 through February 1983*

Diagnostic Category	Southeast Region
High risk infant	7
High risk mothers	2
Cardiac	14
Poisonings	0
Trauma	15
Head injuries	9
Spinal cord injuries	0
Thermal	3
Behavioral	0
General medical	27
Total	77

* 13 months were used since the service started February, 1982. There were 2 southeast transports in the first month, none in the second month.

Source: Airlift Northwest records

Receiving facility for Airlift Northwest transports is based on a physician to physician referral. The receiving physician determines the hospital admission. The four hospitals supporting Airlift Northwest are listed in the table below. Patients are also transported to hospitals other than the four forming the support group.

Table IV-13

Receiving Hospitals in Seattle
for Airlift Northwest Transports
By Diagnostic Category
February, 1982 through February, 1983

Diagnostic Category	Children's Orthopedic	Harborview	Providence	University	Other	Total
High risk infant	4	-	-	3	-	7
High risk mother	-	-	-	2	-	2
Cardiac	1	4	5	4	-	14
Poisonings	-	-	-	-		0
Trauma	1	13	-	-	1	15
Head injuries	-	8	-	-	1	9
Spinal cord injuries	-	-	-	-	-	0
Thermal	-	3	-	-	-	3
Behavioral	-	-	-	-	-	0
General medical	8	9	2	4	4	27
Total	14	37	7	13	6	77

Source: Airlift Northwest records

Alaska Medivac Systems

Alaska Medivac Systems transports patients from all parts of Alaska though the vast majority are from the Southern EMS region. The table below shows the number of transports by region by diagnostic category.

Table IV-15

Alaska Medivac Systems
Medevacs by EMS Region of Origin
and Diagnostic Category
1982

Diagnostic Category	Southern	Southeast	Interior	NANA	North Slope	Total
High risk infants	8	3	2	1	0	14
High risk mothers	12	1	0	0	0	13
Cardiac	7	0	2	0	0	9
Poisonings	2	0	0	0	0	2
Trauma	18	0	1	0	2	21
Head injuries	9	1	0	0	0	10
Spinal cord injuries	5	0	0	0	0	5
Thermal	4	0	0	0	0	4
Behavioral	0	0	0	0	0	0
General medical	22	1	0	0	0	23
Unknown	1	0	0	0	0	1
Total	88	6	5	1	2	102

Source: AMS records

Receiving facility for Alaska Medivac Systems transports is also based on physician - physician referral. OF the 102 transports, 84% were to the three Anchorage civilian hospitals. Of the transports to facilities other than the three civilian acute care medical hospitals in Anchorage, two were back to the outlying subarea referring hospital, and the rest were to Seattle.

Table IV-16

Receiving Facilities
for Alaska Medivac Systems Transports
By Diagnostic Category
1982

Diagnostice Category	Humana	Providence	AK Native Medical Ctr	Other	Unknown	Total
High risk infant	0	3	1	8	2	14
High risk mother	0	9	2	2	0	13
Cardiac	0	8	0	1	0	9
Poisonings	1	0	1	0	0	2
Trauma	5	11	4	1	0	21
Head injuries	3	5	2	0	0	10
Spinal cord injuries	1	4	0	0	0	5
Thermal	0	3	1	0	0	4
Behavioral	0	0	0	0	0	0
General medical	8	13	1	1	0	23
Unknown	0	0	0	1	0	1
Total	18	56	12	14	2	102

Source: AMS records

Jet Alaska

Jet Alaska also transports patients from all parts of Alaska. Again the majority are from the southern region. The table below shows the transports from each region by diagnostic category.

Table IV-18

Jet Alaska
By EMS Region
and Diagnostic Category
1982

Diagnostic Category	Southern	Southeast	Interior	NANA	North Slope	Total
High risk infant	51	6	5	1	1	64
High risk mothers	17	2	1	0	0	20
Cardiac	10	1	2	1	2	16
Poisonings	1	0	0	0	0	1
Trauma	22	1	3	0	4	30
Head injuries	15	0	0	1	0	16
Spinal cord injuries	4	1	1	0	4	10
Thermal	2	1	0	0	0	3
Behavioral	0	0	0	0	0	0
General medical	21	1	1	0	3	26
Total	143	13	13	3	14	186

Source: Jet Alaska records

Receiving facilities for Jet Alaska are primarily in Anchorage. Of the 186 transports, 12 were taken to non-Anchorage facilities (primarily Seattle, but also other Alaskan facilities) and 3 are unknown. In other words, over 92% of the Jet Alaska transports are to Anchorage facilities.

Table IV-19

Receiving Facilities
for Jet Alaska Transports
By Diagnostic Category
1982

Diagnostic Category	Humana	Providence	AK Native Medical Ctr.	Other	Unknown	Total
High risk infant	1	56	3	3	1	64
High risk mothers	0	16	1	3	0	20
Cardiac	1	8	2	4	1	16
Poisonings	0	1	0	0	0	1
Trauma	2	20	6	1	1	30
Head injuries	3	12	1	0	0	16
Spinal cord injuries	0	9	0	0	1	9
Thermal	3	0	0	0	0	3
Behavioral	0	0	0	0	0	0
General medical	3	16	5	2	0	26
Total	13	138	18	13	4	186

Source: Jet Alaska records

Summary of Utilization and Response Times

A summary of utilization of the three ambulance services operating in Alaska is shown in the table below by region and diagnostic category for 1982.

Table IV-21

Medevac Transports by Air Ambulance Services
in Alaska by Region of Origin
and Diagnostic Category
1982

Diagnostic Category	Southern	Southeast	Interior	NANA	North Slope	Total
High risk infant	59	16	7	2	1	85
High risk mothers	29	5	1	0	0	35
Cardiac	17	15	4	1	2	39
Poisonings	3	0	0	0	0	3
Trauma	40	16	4	0	6	66
Head Injuries	24	10	0	1	0	35
Spinal cord injuries	9	1	1	0	4	15
Thermal	6	4	0	0	0	10
Behavioral	0	0	0	0	0	0
General medical	43	29	1	0	3	76
Unknown	1	0	0	0	0	1
Total	231	96	18	4	16	365

A summary of the receiving facilities for Alaskan transports by the three air ambulance services operating in Alaska is shown in the following table.

Table IV-22

Receiving Facilities
Alaskans Transported by Air Ambulances
1982

	Anchorage			Seattle					
Diagnostic Category	ANMC	Humana	Prov.	Children's Orthopedic	Harborview	Prov.	Univ.	Other*	Total
High risk infant	4	2	59	4	0	0	3	14	86
High risk mothers	3	0	25	0	0	0	2	5	35
Cardiac	2	1	16	1	4	5	4	6	39
Poisonings	1	1	1	0	0	0	0	0	3
Trauma	10	7	31	1	13	0	0	3	65
Head injuries	3	6	17	0	8	0	0	1	35
Spinal cord injuries	0	1	13	0	0	0	0	1	15
Thermal	1	3	3	0	3	0	0	0	10
Behavioral	0	0	0	0	0	0	0	0	0
General medical	6	11	29	8	9	2	4	7	76
Total	30	32	194	14	37	7	13	37	365

* Includes some within Alaskan, some to other Seattle facilities, some unknown.

E. Military, Coast Guard, Other Public Agency Involvement in Air Transport

The military groups in Alaska are involved in the emergency transport of patients by air through the Alaskan Air Command Rescue Coordination Center. Table IV-24 shows that 69 medical evacuations were carried out in 1981 by U.S. Air Force units located at Elmendorf Air Force Base. Most of the cases were transported from location of incident to Elmendorf Air Force Base Hospital or Providence Hospital. In some cases, patients were transported from the village to a regional center.

TABLE IV-24

Alaska Air Command
Rescue Coordination Center Emergency Air Transports
By Location of Incident* and Diagnostic Category
1981

Diagnostic Category	NANA	Southeast	Southern	Interior	Total
High Risk Infants					
High Risk Mothers			1		1
Cardiac	1			2	3
Poisonings					0
Trauma	2		20	5	27
Head Injuries			1	2	3
Spinal Cord Injuries	2		3	4	9
Thermal	3		9	2	14
Behavioral	1				1
General Medical		1	6	4	11
Total	9	1	40	19	59

*None reported for North Slope

Source: Alaska Air Command, Rescue Coordination Center
SAR Recapitulation

The Alaska State Troopers are also involved in rescue efforts. For fiscal year 1981, as shown in Table IV-25, 37 people were transported by air.

TABLE IV-25

Alaska State Trooper
Emergency Air Transports
By Location of Patient and Diagnostic Category
FY 1981

Diagnostic Category	Southeast	Southern	North Slope	Interior	NANA	Total
High Risk Infant						
High Risk Mothers						
Cardiac	3		1			4
Poisonings						
Trauma	12	3				15
Head Injuries		1				1
Spinal Cord Injuries	1				2	3
Thermal	3	3		3	4	13
Behavioral						
General Medical	1					1
Total	20	7	1	3	6	37

Source: Alaska State Troopers
Note - Trooper records were quite detailed and include information on all incidents they participated in. When it appeared that there was duplication between Medevacs actually made by Coast Guard or Mast, and troopers primarily provided backup, those evacuations were counted elsewhere.

The United States Coast Guard plays a major role in emergency air transports through their coordination center in Juneau. In addition to providing emergency transport for a large number of patients, the Coast Guard serves as a communication link providing medical consultation services in some cases and advice as to closest medical service (in most cases closest port, but in some cases closest ship with a physician).

Records were reviewed for calendar year 1982. Of the 251 medevac/medico files reviewed, 164 resulted in emergency transport. While most transports involved aircraft, some were performed solely by boat. Most of the 164 emergency transports were performed by the Coast Guard, however 19 were carried out by commercial aircraft, some organized by State Troopers, some by other local residents. Transports overseen by the Coast Guard are shown by diagnostic category in Table IV-26. Trauma and general medical lead in categories of transports.

TABLE IV-26

U.S. Coast Guard
Emergency Transports*
By Diagnostic Category
1982

Diagnostic Category	Transports
High Risk Infants	3
High Risk Mothers	3
Cardiac	14
Poisonings	1
Trauma	55
Head Injuries	5
Spinal Cord Injuries	11
Thermal	7
Behavioral	8
General Medical	44
Unknown	13
Total	164

*Includes 19 transports conducted by commercial carriers.
Source: Review of USCG files.

The originating locations of the transports are shown by region in Table IV-27. The vast majority occur in the Kodiak area and southeast Alaska where the major Coast Guard installations are located.

TABLE IV-27

U.S. Coast Guard
Emergency Transports
By Origin of Patients
1982

Origin of Patients	Transports
Southeast	51
Southern	
Kodiak	71
Aleutians/St.Paul	18
Other	24
Total	164

Source: Review of USCG files.

F. Summary of Utilization Information

In this chapter, data have been presented on numbers of emergency medical air transports from subregional communities into regional centers, from regional centers into the three tertiary referral centers (Anchorage, Fairbanks, and Seattle), and from the two Alaska tertiary referral centers to Seattle and other specialized centers outside Alaska.

Table IV-29 summarizes the data on the three major tertiary referral centers by diagnostic category. Over half of the referrals in all diagnostic categories are to Anchorage. In fact, over three-fourths of the transports in all categories except cardiac and general medical cases are into Anchorage.

Table IV-29

Frequency and Percent of Medevac
Referrals to Anchorage, Fairbanks, and Seattle
By Diagnostic Category

	Anchorage		Fairbanks		Seattle	
	#	%	#	%	#	%
Cardiac	23	52.2	6	13.6	15	34.1
High Risk Infant	57	81.7		1.2	14	17.1
High Risk Mother	60	82.1	10	13.7	3	4.1
Thermal	23	85.2	1	3.7	3	11.1
Poison	7	77.8	2	22.2	0	0
Head	72	76.6	12	12.8	10	10.6
Spinal	62	84.9	8	10.9	3	4.1
Behavioral	14	82.3	0		3	17.6
Trauma	237	75.7	45	14.4	31	9.9
General Medical	238	69.8	47	13.8	56	16.4
Unknown	3	75.0	1	25.0	0	0

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Chapter 15

BEHAVIORAL CONSEQUENCES OF CLOSED HEAD INJURY[1]

ARTHUR BENTON, M.D.*

I. Introduction

Cognitive defects, emotional disturbances and "personality change" have always been recognized as salient and sometimes permanent sequelae to the acute phase of a head injury. Among the features of this posttraumatic symptom-complex are: (1) impairment in attention and concentration; (2) fatigability; (3) disturbances in memory; (4) emotional instability and lowered tolerance of frustration and noise; (5) personality alteration in the direction of either depression and withdrawal or disinhibition and euphoria; (6) asphasic deficits; (7) basic and higher-level sensory deficits of various types. Some symptoms occur with remarkably high frequency as late effects of head trauma. Caveness (1966) found in a sample of 281 military men examined 5 years after head injury that 41 percent complained of inability to concentrate, 47 percent of excessive fatigability and 42 percent of impairment in memory, the base rate for these complaints in a control group of non-injured military personnel being about 10 percent. Forty percent of the men manifesting these features of the posttraumatic "syndrome" had failed to make a satisfactory socioeconomic adjustment, as compared to 11 percent of the controls.

Any of these cognitive and emotional changes can occur after closed head injury from blunt trauma as well as after penetrating brain wounds and it is sometimes suggested that, in studying their sequelae, a sharp distinction between the two types of trauma is not justified (cf. Teuber, 1969). However, the *modal* posttraumatic behavioral pictures are different. Specific cognitive impairments indicative of focal brain injury, such as aphasic disorders, sensory defects and higher-level perceptual deficits (i.e., "agnosias"), in combination with neurological signs of focal damage, occur much more frequently after penetrating brain damage. The more common picture after closed head injury is a constellation of relatively vague complaints of impairment in concentration, disturbances in memory and emotional instability with a paucity of specific neurological signs of cerebral abnormality. This set of more general complaints or deficits, which may occur after relatively mild closed head injury, is sufficiently distinctive to be often designated as "the" posttraumatic syndrome. Nevertheless, highly specific cognitive deficits such as one or another form a aphasic disorder may occur as a persisting consequence of blunt trauma, particularly in older individuals (Welte, 1948; Hillbom, 1960; Ota, 1966; Heilman et al., 1971). Conversely, posttraumatic emotional instability with irritability is not an uncommon sequela of penetrating missile injury (Lishman, 1968).

The question of the behavioral sequelae of head trauma in children presents is own peculiar problems. The lack of firm establishment of hemispheric specialization of function and the greater possibilities for restitution of function after injury in the developing nervous system lead to the expectation that the main consequence of trauma would be a general lowering of cognitive abilities with a paucity of focal defects such as aphasia. Moreover, a swifter recovery of function might be anticipated because of the greater "plasticity" of the immature nervous system. Yet psychiatric disturbance in various forms appears to be extraordinarily frequent (Leischner, 1962; Klonoff & Paris, 1974; Shaffer et al., 1975). However, systematic comparative studies of the consequences of head trauma in adults and children, using the same methods of assessment and focusing on the same cognitive and behavioral characteristics, have not been undertaken. It is possible that such controlled study would disclose fewer differences in the symptom-picture, course of recovery and outcome than

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[1] I am greatly indebted to Dr Harvey S. Levin for his valuable suggestions and criticisms.

HEAD INJURY REHABILITATION

Head injuries or intracranial injuries are a major medical problem affecting hundreds of Alaskans each year. A review of the 1984 State Health Plan for Alaska attests to the severity of this disabling problem. In 1981, 344 acute care hospitalizations carried a primary diagnosis of intracranial injury. Four percent of all work-related injuries reported during 1981 involved head trauma.

Accidents continue to be a leading cause of death in Alaska. In fact, Alaska's accident-related mortality rate is 220% above the national average. Motor vehicle accidents are the leading cause of accidental death in Alaska. With improved emergency medical technology, an ever-increasing proportion of severe injury victims survive. However, many of these survivors suffer from life-long severe cognitive and psychosocial impairment as a consequence of brain damage caused by closed or penetrating head injuries suffered during accidents. Throughout the nation, these individuals were previously ignored after they had received acute medical treatment followed by traditional rehabilitation services such as physical therapy, occupational therapy and speech therapy. Insofar as the cognitive deficits are typically the most debilitating consequence of a head injury (Levin, H.S., A.L. Benton & R.G. Grossman, Neurobehavioral Consequences of Closed Head Injury. New York: Oxford University Press, 1982), many head-injured patients would experience repeated failures when trying to function vocationally and psychosocially. Eventually these victims usually retreated from society, became depressed and vegetated day after day in front of a television.

During the past five years, a nation-wide interest in the appropriate rehabilitation of head injury patients has emerged. The National Head Injury Foundation, in collaboration with concerned professionals, has fostered an increased awareness of the rehabilitation needs of this unique population. Several outpatient post-acute rehabilitation programs have been established in the "Lower 48". Program evaluation data indicate that these specialized treatment programs result in improved functioning of head-injured participants, including a significant increase in competitive employment when comparing treated patients with similar head injury cases receiving only traditional rehabilitation services (see Prigatano, G.P. et al., "Neuropsychological Rehabilitation After Closed Head Injury in Young Adults". Journal of Neurology, Neurosurgery and Psychiatry, May, 1984, pp. 505-513).

Head injury clients usually demonstrate a characteristic set of cognitive and psychosocial changes following acute recovery, due to the nature of the brain injury incurred. Typically, the frontal and temporal lobes of the brain are contused or bruised due to the jarring of the brain within the cranium. Similarly, diffuse tearing and shearing of white matter deep in the cerebral hemispheres and brain stem is

typically involved. The neuropsychological consequences of these characteristic injuries include impairments in memory, planning, judgment, organizational skills, language, attention and concentration. Cognitive processing of new information is notably slower than normal, and significant organically-caused personality changes are frequently observed (e.g., impulsivity, emotional lability, anger or lethargy). These patients are often quite confused in their thinking and display anosagnosia (that is, a failure to recognize their cognitive impairments and a failure to appreciate the implications of these deficits relative to everyday functioning). Inasmuch as brain cells do not regenerate, these deficits can be permanent. Given that the majority of head injuries occur to individuals between the ages of 20 and 30 years, these victims have a long but bleak future to look forward to unless they are successfully rehabilitated to maximize their post-injury functioning.

The Alaska Treatment Center is developing an outpatient head injury rehabilitation program. This is the only program of its kind in Alaska and is designed to meet an important human service need. The Treatment Center is a private nonprofit corporation, which derives financial support for its programs through fee for service reimbursement.

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ENRIQUETA TERCILLA, PH.D.
CLINICAL NEUROPSYCHOLOGIST

November 26, 1985

RECD NOV 30 1985

Ms. Heather Double
Denali Towers So., Suite 501
2600 Denali St.
Anchorage, AK 99503

Dear Ms. Double:

The enclosed article is sent at the request of Mrs. Shirley Nodell, Regional Vice-President of the National Head Injury Foundation, who thought the material might be of interest to your group. It was originally prepared for presentation at the Washington State Head Injury Foundation Annual Meeting.

Please feel free to reproduce it if you wish but make sure that the complete article is reproduced and that appropriate credit is given to Rehabilitation Psychology Associates.

For those of you who maintain files on available treatment programs, we have also included brochures describing our programs.

Good luck in your efforts.

Sincerely,

Enriqueta Tercilla

Enriqueta Tercilla, Ph.D.
Clinical Neuropsychologist

Judith Falconer

Judith A. Falconer, Ph.D.
Rehabilitation Psychologist

Enc.: Chemical Abuse and Head Injury
Brochure

CHEMICAL ABUSE AND HEAD INJURY

Judith A. Falconer, Ph.D. & Enriqueta Tercilla, Ph.D.

INTRODUCTION

Research studies have repeatedly demonstrated that a disproportionate number of individuals who sustain head injuries have histories of recreational drug and alcohol abuse and, in many cases, had consumed such substances immediately prior to their accidents. Such abuse clearly plays a significant role in contributing to or causing head injuries in this country. For example, Rumbaugh and Fang (1980) state:

> The importance of the interrelationship between head trauma and drug abuse cannot be overemphasized. Trauma to the head is a direct result of drug misuse in many of the patients arriving at the hospital emergency room. This is particularly true in the younger age group. The problem is essentially the same as with alcohol abuse except that the alcohol abuse patient is frequently older. Many misuse both drugs and alcohol.

Although recreational drugs and alcohol are the substances most frequently addressed in the professional literature, consideration must also be given to abuse, misuse and mixing of prescription and non-prescription drugs and other more common substances by individuals who have sustained head injuries.

SCOPE OF THE PROBLEM

Those studies which document the incidence of pre-injury drug and alcohol abuse in head injured populations almost invariably fail to state criteria for inclusion in such a category (e.g. how many drinks per day, week, etc. constitute abuse). In addition, the sources of information used to identify such abuse are usually stated in extremely general terms (e.g. "family reports"): the accuracy of the data therefore becomes suspect. But, since family members and friends are unlikely to exaggerate the use pattern of such substances to health care professionals, it is probably safe to assume that research statistics underestimate the severity of the problem. For example, Rimel & Jane (1983) report that 52% of their sample of acutely head injured individuals were considered legally intoxicated (blood alcohol level >.10) at the time of injury; 25% had received some type of professional treatment for alcohol abuse and 4% for drug abuse. In the Scandanavian population studied by Tobis, et. al (1982), 51 of 75 patients had histories of excessive alcohol intake and intoxication and were less than 20 years old; 29 of them had histories of drug use including marijuana as well as oral and injectable drugs. Of the 63 patients examined by McLaughlin & Schaffer (1985), 55% were involved with drugs or alcohol at the time of the injury and 38% were known to have had alcohol or drug abuse

problems pre-injury. Given the relatively young age distribution of individuals sustaining head injuries, it is not surprising to discover histories of marijuana use: as of 1979, 50% of people age 18-25 reported some use of marijuana (Schuckit, 1979).

For a variety of reasons, studies of prognosis and outcome following head injury frequently exclude individuals who abused recreational drugs and/or alcohol prior to their accidents, even though such a practice produces a significant distortion of the data. Although it is unclear from research reports how often recreational drug and alcohol abuse continues or arises after head injury, clinical experience suggests it is a significant problem. It is important to note that a pattern of substance use pre-injury, even though unchanged in quantity or frequency, may be one of substance abuse after significant head injury because of physical, cognitive, behavioral and emotional deficits. Thus, the individual who consumed several glasses of beer or several "joints" per day is no longer able to do so without significantly increasing post-injury problems.

It is also critical to address problems in misuse, abuse or mixing of prescription drugs after an individual has sustained a head injury. Medical complications after such an injury frequently result in the need for multiple medications to control physical problems such as seizures, neurogenic bladder, heterotopic ossification, tone and spasticity. When such medications are prescribed by multiple physicians, the possibility of drug interaction and increased side-effects may not be adequately explored. But even when such powerful substances are appropriately prescribed, there is a signficant risk that prescribed patterns of use will not be followed. This is especially true of seizure medications but is also seen with pychoactive (anti-psychotics, anti-depressants, and anti-anxiety) and pain medications. Individuals who have documented seizure disorders commonly report that they take their medication only when they "feel a seizure coming on." Family members frequently report failure to administer prescribed psychoactive medications because of the implication that their loved one is "crazy" or discontinue those medications as soon as behavior control is established secondary to the drug. When taking most of the medications prescribed for head injury related problems, consumption of alcohol and/or recreational drugs is clearly contraindicated.

Misuse, abuse or mixing of non-prescription (OTC) drugs may also play a significant role in causing head injuries, may interfere with recovery following a head injury, and/or may complicate long term adjustment to residual deficits. The absence of a documented role of such medications in accident reports, hospital data, or rehabilitation progress notes does not preclude such an effect. In our chemically oriented society, one cannot exclude the possibility of medication interactions and potentiation contributing to the causes and outcome of head injury if the injured individual, in addition to prescribed drugs, consumes OTC preparations for each minor discomfort or symptom. For example, the common practice of taking aspirin for headache relief frequently increases the severity of ruptured brain aneurysms by interfering with normal clotting times: bleeding becomes more

difficult to control. Many OTC medications are known to cause drowsiness, decrease cognition, and lead to confusion and lethargy even when taken in recommended doses.

Clinical experience also suggests that head injured individuals may abuse more common substances such as tobacco, caffeine and vitamins. Given the known metabolic changes following head injury, it is unclear what effects may be experienced when such substances are used in normal quantities much less when they are abused or used in combination with medications, drugs and/or alcohol. Consumption of 10 - 15 cups of coffee per day may well cause significant agitation and restlessness in an individual who has sustained a head injury. Some head injured individuals and their families engage in megavitamin therapy in the belief such a practice will speed recovery; the effect of such a practice is unknown but vitamins are powerful chemical substances which can disrupt metabolism and, in large doses, are clearly toxic.

Thus, although this paper focusses primarily on abuse of recreational drugs and alcohol, it is critical to keep in mind the possible role of these other substances in complicating and confounding the total picture in head injury.

THE CHRONOLOGY OF SUBSTANCE ABUSE IN HEAD INJURY

Paving the Way: Pre-injury chemical abuse

Studies of individuals known to have abused chemical substances (e.g. marijuana, cocaine, alcohol, etc.) document the negative effects of such behavior on the brain. In addition to the observed social, psychological and behavioral problems involved in substance abuse, pathological changes, some of which are irreversible, have been demonstrated within the brain and central nervous system. The absolute amount of brain damage sustained by the chemical abuser depends to a large degree upon the drug(s) utilized, their purity and the frequency and duration of abuse. When a head injury occurs after chemical abuse, pre-existing biochemical and structural damage to the brain is added to that caused by the head injury itself and complicates the clinical picture. Rumbaugh & Fang (1980) make this point very dramatically in their presentation of 6 case studies where drug abuse directly caused head injuries.

As evidence accumulates, it is becoming clear that many individuals who sustain head injuries have histories of other head injuries. In the Tobis et.al. study (1982), for example, 15 of 75 patients had a previous history of head trauma. The Santa Clara Valley Head Injury Rehabilitation Project (1982) reported 11.3% of their sample had previous histories of head injury. It may well be that the previous head injury led (directly or indirectly) to chemical abuse or that chemical abuse was implicated in causing previous or subsequent head injuries.

Confounding the Picture: Acute care

A number of studies have commented on the difficulty of making a

differential diagnosis when a head injury is accompanied by moderate to high levels of blood alcohol or drugs at the time of the injury. The behaviors noted following acute intoxication and overdose are very similar to those following head injury (lethargy or agitation, confusion, disorientation, respiratory depression, etc.). It appears that in some emergency rooms, patients may be discharged with a diagnosis of intoxication when they have also sustained an undiagnosed head injury. Gallagher & Browder (1968) noted that in one-third of 167 patients, alcohol obscured changes in consciousness, leading to misdiagnosis or delayed diagnosis. In 21 of the patients a subdural hematoma was only diagnosed at post-mortem. Galbraith (1976) reports similar diagnostic problems.

Once the acute medical emergency has passed, there is usually time to collect background data on the injured person. When the family and significant others are interviewed they may deny a history of chemical abuse or, in such a stressful time, truly forget that the problem existed. In some instances, the physician may fail to specifically ask about chemical use or abuse; in other cases, the family may be unaware of the extent of the problem or its very existence. In any event, it is clear that many hospital records do not mention chemical abuse histories where clear evidence for such exists.

Within the acute care setting, the stage may inadvertently be set for later problems with chemical abuse. Individuals who experience seizures (or who are at high risk to do so) may be started on seizure prophylaxis. When combative or aggressive behavior is exhibited, chemical restraints may be used for control. Physicians may prescribe medications to induce sleep or decrease pain. The sedative effect of many medications may significantly decrease levels of cognition and make the head injury appear different and/or more serious than it objectively is.

Cracks in the Window: Acute Rehabilitation

By the time the head injured individual enters a rehabilitation setting, physiological withdrawal from recreational drugs or alcohol, if present at the time of injury, has been completed. Unfortunately, psychological dependency has not been addressed so the problem continues to pose an underground threat. The rehabilitation facility may be unaware of pre-existing problems in this area since neither patient nor family members are likely to voluntarily admit to such problems for fear of making the patient appear a poorer candidate for rehabilitation; accompanying medical records may not include this information.

Entry into the rehabilitation setting frequently coincides with or initiates significant changes in prescribed medications as health care professionals begin to address long term issues such as seizure control, continence and spasticity. Comprehensive medical, physical and psychological assessments are completed and predictions about prognosis are relayed to the injured individual and/or family.

In the rehabilitation setting the head injured individual interacts with other individuals who may have histories of drug and alcohol

abuse. In addition, the relative social freedom of many rehabilitation settings allows drugs and alcohol to be introduced or re-introduced into the environment of the head injured individual. Home passes may begin and peers may visit, some of whom may be chemical users.

Of critical importance is the fact that a number of myths exist about the positive effects of drugs, especially marijuana, on a variety of medical problems experienced after head injury. The patient grapevine frequently communicates that such substances decrease spasticity, ataxia, and dysarthria. As a consequence, even the individual who has no history of drug use may experiment with such substances in an attempt to relieve troublesome symptoms. Despite the increased chance of exposure, the rehabilitation setting is quite sheltered and chemical abuse is unlikely to present a significant problem at this point in recovery.

Resuming the Pattern?: Community Care

Once individuals who have sustained head injuries are discharged into the community, opportunities to resume previous relationships and behavior patterns surface. With the structure of the rehabilitation setting withdrawn, the individual has significantly more free time to fill and less activities with which to fill that time. In many cases, former friends rarely visit. While family members eagerly fill the time initially, many of them soon return to their own lives out of economic and social necessity.

Physical, cognitive, emotional and behavioral limitations frequently preclude many favored pre-injury activities. Since the cognitive and physical requirements for successful drug and alcohol abuse are minimal, such behaviors are readily accessible to even severely injured individuals and may well provide both a link with the past and an entre into peer groups. Individuals who previously refused marijuana, alcohol or other drugs may now accept such substances in an attempt to be "one of the guys".

Since most moderately to severely head injured individuals are unable to return to work for extended periods of time (if at all), role reversals and decreased self-esteem become common problems. It is at this point in the recovery process that depression, frustration and boredom may begin to surface. Within the unadapted home and community environments, the full impact of various deficts may be experienced for the first time. Rather than deal with the emotional consequences of such awareness, the injured individual may well seek refuge in the bottle, especially if such a pattern existed in the past. Unfortunately, it has been well documented that tolerance for alcohol is decreased following head injury so even minimal consumption may rapily produce intoxication.

For most individuals, consumption of drugs and/or alcohol entails more than an attempt to reach a physiological high: the social settings in which drug and alcohol are consumed are far different from those of the workplace and community at large. Of critical importance is the fact that members of the drug culture are usually more accepting of

cognitive and physical limitations than those in the mainstream culture. In sharp contrast to the rejection experienced by head injured individuals in other situations, members of the drug culture extend a warm and friendly welcome.

The individual who is left with moderate to severe physical and cognitive deficits is frequently unable to independently find sources of drugs or alcohol. Family members, however, may feel uncomfortable denying alcohol to an adult who was previously allowed to drink. The rationale may be "everything else has been taken away; I can't take away that one remaining pleasure." Which is understandable but ignores the fact that tolerance for alcohol is decreased following a head injury and that alcohol, even in small amounts, further decreases cognitive and physical functioning and lowers the seizure threshold. So the memory-impaired individual may rapidly forget consuming alcohol and may have a seizure as a side-effect. In this framework, it may be easier for the caregiver to refuse alcohol.

Those individuals with less severe disabilities may well be able to obtain drugs and alcohol independently. When unsupervised in the community, such substances may be offered to the injured individual. Since many individuals who have sustained head injuries have extremely limited financial resources, they may be unable to purchase such items or may do so at the expense of more essential resources. Head injured individuals have been known to purchase a variety of harmless substances in the mistaken belief that they were buying marijuana: they fall easy prey to unscrupulous drug dealers and pushers.

It is also important to note that the deficits which commonly follow head injury are such that the affected individual may well be questioned and/or arrested by local authorities as drunk or high: slurred speech, unsteady gait, poor memory, and altered moods can quite easily be misinterpreted by uninformed officers. If such situations recur, individuals who have sustained head injuries may soon feel "I got the name, I might as well have the game."

DETECTION

Given the memory deficits experienced by many individuals who have sustained head injuries, expectations of accurate self-reporting of chemical abuse may be unrealistic. The head injured individual may truly not recall having consumed inappropriate chemical substances or may underestimate amounts consumed. At the same time, however, cognitive and behavioral limitations make it less likely that the abusing individual will be able to successfully hide patterns of chemical abuse.

For those involved in providing supervision to head injured individuals, detection of drug and/or alcohol abuse may be quite difficult: symptomatic behaviors following chemical abuse are very similar to those seen in head injured individuals (unsteady gait, decreased memory, uninhibited behavior, euphoria, sleep disturbance, altered appetite, visual disturbances, etc.). Nevertheless, any drug or alcohol effects are superimposed upon the injured individual's typical post-injury cognitive, physical, emotional and behavioral

patterns.

Therefore detection becomes a process of carefully noting decreases in functional abilities which are not explainable on any other basis and which coincide with time periods where alcohol or drugs might have been consumed. It is critical, however, to ensure that such functional decreases are not explainable in terms of acute illnesses (e.g. respiratory infections, hydrocephalus, development of seizures) or newly instituted medications.

On a less sophisticated level, one need only note the odor of alcohol or marijuana on the breath of the injured person or episodic nasal congestion and irritation combined with euphoria in the case of cocaine, to detect abuse of those substances.

PREVENTION

Given the fact that it is extremely difficult to alter established patterns of chemical abuse in individuals who have not sustained head injuries, it is not suprising that the same problem is experienced when working with individuals who are head injured. Since many individuals who sustain head injuries are unable to be competitively employed, the threat of job loss is an empty one. Given social norms which exert strong pressure on family members to take care of individuals who are ill, threats to remove family support are rarely credible.

Repeated attempts to "persuade" the injured individual to avoid chemical substances are usually unsuccessful. This is largely attributable to the kinds of cognitive and behavioral deficits typically found after head injury: decreased judgment and reasoning; impaired abstraction; decreased generalization ability; and impaired memory. Many individuals who have sustained moderate to severe head injuries vehemently deny the existence of any disabilities and feel attempts to change pre-injury behavior are unnecessary and inappropriate.

Probably the best way to prevent chemical abuse following head injury is to ensure sufficient meaningful relationships and activities to maximize quality of life: if there are no voids, there will usually be no attempts to fill them with chemicals. While it is impossible to force others to interact with head injured individuals, caregivers can decrease social isolation by using appropriate behavior management techniques to maximize the social behavior of the head injured individual. Exploration of community services such as support groups, YMCA/YWCA, UCP, adapted recreational services, and community colleges, may aid in the search for appropriate social opportunities.

Wherever possible, the individual who has sustained a head injury should be involved in active rehabilitation attempts to remediate deficits and to ensure maximal recovery. Once the individual's medical status is stable, continued reliance on the medical model may encourage dependency upon medical approaches to deficit remediation, including use of chemicals for behavior control. At that point in the recovery process, cognitive and behavioral rehabilitation approaches

are more likely to be successful in preventing chemical abuse since they require injured individuals to accept responsibility for their own behavior, provide consistent objective feedback on performance, and more directly address the long term deficits which lead to chemical abuse.

Although head injured individuals almost invariably fail to recognize the need for supervision, it is clear that such control over their environment is often necessary. Caregivers who are aware of chemical abuse problems need to ensure that cues to engage in such activity are withdrawn from the environment. Alcohol may need to be removed from the house or stored in locations which are inaccessible to the injured individual. This may also include denying opportunities for social relationships with pre-injury friends who are known to use and/or abuse chemicals. Obviously, the caregiver becomes the "heavy" when such tactics are required but there is no reasonable alternative in such situations. Reasonable limitations on access to funds may be necessary to prevent the purchase of chemical substances.

The physical and medical deficits following head injury are frequently so wide-ranging that multiple physicians are involved in diagnosis and management. Therefore, to forestall the misuse or abuse of prescription drugs, it is critical that a single physician assume responibility for medication management. Such a practice minimizes undesirable side-effects of powerful medications and ensures continuity of care. Adequate monitoring of medication consumption to ensure that prescribed schedules are followed, however, remains the responsibility of the head injured individual or caregiver. This is especially true of seizure medications, which have been reported as having a relatively high rate of non-compliance. Many head injured individuals reject these medications because of their sedative effect: even when taken in therapeutic doses, they are known to decrease attention and concentration, impair memory, and otherwise negatively affect cognition. Nevertheless, there are multiple reports in the literature which implicate changes in or withdrawal from seizure medications as precipitating seizures (including status epilepticus) when alcohol is consumed. The nature of such events has been well-stated by Victor (1979):

> It should be noted that in patients with idiopathic and posttraumatic epilepsy, the onset of which frequently antedates the patient's alcoholism, the seizures are made worse and more frequent by drinking. In these patients, seizures may be precipitated by a relatively short period of intoxication, e.g. an evening or weekend of heavy social drinking, but the factor of withdrawal is still operative, in that the seizures tend to occur not when the patient is intoxicated but the morning after, i.e. in the "sobering-up" period.

In many instances, it will be necessary for family members to administer and control prescription medication to ensure compliance. When there is any possibility of non-compliance, it is worthwhile for a responsible individual to periodically count the actual number of pills remaining and to monitor prescription refills

An area in which prevention is especially critical is abuse or misuse of non-prescription drugs. With over 500,000 separate compounds available, many of which have not been carefully evaluated and which have not been proven effective, the range of choices is almost unlimited. Nevertheless, such products should be avoided by individuals who have sustained head injuries unless authorized by their primary physician. Family members need to carefully supervise such substances within the home to ensure that abuse does not occur and result in increased problems for the individual who has sustained a head injury.

CONCLUSION

Chemical abuse can frequently be prevented, even when it was present prior to the injury. While many individuals with a history of chemical abuse may benefit from formal drug and alcohol rehabilitation programs, such programs are not designed to directly address the physical and cognitive limitations of those who have sustained head injury. Should enrollment in such a program be considered, it is essential that program personnel be fully apprised of the medical problems of the head injured individual to ensure that medical needs are met.

Family members must, however, be aware that some individuals who sustain head injuries will continue with or develop patterns of chemical abuse which are intractable. While this is an unfortunate situation, feelings of guilt and failure are not justified if reasonable attempts, including enlisting professional assistance if necessary, have been made. It is unrealistic to expect all individuals who have sustained head injuries to avoid chemical abuse when it is so prevalent in our society.

Although the professional literature has generally failed to address the problem of chemical abuse in head injury populations, family members and individuals who have sustained head injuries are painfully aware of the magnitude of the problem. To a large extent, the failure of the medical and rehabilitation community to recognize this problem can be directly attributed to the lack of long term care and follow up of individuals who have sustained head injuries and to the lack of meaningful alternate activities in the community. Until those who are intimately involved in head injury prevention, treatment and rehabilitation become more aware of the problem, it is likely to continue to be ignored, with potentially disastrous consequences.

Nothing in this paper should be construed to imply that all individuals who sustain head injuries are alcoholic and/or junkies. The majority of head injured individuals have no chemical abuse problems and will not develop them. But ignoring a significant problem does not make it go away.

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Prepared for presentation at "Survival--What Next?", Third Annual Statewide Meeting of the Washington State Head Injury Foundation; Bellevue, Washington; October 12, 1985.

Joint Interim Committee on Head Injury

Report and Recommendations

January, 1985

TO THE MEMBERS OF THE EIGHTY-THIRD GENERAL ASSEMBLY:

In accordance with responsibilities set out in Senate Concurrent Resolution No. 12 enacted by the 82nd General Assembly, Second Regular Session, 1984, the duly appointed members of the Joint Interim Committee on Head Injuries respectfully submit their report and recommendations.

Senator Edwin L. Dirck, Chairman
District 24

Representative Marvin Proffer
District 158

Senator Ralph Uthlaut
District 23

Representative James (Jay) Russell
District 75

Senator Harry Wiggins
District 10

Representative Sandra Reeves
District 30

Senator James Murphy
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Representative Sheila Lumpe
District 88

Senator Phil Curls
District 9

Representative Derek Holland
District 49

Dr. Don L. Gann, Director
Division of Vocational Rehabilitation, for Dr. Arthur L. Mallory, Commissioner
Department of Elementary and Secondary Education

Carland Land, Deputy Director
Health Resources-Division of Health
for Barrett Toan, Director
Department of Social Services

Susan Vaughn
Assistant to the Director, for
Dr. Paul R. Ahr, Director
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THE JOINT COMMITTEE ON HEAD INJURIES

State legislators formed the Joint Committee on Head Injuries with the passage of Senate Concurrent Resolution No. 12 during the 82nd General Assembly, Second Regular Session, 1984. Citing the need to recognize traumatic brain damage as a distinct category of disability, the resolution directed committee members to study the extent and effects of head injury in Missouri. The resolution further required the committee to meet with interested groups, consider creating or expanding services for head injured persons, and report its recommendations to the 83rd General Assembly.

Chaired by Senator Edwin L. Dirck, the joint committee was composed of five senators, five state representatives, and four officials representing state agencies and services. All were chosen for their knowledge of issues and programs most likely to affect head injured persons. Legislators, for example, contributed their years of experience with state appropriations, public health and welfare, insurance matters, education, and employment practices. Agency officials complemented this experience with their knowledge of rehabilitative, referral, and social service delivery.

Assisted by the National Head Injury Foundation, Missouri Association, the committee held public hearings in five different cities.

August 15	St. Louis - Forest Park Community College
August 17	Cape Girardeau - Southeast Missouri State University
August 22	Kansas City - Children's Mercy Hospital
August 23	Springfield - Southwest Missouri State University
September 4	Columbia - University of Missouri

Of the 91 witnesses who testified to the committee, 42 percent were relatives of head injured persons, 38 percent were medical or other professionals, and 20 percent were head injured individuals.

Problems of the Head Injured

Severe head injury is defined as "serious traumatic injury to the brain requiring extensive services over an extended period of time."[1] Although many injuries occur as results of automobile or industrial accidents, brain damage also can be caused by physical abuse, falls or conditions that deprive the brain of oxygen.

Witnesses testifying before the Joint Interim Committee on Head Injury noted that each incident of brain trauma is unique - severity of injury, cognitive and behavioral problems suffered, and available financial and rehabilitation support vary with each episode. Nevertheless, while individual testimony varied with regard to specific problems, a common theme became evident during the committee's investigation. Those suffering head injuries are not provided with services and programs which would maximize their recovery. In many cases, this lack of services and programs prevents head injured individuals from being reintegrated into the community as productive citizens.

There are several reasons why appropriate programs to maximize recovery are not available for victims of head injuries.

Increased Number of Head Injury Victims

The improved ability of the health care system to treat severe head trauma has contributed to the lack of programs by increasing the number of people needing such programs. Before the mid-1970's, few victims of severe head trauma survived. Since then, an increasing percentage have been kept alive through the use of Level One Trauma Centers equipped and staffed to treat severe neurological damage.[2] Better understanding of the brain and new medical technology allow physicians to provide better emergency and acute care for victims of brain trauma. Similar advances in the rehabilitation of physical problems caused by brain injury also have increased the number of persons who recover sufficiently to require further long-term rehabilitation and community services. More people, therefore, are being discharged from hospitals and rehabilitation centers into the community.

Limited Availability of Specialized, Long-term Rehabilitation

Acute care and physical rehabilitation for victims of severe head trauma commonly last from three to eight months. Unfortunately, discharge from medical or rehabilitation

facilities does not mean the head injured person is cured. Additional long-term rehabilitation lasting from six months to two years often is required. An important component of such rehabilitation is cognitive retraining, a therapy which involves teaching the uninjured parts of the brain to perform functions formerly performed by the damaged tissue. It is a highly specialized and relatively new form of rehabilitation. Behavioral counseling and modification also may be necessary for the rehabilitation of head injured individuals.

Cognitive retraining is scarce and expensive. According to testimony, few rehabilitation facilities in Missouri offer long-term cognitive and behavioral therapy in conjunction with residential programs. Those facilities which are available generally must discharge their patients before rehabilitation is completed because of inadequate funding by third-party payors or governmental programs. Out-of-state facilities specializing in the treatment of head injuries, according to witnesses' testimony, can cost up to $5,000 per month. Such treatment is available only to those with extensive insurance coverage.

Existing State Programs are not Adequately Treating the Head Injured

Missouri's Department of Elementary and Secondary Education and Department of Mental Health currently offer the state programs most commonly used by the head injured individual. Three complaints were commonly expressed regarding the services provided by these agencies. First, programs are not designed for the specialized deficiencies of the head injured and, as such, are ineffective in improving those deficiencies. Second, counselors, evaluators, caseworkers and special education teachers do not have appropriate training or knowledge of the problems of head injured individuals. Third, state programs have specific eligibility guidelines which often exclude the head injured person.

For example, a child may be served by the education department's special education section. If a head injured person of school age is able to return to school, he or she often is evaluated by those who are unfamiliar with head trauma using tests designed for persons with mental or behavioral disabilities. As a result, the child may be placed in a special education program even though he or she may have a normal I.Q. The special education classroom, as a rule, is not equipped to provide the kind of rehabilitation needed by the head injured child. Special education services, if received, may continue until age 22.[3]

A head injured person may qualify for programs for the

developmentally disabled administered by the Department of Mental Health if the injury originated before age 18. In addition, the Department of Elementary and Secondary Education's Division of Vocational Rehabilitation may recommend placing other head injured individuals in sheltered workshops designed for the mentally retarded.

The only state program available for adults suffering injuries is administered by the Division of Vocational Rehabilitation. The division provides training and assistance to the vocationally handicapped who appear to have a good chance of success in learning the skills necessary to hold a job. Training is provided to the level that vocational rehabilitation counselors think is appropriate; therefore, witnesses expressed a need to educate counselors concerning head injury.

In general, state programs are not organized to provide a coherent system of services which ensures that the head injured person receives rehabilitation and training that are both continuous and specialized enough to be effective. Program eligibility guidelines, in fact, often preclude the delivery of needed services.

It is possible, for example, to be too old for special education services; injured too late in life to qualify for developmental disability programs and services; too impaired for vocational rehabilitation; not impaired enough for nursing care; too poor to afford out-of-state rehabilitation; financially ineligible for Medicaid; or have an I.Q. too high to qualify for programs for the mentally retarded. (See Appendix D for eligibility requirements for state programs commonly used by the head injured.)

Lack of awareness of the specialized needs of the head injured is not exclusively a governmental problem. Witnesses described similar shortcomings among some health care professionals and hospitals. They felt that the health care system should transmit information to head injured patients about appropriate community services after discharge from acute care and rehabilitation facilities. Some hospitals and doctors do this already; some do not. Witnesses also expressed a need to discourage hospitals and physicians from discharging head injured patients from acute care facilities to nursing homes without proper evaluative tests.

Lack of Financial Support

Head trauma almost invariably involves huge medical bills. Patients may require many months of acute care and rehabilitation; bills can total hundreds of thousands of

dollars. Witnesses indicated that financial support for head injury victims and for their families is necessary to provide services and help cover expenses.

Current Medicaid policies, witnesses testsified, limit the head injured persons's recovery opportunities to those found in acute care settings or in rehabilitation facilities. The program does not reimburse the cost of outpatient speech or occupational therapy, nor (unless a case is exceptional) does it help pay for long-term, specialized rehabilitation in the home. When the injured person does use these services as an inpatient, Medicaid reimbursement normally is not adequate to cover the extensive hospital charges associated with traumatic injury.

Some financial aid is available through Crippled Children's Services, a program administered by the Department of Social Services' Division of Health. Established in 1959, the program helps financially eligible children under age 21 obtain medical, rehabilitative and other services. To qualify, a child must be crippled or suffer from a condition which leads to crippling. These guidelines are broad enough to accommodate head injured children, but program funding is limited.

Recent changes in state policy, however, will make more resources available to disabled children under age 21. Because of a waiver of federal Medicaid rules, Missouri will be able to reimburse the cost of rehabilitative therapies in home as well as in institutional settings. Eligible persons, including those who are head injured, can remain in the program past age 21 as long as they continue to meet income guidelines and if they qualify as permanently and totally disabled.

Witnesses suggested that mandatory automobile liability insurance could create more resources for persons injured by uninsured motorists. But, although helpful, these initiatives can reach only a fraction of Missouri's head injured population.

Effects of the Current Service Delivery System

These are the reasons for the lack of programs and services to maximize recovery - what are the effects? Most head injured Missourians find that after physical rehabilitation has been completed they have only a few options available to them.

First, they can be sent home to live with their families who often must provide full-time care and rehabilitation for them. Testimony indicated that this is a highly stressful situation -- there is little respite for families who must provide such constant care. The head injured victim may want to live away from his or her parents but is unemployable and incapable of independent living.

- Second, head injured individuals occasionally go into sheltered workshop settings designed for the mentally retarded. This may be inappropriate because severe head trauma does not necessarily impair the victim's I.Q. or his or her ability to remember personal capabilities prior to injury. Thus, head injured persons or their families often resent placement in programs designed for the mentally retarded.

Third, they can enter nursing homes or other residential or long-term care facilities. But appropriate rehabilitation or opportunities for developing socialization or independent living skills may not be available. In geriatric settings, for example, younger head injured persons are likely to suffer psychological and social problems that further complicate their conditions.

Failure to provide services that maximize recovery not only creates personal hardship for head injury victims and their families. The public also assumes a significant financial burden when those affected by head injury lose or have no capacity to regain their former productive capacities.

The head injury victim usually is under age 35. Without opportunities for appropriate rehabilitation therapies, he may be institutionalized in a nursing home or mental health facility for the rest of his productive life. Unless he has adequate insurance coverage or financial resources at his disposal, he must turn to the state or federal government for medical assistance.

Depending upon his level of recovery, a head injured person who can return to work may have to accept less responsibility, work fewer hours and earn less pay than he did before his injury occurred. Even these ventures can fail, however, when recurring cognitive and behavioral problems prevent successful workplace re-entry.

Families who care for head injured relatives in their homes face similar problems. When professional nursing or rehabilitative services are available or unaffordable, many spouses and parents leave their jobs to attend full time to the injured person. Diminishing family resources, in turn, can lead rapidly to a need for medical and other forms of public assistance.

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[1]Definition from National Institute of Handicapped Research, Office of Special Education and Rehabilitative Services, U. S. Department of Education.

[2]The Level One Trauma Center is equipped and staffed to provide or gain access to all general and special medical services. It has the capability of managing complicated fractures and head, thoracic, visceral and vascular injuries. Facilities and physicians certified by their respective professional boards are available 24 hours a day. Level One Trauma Centers exist in St. Louis, Kansas City and Columbia. (Source: Missouri Division of Health, Hospital Resources for Optimal Care of the Injured Patient, February 1981.)

[3]Special education services are available under P.L. 94-142, the federal Education for All Handicapped Children Act of 1975.

Witnesses' Proposals for Change

Witnesses discussed solutions as well as problems during the joint committee's hearings. Suggestions ranged from subtle matters affecting attitudes toward recovery, to comprehensive changes in state rehabilitation programming. Although witnesses described more than forty different needs to committee members, a consistent thread of agreement and acceptance unified testimony gathered at all sessions.

These needs and proposals for change fall into the eight broad categories listed below. Their order, which indicates their priority as generally expressed by witnesses, was measured by the number of times such proposals were mentioned. (See Appendix C.)

Appropriate Placement

Because it is likely to determine a head injured person's potential for recovery, appropriate placement after hospital discharge is critical. Proper testing and evaluation should guide the person to specialized rehabilitation and away from services intended for other groups. This specialized care must include cognitive retraining and help for the memory, speech and behavioral problems common to head injured persons.

A system of therapies, designed to move the head injured person toward his highest level of independence, should be offered in a variety of settings. Acceptable options include: a long-term rehabilitation center suitable for persons leaving hospitals; in-home therapies for those ready to re-enter family settings; day programs for persons preparing to enter vocational rehabilitation; and transitional living arrangements suitable both for those needing continued guidance and for others preparing for full independence.

The state could test systematic therapies by establishing a pilot project at the University of Missouri's Rusk Rehabilitation Center in Columbia. By cooperating with affiliated medical and mental health care institutions, Rusk could manage treatment, rehabilitation and counseling for head injured persons and their families. Successful tests could lead to permanent state plans and support.

Government Response to Head Injury

Missouri can improve its public response by distinguishing head injury from other behavioral, mental and developmental disabilities and by adjusting existing services to meet different needs. Specially designated officials, either at a

central entry point or in each agency likely to serve the head injured, could guide persons to appropriate programs and monitor the quality of their progress. A designee within the Department of Elementary and Secondary Education, for example, could assure that vocational rehabilitation counselors recognize the characteristics of head injury; help administrators adjust therapies; place persons in available slots; and counsel families during the rehabilitation period.

The state must do more to finance the care of head injured persons and must make resources available to more families. To promote consistent eligibility for government assistance, Missouri should adopt a clear, legal definition of "brain damage secondary to head injury" for use by all appropriate state agencies. Medicaid administrators should raise reimbursement rates, extend coverage for long-term therapies and expand the program to include payment for cognitive, psychosocial and life-skill retraining.

Legislators should support converting the Missouri State Chest Hospital to a state rehabilitation center. Located in Mt. Vernon, the facility is a well-maintained but under-used resource that already serves patients with chronic conditions. Adequately staffed and organized, the hospital could serve Missourians and other head injured persons from bordering states.

Prevention

The state can limit the need for costly services by emphasizing the prevention of head injury. Since most traumatic brain damage occurs as a result of automobile accidents, Missouri should enact mandatory seat belt laws for all citizens and should vigorously enforce existing child restraint laws.

State officials also should make persons aware of the effects of head injury through continuing public information campaigns. The Division of Health, which already reaches some school age children with its spinal and head injury presentations, should attempt to reach all school districts. The Department of Mental Health, in addition, should address head injury in its alcohol and drug abuse prevention programs.

Others who can ease the effects of head injury include child abuse and neglect administrators and juvenile court officials. Caseworkers and other evaluators must recognize the signs of head injury, monitor the pattern of this abuse and document its persistence. Court officials must assure that children are not left in environments where head injury can occur.

Information and Education

Services for the head injured suffer because Missouri lacks a base of accurate, epidemiologic data. To increase knowledge of the extent of head injury in this state, the legislature should enact a mandatory disability reporting system based on the International Classification of Diseases (ICD).

The state must assure that medical professionals, public administrators and educators recognize head injury and appreciate the unusual problems it poses. College curricula should include training in the specialized needs of the head injured. Agencies should train their counselors and caseworkers to administer appropriate tests, to assess neuropsychological evaluations and to be aware of neurobehavioral abnormalities. Special educators should know how to teach injured adults and should be trained in the methods of cognitive rehabilitation.

Proper training of medical professionals will guarantee better recovery potential for many head injured persons. Missouri should fund initiatives that help doctors recognize and refer head injuries to appropriate specialists and that train specialists in methods promoting improved, consistent rehabilitation and recovery.

Support Services

There must be help for those who deal each day with the pressures of recovery from head injury. Rehabilitation for the injured person should include association with and support from others who have similar needs. Services such as subsidized transportation, educational tutoring and loan libraries of communication devices can help restore lost independence.

Families, economically and socially disrupted, need thoughtful counseling during all phases of their loved one's recovery. Adequate referral networks should guide them to assistance. Services such as temporary respite care and temporary family housing during long rehabilitative stays can ease some burdens.

Insurance Practices

Although some insurance plans can accommodate the expense of head injury treatment and recovery, many policies lack flexible coverage. Legislators should require third party payors to offer coverage for cognitive retraining and other practices and devices used to rehabilitate injured persons. Coverage should be available in outpatient settings and at levels that reflect today's health care costs.

Research and Treatment

Because early intervention is so critical to recovery, Missouri should see that Level One trauma centers are available in all areas of the state. More resources must be diverted to specialized acute care and to research that focuses on improved rehabilitation methods. The legislature should consider requiring appropriate and speedy patient referrals to head injury specialists.

Personal Rights

Even during recovery, head injured persons remain vulnerable to abuse of their rights. The state should require that an insurance settlement resulting from an injury claim be used only for the benefit of the injured person. He should be protected from discrimination in employment on the basis of physical or emotional disability. If under guardianship, the person's status should be reviewed regularly as his rehabilitative progress continues.

At times, however, the injured person's rights may affect the health and safety of others. For this reason, anyone known to have suffered severe head trauma should reapply for his vehicle operator's license and be tested for perceptual ability.

Committee Recommendations

The problems of the head injured are so diverse, and the array of proposed solutions so broad, that it is difficult to design a comprehensive legislative package at this time. In fact, some ideas need thorough fiscal and technical analysis before statutory or regulatory changes can be considered.

It is possible, however, to address some broad goals now because appropriate mechanisms are in place, because timing is favorable or because these initiatives would require relatively little new money. The Joint Committee on Head Injury, therefore, proposes actions that:

1) Initiate or expand efforts to prevent head injury;

2) Establish a framework for comprehensive, sequential head injury rehabilitation; and

3) Assure access to continuing, informed advice on matters affecting Missouri's head injured population.

Head Injury Prevention

Preventive measures are, literally, the best medicine for easing the suffering caused by head injury. Equipped with knowledge and encouraged to adopt prudent habits, Missourians actually can lower their chances of sustaining serious head or brain damage. For each incident that does not occur, one more family can avoid the staggering personal and economic loss associated with head injury.

Recommendation No. 1: The General Assembly should enact legislation requiring persons to use safety belts when they operate or ride in passenger cars on Missouri roads.

Of the disabling injuries that occur as a result of auto accidents each year, it is estimated that one third involve damage to the head or brain. In fact, in the United States, injury sustained in auto accidents is the leading cause of epilepsy. Research has shown, however, that safety belt use can cut the number of serious injuries by 50 percent and can lower fatalities by 60 to 70 percent.

These effective preventive tools are widely available and cost-efficient. All cars manufactured since 1964 are equipped with some sort of safety restraint device - either a lap belt or, if built after 1968, a shoulder harness. It costs the driver and passengers nothing to use their safety belts.

Recommendation No. 2: Missouri should continue to support existing educational programs designed to prevent disabling injuries.

Missouri's Spinal Cord and Head Injury Prevention Project attempts to lower the incidence of disabling trauma. Because these injuries are most likely to occur as results of auto accidents involving teenagers and young adults, state health educators reach their audience by visiting junior high and high schools.

Since the project started in 1980, the consequences of serious injury have been described to 31,150 teenagers, in 60 schools, in 35 counties. Missouri should maintain or increase its current level of support to fulfill all requests for program presentations and to reach all members of the target group every three years.

Comprehensive Rehabilitation

Although preventive practices can reduce their frequency, head injuries will continue to disable some Missourians each year. It is necessary, therefore, to maintain rehabilitation opportunities suited to all levels of patient recovery. Missouri should establish a sequence of pilot projects, in a variety of settings, that are designed to move the head injured person toward his highest level of independence. Successful programs, in turn, can be adopted by public and private service providers in other locations.

Recommendation No. 3: Using the facilities and professional resources available at the University of Missouri-Columbia Hospital and Clinics, the state should support a pilot program of systematic, short-term rehabilitation for head injured persons.

It is proven that early, skilled, professional intervention lays a foundation for recovery of the seriously head injured person. Because this trauma is so debilitating, the individual needs access to cognitive, retraining and other specialized therapies to regain his most basic skills. This rehabilitation must begin upon hosptial discharge and continue until the injured person is prepared to function in other settings.

Rusk Rehabilitation Center, part of the University of Missouri-Columbia medical complex, has the staff and experience needed to study short-term intervention technologies. The center now serves head injured persons whose average length of stay is 60 days. Because this group is in place, Rusk can

quickly develop systematic methods for assessing patient and family needs, testing therapy options, monitoring patient progress and counseling after discharge. The project should produce a model for serving patients and families during the crucial, early rehabilitation period.

Recommendation No. 4: The General Assembly should enact legislation that converts the Missouri State Chest Hospital into the Missouri Rehabilitation Center, a facility that will be able to provide transitional rehabilitation in a simulated work and home environment.

Many persons who complete initial periods of rehabilitation need more help before they can consider living independently. During this transition from facility to community, an individual might re-learn self-care and homemaking skills, adjust behavior problems that could prevent employment or continue other specialized therapies. Although a period of transitional living greatly improves an injured person's ability to resume independence, this recovery option is not available in Missouri.

The Missouri State Chest Hospital, if converted to a rehabilitation center, could fill this service deficiency. Located in Mt. Vernon, the complex includes a dormitory, single residential units and other buildings which can be used to simulate work and home environments. The hospital is equipped to provide medical care, rehabilitation therapies and other patient services. Professional staff is available on site or can be drawn from larger labor pools in nearby Springfield or Joplin. A 20-bed pilot project should be establisned now and subsequently evaluated for further expansion.

Recomendation No. 5: To allow head injured persons to resume independent living in their communities, Missouri should contract for locally-based transitional services.

Although not based in a facility, transitional rehabilitation opportunities in other settings may be available in a community and its surrounding area. Often, however, head injured persons and their families simply do not know where to find help. A community transitional living center, staffed by persons familiar with local resources, could direct clients to appropriate services. To avoid duplicating existing public and private efforts, the center would arrange these services through local provider contracts.

Columbia, Missouri is an appropriate trial ground for a community-based pilot project. The transitional center could help persons discharged from the Rusk facility and other local hospitals implement individual rehabilitation plans. Center

staff, in addition, would attempt to manage physical, social, vocational and other therapies for the client's overall benefit. Local contractual arrangements, similar to those used by other state agencies, could result in small group residential programs or in services at patient homes, at provider locations or in day care settings.

Continuing Advice

Recommendation No. 6: To assure that Missouri continues to address the needs of its head injured citizens, the Governor should establish, by Executive Order, a Head Injury Advisory Council.

Because there is no statutory mandate on their behalf, Missouri's head injured have no true advocates. The General Assembly has provided a forum for discussion, but others with more knowledge and experience must transform discussion into action. By forming a Head Injury Advisory Council, the Governor can encourage these actions and guarantee the head injured the same protection now enjoyed by other Missourians.

The council should be composed of 25 voting members representing both public and private interests. A designee from the Office of Administration could participate as a non-voting member. All members could serve until they resign or until they lose the positions that qualify them for participation.

The Governor should appoint 15 members - five panels of three appointees - drawn from the St. Louis, Kansas City, southwest, southeast and central Missouri areas. Each panel would include persons representing the head injured, family members and professionals in the field.

The council also should include one member from each of the following entities: the Senate; the House of Representatives; the Department of Mental Health; the Division of Health; the Division of Family Services-Medical Services section; the Division of Vocational Rehabilitation; the Division of Insurance; the Missouri Protection and Advocacy Council; the Governor's Committee on the Employment of the Handicapped; and the National Head Injury Foundation-Missouri Association. These persons would be selected by the bodies they represent.

As a working group, the council will initiate studies on specific proposals related to head injury. Members can be expected to thoroughly analyze advantages, disadvantages and costs related to each proposal and to seek executive and legislative support for the best ones.

The council will study and recommend action on the following items and on others it may later select.

1. Methods for identifying the extent of head injury in Missouri.

2. A statutory definition of "head injury".

3. Appropriate entry points for head injured persons seeking services from state agencies.

4. Rehabilitative placement opportunities which can be provided with public or private resources.

5. Methods for establishing and funding transitional living centers for the head injured.

6. Methods for advancing the practice and availability of cognitive retraining therapies.

7. Improved coverage by all third party payers for treatment and rehabilitation in institutional, in home and in other settings.

8. Protection of the personal and civil rights of head injured persons.

9. Head injury preventive education.

10. Opportunities for obtaining federal funds through the National Institute of Health Research (NIHR).

The full council should meet quarterly. Members should serve without pay but be reimbursed for costs they incur while conducting council business. To maintain accountability, the council should report annually to the Governor.

Appendix A

Senate Concurrent Resolution No. 12

WHEREAS, in the State of Missouri there are an estimated 10,000 head injuries annually which physically disable and intellectually impair some of our citizens for a lifetime; and

WHEREAS, in addition to those injuries, many of which produce physical, intellectual and emotional disabilities, more than 700 persons each year will die as a result of head injuries; and

WHEREAS, head injury is the major cause of death and disability among Missourians under the age of 35; and

WHEREAS, those figures clearly reflect a problem now recognized as the "Silent Epidemic"; and

WHEREAS, the state, federal and local government agencies, while providing services technically available to head injured persons, may not be meeting the needs of those so injured in even a minimal way because available service systems were designed for other types of disability and are inappropriate for head injury rehabilitation and care; and

WHEREAS, many head injured persons in Missouri are inappropriately placed in mental institutions, schools for the retarded, nursing homes or other programs or facilites that cannot provide the services needed for adequate rehabilitation achievement; and

WHEREAS, many head injury treatment programs are unnecessarily expensive and might be structured to provide better treatment at far less cost; and

WHEREAS, no statewide system exits to assist head injured persons in making the transition from dependent to independent living; and

WHEREAS, there is a need to recognize traumatic brain damage due to head injury, disease and anoxia as a separate and distinct category of disability;

NOW, THEREFORE, BE IT RESOLVED by the Senate, the House of Representatives concurring therein, that a joint interim committee be established to study and consider head injuries; and

BE IT FURTHER RESOLVED that the committee be composed of ten legislative members, five of whom shall be appointed by the President Pro Tempore of the Senate, five of whom shall be appointed by the Speaker of the House, and the Commissioner of Education or his designee, the Director of the Department of Mental Health or his designee, the Director of the Department of Social Services or his designee, and a member of the Missouri Protection and Advocacy Council; and

BE IT FURTHER RESOLVED that this committee be authorized to meet and act during the interim, to study the economic impact and emotional hardship of head injuries to the citizens of this state in order to carefully consider the need for additional or expanded programs to provide care and rehabilitation for those suffering from head injuries and for the families of such persons, to the end that all may be returned to useful and productive lives for the good of our state and nation; and

BE IT FURTHER RESOLVED that this committee be encouraged to meet and confer with groups interested in this activity, and/or to establish advisory groups who will gather and present materials to be considered by the committee; and

BE IT FURTHER RESOLVED that the committee be directed to prepare a report, to be submitted to the Eighty-third General Assembly, with recommendations for needed legislation or appropriations to assist with the treatment of head injured persons; and

BE IT FURTHER RESOLVED that the Senate members be reimbursed for their actual and necessary expenses incurred in the performance of their duty from the Senate Contingent Fund, that House members be reimbursed from the House Contingent Fund, and that the state officials be reimbursed from their respective offices; and

BE IT FURTHER RESOLVED that the committee be authorized to seek clerical, technical and bill drafting assistance from the Senate Research office, the House Research office, the Committee on Fiscal Affairs, or the Committee on Legislative Research.

Appendix B

Joint Committee on Head Injury

Witness Groups by Hearing Location*

City	Witness Groups: Professionals	Head Injured Persons	Relatives	Total Witnesses
St. Louis	5	4	14	23
Cape Girardeau	3	2	2	7
Kansas City	5	3	13	21
Springfield	6	6	3	15
Columbia	16	3	6	25
Total	35 (38%)	18 (20%)	38 (42%)	91 (100%)

*Includes only persons who attended hearings, who identified themselves as witnesses, and who spoke to the committee.

Appendix C

Joint Committee on Head Injury

Proposals for Change - Number of Times Mentioned by Witness Group

Proposal Category	Witness Group: Professionals	Head Injured Persons	Relatives	Total Times Mentioned
Appropriate Placement	31	1	30	62
Government Response	12	4	30	46
Prevention	18	2	5	27
Education and Information	8	1	12	21
Support Services	11	4	5	20
Insurance Practices	6	3	9	18
Research and Treatment	11	1	6	18
Personal Rights	1	3	1	5
No Specific Recommendations	6	7	5	18

Appendix D

State Programs Commonly Used by the Head Injured:

Eligibility Requirements and Statutory Definitions

Department of Elementary and Secondary Education

Division of Vocational Rehabilitation

A. Must have a disability
B. Disability must be a handicap to employment
C. There must be a reasonable expectation that services provided will lead to permanent employment

Division of Special Education

Must meet specific eligibility criteria in at least one of the following areas

(a) Learning disabled
(b) Behaviorally disordered/emotionally disturbed
(c) Mentally retarded
(d) Physically impaired
(e) Other health impaired
(f) Visually impaired
(g) Hearing impaired
(h) Deaf/blind
(i) Autistic

Definition of "handicapped" relating to sheltered workshops (§178.900, RSMo 1978)

> Handicapped person: a lower range educable or upper range trainable mentally retarded or other handicapped person sixteen years of age or over who has had school training and has a productive work capacity in a sheltered environment adapted to the abilities of the mentally retarded but whose limited capabilities make him nonemployable in competitive business and industry and unsuited for vocational rehabilitation training.

Department of Mental Health

Definition of "developmental disability" (§630.005, RSMo Supp. 1983)

A disability:
(a) Which is attributable to mental retardation, cerebral palsy, autism, epilepsy, a learning disability related to a brain dysfunction or a similar condition or conditions found by comprehensive evaluation to be closely related to such conditions or to require habilitation similar to that required for mentally retarded persons;
(b) Which originated before age eighteen; and
(c) Which can be expected to continue indefinitely.

Definition of "mental retardation" (§630.005, RSMo Supp. 1983)

Significantly subaverage general intellectual functioning (I.Q. less than 69) which:
(a) originates before age eighteen;
(b) is associated with a significant impairment in adaptive behavior.

EXECUTIVE ORDER
85-6

WHEREAS, there are an estimated 10,000 head injuries in the State of Missouri each year which physically disable and intellectually impair some of our citizens for a lifetime; and

WHEREAS, more than 700 persons each year will die as a result of head injuries; and

WHEREAS, head injury is the major cause of death and disability among Missourians under the age of 35; and

WHEREAS, the State of Missouri should assume a leadership role in the collection and dissemination of information about head injuries and the appropriate response of government and private groups to prevent them and treat those who suffer them; and

WHEREAS, the State of Missouri offers a wide range of services to persons with head injuries, and appropriate placement of head injured persons in these programs is critical to the individual's potential for recovery, and important to the state's desire to provide appropriate service in a cost-effective manner,

NOW, THEREFORE, I, JOHN ASHCROFT, GOVERNOR OF THE STATE OF MISSOURI, by virture of the authority vested in me by the Constitution and laws of Missouri hereby create and establish the Missouri Head Injury Advisory Council. The Council shall be composed of 25 members appointed as follows: 2 members of the Council shall be members of the House of Representatives and appointed by the Speaker of the House of Representatives, to serve for the remainder of their terms; 2 shall be members of the Missouri Senate and appointed by the President Pro Tem of the Missouri Senate, to serve for the remainder of their terms; and 21 members shall be appointed by the Governor, representing persons with head injuries, representing relatives of persons with head injuries, representing proprietary schools, professional groups, health institutions, private industry, and state agencies which administer programs regarding mental health, education, public health, public safety, insurance and medicaid. The appointment of individuals representing state agencies shall be conditioned on their continued employment in their respective agencies.

The Missouri Head Injury Advisory Council is assigned to the Division of General Services in the Office of Administration. Members of the Council shall receive no compensation for their service but shall be reimbursed for their actual and necessary expenses incurred in the performance of their duties. Members of the Council appointed by the Governor shall serve at the pleasure of the Governor.

The Council may study and recommend action by private and public entities on the following items and on others it may select:

1. Methods for identifying the extent of head injury in Missouri.
2. A statutory definition of "head injury".
3. Appropriate entry points for head injured persons seeking services from state agencies.
4. Rehabilitative placement opportunities which can be provided with public or private resources.
5. Methods for establishing and funding transitional living centers for the head injured.
6. Methods for advancing the practice and availability of cognitive retraining therapies.

7. Improved coverage by all third party payers for treatment and rehabilitation in institutional, in home and in other settings.

8. Protection of the personal and civil rights of head injured persons.

9. Head injury preventive education.

10. Opportunities for obtaining federal funds through the National Institute of Health Research (NIHR).

The Council shall meet when called by the Chairman, but at least quarterly. The Council shall elect annually one of its members to serve as Chairman. The Council shall adopt written procedures to govern its activities. Staff and consultants shall be provided for the Council from appropriations requested by the Commissioner for such purposes.

The Council shall report annually to the Commissioner of Administration on its activities, and on the results of its studies, and shall include any recommendations in said report. This Order shall be effective July 1, 1985, and shall expire on July 1, 1988 unless renewed by an Executive Order executed prior to that date.

IN WITNESS WHEREOF, I have hereunto set my hand and caused to be affixed the Great Seal of the State of Missouri, in the City of Jefferson, on this 5 day of March, 1985.

John Ashcroft
GOVERNOR

ATTEST:

SECRETARY OF STATE

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FOR IMMEDIATE RELEASE

March 12, 1984

Governor Charles S. Robb signed into law the Head Injury Registry Bill on March 7, 1984. The bill was introduced by Senator Clive DuVal, (D) 32nd District and passed the Senate unanimously. Delegate Mary Marshall, (D) 48th District (Arlington) handled the bill in the House of Delegates, where it passed 95-1. Virginia Head Injury Foundation (VHIF), its members state-wide, and the Department of Rehabilitative Services (DRS) vigorously supported the bill.

The legislation will establish and maintain a Central Registry, through the Department of Rehabilitative Services, of persons who sustain Head Injuries. It is the first law of its kind to be enacted in the United States. The bill was patterned after the Virginia Spinal Cord Registry Law. Under this new law, effective July 1, every hospital and

Under this new law, effective July 1, 1984, every hospital and attending physician is required to report to the Commissioner by the most expeditious means within 7 days after the identification of any persons sustaining a head injury. The objectives of the legislation are "to facilitate the provision of appropriate Rehabilitative Services by the Department and other state agencies to such persons."

"I appreciate the efforts of the VHIF and the Department in the assisting in the passage of this measure. Virginia can truly be proud of its leadership in recognizing the needs of its head injured population", says Senator Clive DuVal.

(more)

According to VHIF, this is the first step toward assessing the needs of Head Injured persons in the Commonwealth of Virginia. "We are proud that the Commonwealth of Virginia is the first state to enact such legislation. In the long run, proper rehabilitation programs at the outset will save the Virginia taxpayers hundreds of thousands of dollars" states Alice Demichelis, State Vice-President of Virginia Head Injury Foundation.

Wayne M. Alves, Ph.D., Director of Clinical Research, Head Trauma Center, Department of Neurosurgery, University of Virginia School of Medicine stated that "an aggressive, early effort to rehabilitate the brain injured seems to promise the greatest chance for restoring social competence and allowing head injured persons to resume a useful and productive life."

Virginia Head Injury Foundation is a non-profit organization, assisting head injured persons and their families adjust to the changes in their lives brought about by head injury. The chapters are located in the following locations: Northern Virginia, Richmond Area, Central Virginia, Southwest Virginia, Tidewater Area, and Virginia Beach Area.

Diane Huddle, M.A., LPC, Executive Director of VHIF, said, "on behalf of all head injured and their family members, we express our heartfelt gratitude to all the members of the Virginia General Assembly, DRS Commissioner Altamont Dickerson, and George Meeks, Director of DRS's Legal legislative and Consumer Affairs section. We also express special gratitude to the Honorable Joseph L. Fisher, Secretary of Human Resources. Establishment of a central registry is a major accomplishment for VHIF. We are now producing the nation's first film, expected to be released in April, about the head injured, stressing the importance of prevention and early intervention. The film will reach one-million Virginians before being distributed nationally.

VIRGINIA HEAD INJURY REGISTRY BILL

The Virginia Department of Rehabilitation has prepared a bill to be introduced in the Virginia 1984 legislative session which will estabi a state-wide register of head injured persons. The bill is patterned af the Spinal Cord Injury Registry currently in effect. ie Virginia Head Injury Foundation supports this bill. Enactment of the Head Injury Regi Bill will assist the Virginia Department of Rehabilitative Services in developing appropriate programs and facilities for head injured persons. In the long run, proper rehabilitation programs at the outset will save the Virginia taxpayers hundreds of thousands of dollars. According to a noted authority, Wayne M. Alves, Ph.d., Director of Clinical Research, Head Trauma Center, Department of Neurosurgery, University of Virginia School of Medicine, "an aggressive, early effort to rehabilitate the bra injured seems to promise the greatest chance for restoring social compet and allowing head injured persons to resume a useful and productive life

Head injury, primarily caused by automobile accidents, has reached epidemic proportions and is a major health problem. A recent survey, ab to be released by the Virginia Head Injury Foundation, has revealed that 1982 alone, 13,000 people in Virginia sustained a head injury. These staggering figures were obtained from hospital reports throughout the st

At the present time, Virginia lacks the needed facilities for prope rehabilitation of head injured persons. Once he/she reaches medical and physical stability, acute rehabilitation facilities are often forced to discharge them long before they are capable of resuming a useful and pro ductive life. The head injured individual and his/her family have nowhe to turn for help.

Although Virginia does have a small program at Woodrow Wilson Rehab tation Center in Stanton, the nearest rehabilitatiion centers for the he injured persons are in Pennsylvania and Connecticut. Many Virginia fami must travel out of state to receive necessary services, if they can loca appropriate services at all.

Six chapters of VHIF are located throughout the state. We are less than a year old and are now directly serving hundreds of Virginia famili

We were most fortunate to recieve a grant from the Department of Pehabil tation Services to conduct the survey which identified those 13,000 who

were head injured in 1982. This Bill will establish a register on a permanent basis which will identify for the Department of Rehabilitation, the persons in need of rehabilitative programs on the same basis as persons with spinal cord injuries.

On behalf of the thousands of head injured persons and their families, VHIF is asking for your support of the Head Injury Registry Bill.

LD0240305

SENATE BILL NO. 142

Offered January 17, 1984

A BILL to amend and reenact § 2.1-583 of the Code of Virginia, relating to a central registry of persons sustaining head injuries.

Patrons--DuVal, Waddell, Saslaw, Gartlan, Colgan, Holland, E. M., and Russell, J. W.; Delegates: Stambaugh, Cohen, Almand, Plum, Diamonstein, McDiarmid, Cody, Callahan, Medico, Cunningham, Keating, and Gordy

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Referred to the Committee on General Laws

Be it enacted by the General Assembly of Virginia:

1. That § 2.1-583 of the Code of Virginia is amended and reenacted as follows:

§ 2.1-583. Central registry.– *A.* The Commissioner shall establish and maintain a central registry of persons who sustain spinal cord injury other than through disease, whether or not permanent disability results, in order to facilitate the provision of appropriate rehabilitative services by the Department and other state agencies to such persons.

Every hospital and attending physician shall report to the Commissioner by the most expeditious means within seven days after identification of any person sustaining such an injury. The report shall contain the name, age and residence of the person, date and cause of the injury, and such additional information as the Commissioner may deem necessary.

B. The Commissioner shall establish and maintain a central registry of persons who sustain head injuries, if permanent disability is likely to result. Reporting requirements shall be consistent with those set out in paragraph A of this section.

Official Use By Clerks	
Passed By The Senate	Passed By The House of Delegates
without amendment ☐	without amendment ☐
with amendment ☐	with amendment ☐
substitute ☐	substitute ☐
substitute w/amdt ☐	substitute w/amdt ☐
Date: _____	Date: _____
_____	_____
Clerk of the Senate	Clerk of the House of Delegates

Draft

COMMONWEALTH OF VIRGINIA

Department of Rehabilitative Services
Combined Head Injury/Spinal Cord Injury Central Registry
Section 2.1-583, Code of Virginia, requires that injury be reported within seven days after hospitalization

PATIENT'S NAME _____ BIRTH DATE _____
(last, first, middle)

SOCIAL SECURITY NUMBER _____

STREET _____ CITY _____ STATE _____

COUNTY _____ ZIP CODE _____

SUPPORTIVE CONTACT (FAMILY/FRIEND) _____
(relationship)

MAILING ADDRESS _____

_____

TELEPHONE # _____

PLEASE CIRCLE OR FILL IN THE APPROPRIATE ITEMS BELOW:

STATUS: LIVING DECEASED (IF SO, DATE _____)

SEX: MALE FEMALE VETERAN: YES NO . UNKNOWN

CAUSE: MOTOR VEHICLE DIVING GUNSHOT FALLS ASSAULT OTHER _____
(please specify)

DATE OF INJURY: _____ DATE OF ADMISSION _____

ATTENDING PHYSICIAN _____ TELEPHONE # _____

Head Injury

Report only on these ICD-9-CM Codes. (Circle)

800 - Fracture of vault of skull
801 - Fracture of base of skull
802 - Fracture of face bones
803 - Other and unqualified skull fractures
804 - Multiple fractures of skull and face
850 - Concussion
851 - Cerebral laceration and contusion
854 - Intercranial injury of other and unspecified nature, such as closed head injury

Spinal Cord Injury

ICD-9-CM Code (Circle)

344.0 - Quadraplegia
344.1 - Paraplegia

_____
Person Supplying Information

Hospital Name _____

Address _____

_____

Date Form Completed _____

Return to:

Spinal Cord/Head Injury
Central Registry
P. O. Box 11045
Richmond, VA 23230