

Acquired Brain Injury by Local Health Integration Network in Ontario

Toronto Central



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Methods

Acquired brain injury (ABI), which includes brain injury from traumatic (e.g., falls, motor vehicle collisions) and non-traumatic (e.g., anoxia, brain tumours) causes, is a leading cause of death and disability in Canada (please see Table 13 and Table 14 for a list of ABI definitions used in this report). ABI is more common than breast cancer, HIV/AIDS, spinal cord injury, and multiple sclerosis combined. The ABI Dataset Project, funded by the Ontario Neurotrauma Foundation, utilized existing administrative data to answer important research questions about ABI in Ontario that resulted from a recent publication of ABI by Local Health Integration Network (LHIN) in Ontario (please see www.onf.org → ABI → Program in Action → ABI Data).

This analysis included fiscal years 2003/04 to 2009/10. LHIN-specific analyses based on inpatient acute care data were obtained from the Discharge Abstract Database (DAD) and inpatient rehabilitation data were obtained from the National Rehabilitation Reporting System (NRS).

Six questions were addressed in this report:

1. Who is discharged to long term care from acute care?
2. Who is discharged to inpatient rehabilitation from acute care?
3. Who is living in residential care at discharge from inpatient rehabilitation?
4. What are the characteristics of ABI patients with 15+ days in alternate level of care?
5. What are the characteristics of ABI patients with extended length of stay in acute care?
6. Who is readmitted to acute care within 30 days of discharge?

Definitions of terms used in the report:

- **Alternate Level of Care (ALC):** An ALC patient is one who “has completed the acute care phase of his or her treatment but remains in the acute care bed” (CIHI 2009)
- **Charlson Comorbidity Index:** The Charlson Comorbidity Index estimates the risk of death from comorbid diseases and is calculated as an indicator of the need of patients with ABI
- **Special Care Days:** The cumulative number of days spent in all intensive care units

Who is Discharged to Long Term Care from Acute Care?

Table 1. Characteristics of TBI Patients Discharged to Long Term Care from Acute Care, 2003/04 – 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	181	100	1,558	100
Age				
<19	0	0	<5	.
19 – 54	13	7.2	NR	.
55 – 64	18	9.9	128	8.2
65 – 74	12	6.6	168	10.8
75 – 84	75	41.4	520	33.4
85+	63	34.8	627	40.2
Sex				
Female	98	54.1	825	53.0
Male	83	45.9	733	47.0
Fiscal Year of Discharge				
2003/04	16	8.8	169	10.8
2004/05	24	13.3	186	11.9
2005/06	19	10.5	199	12.8
2006/07	27	14.9	221	14.2
2007/08	23	12.7	228	14.6
2008/09	36	19.9	264	16.9
2009/10	36	19.9	291	18.7
Length of Stay in Acute Care				
1 – 2	12	6.6	102	6.5
3 – 5	15	8.3	258	16.6
6 – 11	20	11.0	314	20.2
12+	134	74.0	884	56.7
Charlson Comorbidity Index Score				
0 – 1 (low)	122	67.4	1,168	75.0
2 - 3	47	26.0	311	20.0
4+ (high)	12	6.6	79	5.1
Psychiatric Comorbidity				
Yes	99	54.7	724	46.5
No	82	45.3	834	53.5
Number of ALC Days				
None	81	44.8	893	57.3
1 – 2	<5	.	32	2.1
3 – 5	NR	.	35	2.2
6 – 11	13	7.2	101	6.5

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
12+	77	42.5	497	31.9
Number of Special Care Days				
None	139	76.8	1,308	84.0
1 – 2	12	6.6	79	5.1
3 – 5	10	5.5	75	4.8
6 – 11	11	6.1	51	3.3
12+	9	5.0	45	2.9
Motor Vehicle Collision				
Yes	6	3.3	77	4.9
No	175	96.7	1,481	95.1
Number of Previous ABI Admissions				
0	124	68.5	1,135	72.8
1	41	22.7	315	20.2
2+	16	8.8	108	6.9

Note: NR = not reportable due to small cell size

Table 2. Characteristics of nTBI Patients Discharged to Long Term Care from Acute Care, 2003/04 – 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	552	100	4,214	100
Age				
<19	0	0	<5	.
19 – 54	48	8.7	NR	.
55 – 64	60	10.9	397	9.4
65 – 74	108	19.6	755	17.9
75 – 84	188	34.1	1,619	38.4
85+	148	26.8	1,168	27.7
Sex				
Female	291	52.7	2,466	58.5
Male	261	47.3	1,748	41.5
Fiscal Year of Discharge				
2003/04	85	15.4	683	16.2
2004/05	85	15.4	688	16.3
2005/06	68	12.3	630	15.0
2006/07	77	13.9	582	13.8
2007/08	67	12.1	533	12.6
2008/09	101	18.3	569	13.5
2009/10	69	12.5	529	12.6
Length of Stay in Acute Care				
1 – 2	14	2.5	149	3.5
3 – 5	75	13.6	612	14.5
6 – 11	125	22.6	1,041	24.7
12+	338	61.2	2,412	57.2
Charlson Comorbidity Index Score				
0 – 1 (low)	227	41.1	1,832	43.5
2 – 3	210	38.0	1,406	33.4
4+ (high)	115	20.8	976	23.2
Psychiatric Comorbidity				
Yes	257	46.6	1,546	36.7
No	295	53.4	2,668	63.3
Number of ALC Days				
None	336	60.9	2,645	62.8
1 – 2	12	2.2	81	1.9
3 – 5	15	2.7	100	2.4
6 – 11	41	7.4	277	6.6
12+	148	26.8	1,111	26.4
Number of Special Care Days				
None	449	81.3	3,613	85.7
1 – 2	38	6.9	202	4.8
3 – 5	21	3.8	165	3.9
6 – 11	24	4.3	118	2.8

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
12+	20	3.6	116	2.8
Number of Previous ABI Admissions				
0	377	68.3	2,868	68.1
1	112	20.3	848	20.1
2+	63	11.4	498	11.8

Note: NR = not reportable due to small cell size

Who is Discharged to Inpatient Rehabilitation from Acute Care?

Table 3. Characteristics of TBI Patients Discharged to Inpatient Rehabilitation from Acute Care, 2003/04 – 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	432	100	3,248	100
Age				
<19	<5	.	182	5.6
19 – 54	147	34.0	1,276	39.3
55 – 64	NR	.	382	11.8
65 – 74	69	16.0	454	14.0
75 – 84	86	19.9	659	20.3
85+	71	16.4	295	9.1
Sex				
Female	167	38.7	1,144	35.2
Male	265	61.3	2,104	64.8
Fiscal Year of Discharge				
2003/04	42	9.7	375	11.5
2004/05	67	15.5	396	12.2
2005/06	47	10.9	423	13.0
2006/07	65	15.0	471	14.5
2007/08	70	16.2	522	16.1
2008/09	66	15.3	515	15.9
2009/10	75	17.4	546	16.8
Length of Stay in Acute Care				
1 – 2	<5	.	22	0.7
3 – 5	NR	.	159	4.9
6 – 11	68	15.7	642	19.8
12+	346	80.1	2,425	74.7
Charlson Comorbidity Index Score				
0 – 1 (low)	369	85.4	2,804	86.3
2 - 3	50	11.6	389	12.0
4+ (high)	13	3.0	55	1.7
Psychiatric Comorbidity				
Yes	103	23.8	667	20.5
No	329	76.2	2,581	79.5
Number of ALC Days				
None	169	39.1	1,669	51.4
1 – 2	37	8.6	232	7.1
3 – 5	46	10.6	281	8.7
6 – 11	73	16.9	456	14.0

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
12+	107	24.8	610	18.8
Number of Special Care Days				
None	193	44.7	1,429	44.0
1 – 2	59	13.7	351	10.8
3 – 5	51	11.8	376	11.6
6 – 11	47	10.9	423	13.0
12+	82	19.0	669	20.6
Motor Vehicle Collision				
Yes	96	22.2	1,003	30.9
No	336	77.8	2,245	69.1
Number of Previous ABI Admissions				
0	321	74.3	2,294	70.6
1	77	17.8	771	23.7
2+	34	7.9	183	5.6

Note: NR = not reportable due to small cell size

Table 4. Characteristics of nTBI Patients Discharged to Inpatient Rehabilitation from Acute Care, 2003/04 – 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	609	100	4,936	100
Age				
<19	<5	.	51	1.0
19 – 54	161	26.4	1,325	26.8
55 – 64	107	17.6	931	18.9
65 – 74	118	19.4	1,060	21.5
75 – 84	159	26.1	1,193	24.2
85+	NR	.	376	7.6
Sex				
Female	280	46.0	2,293	46.5
Male	329	54.0	2,643	53.5
Fiscal Year of Discharge				
2003/04	78	12.8	605	12.3
2004/05	81	13.3	646	13.1
2005/06	84	13.8	697	14.1
2006/07	83	13.6	714	14.5
2007/08	83	13.6	714	14.5
2008/09	98	16.1	744	15.1
2009/10	102	16.7	816	16.5
Length of Stay in Acute Care				
1 – 2	<5	.	50	1.0
3 – 5	NR	.	271	5.5
6 – 11	94	15.4	1,037	21.0
12+	486	79.8	3,578	72.5
Charlson Comorbidity Index Score				
0 – 1 (low)	289	47.5	2,613	52.9
2 – 3	196	32.2	1,436	29.1
4+ (high)	124	20.4	887	18.0
Psychiatric Comorbidity				
Yes	135	22.2	836	16.9
No	474	77.8	4,100	83.1
Number of ALC Days				
None	250	41.1	2,660	53.9
1 – 2	44	7.2	399	8.1
3 – 5	61	10.0	460	9.3
6 – 11	110	18.1	639	12.9
12+	144	23.6	778	15.8
Number of Special Care Days				
None	297	48.8	2,710	54.9
1 – 2	104	17.1	627	12.7
3 – 5	52	8.5	482	9.8
6 – 11	60	9.9	436	8.8

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
12+	96	15.8	681	13.8
Number of Previous ABI Admissions				
0	364	59.8	2,848	57.7
1	169	27.8	1,322	26.8
2+	76	12.5	766	15.5

Note: NR = not reportable due to small cell size

Who Lives in Residential Care* at Discharge from Inpatient Rehabilitation?

* This analysis combined data for ABI patients living in a residential care facility and those living in assisted living settings at discharge from inpatient rehabilitation.

Table 5. Characteristics of TBI Patients Living in Residential Care at Discharge from Inpatient Rehabilitation, 2003/04 - 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	63	100	431	100
Age				
19 – 54	23	36.5	136	31.6
55 – 64	9	14.3	49	11.4
65 – 74	11	17.5	55	12.8
75 – 84	11	17.5	117	27.1
85+	9	14.3	74	17.2
Sex				
Female	20	31.7	183	42.5
Male	43	68.3	248	57.5
Fiscal Year of Discharge				
2003/04	11	17.5	70	16.2
2004/05	14	22.2	65	15.1
2005/06	NR	.	57	13.2
2006/07	<5	.	67	15.5
2007/08	11	17.5	63	14.6
2008/09	8	12.7	68	15.8
2009/10	7	11.1	41	9.5
Length of Stay in Acute Care				
1 – 2	<5	.	6	1.4
3 – 5	<5	.	18	4.2
6 – 11	<5	.	67	15.5
12+	55	87.3	340	78.9
Charlson Comorbidity Index Score				
0 – 1 (low)	50	79.4	358	83.1
2 - 3	NR	.	61	14.2
4+ (high)	<5	.	12	2.8
Psychiatric Comorbidity				
Yes	18	28.6	97	22.5
No	45	71.4	334	77.5
Number of ALC Days				
None	24	38.1	210	48.7
1 – 2	<5	.	21	4.9

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
3 – 5	<5	.	28	6.5
6 – 11	9	14.3	65	15.1
12+	23	36.5	107	24.8
Number of Special Care Days				
None	19	30.2	187	43.4
1 – 2	14	22.2	48	11.1
3 – 5	8	12.7	42	9.7
6 – 11	6	9.5	50	11.6
12+	16	25.4	104	24.1
Motor Vehicle Collision				
Yes	15	23.8	120	27.8
No	48	76.2	311	72.2
Number of Previous ABI Admissions				
0	53	84.1	333	77.3
1	NR	.	81	18.8
2+	<5	.	17	3.9

Note: NR = not reportable due to small cell size

Table 6. Characteristics of nTBI Patients Living in Residential Care at Discharge from Inpatient Rehabilitation, 2003/04 - 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	76	100	525	100
Age				
19 – 54	19	25.0	135	25.7
55 – 64	11	14.5	74	14.1
65 – 74	17	22.4	96	18.3
75 – 84	20	26.3	157	29.9
85+	9	11.8	63	12.0
Sex				
Female	37	48.7	268	51.0
Male	39	51.3	257	49.0
Fiscal Year of Discharge				
2003/04	9	11.8	82	15.6
2004/05	12	15.8	94	17.9
2005/06	17	22.4	71	13.5
2006/07	14	18.4	85	16.2
2007/08	6	7.9	65	12.4
2008/09	11	14.5	70	13.3
2009/10	7	9.2	58	11.0
Length of Stay in Acute Care				
1 – 2	<5	.	13	2.5
3 – 5	<5	.	43	8.2
6 – 11	8	10.5	81	15.4
12+	64	84.2	388	73.9
Charlson Comorbidity Index Score				
0 – 1 (low)	37	48.7	303	57.7
2 - 3	25	32.9	170	32.4
4+ (high)	14	18.4	52	9.9
Psychiatric Comorbidity				
Yes	17	22.4	113	21.5
No	59	77.6	412	78.5
Number of ALC Days				
None	32	42.1	279	53.1
1 – 2	<5	.	28	5.3
3 – 5	NR	.	45	8.6
6 – 11	14	18.4	64	12.2
12+	22	28.9	109	20.8
Number of Special Care Days				
None	36	47.4	298	56.8
1 – 2	8	10.5	44	8.4
3 – 5	8	10.5	43	8.2
6 – 11	6	7.9	49	9.3

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
12+	18	23.7	91	17.3
Number of Previous ABI Admissions				
0	59	77.6	394	75.0
1	NR	.	101	19.2
2+	<5	.	30	5.7

Note: NR = not reportable due to small cell size

What are the Characteristics of ABI Patients with 15+ Days in ALC*?

* This analysis focused on the characteristics of ABI patients with 15+ days in ALC as a result of feedback received from LHINs on the recently published ABI reports.

Table 7. Characteristics of TBI Patients with 15+ Days in ALC, 2003/04 - 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	262	100	1,791	100
Age				
<19	<5	.	31	1.7
19 – 54	57	21.8	413	23.1
55 – 64	NR	.	206	11.5
65 – 74	39	14.9	255	14.2
75 – 84	83	31.7	464	25.9
85+	47	17.9	422	23.6
Sex				
Female	96	36.6	698	39.0
Male	166	63.4	1,093	61.0
Fiscal Year of Discharge				
2003/04	28	10.7	181	10.1
2004/05	36	13.7	204	11.4
2005/06	22	8.4	181	10.1
2006/07	39	14.9	233	13.0
2007/08	46	17.6	304	17.0
2008/09	43	16.4	335	18.7
2009/10	48	18.3	353	19.7
Charlson Comorbidity Index Score				
0 – 1 (low)	193	73.7	1,361	76.0
2 - 3	49	18.7	327	18.3
4+ (high)	20	7.6	103	5.8
Psychiatric Comorbidity				
Yes	125	47.7	747	41.7
No	137	52.3	1,044	58.3
Number of Special Care Days				
None	137	52.3	1,071	59.8
1 – 2	18	6.9	99	5.5
3 – 5	26	9.9	139	7.8
6 – 11	30	11.5	150	8.4
12+	51	19.5	332	18.5
Motor Vehicle Collision				
Yes	22	8.4	299	16.7

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
No	240	91.6	1,492	83.3
Number of Previous ABI Admissions				
0	190	72.5	1,215	67.8
1	56	21.4	462	25.8
2+	16	6.1	114	6.4
Discharge Destination ¹				
Death	17	6.5	135	7.5
Home	50	19.1	378	21.1
Inpatient Rehabilitation	84	32.1	479	26.7
Long Term Care	68	26.0	442	24.7
Transferred ²	42	16.0	350	19.5

Note: NR = not reportable due to small cell size

¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

Table 8. Characteristics of nTBI Patients with 15+ Days in ALC, 2003/04 - 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	551	100	4,662	100
Age				
<19	0	0	16	0.3
19 – 54	128	23.2	812	17.4
55 – 64	78	14.2	771	16.5
65 – 74	101	18.3	1,019	21.9
75 – 84	168	30.5	1,425	30.6
85+	76	13.8	619	13.3
Sex				
Female	248	45.0	2,260	48.5
Male	303	55.0	2,402	51.5
Fiscal Year of Discharge				
2003/04	84	15.2	648	13.9
2004/05	66	12.0	554	11.9
2005/06	67	12.2	585	12.5
2006/07	91	16.5	645	13.8
2007/08	64	11.6	718	15.4
2008/09	84	15.2	760	16.3
2009/10	95	17.2	752	16.1
Charlson Comorbidity Index Score				
0 – 1 (low)	231	41.9	1,571	33.7
2 - 3	175	31.8	1,423	30.5
4+ (high)	145	26.3	1,668	35.8
Psychiatric Comorbidity				
Yes	244	44.3	1,491	32.0
No	307	55.7	3,171	68.0
Number of Special Care Days				
None	310	56.3	3,309	71
1 – 2	40	7.3	226	4.8
3 – 5	40	7.3	257	5.5
6 – 11	60	10.9	297	6.4
12+	101	18.3	573	12.3
Number of Previous ABI Admissions				
0	362	65.7	2,837	60.9
1	125	22.7	1,151	24.7
2+	64	11.6	674	14.5
Discharge Destination ¹				
Death	74	13.4	1,054	22.6
Home	97	17.6	780	16.7
Inpatient Rehabilitation	113	20.5	599	12.8
Long Term Care	132	24.0	973	20.9

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Transferred ²	134	24.3	1,241	26.6

Note: ¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

Who is Discharged with Extended Length of Stay* in Acute Care?

* Extended length of stay (LOS) is defined as LOS in the 75th percentile and higher.

Table 9. Characteristics of TBI Patients Discharged with Extended Length of Stay in Acute Care, 2003/04 - 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	1,041	100	9,399	100
Age				
<19	40	3.8	912	9.7
19 – 54	299	28.7	2,822	30.0
55 – 64	126	12.1	958	10.2
65 – 74	126	12.1	1,266	13.5
75 – 84	260	25.0	2,059	21.9
85+	190	18.3	1,382	14.7
Sex				
Female	395	37.9	3,454	36.7
Male	646	62.1	5,945	63.3
Fiscal Year of Discharge				
2003/04	113	10.9	1,169	12.4
2004/05	160	15.4	1,296	13.8
2005/06	135	13.0	1,269	13.5
2006/07	144	13.8	1,286	13.7
2007/08	170	16.3	1,407	15.0
2008/09	149	14.3	1,414	15.0
2009/10	170	16.3	1,558	16.6
Charlson Comorbidity Index Score				
0 – 1 (low)	818	78.6	7,539	80.2
2 - 3	169	16.2	1,437	15.3
4+ (high)	54	5.2	423	4.5
Psychiatric Comorbidity				
Yes	386	37.1	2,948	31.4
No	655	62.9	6,451	68.6
Number of ALC Days				
None	505	48.5	5,545	59.0
1 – 2	29	2.8	256	2.7
3 – 5	54	5.2	433	4.6
6 – 11	131	12.6	1,005	10.7
12+	322	30.9	2,160	23.0
Number of Special Care Days				
None	482	46.3	4,529	48.2
1 – 2	110	10.6	730	7.8

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
3 – 5	120	11.5	1,052	11.2
6 – 11	119	11.4	1,248	13.3
12+	210	20.2	1,840	19.6
Motor Vehicle Collision				
Yes	137	13.2	2,203	23.4
No	904	86.8	7,196	76.6
Number of Previous ABI Admissions				
0	789	75.8	6,706	71.3
1	189	18.2	2,097	22.3
2+	63	6.1	596	6.3
Discharge Destination ¹				
Death	115	11.0	890	9.5
Home	343	32.9	3,641	38.7
Inpatient Rehabilitation	328	31.5	2,303	24.5
Long Term Care	130	12.5	851	9.1
Transferred ²	120	11.5	1,677	17.8

Note: ¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

Table 10. Characteristics of nTBI Patients Discharged with Extended Length of Stay in Acute Care, 2003/04 – 2009/10

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Overall	3,049	100	29,710	100
Age				
<19	209	6.9	2,315	7.8
19 – 54	720	23.6	6,357	21.4
55 – 64	501	16.4	5,387	18.1
65 – 74	601	19.7	6,511	21.9
75 – 84	692	22.7	6,807	22.9
85+	326	10.7	2,333	7.9
Sex				
Female	1,417	46.5	14,355	48.3
Male	1,632	53.5	15,355	51.7
Fiscal Year of Discharge				
2003/04	495	16.2	4,445	15.0
2004/05	444	14.6	4,273	14.4
2005/06	445	14.6	4,294	14.5
2006/07	415	13.6	4,039	13.6
2007/08	393	12.9	4,045	13.6
2008/09	417	13.7	4,251	14.3
2009/10	440	14.4	4,363	14.7
Charlson Comorbidity Index Score				
0 – 1 (low)	1,074	35.2	10,238	34.5
2 – 3	847	27.8	8,033	27.0
4+ (high)	1,128	37.0	11,439	38.5
Psychiatric Comorbidity				
Yes	851	27.9	6,413	21.6
No	2,198	72.1	23,297	78.4
Number of ALC Days				
None	1,949	63.9	20,085	67.6
1 – 2	70	2.3	644	2.2
3 – 5	107	3.5	1,008	3.4
6 – 11	267	8.8	2,285	7.7
12+	656	21.5	5,688	19.1
Number of Special Care Days				
None	1,855	60.8	18,596	62.6
1 – 2	205	6.7	1,958	6.6
3 – 5	183	6.0	2,025	6.8
6 – 11	253	8.3	2,454	8.3
12+	553	18.1	4,677	15.7
Number of Previous ABI Admissions				
0	1,954	64.1	18,246	61.4
1	678	22.2	6,867	23.1
2+	417	13.7	4,597	15.5

Characteristics	Toronto Central		Ontario	
	N	Col%	N	Col%
Discharge Destination ¹				
Death	757	24.8	7,645	25.7
Home	1,058	34.7	11,618	39.1
Inpatient Rehabilitation	426	14.0	2,930	9.9
Long Term Care	292	9.6	2,027	6.8
Transferred ²	504	16.5	5,418	18.2

Note: ¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

Who is Readmitted to Acute Care within One Month of Discharge?

Table 11. Characteristics of TBI Patients Readmitted to Acute Care within One Month of Discharge, 2003/04 - 2008/09

Characteristics	Toronto Central (N = 2,702)		Ontario (N = 30,579)	
	N	Col%	N	Col%
Overall	111	100	1,220	100
Age				
<19	8	7.2	199	16.3
19 – 54	38	34.2	386	31.6
55 – 64	13	11.7	144	11.8
65 – 74	9	8.1	160	13.1
75 – 84	29	26.1	235	19.3
85+	14	12.6	96	7.9
Sex				
Female	27	24.3	360	29.5
Male	84	75.7	860	70.5
Fiscal Year of Discharge				
2003/04	10	9.0	163	13.4
2004/05	23	20.7	238	19.5
2005/06	19	17.1	224	18.4
2006/07	23	20.7	190	15.6
2007/08	19	17.1	186	15.2
2008/09	17	15.3	219	18.0
Length of Stay in Acute Care				
1 – 2	16	14.4	194	15.9
3 – 5	39	35.1	410	33.6
6 – 11	23	20.7	282	23.1
12+	33	29.7	334	27.4
Charlson Comorbidity Index Score				
0 – 1 (low)	93	83.8	1,068	87.5
2 - 3	NR	.	124	10.2
4+ (high)	<5	.	28	2.3
Psychiatric Comorbidity				
Yes	26	23.4	277	22.7
No	85	76.6	943	77.3
Number of ALC Days				
None	92	82.9	1,099	90.1
1 – 2	<5	.	22	1.8
3 – 5	<5	.	18	1.5
6 – 11	6	5.4	28	2.3
12+	8	7.2	53	4.3

Characteristics	Toronto Central (N = 2,702)		Ontario (N = 30,579)	
	N	Col%	N	Col%
Number of Special Care Days				
None	74	66.7	867	71.1
1 – 2	19	17.1	170	13.9
3 – 5	9	8.1	86	7.0
6 – 11	<5	.	53	4.3
12+	<5	.	44	3.6
Motor Vehicle Collision				
Yes	14	12.6	164	13.4
No	97	87.4	1,056	86.6
Number of Previous ABI Admissions				
0	8	7.2	76	6.2
1	69	62.2	755	61.9
2+	34	30.6	389	31.9
Discharge Destination ¹				
Home	80	72.1	911	74.7
Inpatient Rehabilitation	16	14.4	111	9.1
Long Term Care	NR	.	54	4.4
Transferred ²	<5	.	142	11.6

Note: NR = not reportable due to small cell size

¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

Table 12. Characteristics of nTBI Patients Readmitted to Acute Care within One Month of Discharge, 2003/04 - 2008/09

Characteristics	Toronto Central (N = 8,750)		Ontario (N = 97,700)	
	N	Col%	N	Col%
Overall	715	100	9,300	100
Age				
<19	69	9.7	1,569	16.9
19 – 54	265	37.1	2,688	28.9
55 – 64	142	19.9	1,904	20.5
65 – 74	143	20.0	1,794	19.3
75 – 84	77	10.8	1,144	12.3
85+	19	2.7	201	2.2
Sex				
Female	308	43.1	4,165	44.8
Male	407	56.9	5,135	55.2
Fiscal Year of Discharge				
2003/04	139	19.4	1,562	16.8
2004/05	91	12.7	1,492	16.0
2005/06	116	16.2	1,561	16.8
2006/07	112	15.7	1,578	17.0
2007/08	134	18.7	1,553	16.7
2008/09	123	17.2	1,554	16.7
Length of Stay in Acute Care				
1 – 2	98	13.7	1,169	12.6
3 – 5	226	31.6	2,928	31.5
6 – 11	184	25.7	2,747	29.5
12+	207	29.0	2,456	26.4
Charlson Comorbidity Index Score				
0 – 1 (low)	221	30.9	2,425	26.1
2 - 3	178	24.9	2,642	28.4
4+ (high)	316	44.2	4,233	45.5
Psychiatric Comorbidity				
Yes	66	9.2	666	7.2
No	649	90.8	8,634	92.8
Number of ALC Days				
None	666	93.1	8,812	94.8
1 – 2	9	1.3	73	0.8
3 – 5	8	1.1	97	1.0
6 – 11	13	1.8	145	1.6
12+	19	2.7	173	1.9
Number of Special Care Days				
None	567	79.3	7,802	83.9
1 – 2	94	13.1	921	9.9
3 – 5	28	3.9	324	3.5
6 – 11	12	1.7	152	1.6
12+	14	2.0	101	1.1

Characteristics	Toronto Central (N = 8,750)		Ontario (N = 97,700)	
	N	Col%	N	Col%
Number of Previous ABI Admissions				
0	9	1.3	92	1.0
1	298	41.7	3,220	34.6
2+	408	57.1	5,988	64.4
Discharge Destination ¹				
Home	626	87.6	8,234	88.5
Inpatient Rehabilitation	24	3.4	303	3.3
Long Term Care	17	2.4	146	1.6
Transferred ²	47	6.6	611	6.6

Note: ¹ Missing values were excluded and thus, column percentages may not add up to 100%

² Transferred includes transferred to another facility providing inpatient hospital care and to other

ICD-10 Definitions of ABI

Table 13. ICD-10 Definition of TBI

Diagnosis	ICD-10 Code and Description
1. Fracture and crushing of the skull and facial bones	<ul style="list-style-type: none"> ✓ S02.0 Fracture of vault of skull ✓ S02.1 Fracture of base of skull ✓ S02.3 Fracture of the orbital floor ✓ S02.7 Multiple fractures involving skull and facial bones ✓ S02.8 Fractures of other skull and facial bones ✓ S02.9 Fractures of skull and facial bones, part unspecified ✓ S07.1 Crushing injury of skull
2. Intracranial injury, excluding those with skull fracture	<ul style="list-style-type: none"> ✓ S06.0 Concussion ✓ S06.1 Traumatic cerebral oedema ✓ S06.2 Diffuse brain injury ✓ S06.3 Focal brain injury ✓ S06.4 Epidural hemorrhage ✓ S06.5 Traumatic subdural hemorrhage ✓ S06.6 Traumatic subarachnoid hemorrhage ✓ S06.7 Intracranial injury with prolonged coma ✓ S06.8 Other intracranial injuries ✓ S06.9 Intracranial injury, unspecified
3. Late effects of injuries The "sequelae" include conditions specified as such or as late effects, or those present one year or more after onset of the causal condition.	<ul style="list-style-type: none"> ✓ F07.2 Post concussion syndrome ✓ T90.2 Sequelae of fracture of skull and facial bones ✓ T90.5 Sequelae of intracranial injury

Table 14. ICD-10 Definition of nTBI

Diagnosis	ICD-10 Code and Description
1. Toxic effect of substances, chiefly non-medical as to source	<ul style="list-style-type: none"> ✓ T40.5 Poisoning: cocaine ✓ T42.6 Poisoning by other antiepileptic and sedative-hypnotic drugs, Methaqualone, Valproic acid ✓ T51 Toxic effect of alcohol ✓ T56 Toxic effect of metals ✓ T57.0 Toxic effect of arsenic and its compounds ✓ T57.2 Toxic effect of manganese and its compounds ✓ T57.3 Toxic effect of hydrogen cyanide ✓ T58 Toxic effect of carbon monoxide ✓ T64 Toxic effect of aflatoxin and other mycotoxin food contaminants ✓ T65.0 Toxic effect of cyanides
2. Anoxia	<ul style="list-style-type: none"> ✓ G93.1 Anoxic brain damage (includes all causes of anoxia except those occurring following abortions, ectopic pregnancy, labour and delivery and newborn) ✓ T71 Asphyxiation, suffocation (by strangulation) ✓ T75.1 Drowning and nonfatal submersion ✓ R09.0 Asphyxia
3. Vascular insults (not captured in stroke analyses)	<ul style="list-style-type: none"> ✓ I62.0 Subdural hemorrhage ✓ I62.9 Unspecified intracranial hemorrhage
4. Brain tumours	<ul style="list-style-type: none"> ✓ C70 Malignant neoplasm of brain ✓ C71 Malignant neoplasm of brain ✓ C79.3 Secondary malignant neoplasm of brain and cerebral meninges ✓ C79.4 Secondary malignant neoplasm of other and unspecified part of nervous system ✓ D32.0 Benign neoplasm of cerebral meninges ✓ D33.0 Benign neoplasm of brain, supratentorial ✓ D33.1 Benign neoplasm of brain, infratentorial ✓ D33.2 Benign neoplasm of brain, unspecified ✓ D33.3 Benign neoplasm of cranial nerves ✓ D42.0 Neoplasm of uncertain or unknown behaviour of cerebral meninges ✓ D43 Neoplasm of uncertain or unknown behaviour of brain and central nervous system ✓ D43.2 Neoplasm of brain, unspecified ✓ G06.0 Intracranial abscess and granuloma ✓ G06.1 Intraspinous abscess and granuloma ✓ G06.2 Extradural and subdural abscess, unspecified ✓ G07 Intracranial and intraspinal abscess and granuloma in disease classified elsewhere ✓ G93.0 Cerebral cysts

Diagnosis	ICD-10 Code and Description
5. Encephalitis	<ul style="list-style-type: none"> ✓ A81.1 Subacute, sclerosing encephalitis ✓ A83.0 Japanese encephalitis ✓ A83.2 Eastern equine encephalitis ✓ A86.0 Unspecified viral encephalitis ✓ B00.4 Herpes viral meningoencephalitis ✓ B01.1 Varicella encephalitis ✓ B02.0 Zoster encephalitis ✓ B05.0 Postmeasles encephalitis ✓ B94.1 Sequelae of viral encephalitis ✓ G04.0 Acute disseminated encephalitis ✓ G04.2 Bacterial meningoencephalitis and meningomyelitis, not elsewhere classified ✓ G04.8 Other encephalitis, myelitis and encephalomyelitis ✓ G04.9 Encephalitis, myelitis, and encephalomyelitis, unspecified ✓ G05 Encephalitis, myelitis, and encephalomyelitis in diseases classified elsewhere ✓ G09 Sequelae of inflammatory diseases of central nervous system
6. Metabolic encephalopathies	<ul style="list-style-type: none"> ✓ E10.0 (Type I) ✓ E11.0 (Type II) ✓ E13.0 Other specified diabetes mellitus with coma ✓ E14.0 Unspecified diabetes mellitus with coma ✓ E15 Nondiabetic hypoglycaemic coma ✓ G92 Toxic encephalopathy ✓ G93.4 Encephalopathy, unspecified
7. Meningitis	<ul style="list-style-type: none"> ✓ A87 Viral meningitis ✓ B01.0 Varicella meningitis ✓ B37.5 Candidal meningitis ✓ G00 Bacterial meningitis, not elsewhere classified ✓ G01 Meningitis in bacterial diseases classified elsewhere ✓ G02 Meningitis in other infectious and parasitic diseases classified elsewhere ✓ G03 Meningitis due to other and unspecified causes
8. Other brain disorders and infections	<ul style="list-style-type: none"> ✓ G91.0 Communicating hydrocephalus ✓ G91.1 Obstructive hydrocephalus ✓ G91.2 Normal-pressure hydrocephalus ✓ G93.2 Benign intracranial hypertension ✓ G93.5 Compression of brain ✓ G93.6 Cerebral oedema ✓ G93.8 Other specified disorders of the brain (including post-radiation encephalopathy) ✓ G93.9 Disorder of the brain, unspecified ✓ G99.8 Other specified disorders of nervous system in diseases classified elsewhere ✓ R29.1 Meningismus