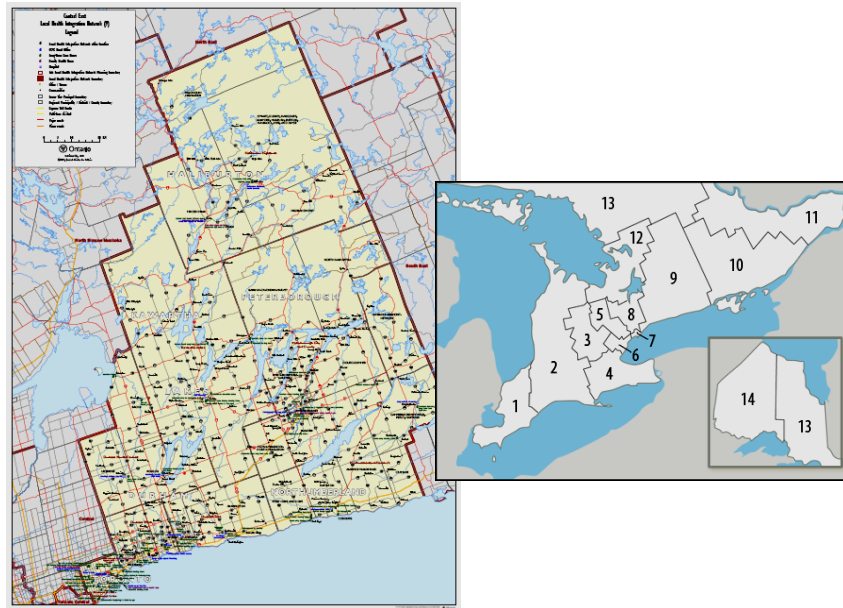


## Acquired Brain Injury by Local Health Integration Network in Ontario

### Central East



#### Research Team:

**Angela Colantonio**, Principal Investigator  
Senior Research Scientist, Toronto  
Rehabilitation Institute – UHN  
Professor of Occupational Sciences and  
Occupational Therapy,  
University of Toronto  
416-978-1098,  
[angela.colantonio@utoronto.ca](mailto:angela.colantonio@utoronto.ca)  
Lab: 416-946-8575; Fax: 416-946-8570

**Vincy Chan**, Research Analyst  
**Daria Parsons**, Consultant  
**Brandon Zagorski**, Statistical Consultant

[www.abiresearch.utoronto.ca](http://www.abiresearch.utoronto.ca)



#### Acknowledgements:

This study was funded by the Ontario Neurotrauma Foundation. We wish to acknowledge support from the Ontario Ministry of Health and Long Term Care, the Toronto Rehabilitation Institute – UHN, and the University of Toronto.

## LIST OF TABLES

TABLE 1. CHARACTERISTICS OF TBI PATIENTS DISCHARGED TO LONG TERM CARE FROM ACUTE CARE, 2003/04 – 2009/10 .....	3
TABLE 2. CHARACTERISTICS OF NTBI PATIENTS DISCHARGED TO LONG TERM CARE FROM ACUTE CARE, 2003/04 – 2009/10 .....	5
TABLE 3. CHARACTERISTICS OF TBI PATIENTS DISCHARGED TO INPATIENT REHABILITATION FROM ACUTE CARE, 2003/04 – 2009/10.....	7
TABLE 4. CHARACTERISTICS OF NTBI PATIENTS DISCHARGED TO INPATIENT REHABILITATION FROM ACUTE CARE, 2003/04 – 2009/10....	9
TABLE 5. CHARACTERISTICS OF TBI PATIENTS LIVING IN RESIDENTIAL CARE AT DISCHARGE FROM INPATIENT REHABILITATION, 2003/04 - 2009/10 .....	11
TABLE 6. CHARACTERISTICS OF NTBI PATIENTS LIVING IN RESIDENTIAL CARE AT DISCHARGE FROM INPATIENT REHABILITATION, 2003/04 - 2009/10 .....	13
TABLE 7. CHARACTERISTICS OF TBI PATIENTS WITH 15+ DAYS IN ALC, 2003/04 - 2009/10.....	15
TABLE 8. CHARACTERISTICS OF NTBI PATIENTS WITH 15+ DAYS IN ALC, 2003/04 - 2009/10.....	17
TABLE 9. CHARACTERISTICS OF TBI PATIENTS DISCHARGED WITH EXTENDED LENGTH OF STAY IN ACUTE CARE, 2003/04 - 2009/10 .....	19
TABLE 10. CHARACTERISTICS OF NTBI PATIENTS DISCHARGED WITH EXTENDED LENGTH OF STAY IN ACUTE CARE, 2003/04 – 2009/10.	21
TABLE 11. CHARACTERISTICS OF TBI PATIENTS READMITTED TO ACUTE CARE WITHIN ONE MONTH OF DISCHARGE, 2003/04 - 2008/09.	23
TABLE 12. CHARACTERISTICS OF NTBI PATIENTS READMITTED TO ACUTE CARE WITHIN ONE MONTH OF DISCHARGE, 2003/04 - 2008/09 .....	25
TABLE 13. ICD-10 DEFINITION OF TBI .....	27
TABLE 14. ICD-10 DEFINITION OF NTBI .....	28

# 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](http://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	Central East		Ontario	
	N	Col%	N	Col%
Overall	178	100	1,558	100
<b>Age</b>				
<19	0	0	<5	.
19 – 54	18	10.1	NR	.
55 – 64	11	6.2	128	8.2
65 – 74	18	10.1	168	10.8
75 – 84	60	33.7	520	33.4
85+	71	39.9	627	40.2
<b>Sex</b>				
Female	108	60.7	825	53.0
Male	70	39.3	733	47.0
<b>Fiscal Year of Discharge</b>				
2003/04	22	12.4	169	10.8
2004/05	21	11.8	186	11.9
2005/06	18	10.1	199	12.8
2006/07	24	13.5	221	14.2
2007/08	29	16.3	228	14.6
2008/09	30	16.9	264	16.9
2009/10	34	19.1	291	18.7
<b>Length of Stay in Acute Care</b>				
1 – 2	11	6.2	102	6.5
3 – 5	35	19.7	258	16.6
6 – 11	35	19.7	314	20.2
12+	97	54.5	884	56.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	122	68.5	1,168	75.0
2 - 3	42	23.6	311	20.0
4+ (high)	14	7.9	79	5.1
<b>Psychiatric Comorbidity</b>				
Yes	96	53.9	724	46.5
No	82	46.1	834	53.5
<b>Number of ALC Days</b>				
None	103	57.9	893	57.3
1 – 2	<5	.	32	2.1
3 – 5	<5	.	35	2.2
6 – 11	10	5.6	101	6.5

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
12+	58	32.6	497	31.9
<b>Number of Special Care Days</b>				
None	159	89.3	1,308	84.0
1 – 2	<5	.	79	5.1
3 – 5	8	4.5	75	4.8
6 – 11	<5	.	51	3.3
12+	<5	.	45	2.9
<b>Motor Vehicle Collision</b>				
Yes	6	3.4	77	4.9
No	172	96.6	1,481	95.1
<b>Number of Previous ABI Admissions</b>				
0	117	65.7	1,135	72.8
1	47	26.4	315	20.2
2+	14	7.9	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	447	100	4,214	100
<b>Age</b>				
<19	0	0	<5	.
19 – 54	30	6.7	NR	.
55 – 64	45	10.1	397	9.4
65 – 74	76	17.0	755	17.9
75 – 84	180	40.3	1,619	38.4
85+	116	26.0	1,168	27.7
<b>Sex</b>				
Female	270	60.4	2,466	58.5
Male	177	39.6	1,748	41.5
<b>Fiscal Year of Discharge</b>				
2003/04	66	14.8	683	16.2
2004/05	67	15.0	688	16.3
2005/06	87	19.5	630	15.0
2006/07	52	11.6	582	13.8
2007/08	57	12.8	533	12.6
2008/09	57	12.8	569	13.5
2009/10	61	13.6	529	12.6
<b>Length of Stay in Acute Care</b>				
1 – 2	12	2.7	149	3.5
3 – 5	63	14.1	612	14.5
6 – 11	119	26.6	1,041	24.7
12+	253	56.6	2,412	57.2
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	172	38.5	1,832	43.5
2 – 3	165	36.9	1,406	33.4
4+ (high)	110	24.6	976	23.2
<b>Psychiatric Comorbidity</b>				
Yes	174	38.9	1,546	36.7
No	273	61.1	2,668	63.3
<b>Number of ALC Days</b>				
None	304	68.0	2,645	62.8
1 – 2	7	1.6	81	1.9
3 – 5	10	2.2	100	2.4
6 – 11	27	6.0	277	6.6
12+	99	22.1	1,111	26.4
<b>Number of Special Care Days</b>				
None	390	87.2	3,613	85.7
1 – 2	17	3.8	202	4.8
3 – 5	15	3.4	165	3.9
6 – 11	11	2.5	118	2.8

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
12+	14	3.1	116	2.8
<b>Number of Previous ABI Admissions</b>				
0	306	68.5	2,868	68.1
1	93	20.8	848	20.1
2+	48	10.7	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	412	100	3,248	100
<b>Age</b>				
<19	17	4.1	182	5.6
19 – 54	163	39.6	1,276	39.3
55 – 64	48	11.7	382	11.8
65 – 74	52	12.6	454	14.0
75 – 84	95	23.1	659	20.3
85+	37	9.0	295	9.1
<b>Sex</b>				
Female	160	38.8	1,144	35.2
Male	252	61.2	2,104	64.8
<b>Fiscal Year of Discharge</b>				
2003/04	47	11.4	375	11.5
2004/05	46	11.2	396	12.2
2005/06	58	14.1	423	13.0
2006/07	58	14.1	471	14.5
2007/08	70	17.0	522	16.1
2008/09	62	15.0	515	15.9
2009/10	71	17.2	546	16.8
<b>Length of Stay in Acute Care</b>				
1 – 2	<5	.	22	0.7
3 – 5	NR	.	159	4.9
6 – 11	84	20.4	642	19.8
12+	302	73.3	2,425	74.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	338	82.0	2,804	86.3
2 - 3	61	14.8	389	12.0
4+ (high)	13	3.2	55	1.7
<b>Psychiatric Comorbidity</b>				
Yes	79	19.2	667	20.5
No	333	80.8	2,581	79.5
<b>Number of ALC Days</b>				
None	178	43.2	1,669	51.4
1 – 2	34	8.3	232	7.1
3 – 5	41	10.0	281	8.7
6 – 11	79	19.2	456	14.0



Characteristics	Central East		Ontario	
	N	Col%	N	Col%
12+	80	19.4	610	18.8
<b>Number of Special Care Days</b>				
None	197	47.8	1,429	44.0
1 – 2	37	9.0	351	10.8
3 – 5	41	10.0	376	11.6
6 – 11	55	13.3	423	13.0
12+	82	19.9	669	20.6
<b>Motor Vehicle Collision</b>				
Yes	135	32.8	1,003	30.9
No	277	67.2	2,245	69.1
<b>Number of Previous ABI Admissions</b>				
0	275	66.7	2,294	70.6
1	111	26.9	771	23.7
2+	26	6.3	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	565	100	4,936	100
<b>Age</b>				
<19	<5	.	51	1.0
19 – 54	158	28.0	1,325	26.8
55 – 64	116	20.5	931	18.9
65 – 74	121	21.4	1,060	21.5
75 – 84	129	22.8	1,193	24.2
85+	NR	.	376	7.6
<b>Sex</b>				
Female	269	47.6	2,293	46.5
Male	296	52.4	2,643	53.5
<b>Fiscal Year of Discharge</b>				
2003/04	61	10.8	605	12.3
2004/05	61	10.8	646	13.1
2005/06	58	10.3	697	14.1
2006/07	74	13.1	714	14.5
2007/08	96	17.0	714	14.5
2008/09	97	17.2	744	15.1
2009/10	118	20.9	816	16.5
<b>Length of Stay in Acute Care</b>				
1 – 2	6	1.1	50	1.0
3 – 5	37	6.5	271	5.5
6 – 11	123	21.8	1,037	21.0
12+	399	70.6	3,578	72.5
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	291	51.5	2,613	52.9
2 – 3	170	30.1	1,436	29.1
4+ (high)	104	18.4	887	18.0
<b>Psychiatric Comorbidity</b>				
Yes	87	15.4	836	16.9
No	478	84.6	4,100	83.1
<b>Number of ALC Days</b>				
None	279	49.4	2,660	53.9
1 – 2	57	10.1	399	8.1
3 – 5	57	10.1	460	9.3
6 – 11	71	12.6	639	12.9
12+	101	17.9	778	15.8
<b>Number of Special Care Days</b>				
None	299	52.9	2,710	54.9
1 – 2	83	14.7	627	12.7
3 – 5	44	7.8	482	9.8
6 – 11	60	10.6	436	8.8

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
12+	79	14.0	681	13.8
<b>Number of Previous ABI Admissions</b>				
0	319	56.5	2,848	57.7
1	167	29.6	1,322	26.8
2+	79	14.0	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	62	100	431	100
<b>Age</b>				
19 – 54	16	25.8	136	31.6
55 – 64	NR	.	49	11.4
65 – 74	<5	.	55	12.8
75 – 84	28	45.2	117	27.1
85+	7	11.3	74	17.2
<b>Sex</b>				
Female	25	40.3	183	42.5
Male	37	59.7	248	57.5
<b>Fiscal Year of Discharge</b>				
2003/04	11	17.7	70	16.2
2004/05	<5	.	65	15.1
2005/06	9	14.5	57	13.2
2006/07	9	14.5	67	15.5
2007/08	7	11.3	63	14.6
2008/09	16	25.8	68	15.8
2009/10	<5	.	41	9.5
<b>Length of Stay in Acute Care</b>				
1 – 2	0	0	6	1.4
3 – 5	<5	.	18	4.2
6 – 11	NR	.	67	15.5
12+	47	75.8	340	78.9
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	55	88.7	358	83.1
2 - 3	7	11.3	61	14.2
4+ (high)	0	0	12	2.8
<b>Psychiatric Comorbidity</b>				
Yes	14	22.6	97	22.5
No	48	77.4	334	77.5
<b>Number of ALC Days</b>				
None	30	48.4	210	48.7
1 – 2	<5	.	21	4.9

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
3 – 5	NR	.	28	6.5
6 – 11	8	12.9	65	15.1
12+	12	19.4	107	24.8
<b>Number of Special Care Days</b>				
None	33	53.2	187	43.4
1 – 2	<5	.	48	11.1
3 – 5	9	14.5	42	9.7
6 – 11	9	14.5	50	11.6
12+	NR	.	104	24.1
<b>Motor Vehicle Collision</b>				
Yes	21	33.9	120	27.8
No	41	66.1	311	72.2
<b>Number of Previous ABI Admissions</b>				
0	42	67.7	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	63	100	525	100
<b>Age</b>				
19 – 54	19	30.2	135	25.7
55 – 64	7	11.1	74	14.1
65 – 74	6	9.5	96	18.3
75 – 84	23	36.5	157	29.9
85+	8	12.7	63	12.0
<b>Sex</b>				
Female	24	38.1	268	51.0
Male	39	61.9	257	49.0
<b>Fiscal Year of Discharge</b>				
2003/04	8	12.7	82	15.6
2004/05	9	14.3	94	17.9
2005/06	NR	.	71	13.5
2006/07	11	17.5	85	16.2
2007/08	9	14.3	65	12.4
2008/09	14	22.2	70	13.3
2009/10	<5	.	58	11.0
<b>Length of Stay in Acute Care</b>				
1 – 2	0	0	13	2.5
3 – 5	6	9.5	43	8.2
6 – 11	11	17.5	81	15.4
12+	46	73	388	73.9
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	32	50.8	303	57.7
2 - 3	24	38.1	170	32.4
4+ (high)	7	11.1	52	9.9
<b>Psychiatric Comorbidity</b>				
Yes	17	27.0	113	21.5
No	46	73.0	412	78.5
<b>Number of ALC Days</b>				
None	34	54.0	279	53.1
1 – 2	<5	.	28	5.3
3 – 5	7	11.1	45	8.6
6 – 11	<5	.	64	12.2
12+	16	25.4	109	20.8
<b>Number of Special Care Days</b>				
None	39	61.9	298	56.8
1 – 2	<5	.	44	8.4
3 – 5	<5	.	43	8.2
6 – 11	8	12.7	49	9.3

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
12+	8	12.7	91	17.3
<b>Number of Previous ABI Admissions</b>				
0	46	73.0	394	75.0
1	10	15.9	101	19.2
2+	7	11.1	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	Central East		Ontario	
	N	Col%	N	Col%
Overall	207	100	1,791	100
<b>Age</b>				
<19	<5	.	31	1.7
19 – 54	53	25.6	413	23.1
55 – 64	24	11.6	206	11.5
65 – 74	NR	.	255	14.2
75 – 84	64	30.9	464	25.9
85+	43	20.8	422	23.6
<b>Sex</b>				
Female	85	41.1	698	39.0
Male	122	58.9	1,093	61.0
<b>Fiscal Year of Discharge</b>				
2003/04	17	8.2	181	10.1
2004/05	25	12.1	204	11.4
2005/06	11	5.3	181	10.1
2006/07	26	12.6	233	13.0
2007/08	39	18.8	304	17.0
2008/09	38	18.4	335	18.7
2009/10	51	24.6	353	19.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	153	73.9	1,361	76.0
2 - 3	39	18.8	327	18.3
4+ (high)	15	7.2	103	5.8
<b>Psychiatric Comorbidity</b>				
Yes	84	40.6	747	41.7
No	123	59.4	1,044	58.3
<b>Number of Special Care Days</b>				
None	135	65.2	1,071	59.8
1 – 2	6	2.9	99	5.5
3 – 5	11	5.3	139	7.8
6 – 11	13	6.3	150	8.4
12+	42	20.3	332	18.5
<b>Motor Vehicle Collision</b>				
Yes	39	18.8	299	16.7



Characteristics	Central East		Ontario	
	N	Col%	N	Col%
No	168	81.2	1,492	83.3
<b>Number of Previous ABI Admissions</b>				
0	128	61.8	1,215	67.8
1	65	31.4	462	25.8
2+	14	6.8	114	6.4
<b>Discharge Destination <sup>1</sup></b>				
Death	21	10.1	135	7.5
Home	33	15.9	378	21.1
Inpatient Rehabilitation	65	31.4	479	26.7
Long Term Care	51	24.6	442	24.7
Transferred <sup>2</sup>	37	17.9	350	19.5

**Note:** NR = not reportable due to small cell size

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

<sup>2</sup> 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	Central East		Ontario	
	N	Col%	N	Col%
Overall	508	100	4,662	100
<b>Age</b>				
<19	0	0	16	0.3
19 – 54	87	17.1	812	17.4
55 – 64	95	18.7	771	16.5
65 – 74	108	21.3	1,019	21.9
75 – 84	157	30.9	1,425	30.6
85+	61	12.0	619	13.3
<b>Sex</b>				
Female	257	50.6	2,260	48.5
Male	251	49.4	2,402	51.5
<b>Fiscal Year of Discharge</b>				
2003/04	63	12.4	648	13.9
2004/05	50	9.8	554	11.9
2005/06	72	14.2	585	12.5
2006/07	61	12.0	645	13.8
2007/08	82	16.1	718	15.4
2008/09	81	15.9	760	16.3
2009/10	99	19.5	752	16.1
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	146	28.7	1,571	33.7
2 - 3	158	31.1	1,423	30.5
4+ (high)	204	40.2	1,668	35.8
<b>Psychiatric Comorbidity</b>				
Yes	181	35.6	1,491	32.0
No	327	64.4	3,171	68.0
<b>Number of Special Care Days</b>				
None	374	73.6	3,309	71.0
1 – 2	14	2.8	226	4.8
3 – 5	23	4.5	257	5.5
6 – 11	33	6.5	297	6.4
12+	64	12.6	573	12.3
<b>Number of Previous ABI Admissions</b>				
0	327	64.4	2,837	60.9
1	119	23.4	1,151	24.7
2+	62	12.2	674	14.5
<b>Discharge Destination <sup>1</sup></b>				
Death	112	22.0	1,054	22.6
Home	68	13.4	780	16.7
Inpatient Rehabilitation	75	14.8	599	12.8
Long Term Care	84	16.5	973	20.9

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
Transferred <sup>2</sup>	169	33.3	1,241	26.6

**Note:** <sup>1</sup> Missing values were excluded and thus, column percentages may not add up to 100%

<sup>2</sup> 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 75<sup>th</sup> percentile and higher.

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

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
Overall	981	100	9,399	100
<b>Age</b>				
<19	116	11.8	912	9.7
19 – 54	285	29.1	2,822	30.0
55 – 64	99	10.1	958	10.2
65 – 74	106	10.8	1,266	13.5
75 – 84	233	23.8	2,059	21.9
85+	142	14.5	1,382	14.7
<b>Sex</b>				
Female	380	38.7	3,454	36.7
Male	601	61.3	5,945	63.3
<b>Fiscal Year of Discharge</b>				
2003/04	118	12.0	1,169	12.4
2004/05	135	13.8	1,296	13.8
2005/06	136	13.9	1,269	13.5
2006/07	135	13.8	1,286	13.7
2007/08	148	15.1	1,407	15.0
2008/09	147	15.0	1,414	15.0
2009/10	162	16.5	1,558	16.6
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	750	76.5	7,539	80.2
2 - 3	168	17.1	1,437	15.3
4+ (high)	63	6.4	423	4.5
<b>Psychiatric Comorbidity</b>				
Yes	334	34.0	2,948	31.4
No	647	66.0	6,451	68.6
<b>Number of ALC Days</b>				
None	543	55.4	5,545	59.0
1 – 2	24	2.4	256	2.7
3 – 5	45	4.6	433	4.6
6 – 11	122	12.4	1,005	10.7
12+	247	25.2	2,160	23.0
<b>Number of Special Care Days</b>				
None	527	53.7	4,529	48.2
1 – 2	54	5.5	730	7.8

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
3 – 5	92	9.4	1,052	11.2
6 – 11	124	12.6	1,248	13.3
12+	184	18.8	1,840	19.6
<b>Motor Vehicle Collision</b>				
Yes	245	25.0	2,203	23.4
No	736	75.0	7,196	76.6
<b>Number of Previous ABI Admissions</b>				
0	651	66.4	6,706	71.3
1	271	27.6	2,097	22.3
2+	59	6.0	596	6.3
<b>Discharge Destination <sup>1</sup></b>				
Death	103	10.5	890	9.5
Home	344	35.1	3,641	38.7
Inpatient Rehabilitation	286	29.2	2,303	24.5
Long Term Care	93	9.5	851	9.1
Transferred <sup>2</sup>	151	15.4	1,677	17.8

**Note:** <sup>1</sup> Missing values were excluded and thus, column percentages may not add up to 100%

<sup>2</sup> 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	Central East		Ontario	
	N	Col%	N	Col%
Overall	3,332	100	29,710	100
<b>Age</b>				
<19	280	8.4	2,315	7.8
19 – 54	738	22.1	6,357	21.4
55 – 64	587	17.6	5,387	18.1
65 – 74	737	22.1	6,511	21.9
75 – 84	763	22.9	6,807	22.9
85+	227	6.8	2,333	7.9
<b>Sex</b>				
Female	1,644	49.3	14,355	48.3
Male	1,688	50.7	15,355	51.7
<b>Fiscal Year of Discharge</b>				
2003/04	479	14.4	4,445	15.0
2004/05	471	14.1	4,273	14.4
2005/06	483	14.5	4,294	14.5
2006/07	442	13.3	4,039	13.6
2007/08	462	13.9	4,045	13.6
2008/09	485	14.6	4,251	14.3
2009/10	510	15.3	4,363	14.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	1,055	31.7	10,238	34.5
2 – 3	912	27.4	8,033	27.0
4+ (high)	1,365	41.0	11,439	38.5
<b>Psychiatric Comorbidity</b>				
Yes	753	22.6	6,413	21.6
No	2,579	77.4	23,297	78.4
<b>Number of ALC Days</b>				
None	2,320	69.6	20,085	67.6
1 – 2	66	2.0	644	2.2
3 – 5	91	2.7	1,008	3.4
6 – 11	233	7.0	2,285	7.7
12+	622	18.7	5,688	19.1
<b>Number of Special Care Days</b>				
None	2,144	64.3	18,596	62.6
1 – 2	185	5.6	1,958	6.6
3 – 5	214	6.4	2,025	6.8
6 – 11	255	7.7	2,454	8.3
12+	534	16.0	4,677	15.7
<b>Number of Previous ABI Admissions</b>				
0	2,027	60.8	18,246	61.4
1	807	24.2	6,867	23.1
2+	498	14.9	4,597	15.5

Characteristics	Central East		Ontario	
	N	Col%	N	Col%
<b>Discharge Destination <sup>1</sup></b>				
Death	984	29.5	7,645	25.7
Home	1,239	37.2	11,618	39.1
Inpatient Rehabilitation	329	9.9	2,930	9.9
Long Term Care	207	6.2	2,027	6.8
Transferred <sup>2</sup>	570	17.1	5,418	18.2

**Note:** <sup>1</sup> Missing values were excluded and thus, column percentages may not add up to 100%

<sup>2</sup> 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	Central East (N = 3,184)		Ontario (N = 30,579)	
	N	Col%	N	Col%
Overall	157	100	1,220	100
<b>Age</b>				
<19	35	22.3	199	16.3
19 – 54	31	19.7	386	31.6
55 – 64	12	7.6	144	11.8
65 – 74	21	13.4	160	13.1
75 – 84	40	25.5	235	19.3
85+	18	11.5	96	7.9
<b>Sex</b>				
Female	52	33.1	360	29.5
Male	105	66.9	860	70.5
<b>Fiscal Year of Discharge</b>				
2003/04	21	13.4	163	13.4
2004/05	30	19.1	238	19.5
2005/06	28	17.8	224	18.4
2006/07	23	14.6	190	15.6
2007/08	24	15.3	186	15.2
2008/09	31	19.7	219	18.0
<b>Length of Stay in Acute Care</b>				
1 – 2	23	14.6	194	15.9
3 – 5	49	31.2	410	33.6
6 – 11	39	24.8	282	23.1
12+	46	29.3	334	27.4
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	133	84.7	1,068	87.5
2 - 3	15	9.6	124	10.2
4+ (high)	9	5.7	28	2.3
<b>Psychiatric Comorbidity</b>				
Yes	37	23.6	277	22.7
No	120	76.4	943	77.3
<b>Number of ALC Days</b>				
None	135	86	1,099	90.1
1 – 2	<5	.	22	1.8
3 – 5	<5	.	18	1.5
6 – 11	6	3.8	28	2.3
12+	13	8.3	53	4.3



Characteristics	Central East (N = 3,184)		Ontario (N = 30,579)	
	N	Col%	N	Col%
<b>Number of Special Care Days</b>				
None	117	74.5	867	71.1
1 – 2	19	12.1	170	13.9
3 – 5	9	5.7	86	7.0
6 – 11	NR	.	53	4.3
12+	<5	.	44	3.6
<b>Motor Vehicle Collision</b>				
Yes	23	14.6	164	13.4
No	134	85.4	1,056	86.6
<b>Number of Previous ABI Admissions</b>				
0	7	4.5	76	6.2
1	106	67.5	755	61.9
2+	44	28.0	389	31.9
<b>Discharge Destination <sup>1</sup></b>				
Home	108	68.8	911	74.7
Inpatient Rehabilitation	18	11.5	111	9.1
Long Term Care	7	4.5	54	4.4
Transferred <sup>2</sup>	24	15.3	142	11.6

**Note:** NR = not reportable due to small cell size

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

<sup>2</sup> 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	Central East (N = 10,652)		Ontario (N = 97,700)	
	N	Col%	N	Col%
Overall	1,021	100	9,300	100
<b>Age</b>				
<19	202	19.8	1,569	16.9
19 – 54	267	26.2	2,688	28.9
55 – 64	209	20.5	1,904	20.5
65 – 74	189	18.5	1,794	19.3
75 – 84	123	12.0	1,144	12.3
85+	31	3.0	201	2.2
<b>Sex</b>				
Female	451	44.2	4,165	44.8
Male	570	55.8	5,135	55.2
<b>Fiscal Year of Discharge</b>				
2003/04	185	18.1	1,562	16.8
2004/05	147	14.4	1,492	16.0
2005/06	189	18.5	1,561	16.8
2006/07	167	16.4	1,578	17.0
2007/08	153	15.0	1,553	16.7
2008/09	180	17.6	1,554	16.7
<b>Length of Stay in Acute Care</b>				
1 – 2	106	10.4	1,169	12.6
3 – 5	312	30.6	2,928	31.5
6 – 11	309	30.3	2,747	29.5
12+	294	28.8	2,456	26.4
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	234	22.9	2,425	26.1
2 - 3	311	30.5	2,642	28.4
4+ (high)	476	46.6	4,233	45.5
<b>Psychiatric Comorbidity</b>				
Yes	69	6.8	666	7.2
No	952	93.2	8,634	92.8
<b>Number of ALC Days</b>				
None	973	95.3	8,812	94.8
1 – 2	7	0.7	73	0.8
3 – 5	11	1.1	97	1.0
6 – 11	15	1.5	145	1.6
12+	15	1.5	173	1.9
<b>Number of Special Care Days</b>				
None	844	82.7	7,802	83.9
1 – 2	116	11.4	921	9.9
3 – 5	36	3.5	324	3.5
6 – 11	12	1.2	152	1.6
12+	13	1.3	101	1.1

Characteristics	Central East (N = 10,652)		Ontario (N = 97,700)	
	N	Col%	N	Col%
<b>Number of Previous ABI Admissions</b>				
0	9	0.9	92	1.0
1	362	35.5	3,220	34.6
2+	650	63.7	5,988	64.4
<b>Discharge Destination <sup>1</sup></b>				
Home	904	88.5	8,234	88.5
Inpatient Rehabilitation	34	3.3	303	3.3
Long Term Care	11	1.1	146	1.6
Transferred <sup>2</sup>	72	7.1	611	6.6

**Note:** <sup>1</sup> Missing values were excluded and thus, column percentages may not add up to 100%

<sup>2</sup> 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"> <li>✓ S02.0 Fracture of vault of skull</li> <li>✓ S02.1 Fracture of base of skull</li> <li>✓ S02.3 Fracture of the orbital floor</li> <li>✓ S02.7 Multiple fractures involving skull and facial bones</li> <li>✓ S02.8 Fractures of other skull and facial bones</li> <li>✓ S02.9 Fractures of skull and facial bones, part unspecified</li> <li>✓ S07.1 Crushing injury of skull</li> </ul>
2. Intracranial injury, excluding those with skull fracture	<ul style="list-style-type: none"> <li>✓ S06.0 Concussion</li> <li>✓ S06.1 Traumatic cerebral oedema</li> <li>✓ S06.2 Diffuse brain injury</li> <li>✓ S06.3 Focal brain injury</li> <li>✓ S06.4 Epidural hemorrhage</li> <li>✓ S06.5 Traumatic subdural hemorrhage</li> <li>✓ S06.6 Traumatic subarachnoid hemorrhage</li> <li>✓ S06.7 Intracranial injury with prolonged coma</li> <li>✓ S06.8 Other intracranial injuries</li> <li>✓ S06.9 Intracranial injury, unspecified</li> </ul>
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"> <li>✓ F07.2 Post concussion syndrome</li> <li>✓ T90.2 Sequelae of fracture of skull and facial bones</li> <li>✓ T90.5 Sequelae of intracranial injury</li> </ul>

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

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