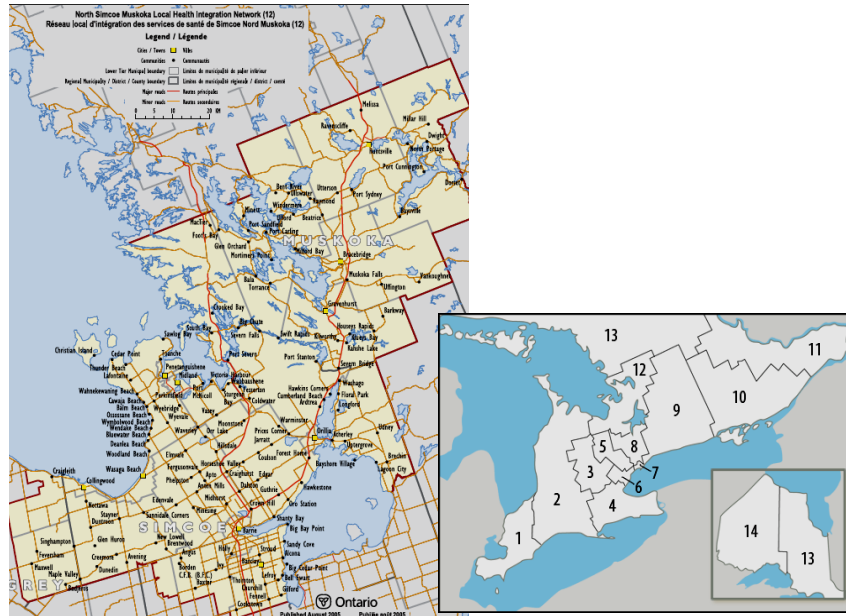


## Acquired Brain Injury by Local Health Integration Network in Ontario

### 12 North Simcoe Muskoka



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# Methods

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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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	47	100	1,558	100
<b>Age</b>				
<19	0	0	<5	.
19 – 54	<5	.	NR	.
55 – 64	<5	.	128	8.2
65 – 74	<5	.	168	10.8
75 – 84	14	29.8	520	33.4
85+	24	51.1	627	40.2
<b>Sex</b>				
Female	28	59.6	825	53.0
Male	19	40.4	733	47.0
<b>Fiscal Year of Discharge</b>				
2003/04	<5	.	169	10.8
2004/05	6	12.8	186	11.9
2005/06	<5	.	199	12.8
2006/07	6	12.8	221	14.2
2007/08	8	17.0	228	14.6
2008/09	6	12.8	264	16.9
2009/10	12	25.5	291	18.7
<b>Length of Stay in Acute Care</b>				
1 – 2	<5	.	102	6.5
3 – 5	NR	.	258	16.6
6 – 11	17	36.2	314	20.2
12+	16	34.0	884	56.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	38	80.9	1,168	75.0
2 - 3	NR	.	311	20.0
4+ (high)	<5	.	79	5.1
<b>Psychiatric Comorbidity</b>				
Yes	18	38.3	724	46.5
No	29	61.7	834	53.5
<b>Number of ALC Days</b>				
None	35	74.5	893	57.3
1 – 2	<5	.	32	2.1
3 – 5	<5	.	35	2.2
6 – 11	<5	.	101	6.5

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
12+	8	17.0	497	31.9
<b>Number of Special Care Days</b>				
None	42	89.4	1,308	84.0
1 – 2	<5	.	79	5.1
3 – 5	<5	.	75	4.8
6 – 11	<5	.	51	3.3
12+	<5	.	45	2.9
<b>Motor Vehicle Collision</b>				
Yes	<5	.	77	4.9
No	NR	.	1,481	95.1
<b>Number of Previous ABI Admissions</b>				
0	36	76.6	1,135	72.8
1	NR	.	315	20.2
2+	<5	.	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	112	100	4,214	100
<b>Age</b>				
<19	0	0	<5	.
19 – 54	<5	.	NR	.
55 – 64	NR	.	397	9.4
65 – 74	26	23.2	755	17.9
75 – 84	39	34.8	1,619	38.4
85+	30	26.8	1,168	27.7
<b>Sex</b>				
Female	67	59.8	2,466	58.5
Male	45	40.2	1,748	41.5
<b>Fiscal Year of Discharge</b>				
2003/04	18	16.1	683	16.2
2004/05	19	17.0	688	16.3
2005/06	14	12.5	630	15.0
2006/07	12	10.7	582	13.8
2007/08	17	15.2	533	12.6
2008/09	17	15.2	569	13.5
2009/10	15	13.4	529	12.6
<b>Length of Stay in Acute Care</b>				
1 – 2	7	6.3	149	3.5
3 – 5	19	17.0	612	14.5
6 – 11	29	25.9	1,041	24.7
12+	57	50.9	2,412	57.2
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	65	58.0	1,832	43.5
2 – 3	30	26.8	1,406	33.4
4+ (high)	17	15.2	976	23.2
<b>Psychiatric Comorbidity</b>				
Yes	26	23.2	1,546	36.7
No	86	76.8	2,668	63.3
<b>Number of ALC Days</b>				
None	74	66.1	2,645	62.8
1 – 2	0	0	81	1.9
3 – 5	<5	.	100	2.4
6 – 11	<5	.	277	6.6
12+	31	27.7	1,111	26.4
<b>Number of Special Care Days</b>				
None	95	84.8	3,613	85.7
1 – 2	9	8.0	202	4.8
3 – 5	NR	.	165	3.9
6 – 11	0	0	118	2.8

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
12+	<5	.	116	2.8
<b>Number of Previous ABI Admissions</b>				
0	69	61.6	2,868	68.1
1	22	19.6	848	20.1
2+	21	18.8	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	83	100	3,248	100
<b>Age</b>				
<19	7	8.4	182	5.6
19 – 54	43	51.8	1,276	39.3
55 – 64	13	15.7	382	11.8
65 – 74	NR	.	454	14.0
75 – 84	11	13.3	659	20.3
85+	<5	.	295	9.1
<b>Sex</b>				
Female	31	37.3	1,144	35.2
Male	52	62.7	2,104	64.8
<b>Fiscal Year of Discharge</b>				
2003/04	12	14.5	375	11.5
2004/05	6	7.2	396	12.2
2005/06	9	10.8	423	13.0
2006/07	13	15.7	471	14.5
2007/08	7	8.4	522	16.1
2008/09	19	22.9	515	15.9
2009/10	17	20.5	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	16	19.3	642	19.8
12+	58	69.9	2,425	74.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	75	90.4	2,804	86.3
2 - 3	8	9.6	389	12.0
4+ (high)	0	0	55	1.7
<b>Psychiatric Comorbidity</b>				
Yes	13	15.7	667	20.5
No	70	84.3	2,581	79.5
<b>Number of ALC Days</b>				
None	53	63.9	1,669	51.4
1 – 2	<5	.	232	7.1
3 – 5	NR	.	281	8.7
6 – 11	10	12.0	456	14.0



Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
12+	9	10.8	610	18.8
<b>Number of Special Care Days</b>				
None	41	49.4	1,429	44.0
1 – 2	<5	.	351	10.8
3 – 5	NR	.	376	11.6
6 – 11	12	14.5	423	13.0
12+	19	22.9	669	20.6
<b>Motor Vehicle Collision</b>				
Yes	30	36.1	1,003	30.9
No	53	63.9	2,245	69.1
<b>Number of Previous ABI Admissions</b>				
0	47	56.6	2,294	70.6
1	NR	.	771	23.7
2+	<5	.	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	141	100	4,936	100
<b>Age</b>				
<19	<5	.	51	1.0
19 – 54	31	22.0	1,325	26.8
55 – 64	33	23.4	931	18.9
65 – 74	29	20.6	1,060	21.5
75 – 84	37	26.2	1,193	24.2
85+	NR	.	376	7.6
<b>Sex</b>				
Female	58	41.1	2,293	46.5
Male	83	58.9	2,643	53.5
<b>Fiscal Year of Discharge</b>				
2003/04	16	11.3	605	12.3
2004/05	14	9.9	646	13.1
2005/06	13	9.2	697	14.1
2006/07	30	21.3	714	14.5
2007/08	23	16.3	714	14.5
2008/09	17	12.1	744	15.1
2009/10	28	19.9	816	16.5
<b>Length of Stay in Acute Care</b>				
1 – 2	<5	.	50	1.0
3 – 5	NR	.	271	5.5
6 – 11	37	26.2	1,037	21.0
12+	88	62.4	3,578	72.5
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	85	60.3	2,613	52.9
2 – 3	35	24.8	1,436	29.1
4+ (high)	21	14.9	887	18.0
<b>Psychiatric Comorbidity</b>				
Yes	13	9.2	836	16.9
No	128	90.8	4,100	83.1
<b>Number of ALC Days</b>				
None	95	67.4	2,660	53.9
1 – 2	9	6.4	399	8.1
3 – 5	7	5.0	460	9.3
6 – 11	17	12.1	639	12.9
12+	13	9.2	778	15.8
<b>Number of Special Care Days</b>				
None	94	66.7	2,710	54.9
1 – 2	11	7.8	627	12.7
3 – 5	13	9.2	482	9.8
6 – 11	6	4.3	436	8.8

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
12+	17	12.1	681	13.8
<b>Number of Previous ABI Admissions</b>				
0	54	38.3	2,848	57.7
1	55	39.0	1,322	26.8
2+	32	22.7	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	9	100	431	100
<b>Age</b>				
19 – 54	<5	.	136	31.6
55 – 64	<5	.	49	11.4
65 – 74	<5	.	55	12.8
75 – 84	<5	.	117	27.1
85+	<5	.	74	17.2
<b>Sex</b>				
Female	<5	.	183	42.5
Male	NR	.	248	57.5
<b>Fiscal Year of Discharge</b>				
2003/04	<5	.	70	16.2
2004/05	<5	.	65	15.1
2005/06	0	0	57	13.2
2006/07	<5	.	67	15.5
2007/08	0	0	63	14.6
2008/09	<5	.	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	<5	.	67	15.5
12+	NR	.	340	78.9
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	NR	.	358	83.1
2 - 3	<5	.	61	14.2
4+ (high)	0	0	12	2.8
<b>Psychiatric Comorbidity</b>				
Yes	<5	.	97	22.5
No	NR	.	334	77.5
<b>Number of ALC Days</b>				
None	<5	.	210	48.7
1 – 2	<5	.	21	4.9

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
3 – 5	<5	.	28	6.5
6 – 11	<5	.	65	15.1
12+	<5	.	107	24.8
<b>Number of Special Care Days</b>				
None	<5	.	187	43.4
1 – 2	<5	.	48	11.1
3 – 5	<5	.	42	9.7
6 – 11	<5	.	50	11.6
12+	<5	.	104	24.1
<b>Motor Vehicle Collision</b>				
Yes	<5	.	120	27.8
No	NR	.	311	72.2
<b>Number of Previous ABI Admissions</b>				
0	6	66.7	333	77.3
1	<5	.	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	15	100	525	100
<b>Age</b>				
19 – 54	<5	.	135	25.7
55 – 64	<5	.	74	14.1
65 – 74	<5	.	96	18.3
75 – 84	<5	.	157	29.9
85+	<5	.	63	12.0
<b>Sex</b>				
Female	7	46.7	268	51.0
Male	8	53.3	257	49.0
<b>Fiscal Year of Discharge</b>				
2003/04	<5	.	82	15.6
2004/05	<5	.	94	17.9
2005/06	0	0	71	13.5
2006/07	<5	.	85	16.2
2007/08	<5	.	65	12.4
2008/09	<5	.	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	0	0	43	8.2
6 – 11	<5	.	81	15.4
12+	NR	.	388	73.9
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	9	60.0	303	57.7
2 - 3	<5	.	170	32.4
4+ (high)	<5	.	52	9.9
<b>Psychiatric Comorbidity</b>				
Yes	<5	.	113	21.5
No	NR	.	412	78.5
<b>Number of ALC Days</b>				
None	6	40.0	279	53.1
1 – 2	<5	.	28	5.3
3 – 5	<5	.	45	8.6
6 – 11	<5	.	64	12.2
12+	<5	.	109	20.8
<b>Number of Special Care Days</b>				
None	7	46.7	298	56.8
1 – 2	<5	.	44	8.4
3 – 5	<5	.	43	8.2
6 – 11	<5	.	49	9.3

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
12+	<5	.	91	17.3
<b>Number of Previous ABI Admissions</b>				
0	11	73.3	394	75.0
1	<5	.	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	39	100	1,791	100
<b>Age</b>				
<19	0	0	31	1.7
19 – 54	8	20.5	413	23.1
55 – 64	<5	.	206	11.5
65 – 74	<5	.	255	14.2
75 – 84	13	33.3	464	25.9
85+	9	23.1	422	23.6
<b>Sex</b>				
Female	16	41.0	698	39.0
Male	23	59.0	1,093	61.0
<b>Fiscal Year of Discharge</b>				
2003/04	<5	.	181	10.1
2004/05	<5	.	204	11.4
2005/06	<5	.	181	10.1
2006/07	<5	.	233	13.0
2007/08	9	23.1	304	17.0
2008/09	9	23.1	335	18.7
2009/10	10	25.6	353	19.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	29	74.4	1,361	76.0
2 - 3	NR	.	327	18.3
4+ (high)	<5	.	103	5.8
<b>Psychiatric Comorbidity</b>				
Yes	17	43.6	747	41.7
No	22	56.4	1,044	58.3
<b>Number of Special Care Days</b>				
None	28	71.8	1,071	59.8
1 – 2	<5	.	99	5.5
3 – 5	<5	.	139	7.8
6 – 11	<5	.	150	8.4
12+	<5	.	332	18.5
<b>Motor Vehicle Collision</b>				
Yes	6	15.4	299	16.7



Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
No	33	84.6	1,492	83.3
<b>Number of Previous ABI Admissions</b>				
0	19	48.7	1,215	67.8
1	NR	.	462	25.8
2+	<5	.	114	6.4
<b>Discharge Destination <sup>1</sup></b>				
Death	<5	.	135	7.5
Home	13	33.3	378	21.1
Inpatient Rehabilitation	<5	.	479	26.7
Long Term Care	6	15.4	442	24.7
Transferred <sup>2</sup>	15	38.5	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	135	100	4,662	100
<b>Age</b>				
<19	0	0	16	0.3
19 – 54	18	13.3	812	17.4
55 – 64	25	18.5	771	16.5
65 – 74	34	25.2	1,019	21.9
75 – 84	38	28.1	1,425	30.6
85+	20	14.8	619	13.3
<b>Sex</b>				
Female	67	49.6	2,260	48.5
Male	68	50.4	2,402	51.5
<b>Fiscal Year of Discharge</b>				
2003/04	21	15.6	648	13.9
2004/05	11	8.1	554	11.9
2005/06	9	6.7	585	12.5
2006/07	14	10.4	645	13.8
2007/08	24	17.8	718	15.4
2008/09	28	20.7	760	16.3
2009/10	28	20.7	752	16.1
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	42	31.1	1,571	33.7
2 - 3	34	25.2	1,423	30.5
4+ (high)	59	43.7	1,668	35.8
<b>Psychiatric Comorbidity</b>				
Yes	34	25.2	1,491	32.0
No	101	74.8	3,171	68.0
<b>Number of Special Care Days</b>				
None	118	87.4	3,309	71.0
1 – 2	<5	.	226	4.8
3 – 5	<5	.	257	5.5
6 – 11	<5	.	297	6.4
12+	6	4.4	573	12.3
<b>Number of Previous ABI Admissions</b>				
0	77	57.0	2,837	60.9
1	34	25.2	1,151	24.7
2+	24	17.8	674	14.5
<b>Discharge Destination <sup>1</sup></b>				
Death	33	24.4	1,054	22.6
Home	30	22.2	780	16.7
Inpatient Rehabilitation	7	5.2	599	12.8
Long Term Care	26	19.3	973	20.9

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Transferred <sup>2</sup>	39	28.9	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	291	100	9,399	100
<b>Age</b>				
<19	36	12.4	912	9.7
19 – 54	99	34.0	2,822	30.0
55 – 64	25	8.6	958	10.2
65 – 74	34	11.7	1,266	13.5
75 – 84	59	20.3	2,059	21.9
85+	38	13.1	1,382	14.7
<b>Sex</b>				
Female	116	39.9	3,454	36.7
Male	175	60.1	5,945	63.3
<b>Fiscal Year of Discharge</b>				
2003/04	43	14.8	1,169	12.4
2004/05	34	11.7	1,296	13.8
2005/06	26	8.9	1,269	13.5
2006/07	39	13.4	1,286	13.7
2007/08	46	15.8	1,407	15.0
2008/09	53	18.2	1,414	15.0
2009/10	50	17.2	1,558	16.6
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	243	83.5	7,539	80.2
2 - 3	42	14.4	1,437	15.3
4+ (high)	6	2.1	423	4.5
<b>Psychiatric Comorbidity</b>				
Yes	85	29.2	2,948	31.4
No	206	70.8	6,451	68.6
<b>Number of ALC Days</b>				
None	185	63.6	5,545	59.0
1 – 2	7	2.4	256	2.7
3 – 5	18	6.2	433	4.6
6 – 11	30	10.3	1,005	10.7
12+	51	17.5	2,160	23.0
<b>Number of Special Care Days</b>				
None	150	51.5	4,529	48.2
1 – 2	12	4.1	730	7.8

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
3 – 5	40	13.7	1,052	11.2
6 – 11	34	11.7	1,248	13.3
12+	55	18.9	1,840	19.6
<b>Motor Vehicle Collision</b>				
Yes	71	24.4	2,203	23.4
No	220	75.6	7,196	76.6
<b>Number of Previous ABI Admissions</b>				
0	184	63.2	6,706	71.3
1	91	31.3	2,097	22.3
2+	16	5.5	596	6.3
<b>Discharge Destination <sup>1</sup></b>				
Death	21	7.2	890	9.5
Home	122	41.9	3,641	38.7
Inpatient Rehabilitation	55	18.9	2,303	24.5
Long Term Care	15	5.2	851	9.1
Transferred <sup>2</sup>	77	26.5	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	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
Overall	909	100	29,710	100
<b>Age</b>				
<19	84	9.2	2,315	7.8
19 – 54	155	17.1	6,357	21.4
55 – 64	195	21.5	5,387	18.1
65 – 74	227	25.0	6,511	21.9
75 – 84	195	21.5	6,807	22.9
85+	53	5.8	2,333	7.9
<b>Sex</b>				
Female	444	48.8	14,355	48.3
Male	465	51.2	15,355	51.7
<b>Fiscal Year of Discharge</b>				
2003/04	125	13.8	4,445	15.0
2004/05	120	13.2	4,273	14.4
2005/06	96	10.6	4,294	14.5
2006/07	139	15.3	4,039	13.6
2007/08	125	13.8	4,045	13.6
2008/09	141	15.5	4,251	14.3
2009/10	163	17.9	4,363	14.7
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	294	32.3	10,238	34.5
2 – 3	245	27.0	8,033	27.0
4+ (high)	370	40.7	11,439	38.5
<b>Psychiatric Comorbidity</b>				
Yes	144	15.8	6,413	21.6
No	765	84.2	23,297	78.4
<b>Number of ALC Days</b>				
None	623	68.5	20,085	67.6
1 – 2	21	2.3	644	2.2
3 – 5	28	3.1	1,008	3.4
6 – 11	62	6.8	2,285	7.7
12+	175	19.3	5,688	19.1
<b>Number of Special Care Days</b>				
None	650	71.5	18,596	62.6
1 – 2	49	5.4	1,958	6.6
3 – 5	51	5.6	2,025	6.8
6 – 11	50	5.5	2,454	8.3
12+	109	12.0	4,677	15.7
<b>Number of Previous ABI Admissions</b>				
0	480	52.8	18,246	61.4
1	255	28.1	6,867	23.1
2+	174	19.1	4,597	15.5

Characteristics	North Simcoe Muskoka		Ontario	
	N	Col%	N	Col%
<b>Discharge Destination <sup>1</sup></b>				
Death	246	27.1	7,645	25.7
Home	383	42.1	11,618	39.1
Inpatient Rehabilitation	63	6.9	2,930	9.9
Long Term Care	46	5.1	2,027	6.8
Transferred <sup>2</sup>	170	18.7	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	North Simcoe Muskoka (N = 1,138)		Ontario (N = 30,579)	
	N	Col%	N	Col%
Overall	47	100	1,220	100
<b>Age</b>				
<19	13	27.7	199	16.3
19 – 54	13	27.7	386	31.6
55 – 64	<5	.	144	11.8
65 – 74	7	14.9	160	13.1
75 – 84	11	23.4	235	19.3
85+	<5	.	96	7.9
<b>Sex</b>				
Female	20	42.6	360	29.5
Male	27	57.4	860	70.5
<b>Fiscal Year of Discharge</b>				
2003/04	NR	.	163	13.4
2004/05	<5	.	238	19.5
2005/06	7	14.9	224	18.4
2006/07	8	17.0	190	15.6
2007/08	12	25.5	186	15.2
2008/09	10	21.3	219	18.0
<b>Length of Stay in Acute Care</b>				
1 – 2	<5	.	194	15.9
3 – 5	23	48.9	410	33.6
6 – 11	10	21.3	282	23.1
12+	NR	.	334	27.4
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	43	91.5	1,068	87.5
2 - 3	<5	.	124	10.2
4+ (high)	<5	.	28	2.3
<b>Psychiatric Comorbidity</b>				
Yes	9	19.1	277	22.7
No	38	80.9	943	77.3
<b>Number of ALC Days</b>				
None	NR	.	1,099	90.1
1 – 2	0	0	22	1.8
3 – 5	<5	.	18	1.5
6 – 11	<5	.	28	2.3
12+	<5	.	53	4.3



Characteristics	North Simcoe Muskoka (N = 1,138)		Ontario (N = 30,579)	
	N	Col%	N	Col%
<b>Number of Special Care Days</b>				
None	35	74.5	867	71.1
1 – 2	6	12.8	170	13.9
3 – 5	<5	.	86	7.0
6 – 11	<5	.	53	4.3
12+	0	0	44	3.6
<b>Motor Vehicle Collision</b>				
Yes	9	19.1	164	13.4
No	38	80.9	1,056	86.6
<b>Number of Previous ABI Admissions</b>				
0	<5	.	76	6.2
1	31	66.0	755	61.9
2+	NR	.	389	31.9
<b>Discharge Destination <sup>1</sup></b>				
Home	39	83.0	911	74.7
Inpatient Rehabilitation	<5	.	111	9.1
Long Term Care	0	0	54	4.4
Transferred <sup>2</sup>	NR	.	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	North Simcoe Muskoka (N = 3,640)		Ontario (N = 97,700)	
	N	Col%	N	Col%
Overall	390	100	9,300	100
<b>Age</b>				
<19	50	12.8	1,569	16.9
19 – 54	103	26.4	2,688	28.9
55 – 64	95	24.4	1,904	20.5
65 – 74	79	20.3	1,794	19.3
75 – 84	57	14.6	1,144	12.3
85+	6	1.5	201	2.2
<b>Sex</b>				
Female	197	50.5	4,165	44.8
Male	193	49.5	5,135	55.2
<b>Fiscal Year of Discharge</b>				
2003/04	64	16.4	1,562	16.8
2004/05	58	14.9	1,492	16.0
2005/06	68	17.4	1,561	16.8
2006/07	72	18.5	1,578	17.0
2007/08	64	16.4	1,553	16.7
2008/09	64	16.4	1,554	16.7
<b>Length of Stay in Acute Care</b>				
1 – 2	48	12.3	1,169	12.6
3 – 5	129	33.1	2,928	31.5
6 – 11	117	30.0	2,747	29.5
12+	96	24.6	2,456	26.4
<b>Charlson Comorbidity Index Score</b>				
0 – 1 (low)	89	22.8	2,425	26.1
2 - 3	115	29.5	2,642	28.4
4+ (high)	186	47.7	4,233	45.5
<b>Psychiatric Comorbidity</b>				
Yes	22	5.6	666	7.2
No	368	94.4	8,634	92.8
<b>Number of ALC Days</b>				
None	374	95.9	8,812	94.8
1 – 2	<5	.	73	0.8
3 – 5	<5	.	97	1.0
6 – 11	<5	.	145	1.6
12+	6	1.5	173	1.9
<b>Number of Special Care Days</b>				
None	330	84.6	7,802	83.9
1 – 2	42	10.8	921	9.9
3 – 5	12	3.1	324	3.5
6 – 11	<5	.	152	1.6
12+	<5	.	101	1.1

Characteristics	North Simcoe Muskoka (N = 3,640)		Ontario (N = 97,700)	
	N	Col%	N	Col%
<b>Number of Previous ABI Admissions</b>				
0	<5	.	92	1.0
1	NR	.	3,220	34.6
2+	243	62.3	5,988	64.4
<b>Discharge Destination <sup>1</sup></b>				
Home	324	83.1	8,234	88.5
Inpatient Rehabilitation	23	5.9	303	3.3
Long Term Care	6	1.5	146	1.6
Transferred <sup>2</sup>	37	9.5	611	6.6

**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

# 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>