

## Appendix 1 Epidemiology of LHSC vascular trauma patients

	LHSC	PROOVIT	p-value
<b>Number of patients with named vessel injury</b>	127	542	
<b>Demographics</b>			
Male, n (%)	89 (70.1)	382 (70.5)	0.929
Age, mean (SD), years	40.8 (18.3)	37.7 (17.4)	0.074
BMI, mean (SD)	26.5 (5.6)		
Transferred from outside hospital, n (%)	64 (50.4)		
<b>Comorbidities, n (%)</b>			
Coronary artery disease	2 (1.6)		
Diabetes Mellitus	4 (3.1)	11 (2.0)	0.448
Fully anticoagulated	1 (0.8)	2 (0.4)	0.556
Antiplatelet use	3 (2.4)	9 (1.7)	0.597
Bleeding disorder	1 (0.8)		
Dialysis	0 (0)		
Cirrhosis	1 (0.8)		
<b>Injury type, n (%)</b>			
Blunt	78 (61.4)	255 (47.0)	0.0035 *
Penetrating	47 (37)	198 (36.5)	0.916
Mixed	2 (1.6)	5 (0.9)	0.483
<b>Mechanism, n (%)</b>			
Motor vehicle crash	42 (33.1)	152 (28.0)	0.254
Other or unknown	35 (27.6)	134 (24.7)	0.499
Stabbing	23 (18.1)	39 (7.2)	0.0001 *
Fall	9 (7.1)	39 (7.2)	0.969
Industrial accident	8 (6.3)	17 (3.1)	0.086
Gunshot	5 (3.9)	129 (23.8)	<0.0001 *
Pedestrian vs auto	2 (1.6)	30 (5.5)	0.0634
Athletic injury	3 (2.4)	2 (0.4)	0.021 *
<b>Presentation</b>			
ISS, mean (SD)	21.8 (13.8)	20.7 (14.7)	0.443
ISS $\geq 15$ , n (%)	81 (63.3)	174 (32.1)	<0.0001 *
Head AIS score $\geq 3$ , n (%)	23 (18.1)	65 (12.0)	0.0674
Abdominal AIS score $\geq 3$ , n (%)	36 (28.3)	78 (14.4)	0.0002 *
Chest AIS score $\geq 3$ , n (%)	49 (38.2)	66 (12.2)	<0.0001 *
Extremity AIS score $\geq 3$ , n (%)	62 (48.8)	154 (28.4)	<0.0001 *
Admission SBP, mean (SD)	125.5 (29.3)	120 (34)	0.093
Hypotension (SBP $\leq 90$ ) on arrival, n (%)	12 (11.3)	64 (11.8)	0.875
GCS score $\leq 8$ in arrival, n (%)	15 (14.2)	97 (17.9)	0.320
Admission hemoglobin, mean (SD), g/l	126 (20.0)	123 (22.0)	0.160
Admission pH, mean (SD)	7.27 (0.11)	7.26 (0.15)	0.479

DOI: 10.1503/cjs.002317

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Admission lactate, mean (SD), mmol/l	3.5 (2.7)	4.4 (4.2)	0.022 *
Platelets, mean (SD)	214.9 (71.7)	227 (77)	0.107

**Modality used to identify/characterize injury, n (%)**

Operative exploration	45 (35.4)	161 (29.7)	0.211
CTA	74 (58.3)	215 (39.6)	0.0001 *
Duplex ultrasound	0 (0)	17 (3.1)	0.0446 *
Traditional Angiography	5 (3.9)	62 (11.4)	0.0112 *
MRA	2 (1.6)	0 (0)	0.0032 *
Transesophageal echo	1 (0.8)	0 (0)	0.0373 *
<b>Type of injury identified, n (%)</b>			
Transected	65 (51.2)	136 (25.1)	<0.0001 *
Occlusion	13 (10.2)	96 (17.7)	0.0395 *
Partial transection or flow limiting defect	45 (35.4)	138 (25.5)	0.0244 *
Pseudoaneurysm	11 (8.7)	49 (9.0)	0.915
Other injury type	0 (0)	123 (22.7)	<0.0001 *

**Appendix 2 - Distribution of vascular injuries**

	<b>LHSC</b>	<b>PROOVIT</b>
<b>Named Vessel injured</b>	<b>Total injuries</b>	<b>Total injuries</b>
	<b>(n = 147)</b>	<b>(n = 555)</b>
<b>Neck, n(%)</b>	<b>30 (20.4)</b>	<b>152 (27.4)</b>
Common carotid	1 (0.7)	13 (2.4)
Internal carotid	6 (4.1)	62 (11.4)
External carotid	0 (0.0)	2 (0.4)
Vertebral artery	17 (11.6)	68 (12.5)
Superior thyroid artery	1 (0.7)	
Facial artery	1 (0.7)	
Internal jugular vein	2 (1.4)	7 (1.3)
External jugular vein	2 (1.4)	
<b>Thorax, n (%)</b>	<b>30 (20.4)</b>	<b>66 (11.9)</b>
Aortic arch	3 (2.0)	
Descending thoracic aorta	21 (14.3)	39 (7.2)
Innominate artery	1 (0.7)	2 (0.4)
Subclavian artery	1 (0.7)	15 (2.8)
Coronary artery	1 (0.7)	
Internal mammary artery	1 (0.7)	
Intercostal artery	1 (0.7)	

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Inferior vena cava	1 (0.7)	7 (1.3)
Innominate vein	0 (0.0)	2 (0.4)
Subclavian vein	0 (0.0)	1 (0.2)
<b>Abdomen/Pelvis, n (%)</b>	<b>29 (19.7)</b>	<b>81 (14.6)</b>
Abdominal aorta	3 (2.0)	5 (2.0)
Common, external or internal iliac arteries	4 (2.7)	20 (3.7)
Celiac Artery	1 (0.7)	2 (0.4)
Common hepatic artery	0 (0.0)	4 (0.7)
Superior mesenteric artery	0 (0.0)	2 (0.4)
Renal artery	3 (2.0)	9 (1.7)
Left gastric artery	1 (0.7)	
Middle colic artery	1 (0.7)	
Internal pudendal artery	4 (2.7)	
Superior gluteal artery	2 (1.4)	
Inferior gluteal artery	1 (0.7)	
Obturator artery	2 (1.4)	
Lateral femoral circumflex artery	1 (0.7)	
Infra-renal inferior vena cava	3 (2.0)	14 (2.6)
Iliac vein	0 (0.0)	18 (3.3)
Portal vein	0 (0.0)	3 (0.6)
Renal vein	2 (1.4)	4 (0.7)
Gonadal vein	2 (1.4)	
<b>Upper extremity, n (%)</b>	<b>36 (24.5)</b>	<b>103 (18.6)</b>
Axillary artery	3 (2.0)	8 (1.5)
Brachial artery	13 (8.8)	42 (7.7)
Radial artery	7 (4.8)	25 (4.6)
Ulnar artery	7 (4.8)	25 (4.6)
Posterior circumflex humeral artery	1 (0.7)	
Princeps pollicis artery	1 (0.7)	
Subclavian vein	0 (0.0)	1 (0.2)
Basilic vein	2 (1.4)	2 (0.4)
Brachial vein	2 (1.4)	
<b>Lower extremity, n (%)</b>	<b>22 (15.0)</b>	<b>153 (27.6)</b>
Common, superficial or deep femoral artery	3 (2.0)	57 (10.5)
Popliteal artery	7 (4.8)	36 (6.6)
Anterior tibial artery	4 (2.7)	22 (4.1)
Posterior tibial artery	3 (2.0)	19 (3.5)
Peroneal artery	0 (0.0)	7 (1.3)
Common, superficial or deep femoral vein	2 (1.4)	0 (0.0)
Popliteal vein	2 (1.4)	12 (2.2)
Posterior tibial vein	1 (0.7)	

**Appendix 1** to Smith S, McAlister V, Parry N, et al. Vascular trauma: Does experience in the United States apply to a Canadian centre?. Can J Surg 2019.

DOI: 10.1503/cjs.002317

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*LHSC has adopted a more liberal practice of screening for blunt cerebral vascular injury (BCVI) since the timeframe reported.*

### **Appendix 3 - Management and complications of vascular injuries**

<b>Management</b>	<b>LHSC</b>	<b>PROOVIT</b>
Non-operative management	39 (28.3)	276 (50.9)
Endovascular repair	17 (12.3)	40 (7.4)
Initial non-definitive open surgery	1 (0.7)	39 (14.6)
Definitive open surgery	59 (42.8)	126 (23.2)
Damage control technique	1 (0.7)	57 (10.5)
Fasciotomy	12 (8.7)	52 (9.6)
Shunt used	0 (0)	14 (2.6)
Ligation	22 (15.9)	31 (5.7)
Primary repair	22 (15.9)	37 (6.8)
Autologous repair	23 (16.7)	61 (11.3)
Synthetic graft	3 (2.2)	7 (1.3)
Died before vascular management	3 (2.2)	
Embolization	9 (6.5)	
<b>Complications</b>		
In hospital mortality	12 (9.4)	48 (8.9)
Amputation	3 (2.4)	18 (3.3)
Compartment syndrome	3 (2.4)	19 (3.5)
Surgical site infection	4 (3.1)	
Stroke	4 (3.1)	12 (2.2)

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## Appendix 4 - Management of specific arterial injuries

	Nonoperative management		Endovascular repair		Open Surgery		Died before repair
	LHSC	PROOVIT	LHSC	PROOVIT	LHSC	PROOVIT	LHSC
<b>Neck, n (%)</b>							
Common carotid	1/1 (100)	10/13 (76.9)	0/1	1/13 (7.7)	0/1	2/13 (15.4)	0/1
Internal carotid	6/6 (100)	58/62 (93.5)	0/1	2/62 (3.2)	0/1	2/62 (3.2)	0/1
External carotid	0/0	1/2	0/0	1/2	0/0	0/2	0/0
Vertebral artery	17/17 (100)	64/68 (94.1)	0/17	2/68 (2.9)	0/17	2/68 (2.9)	0/17
<b>Thorax, n (%)</b>							
Aortic arch	1/3 (33.3)		1/3 (33.3)		1/3 (33.3)		0/1
Descending thoracic aorta	7/21 (33.3)	21/39 (53.8)	13/21 (61.9)	16/39 (41.0)	1/21 (4.8)	2/39 (5.1)	0/1
Innominate artery	1/1 (100)	1/2 (50.0)	0/1	1/2 (50.0)	0/1	0/2	0/1
Subclavian artery	0/1	5/15 (33.3)	1/1 (100)	1/15 (6.7)	0/1	9/15 (60.0)	0/1
<b>Abdominal/Pelvis, n (%)</b>							
Abdominal aorta	2/3 (66.6)	3/5 (60.0)	0	1/5 (20.0)	1/3 (33.3)	0/5	0/1
Common, external, or internal iliac arteries	0/4	10/20 (50.0)	0/4	6/20 (30.0)	1/4 (25)	4/20 (20.0)	3/4 (75)
Celiac artery	1/1 (100)	1/2 (50.0)	0/1	1/2 (50.0)	0/1	0/2	0/1
Common hepatic artery	0/0	3/4 (75.0)	0/0	1/4 (25.0)	0/0	0/4	0/0
Superior mesenteric artery	0/0	1/2 (50.0)	0/0	1/2 (50.0)	0/0	0/2	0/0
Renal artery	2/3 (66.6)	2/9 (22.2)	0/3	1/9 (11.1)	1/3 (33.3)	6/9 (66.6)	0/3
<b>Upper extremity, n (%)</b>							
Axillary artery	1/3 (33.3)	4/8 (50.0)	1/3 (33.3)	1/8 (12.5)	1/3 (33.3)	3/8 (37.5)	0/3
Brachial artery	0/13	10/42 (23.8)	0/13	1/42 (2.4)	13/13 (100)	31/42 (73.8)	0/13
Radial artery	0/7	8/25 (32.0)	0/7	0/25	7/7 (100)	17/25 (68)	0/7
Ulnar artery	0/7	8/25 (32.0)	0/7	0/25	7/7 (100)	17/25 (68)	0/7
<b>Lower extremity, n (%)</b>							
Common, superficial or deep femoral artery	0/3	24/57 (42.1)	2/3 (66.6)	2/57 (3.5)	1/3 (33.3)	31/57 (54.4)	0/3
Popliteal artery	0/7	13/36 (36.1)	0/7	1/36 (2.8)	7/7 (100)	22/36 (61.1)	0/7
Anterior tibial artery	1/4 (25)	14/22 (63.6)	0/4	0/22	3/4 (75)	8/22 (36.4)	0/4
Posterior tibial artery	0/3	9/19 (47.4)	0/3	0/19	3/3 (100)	10/19 (52.6)	0/3
Peroneal artery	0/0	6/7 (85.7)	0/0	0/7	0/0	1/7 (14.3)	0/0

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### **Appendix 5 - Tourniquets, fasciotomies, and resuscitative techniques**

	<b>LHSC</b>	<b>PROOVIT</b>
Peripheral artery injuries	49	233
Prehospital tourniquet use	6	47
Trauma bay tourniquet use	4	
Fasciotomy, prophylactic	9	33
Fasciotomy therapeutic	3	19
REBOA use	0	
Resuscitative thoracotomy	3	
Temporary intravascular shunt use	0	14