

Table S1: Sample Rural Trauma Needs Assessment Survey

SAMPLE	
<u>Emergency Department Compliment</u>	Yes No
1. Does your center have a 24-hour emergency department?	x <input type="checkbox"/>
*If yes, please answer the following:	
▪ Does the ED have 24 hours emergency physician or midlevel provider coverage?	x <input type="checkbox"/>
▪ Does the care provider have Advanced Trauma Life Support (ATLS) training?	<input type="checkbox"/> Not all
▪ Is the provider trained in emergency airway management?	x <input type="checkbox"/>
▪ Is emergency access to advanced airway intervention available 24 hours a day?	x
▪ Is the care provider available within 30 minutes if on call?	<input type="checkbox"/>
▪ Does your ED have adequate nursing coverage? * if no, describe in detail the nursing coverage at your center below __ We have 2 RNs and 1 LPN on Days and Evenings and 1 RN with 1 LPN on nights.	x <input type="checkbox"/>
<hr/>	
▪ Have the nurses in the emergency department completed the Trauma Nursing Core Course or an equivalent?	x <input type="checkbox"/> Yes all.
▪ How many beds are available in the ED? __ 9	
2. Does the ED have adequate access to the following equipment:	
▪ Advanced airway management equipment including surgical airway for adults and children?	x <input type="checkbox"/>
	& One small ventilator in ER
▪ Broom tape	x <input type="checkbox"/>
▪ Central and peripheral vascular access including intraosseous equipment	x <input type="checkbox"/>
▪ Chest tubes all sizes	x <input type="checkbox"/>
▪ Fracture stabilization	x <input type="checkbox"/> Backslab
▪ Traction equipment	<input type="checkbox"/> x
▪ Portable or overhead x-ray equipment	x <input type="checkbox"/> No overhead
▪ Monitors	
▪ Transport	<input type="checkbox"/> x
▪ Bedside	x
▪ Fetal	x

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	Yes	No
▪ Rapid infusion warmer	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Surgical equipment (e.g. DPL, thoracotomy tray)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Tourniquets	<input checked="" type="checkbox"/>	<input type="checkbox"/> basic
▪ Trauma resuscitation room	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Universal precautions equipment	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Vascular Doppler	<input type="checkbox"/>	<input checked="" type="checkbox"/>
▪ Warming devices (e.g. bair hugger, warm blankets)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Ultrasound	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Adequate supply of crystalloids and colloids?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		• Portable in ER and full scope in DI during reg hours
		• Usually depends on numbers of casualties.
<u>Access</u>		
3. How many EMS ambulances' are available in your center's area?		___ 3 ___
4. Are they :		
▪ Advanced Cardiac Life Support (ACLS) crews?	<input type="checkbox"/>	<input type="checkbox"/>
▪ Cold Lake has 1 FT ACLS crew and 2 core flex crews made up of 1 ACLS and 1 BLS But we did more than 130 runs for Bonnyville last year because they are short crews leaving Cold Lake in a Code Red situation dozens of times in 2015.		
▪ Basic Cardiac Life Support (BCLS) EMS crews?	<input type="checkbox"/>	<input type="checkbox"/>
5. Please indicate how many of each crew are available in your center's area		
▪ ACLS EMS crews – 8 FT Paramedics _____		
▪ BCLS EMS crews -- 12 FT EMT/EMR _____		
6. Do they have the capability to auto launch STARS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ The can launch STARS but are often denied because STARS can't make it to Cold Lake and back on one tank of fuel		
7. Does your center have a helipad or any area for STARS to access your center?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ We do, but it's not up and running yet. Maybe in April?		
<u>Radiology Compliment</u>		
8. Does your center have the following:		
▪ A board certified radiologist on staff	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Are they available within 30 minutes?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
▪ Conventional radiology available 24 hours a day?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
▪ If no, what are the hours of availability? ___M-F 0800-1600		
▪ Computed tomography available 24 hours a day	<input type="checkbox"/>	<input checked="" type="checkbox"/>
▪ If no, what are the hours of availability? ___M-F 0800-1600 plus call backs for Stroke CT(A) as we are a Stroke Centre		
▪ What is the reason for decreased availability at your center? Money for staffing, training and availability of Radiologist after hours		
▪ Have access to teleradiology?	<input type="checkbox"/>	<input type="checkbox"/>

<ul style="list-style-type: none"> ▪ We have the ability for the Rads to see images at home. 		
<ul style="list-style-type: none"> ▪ Please add other radiological capabilities that your center possesses. Include the times and days of the week available, and whether or not there is adequate technologist coverage. We have UltraSound M-F 0800-1600 and a small portable US in ER 		
<u>Anesthesia Compliment</u>	Yes	No
9. Does your center have access to a board certified anesthesiologist or a certified registered nurse anesthetist?	x	<input type="checkbox"/>
<u>Medical Specialty Compliment</u>		
10. Does your center have access to:		
<ul style="list-style-type: none"> ▪ Internal medicine physician *If yes, is the internist trained to consult on the following? 	x	<input type="checkbox"/> Only 1 Doc
<ul style="list-style-type: none"> ▪ Pulmonology 	<input type="checkbox"/>	?
<ul style="list-style-type: none"> ▪ Cardiology 	<input type="checkbox"/>	?
<ul style="list-style-type: none"> ▪ Gastroenterology 	<input type="checkbox"/>	?
<ul style="list-style-type: none"> ▪ Infectious disease 	<input type="checkbox"/>	?
<ul style="list-style-type: none"> ▪ Nephrology 	<input type="checkbox"/>	?
<ul style="list-style-type: none"> ▪ Family Physician 	x	<input type="checkbox"/>
<u>Laboratory Compliment</u>		
11. Do you have 24 hour availability of laboratory services? call for emergencies 24 hours/day)	<input type="checkbox"/>	x (16 hrs and on
<ul style="list-style-type: none"> ▪ Including microsampling, coagulation studies, blood gas analysis, and microbiology studies? No micro sampling or microbiology on site 	<input type="checkbox"/>	x
<ul style="list-style-type: none"> ▪ 24 hours access to a blood bank? 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ With the ability to type and cross-match? 	x	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Does your center have a massive transfusion protocol established? 	<input type="checkbox"/>	x
<ul style="list-style-type: none"> ▪ Does your blood bank have adequate supply of the following: 		
<ul style="list-style-type: none"> ▪ Packed red blood cells 	x	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Fresh frozen plasma 	x	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Platelets 	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Cryoprecipitate 	<input type="checkbox"/>	x
<ul style="list-style-type: none"> ▪ Albumin 	x	<input type="checkbox"/>
<ul style="list-style-type: none"> ▪ Coagulation factors 	x	with 24 hr notice
<u>Support Services</u>		
12. Does your center have access to:		
<ul style="list-style-type: none"> ▪ Physical therapy services 	x	<input type="checkbox"/> Limited

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▪ Social services	x	<input type="checkbox"/>
▪ Occupational therapy	x	<input type="checkbox"/>
▪ Speech therapy	x	<input type="checkbox"/>
** ST and SS through Public Health – not in house		
<u>Technological Communication</u>	Yes	No
13. Does your center have access to:		
▪ Telehealth	x	<input type="checkbox"/>
▪ Teleconferencing	x	<input type="checkbox"/>
▪ Web conferencing	<input type="checkbox"/>	x
14. Level V centers specifically:		
▪ Is your center open year round or on a seasonal basis? <u>Yes</u>		
▪ Please indicate hours of operation below if seasonal:		

Please provide any additional comments below:		
<p>The Cold Lake Healthcare Centre services a catchment area of 70,000 people and sees more than 32,000 patients annually in a 9 bed ER with one physician, 2 RNs and 1 LPN on shift – except for the graveyard shift which only has 1 RN and 1 LPN.</p> <p>We have a 24 bed OBS and Acute Care combined in-patient unit with 1700 admissions annually and an ALOS of 2.5 days (rapid turnover). We have one general surgeon, two physicians who perform C-sections, and visiting ENT, orthopedic, dental and cataract surgeons and 11 family practitioners.</p> <p>We are a designated Stroke Centre and therefore intake any and all strokes/TIA within the catchment area for head CTs, and/or possible CTA, tPA. We have a Stroke Unit Equivalence Care (SUEC) program. Our DI department is underfunded and understaffed and incorporating the after hour CTA program recently has taxed their staff who work all day and then are on call all night and back to work the following morning. After 2300 the single lab person is also on call from 2300-0700 and must report to work in the morning as well. Availability of Radiologists after hours presents problems with accessibility and the ability to read images.</p> <p>All our RNs in ER are ACLS current and most have TNCC or another equivalent. All have CTAS. Most have PALS (though provincial instructors are lacking and some of our staff have not had the chance to take the course). Most have NRP. Many of the physicians who work in the ED do not have ACLS.</p> <p>Our cardiac monitors in ER are able to monitor adults and peds but do not have a neonate component. In addition, we have NO MONITORS OR TELEMETRY on our Acute Care unit at the moment so no ability to continuously monitor stable patients on the ward (for example, post MI or Stroke).</p>		

Table S2: Rural Trauma Hospital Locations, Distance and Map

City	Hospital Name	Distance by Ground Transport to UAH (km)	Driving Time to UAH/RAH	Level IV or V Trauma Centre
Athabasca	Athabasca Healthcare Centre	151	1H42, 1H39	V
Barrhead	Barrhead Healthcare Centre	124	1H16, 1H16	V
Beaverlodge	Beaverlodge Municipal Hospital	505	5H03, 5H03	V
Bonnyville	Bonnyville Healthcare Centre	247	2H46, 2H39	V
Boyle	Boyle Healthcare Centre	152	1H46, 1H40	V
Camrose	St. Mary's Hospital	95.9	1H6, 1H10	V
Cold Lake	Cold Lake Healthcare Centre	300	3H15, 3H11	V
Daysland	Daysland Health Centre	143	1H31, 1H34	V
Devon	Devon General Hospital	37	32 min, 40min	IV
Drayton Valley	Drayton Valley Hospital and Care Centre	135	1H31, 1H31	V
Edson	Edson Healthcare Centre	204	2H1, 2H1	V
Elk Point	Elk Point Community Health Services	219	2H16, 2H13	V
Fairview	Fairview Health Complex	553	5H26, 5H27	V
Fort Saskatchewan	Fort Saskatchewan Community Hospital	38.7	35 min, 32 min	IV
Fort Vermillion	Fort Vermilion Health Centre	665	6H33, 6H33	V
Fox Creek	Fox Creek Healthcare Centre	266	2H38, 2H38	V
Grande Cache	Grande Cache Community Health Complex	436	4H25, 4H26	V
Grimshaw	Grimshaw/Berwyn and District Community Health Centre	516	5H07, 5H08	V
Hardisty	Hardisty Health Centre	204	2H08, 2H11	V
High Level	High Level General Hospital	745	7H21, 7H21	V
High Prairie	High Prairie Health Complex	370	3H45, 3H45	V
Hinton	Hinton Healthcare Centre	292	2H48, 2H48	V
Jasper	Seton - Jasper Healthcare Centre	368	3H07, 3H07	V
Killam	Killam Health Care Centre	169	1H47, 1H51	V
Lac La Biche	William J. Cadzow - Lac La Biche Healthcare Centre	224	2H26, 2H22	V

Appendix 1 to Jiang H, MacLean A, Yoon J, et al. Evaluation of trauma resources in rural northern Alberta identifies opportunities for improvement. *Can J Surg* 2020.

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Lacombe	Lacombe Hospital and Care Centre	124	1H15, 1H23	V
Leduc	Leduc Community Hospital	35.9	27min, 35min	IV
Manning	Manning Community Health Centre	590	5H46, 5H49	V
Mayerthorpe	Mayerthorpe Healthcare Centre	140	1H23, 1H23	V
McLennan	Sacred Heart Community Health Centre	424	4H19, 4H19	V
Peace River	Peace River Community Health Centre	494	4H51, 4H51	V
Ponoka	Ponoka Hospital and Care Centre	104	1H04, 1H12	V
Provost	Provost Health Centre	287	3H01, 3H05	V
Redwater	Redwater Health Centre	67.4	55, 52MIN	V
Rimbey	Rimbey Hospital and Care Centre	142	1H27, 1H35	V
Rocky Mtn House	Rocky Mountain House Health Centre	213	2H10, 2H18	V
Slave Lake	Slave Lake Healthcare Centre	253	2h43, 2H42	V
Spirit River	Central Peace Health Complex	516	5H05, 5H06	V
St. Paul	St. Therese - St. Paul Healthcare Centre	201	2H02, 2H05	V
Stettler	Stettler Hospital and Care Centre	187	2H01, 2H04	V
Stony Plain	WestView Health Centre	35	34, 34	IV
Swan Hills	Swan Hills Healthcare Centre	227	2H17, 2H17	V
Valleyview	Valleyview Health Centre	352	3H27, 3H27	V
Vegreville	St. Joseph's General Hospital	112	1H8, 1H5	V
Vermillion	Vermilion Health Centre	197	1H55, 1H52	V
Viking	Viking Health Centre	137	1H27, 1H31	V
Wainwright	Wainwright Health Centre	207	2H12, 2H15	V
Westlock	Westlock Healthcare Centre	87.5	1H3, 1H3	V
Wetaskiwin	Wetaskiwin Hospital and Care Centre	66.8	50, 58	V
Whitecourt	Whitecourt Healthcare Centre	182	1H50, 1H50	V