SickKids® | Acute Care Transport Service (ACTS)

ACTS Team Member Composition & Training course

Prof. Dr Hilary Whyte,
Medical Director,
Acute Care Transport Service,
SickKids

I have no disclosures or conflict of interest

I may have some inherent bias as medical director of a superb specialized Neo-Paediatric Transport team, SickKids ACTS

SickKids® | Acute Care Transport Service (ACTS)

Objectives

1. To provide an overview of the team roles and competencies – depends on local context
2. To provide an introduction to the ACTS team.
3. To discuss the ACTS mandate and scope of practice
4. To review the ACTS education program and certification process.

Standards for Transport Systems

- **Ground ambulances – EMS Qmentum standards**
- **Air Ambulances e.g. Ornge - Canadian Aviation standards**

- No requirements for credentialing of teams in transport

- Accreditation is voluntary
  - Hospitals
  - Transport Programs
  - Educational Programs

Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients, 4th Edition, Elk Grove Village: American Academy of Pediatrics. 2016

Canadian Transport Teams

Seven categories of competencies:

- Professional Responsibilities
- Communication
- Health and Safety
- Assessment & Diagnostics
- Therapeutics
- Integration
- Transportation

Canadian Association of Paediatric Health Centres. Competencies profile – Interfacility critical care transport of maternal, neonatal, and paediatric patients. https://www.caphc.org/neonatalpaediatric-transport-systems. 2011

Team Composition and Training

Depends on local context:

Is my health care system regionalised?

- Transport to higher level of care? -> emergent & urgent
- Repatriations? -> elective

Population and potential volumes? -> dedicated vs. ‘on-call’ team

- Scope restricted to neonates? +/- attendance high risk delivery
- Inclusive of paediatric critical care patients? –> increase volume

Demography and distances?

- Air vs. Land transports? -> aeromedical physiology

Health Care Professionals availability and limitations to practice?

- RN vs. NP/APN, RRT vs. paramedic vs. MD (consultant/fellow/resident)

Types of Transport Teams – Critical Care

Specialized teams are most often:

- Institution based from NICU/PICU; ad hoc or dedicated
- Regional or Provincial/State wide
- Scope or populations dictated by patient volumes
- **Dedicated transport teams enhance availability, improve response** -*DeVries S, et al. Int.J. Emerg.Med: 4(1); 2011*

Personnel – combinations of MD, NP, RT, RN, EMT

Most common USA based neonatal teams

- RN/RT – 40%
- RN/RT/NP – 19%
- RN/RT/MD – 16%

Karlsen et al. Pediatrics. Sept 2011

Neonatal Team Composition -USA

TABLE 1 Twelve Most Common Team Compositions for Unit-Based and Dedicated Teams

Neonatal Transport Team Composition	Unit-Based, *n* (%)	Dedicated, *n* (%)
RN-RT	92 (40.2)	47 (44.3)
RN-RT-NNP	44 (19.2)	7 (6.6)
NNP-RT-physician	36 (15.7)	8 (7.5)
RN-RN	15 (6.6)	12 (11.3)
NNP-RT	10 (4.4)	4 (3.8)
RN-neonatologist	5 (2.2)	1 (0.9)
RN-RN-RT	4 (1.7)	1 (0.9)
RN-RT-EMT (basic or intermediate)	3 (1.3)	—
RN-NNP	3 (1.3)	5 (4.7)
RN-RT-paramedic	2 (0.9)	3 (2.8)
RN-paramedic	1 (0.4)	8 (7.5)
RN-neonatal fellow	2 (0.9)	—

EMT (basic or intermediate) indicates emergency medical technician with basic- or intermediate-level national registration.

TABLE 2 Annual Transport Volume for Unit-Based and Dedicated Teams

Transports, *n*/y	Unit-Based, *n* (%)	Dedicated, *n* (%)
<50	65 (28.4)	8 (7.5)
51–99	59 (25.8)	10 (9.4)
100–199	70 (30.6)	11 (10.4)
200–399	29 (12.7)	34 (32.1)
400–599	5 (2.2)	23 (21.7)
600–799	—	12 (11.3)
800–999	—	4 (3.8)
>1000	—	4 (3.8)

Karlsen et al. Pediatrics. Sept 2011

Neonatal Transport Teams - USA

- 229 (68 %) were unit-based teams in hospitals
- 106 (33 %) were dedicated teams (50% had 200-600 pts /yr.)
- Dedicated teams had higher transport volumes (and more ‘air’)
- 26 different NTT compositions were used
  - All had RN or NNP as member
  - RN-RRT ≈ 40%.

Karlsen, K. A. et al. National survey of neonatal transport teams in the United States. Pediatrics 128(4): 685-691. 2011

Team Composition Models - Canada

- RN/RT
- RN/RN
- MD/RN
- RN/NP
- EMT/Paramedic

Regardless of model – no difference in outcomes

- Critical that roles and responsibilities are clearly defined for each team member & they have a degree of cross-training

Lee, Whyte et al. Medical Care; 2002

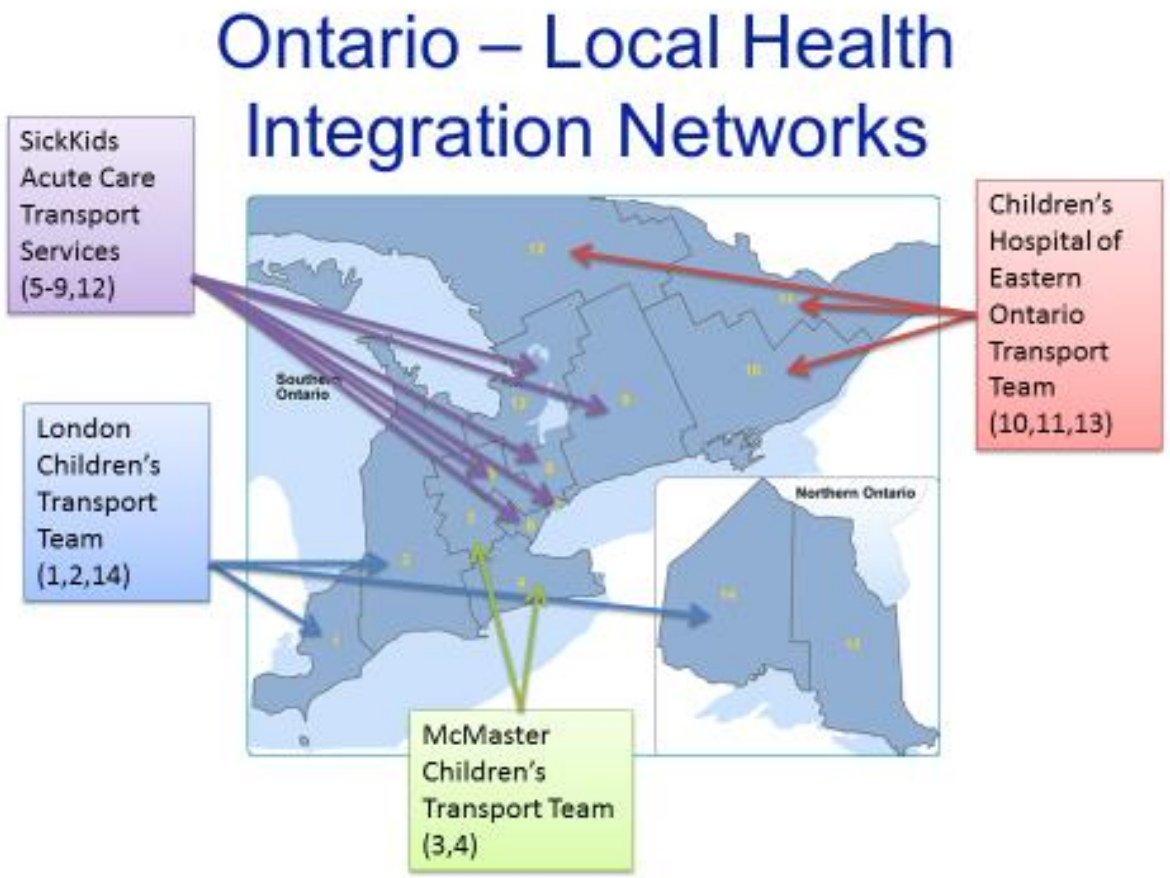
Ontario is a big place…

- 15,000,000 people
- 1.1 million sq kilometers
- 4 Transport Teams cover all neonatal transports
- 2 of the Transport Teams cover paediatrics in addition
- **Ornge** Air and Land Ambulance covers adult and some paediatric transport

Acute Care Transport Service Mandate

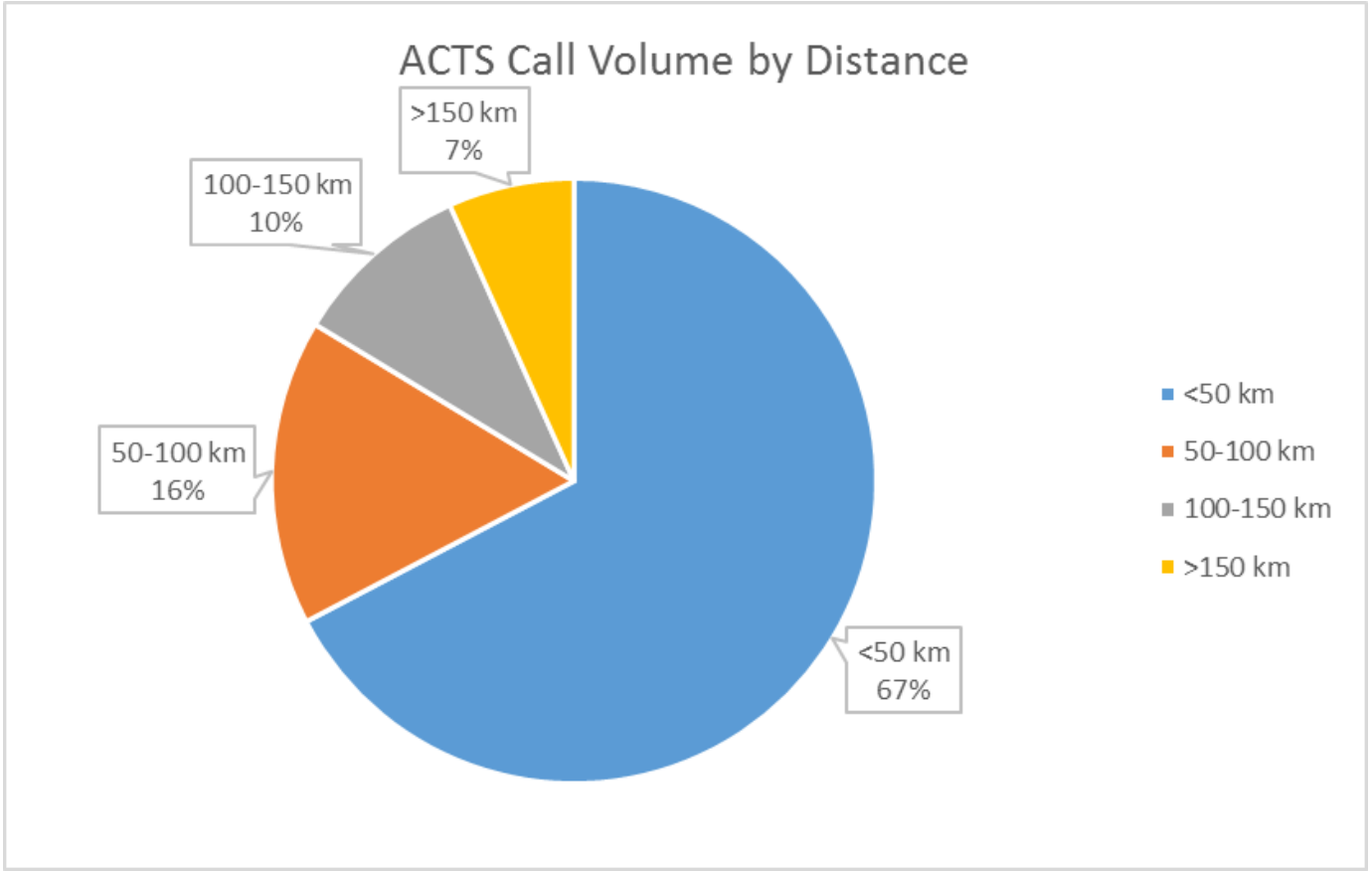
- **ACTS** transports acute and critically ill neonates and children ages 0-18 yrs
- ACTS region is about 30% of Province but we transport 50% of patients.
- London, Hamilton, and Ottawa teams together transport the other 50% of patients requiring specialized team.
- Air ambulance (Ornge) supports less critical patient transfers > 5 kgs.

  Ornge critical care land or air service provides back up to ACTS if unavailable.



ACTS Transport Distances

General Principles
<150 km – Land Ambulance
150-250 km – Rotor Wing
>250 km – Fixed Wing



ACTS require:
Aeromedical physiology training
Under water safety training
Winter survival training

ACTS Transportation Modes

93% of ACTS volumes are transported by land

ORNGE ‘Air Ambulance’ System

44 Team transports

933 paediatric transports
(170 ‘emergent’) > 5 kgs

1034 paediatric transfers (92 ‘emergent’)
240 < 5 Kgs stable
(2 ventilated)

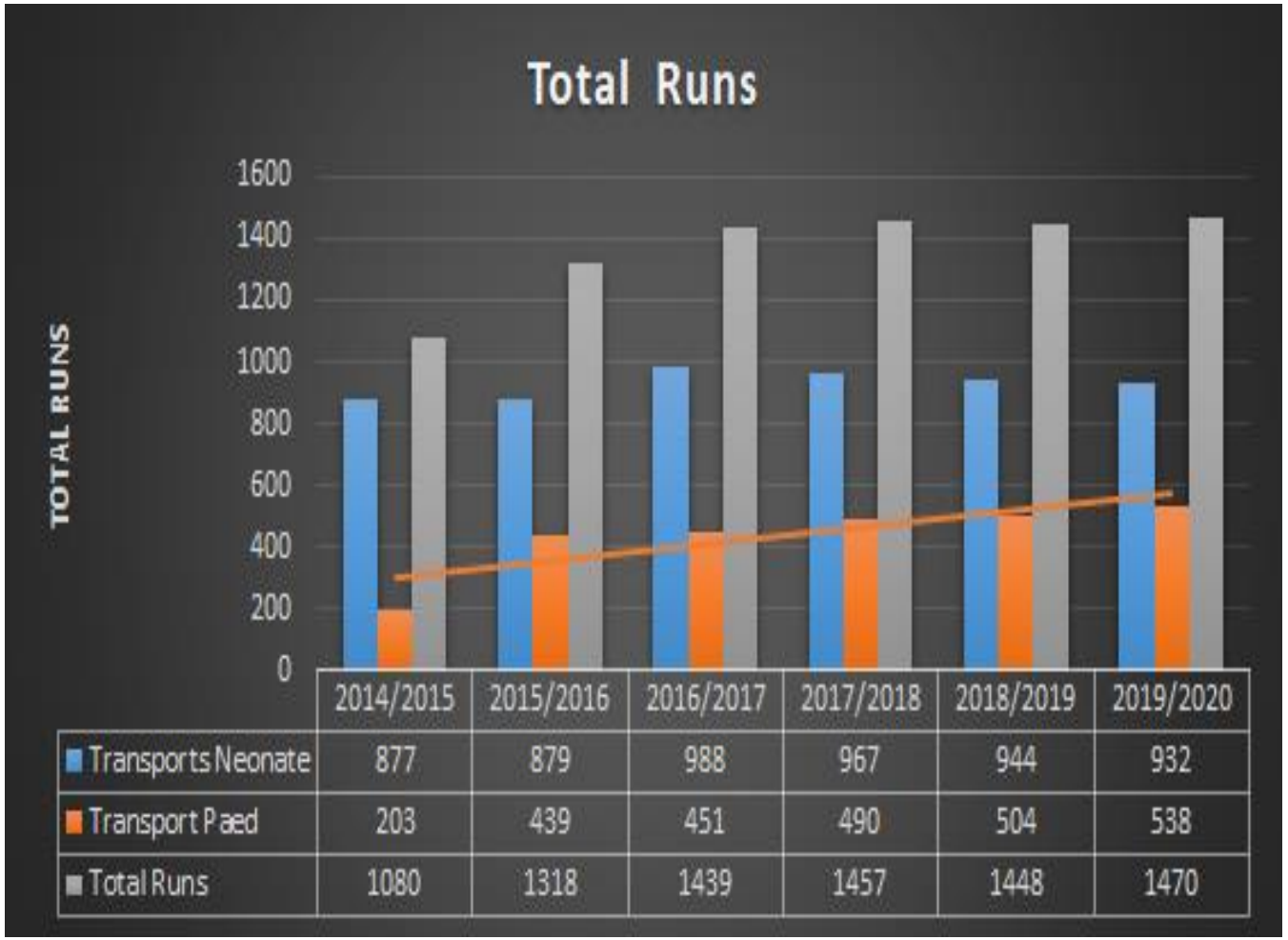
132 Team transports

SickKids 2025

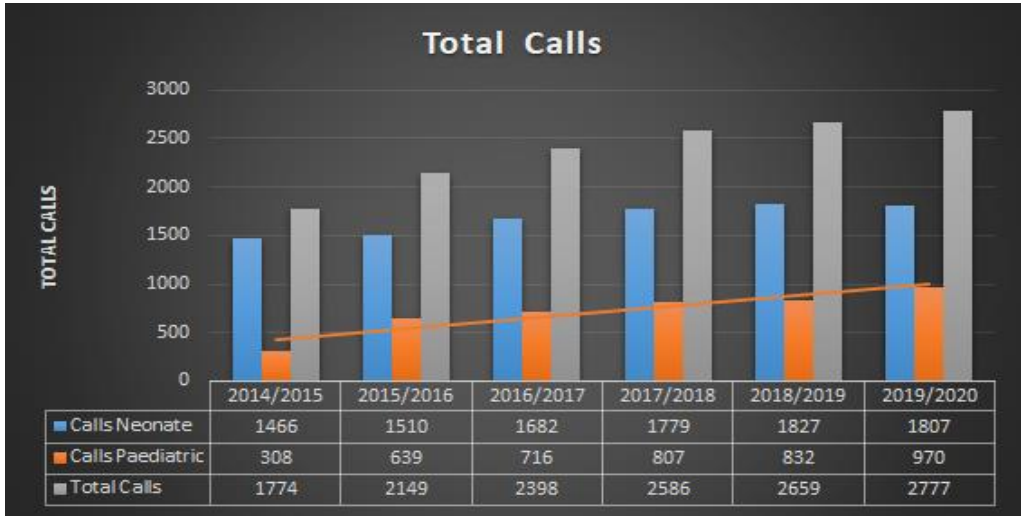
ACTS Scope of Services

- **Attendance at high risk deliveries**
  - Prematurity, multiples, antenatal diagnosis of significant anomaly
- **Neonatal stabilization and transport**
  - Under 5kg, < 28 days or 44 weeks CA
- **Paediatric stabilization and transport**
  - Up to 18th birthday
- **Code Blue Team back up in hospital**
- **ECLS Transport**
  - All ages
- **Intramural Transport**
  - NICU patients
- **International Neonatal and Paediatric Transport**
  - Partnership with Private Air Ambulance

ACTS Annual Data – Consultations & Transports



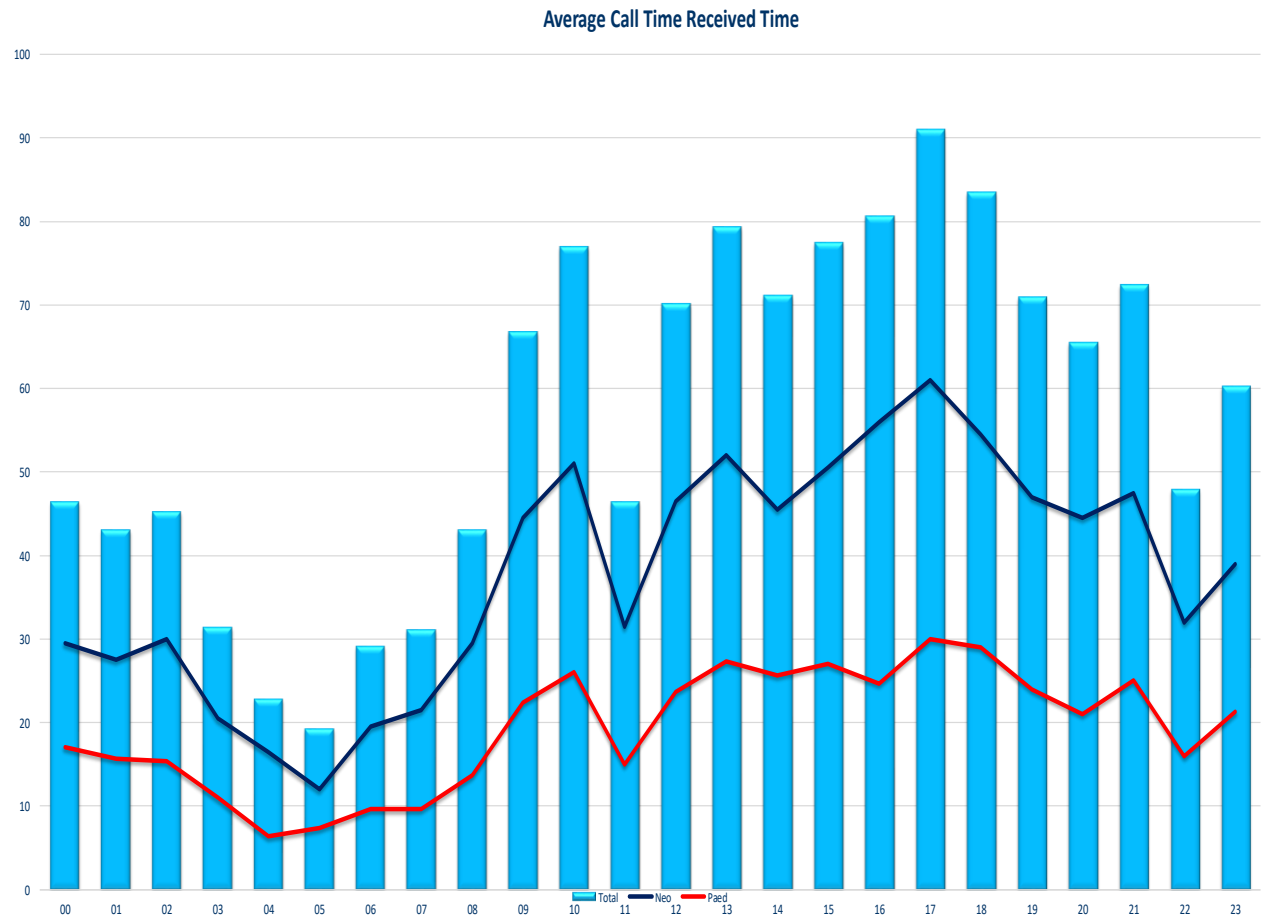
	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Transports Neonate	877	879	988	967	944	932
Transport Paed	203	439	451	490	504	538
Total Runs	1080	1318	1439	1457	1448	1470



	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Calls Neonate	1466	1510	1682	1779	1827	1807
Calls Paediatric	308	639	716	807	832	970
Total Calls	1774	2149	2398	2586	2659	2777

Call Time Received and Shift Times

ACTS Staffing	
Three Teams	Four Teams
0700-1900	0700-1900
1000-2200	0800-2000
1900-0700	1700-0500
	1900-0700



ACTS Human Resources Required

Teams work in pairs as all are cross trained:

RN/RN or RN/RT or RT/RT

Budget 30.0 FTE (with relief) for 24/7 coverage

- Supports 4 Transport Teams; 2 day and 2 night teams
- Intramural Team on day shift: 1 ACTS & 1 trained NICU RN/RT
- Transport Coordinator; 1 day and 1 night shift 7.00; 19.00 hrs
- Ambulance crews – 2 PCP operate on each of 2 ambulances
  - Separate budget provided by MOH to Toronto Paramedic Services

Other ACTS Team Roles and Responsibilities

- **Transport Staff Neonatologists (5)** – provide on line medical control for < 44 weeks CA x 24/7
  - dedicated neonatologists covering ACTS calls and support M-F 08.00-18.00
  - Provide 24/7 on call as medical director for ACTS
- **CCM staff (3)** – Associate Medical Director Paediatrics; Medical liaison Cardiac ICU & PICU
  - Provide on line medical control for paediatrics x 24/7
- **ACTS Transport Fellows (5)** – post subspecialty training in NICU, PICU or PEM
  - 24/7 back up on call for neo-paeds 0-18 yrs; variety of training roles with team
- **Quality improvement /assurance** - 0.5 FTE ACTS
- **Education specialist**- 0.8 FTE ACTS
- **Biomedical Engineering** – 1 FTE (2 x 0.5 FTE)

ACTS TEAM ROLES

Transport Associate – 1 year contract

- **TA** is a contractual position & is a training role guided by ACTS TA Education Program. The TA practices under the guidance of the transport clinician

Clinician in Training – 1 year program

- **CIT** practices in collaboration with the clinician & is a training role that is guided by ACTS CIT Transport Education Program
- Lectures, labs, simulation, exams
- Certification runs

ACTS Clinician RN or RRT

- Certified **Transport Clinician (RN or RRT)** assumes a leadership role in patient stabilization & organization of transport process; the clinician integrates clinical expertise with evidence-based guidelines & utilizes medical directives to provide safe, efficient medical management and care during transport stabilization and transfer
- Operate under 13 medical directives authorized by Neonatology and Critical Care

Transport Staff Neonatologists

- Five dedicated neonatologists covering ACTS calls and support M-F 0800-1700

Biomedical Engineering

- Provide technical advice and repair of all ACTS equipment

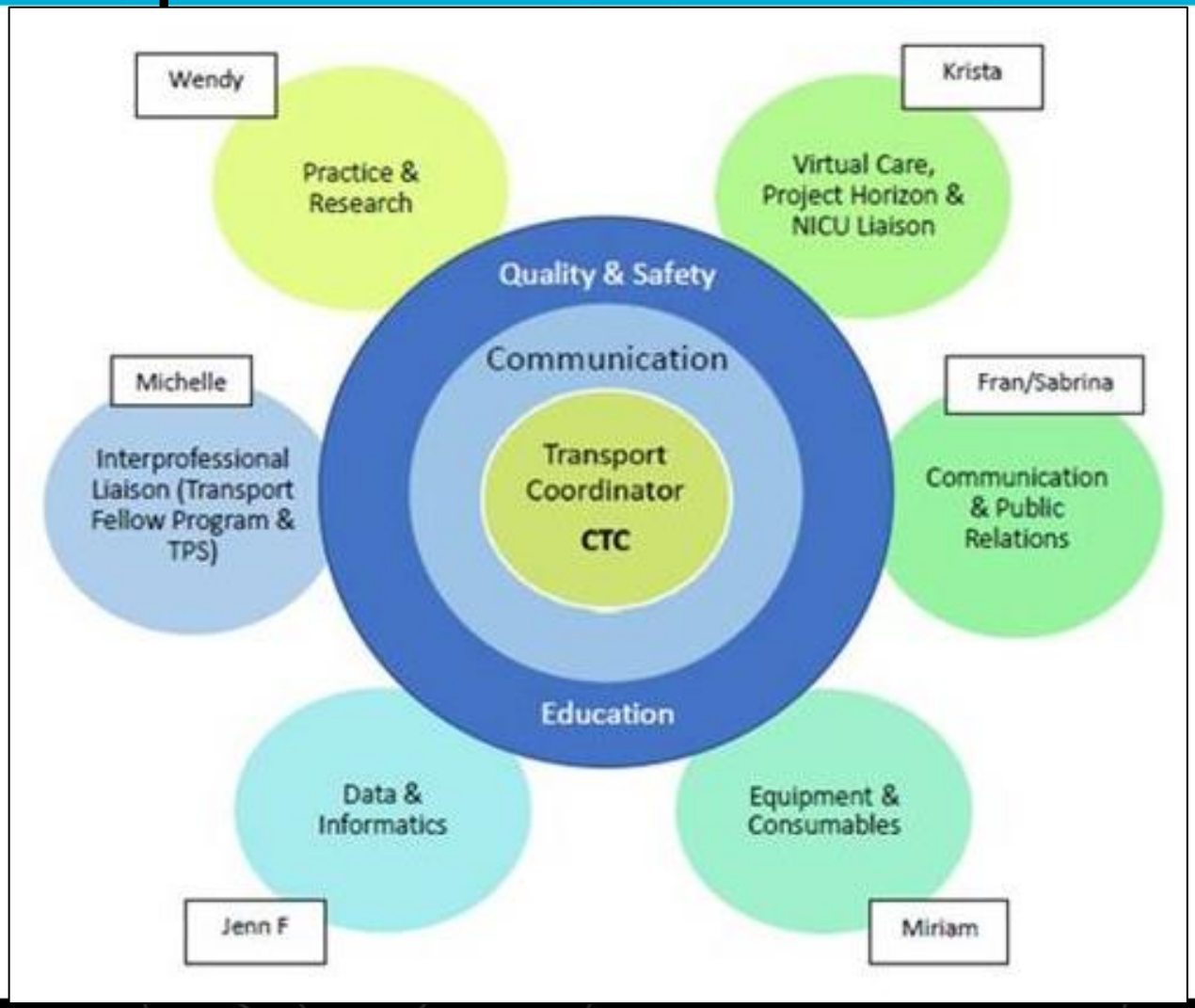
Medical-on line control provided by NICU, CICU, PICU staff physicians and fellows on service

Transport Coordinator Function

Senior clinician, minimum 3 years on team, operates 24/7 to:

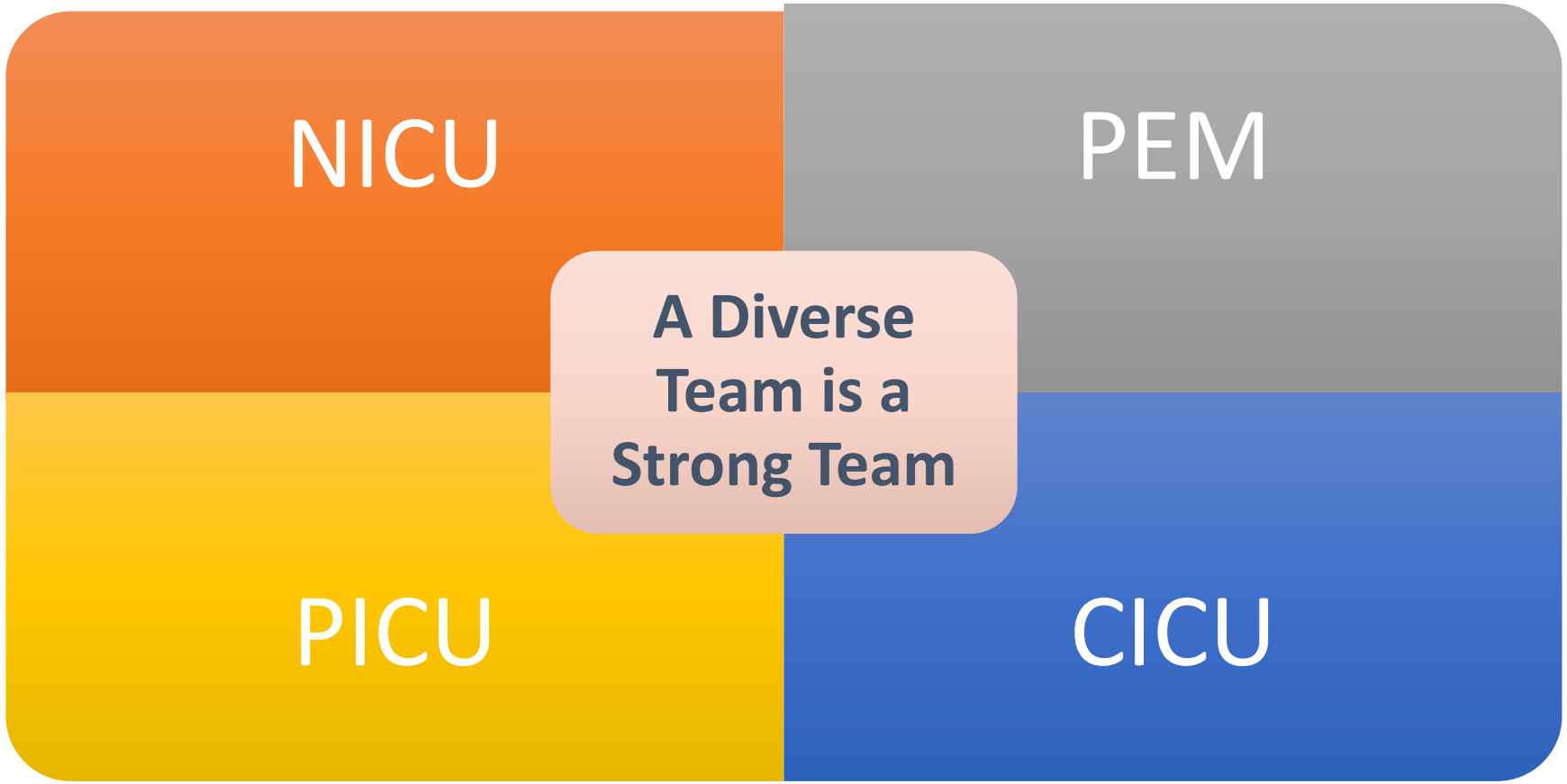
- Provide operational direction and coordination of service
- Support the clinical team to ensure excellence in patient care
- Support MDs in triaging and consultations to enhance their situational awareness regarding referral hospitals and staff
- Engage in process and systems improvements based on area of interest
- Support specific portfolios of Consistent Transport Coordinators

Transport Coordinator Portfolios



ACTS Training Program

RN & RT Recruitment



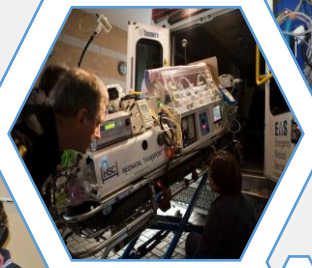
Recruitment Qualities

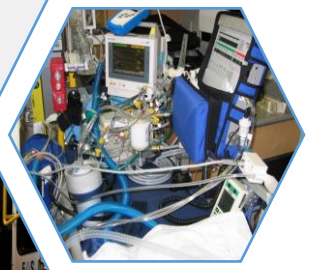
Creative

Integrity

Resilience

Adaptable





Critical Thinker

Team Player

Expert Clinician

Clinical Competency and Responsibilities: ACTS

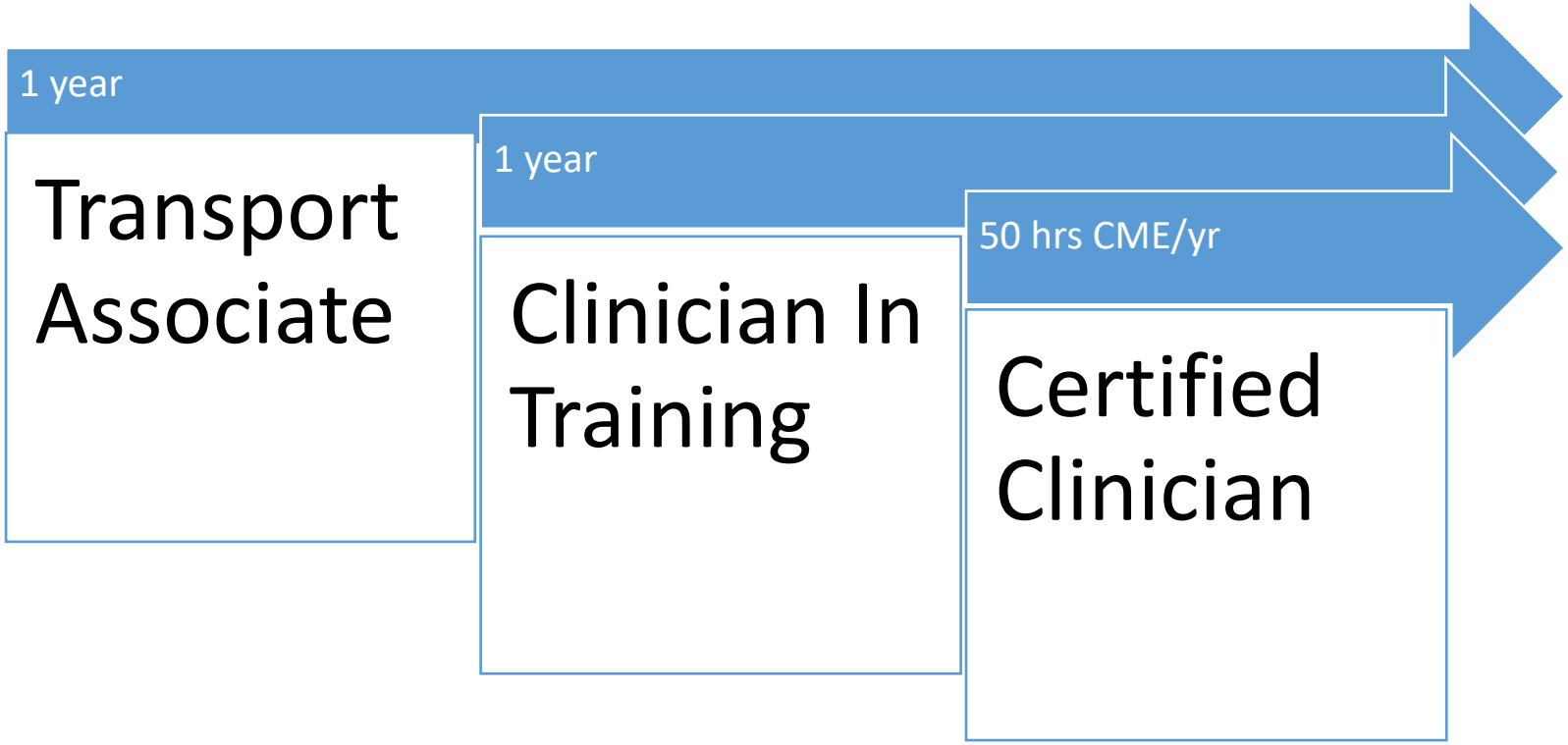
Transport Associate (TA) – 1 yr contract position for RN or RT recruited after 3-5 years ICU experience. Practice under the guidance of a transport clinician and may graduate to CIT

Clinician in Training (CIT) practices with ACTS clinician and is in training role guided by ACTS Transport Education Program

Transport Clinician (RN or RT) assumes a leadership role in patient stabilization & organization of transport process.

They integrate clinical expertise with evidence-based guidelines & utilize medical directives to provide safe, efficient medical management and care during transport stabilization and transfer

ACTS Training and Certification



Merriam, S. B. Adult Learning: Linking Theory and Practice, John Wiley and Sons Inc. 2014

Education Programs - Key Foundation

- COMPETENCIES CATERGORIES, CORE TRANSPORT CRITICAL CARE CURRICULUM & MULTI MODAL EVALUATION
- MEDICAL DIRECTIVES & CLINICAL PRACTICE GUIDELINES
- CORE TECHNICAL SKILLS & EQUIPMENT OPERATIONAL SKILLS

Expanded Roles - RN and RT

- **A: airway** Management: - intubations
- **B: ventilation** Management: invasive and non-invasive
- **C: vascular access** - Umbilical Lines – UVC/UAC; PAL; Intraosseous; PICC
- **D: Drains** -Thoracocentesis & Chest drains, Peritoneal
- **E: Evaluations** -X-Ray & Lab values Interpretation,

- Training - all competency based assessments

SickKids ACTS Curriculum

Airway & Respiratory Management

- Intubation, LMA, NG insertion
- CPAP, BiPAP, HFNC, IMV, iNO
- Surfactant Administration
- Chest Tube Insertion/Needle thoracocentesis

•Cardiovascular

- ECG, Central Lines/IO, Defibrillation, Pacing

•Neurological

- Cooling
- Head Injury Management

•All medications & Blood Products

•Trauma Care

•Aeromedical Medicine

•Lifting Techniques

•Aircraft safety and emergency preparedness

ACTS Transport Associate Program

Core Clinical Certification(s)

1. NRP – Neonatal Resuscitation Program
2. BLS – Basic Life Support
3. PALS & Paeds TLS
4. Underwater survival training
5. Winter survival training
6. STABLE Program is an asset

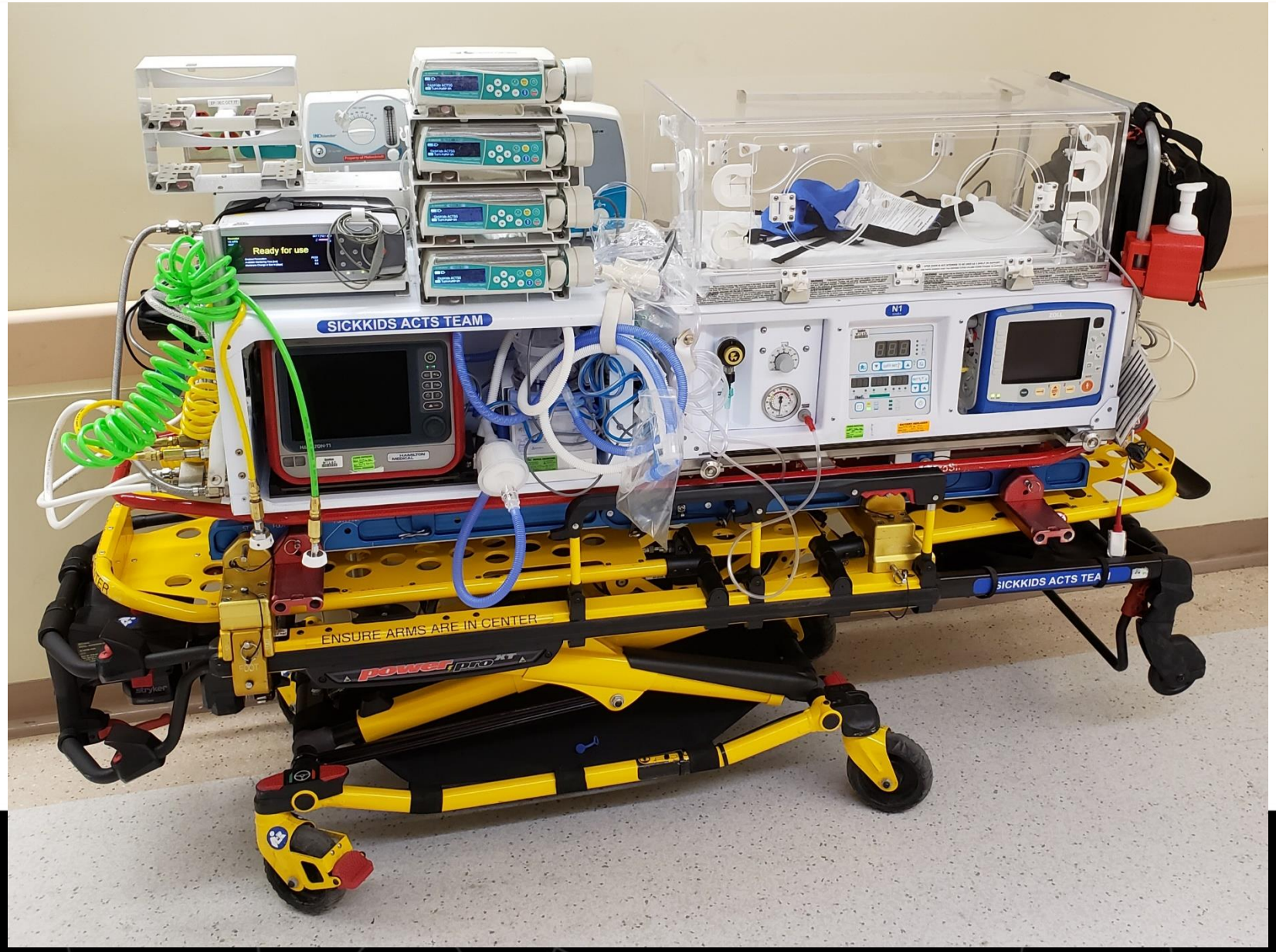
Equipment Certification(s)

1. Neonatal Deck Configuration/Transport ventilator(s) & Neonatal Intramural Deck Configuration- Competency Based Assessment(s) (CBA)
2. Inhaled Nitric Oxide e tutorial/CBA – indications, analyzer & circuit delivery
3. Transport Hamilton T1® ventilator – e tutorial/CBA
4. BBraun®IV pump - CBA
5. Point of Care Testing: I-stat® & glucose meter – I learn module
6. Capnography I learn module
7. Zoll® patient monitor – e tutorial /CBA
8. Defibrillator – e tutorial/CBA

Core Clinical & Technical Skills

1. Vascular & Arterial Access & Sampling: peripheral intravenous insertion, umbilical venous and umbilical arterial insertion, intraosseous needle insertion, peripheral arterial sampling/puncture, capillary blood sampling, SQ port access
2. OG/NGT insertion, urinary catheter insertion, invasive temperature
3. Airway Management: positioning, suctioning/patency, oxygen/air administration, nasal prong-low/high flow delivery, aerosolized mask administration, bag mask ventilation/CPAP, oropharyngeal/nasopharyngeal airway insertion, supraglottic airway insertion.
4. Non –invasive & invasive ventilation with treatment modalities
5. Needle thoracentesis
6. Neonatal therapeutic hypothermia
7. Blood product administration
8. Medication administration.
9. C-spine precautions & motion restriction
10. Aero-medical physiology, & transport safety training
11. Ground & air transportation patient preparation
12. Personnel safety

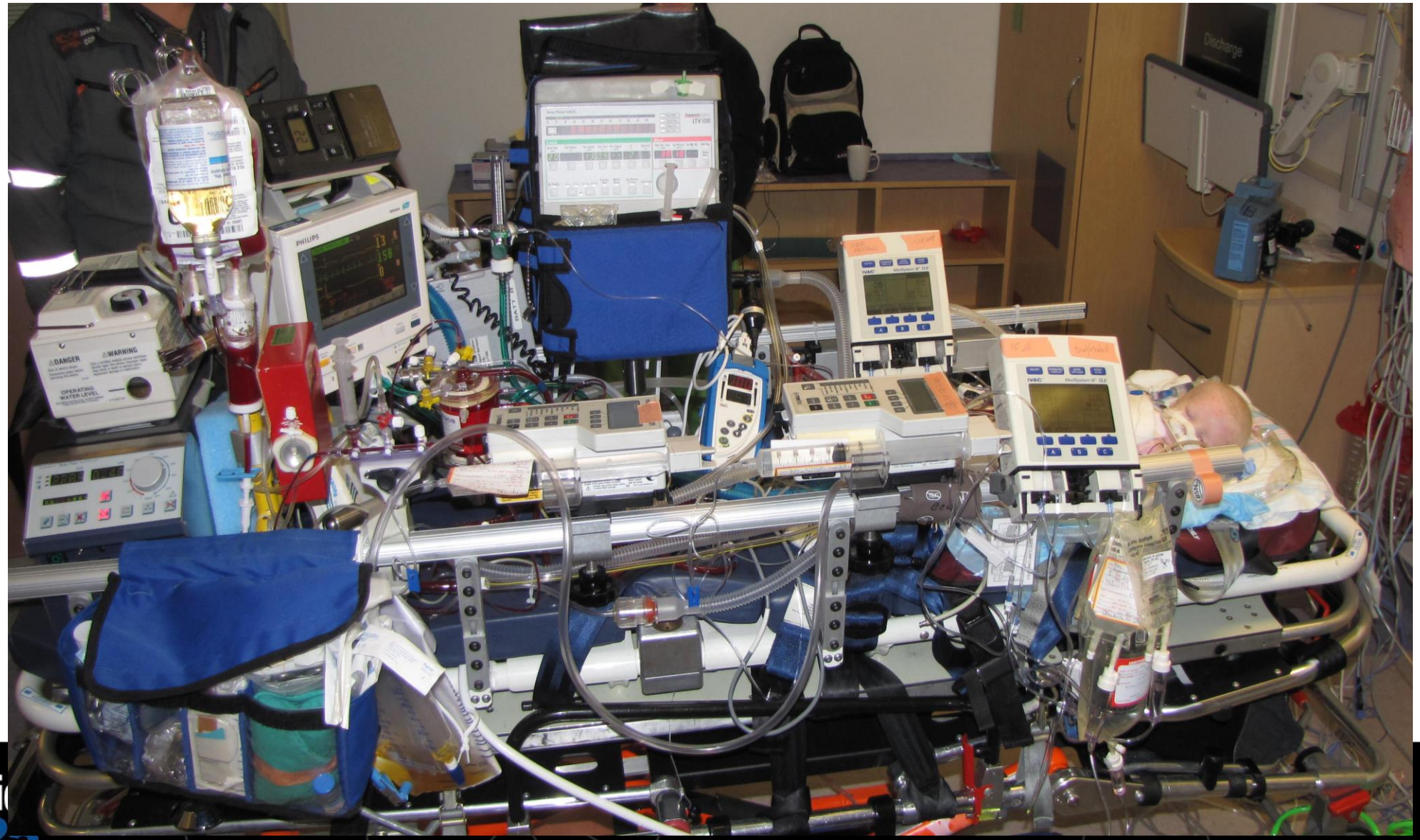
ACTS Neonatal Transport Equipment



ACTS Paediatric Equipment

SickKids 2025

ACTS ECMO Transport System



Communication Tools

SBAR(R): The Basics

Situation: the problem

What is going on with the patient?

Background: brief, related, to the point

What is the clinical background or context?

Assessment: what you found AND what you think

What do I think the problem is?

Recommendation: what you want

What do you need to do your job effectively and safely?

Readback: receiver acknowledges information given

Is the summary of the issues/plan consistent with points above?

SBAR(R) – Important Elements

Critical Language:

Key phrases understood by all to mean "stop and listen to me – we have a potential problem"

United Airlines "CUUS" program:

I'm Concerned
I'm Uncomfortable
This is Unsafe
I'm Scared

Use these words in order, to escalate your expression of concern if you feel the message hasn't gotten across

Stop and make sure you are all on the same page!

Receiving and Providing Feedback

- Feedback is an essential element of the ACTS Team
- Feedback is a gift to our success
- Ability to give and receive feedback is critically important
- There are many models to give and receive feedback
  - We can provide you with additional resources

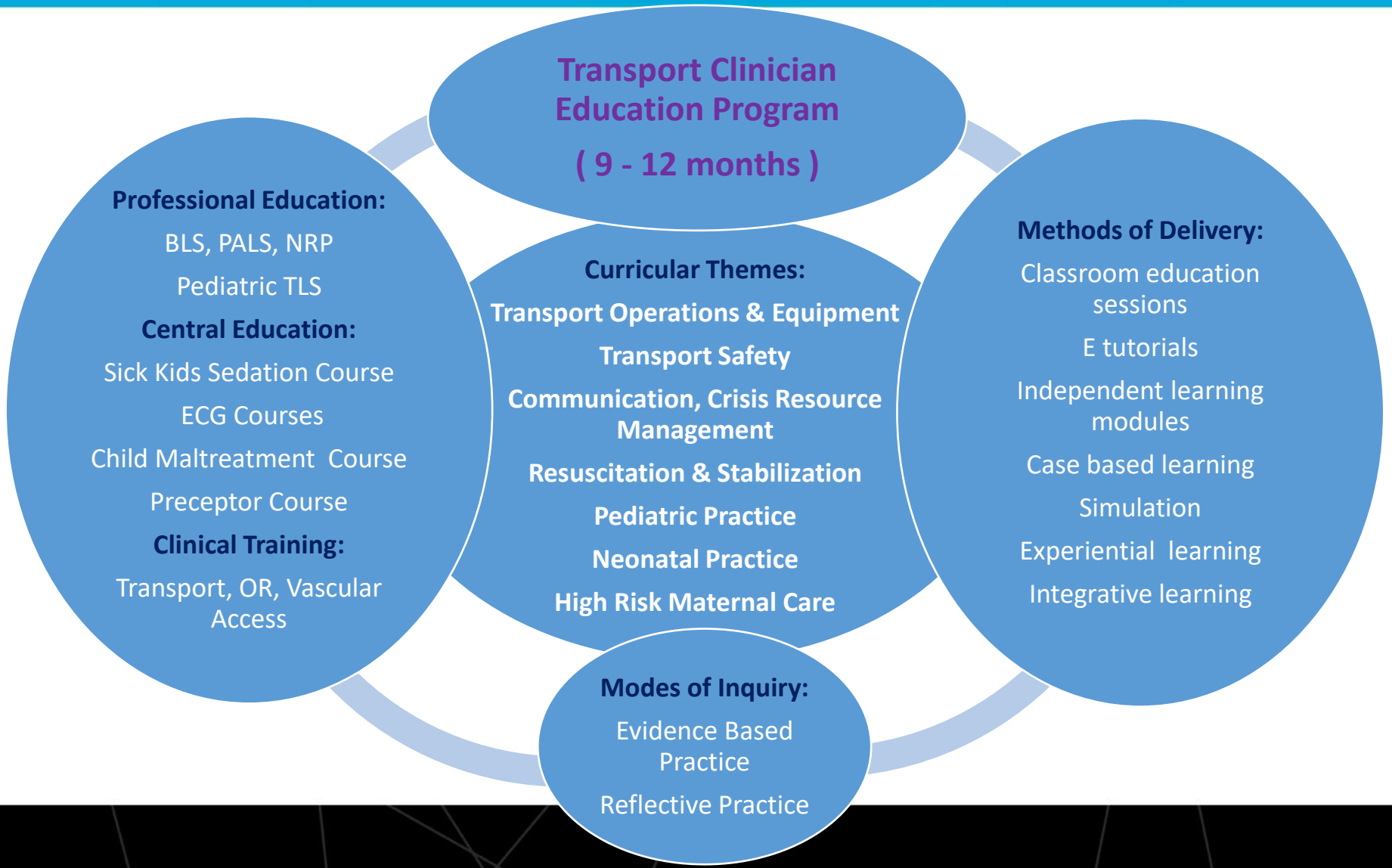
GROW Model of Coaching

- **G – Goal**
  - What do you want to achieve?
  - End goal or performance goal?
  - Timeframe
  - How will you know you have succeeded?
- **R – Reality**
  - What is happening now?
  - Who is involved
  - What have you done about this so far?
- **O – Options/Obstacles**
  - What options do you have?
  - What else could you do?
  - Would you like another suggestion?
- **W – Will**
  - What are you going to do?
  - When are you going to do it?
  - What support do you need?
  - What is your commitment level?

Progression Through the TA Program

- Written Exam
  - Date to be determined and communicated by ACTS educator (after 3-4 months)
- Progress review every three months with manager, educator, medical director, mentor
  - Dates and times to be arranged by educator
- Evaluations to complete (educator will elaborate)
- No surprises

CLINICIAN EDUCATION PROGRAM OVERVIEW



CIT

Phase 1

- **KNOWLEDGE ACQUISITION** (0- 3 Months)
- Joint Orientation (Neonatal & Pediatric didactic sessions)
- **Self- Directed learning modules**, Program Materials provided (Binder and access to iShare, Drop box)
- Resource reading
- **Preceptor(s) identified → 1st partnership begins**
- Clinical placement starts, advanced skills education day(s) & skills OSCE session, clinical education placements
- **Needs assessment completed**
- **Develop Learning Plan**
- Review Clinician In Training progress assessment tool, CIT certification evaluation tool, and Clinical Competencies

Phase 2

- **APPLICATION AND INTEGRATION** (3-6 Months)
- **Advanced Theory education sessions**
- Preceptor/Preceptee clinical experiences on transport
- Participation at Transport Team education days
- Self-directed learning modules, case reviews, high fidelity simulation education day(s), Required courses completed
- Ongoing evaluation with Preceptor and Transport Medical Director/delegate
- **Written exam (validate knowledge transfer)**

Phase 3

- **CERTIFICATION** (6-12 Months)
- Successful integration of knowledge and skills
- **Clinician Competencies demonstrated**
- **OSCEs**
- **Certification Transport Runs with TSN/Staff Intensivist**; ACTS Inter-professional education specialist
- Certification meeting & post certification CE requirements reviewed

Core Technical Advanced Skills

VASCULAR ACCESS

UMBILICAL LINES & IO INSERTION

PAL INSERTION

AIRWAY MANAGEMENT

LMA & INTUBATION

AIRWAY ADJUNCTS

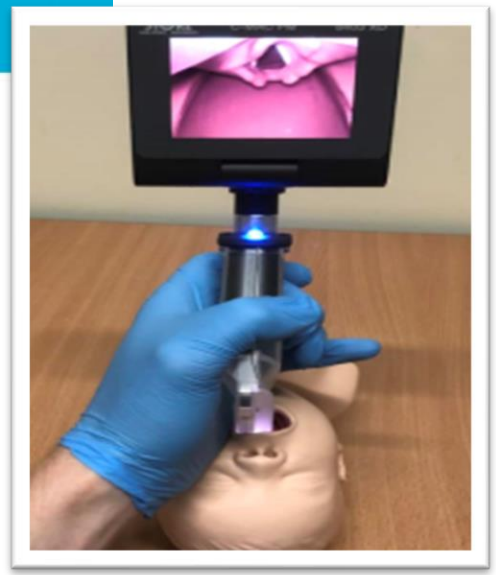
SURGICAL AIRWAY

EMERGENCY SKILLS

CHEST TUBE INSERTION

DEFIBRILLATION/PACING

PERITONEAL DRAIN



Intubation - Video Laryngoscope

- Designed for use during land and air transport
- Acute/high risk nature of intubation
- C-MAC Pocket Monitor

Other Technical Skills

- Vascular access
- Chest Tube Insertion
- Emergency Procedures
- Peritoneal drain
- Surgical airway

ACTS TRANSPORT COMPETENCIES

- ✓Professional Responsibilities
- ✓Communication
- ✓Therapeutics
- ✓Health & Safety
- ✓Assessment & Diagnostics
- ✓Integration
- ✓Transportation

Quality and Process Improvement

The patient must come first and be at the center of our decision-making efforts

Quality/Safety/Risk Program

- Daily Run Reviews
- Monthly Quality Reports
  - Trends
  - Critical Incidents
- Morbidity and Mortality Review
- Structured Debrief Process

The goals of Quality Management:

- Optimize patient safety and quality
- Ensure a safe environment
- Continuous quality improvement
- Service excellence for patients and families.


TORONTO
SickKids
Acute Care Transport
Service (ACTS)


PRESIDENT'S AWARD


AMBULANCE
paramedic

Thank You!


Whyte&ACTS
SickKids
VS
TheOdds


PARAMEDIC

References

References

- Canadian Association of Paediatric Health Centres. Competencies profile - Interfacility critical care transport of maternal, neonatal, and paediatric patients from https://www.caphc.org/neonatalpaediatric-transport-systems/. 2011 Merriam S, Bierma L.L. Adult Learning: Linking Theory and Practice, John Wiley and Sons Inc. 2014.
- Droogh J. M, Smit M, Absalom A.R, Ligtenberg J.J.M, Zijlstra J.G. Transferring the critically ill patient: are we there yet? Crit Care. 2015; 19: 62
- Smith K.A, Gothard M.D, Schwartz H.P, Giuliano J.S. Jr., Forbes M, Bigham M. Risk Factors for Failed Tracheal Intubation in Pediatric and Neonatal Critical Care Specialty Transport. Prehosp Emerg Care. 2015;19(1):17-22.
- KJ Barrington. Premedication for Endotracheal Intubation in the Newborn Infant. Canadian Paediatric Society, Fetus and Newborn Committee. Paediatr Child Health. 2011; 16(3):159-64.
- Wallace M. C, Britton S.T, Meek R, Walsh-Hart S, Col. Carter T.E, Lisco S.J. Comparison of five video-assisted intubation devices by novice and expert laryngoscopists for use in the aeromedical evacuation environment. Mil Med Res. 2017; 4: 20.
- Finan E, Bismilla Z, Whyte H.E, Leblanc V, McNamara P.J. High-fidelity simulator technology may not be superior to traditional low-fidelity equipment for neonatal resuscitation training. J Perinatol. 2012; 32(4): 287-292.
- Powell D.A, Gonzales C, Gunnels R.D. Use of the ferret as a model for pediatric endotracheal intubation training. Lab Anim. Sci. 2001; 41(1): 86-89.
- Hourihane J. O, Crawshaw P.A, Hall M.A. Neonatal chest drain insertion--an animal model. Arch Dis Child Fetal Neonatal Ed. 1995; 72(2): F123-124.

References

- Anastakis D. J, Regehr G, Reznick R.K, Cusimano M, Murnaghan J, Brown M, Hutchison C. Assessment of technical skills transfer from the bench training model to the human model. Am J Surg. 1991; 177(2): 167-170.
- Britt R. C, Novosel T.J, Britt L.D, Sullivan M. The impact of central line simulation before the ICU experience. Am J Surg. 2009; 197(4): 533-536.
- Hunt E. A, Duval-Arnould J.M, Nelson-McMillan K.L, Bradshaw J.H, Diener – West M, Peretta J.S, Shilkofski N.A. Pediatric resident resuscitation skills improve after “rapid cycle deliberate practice" training. Resuscitation. 2014; 85(7): 945-951.
- Singh JM, Gunz AC, Dhanani S, Aghari M, MacDonald R. Frequency, Composition, and Predictors of In-Transit Critical Events During Pediatric Critical Care Transport. Pediatr Crit Care Med. 2016;17(10):984-991.
- Cheng A, Donoghue A, Gilfoyle E, Eppich W. Simulation-based crisis resource management training for pediatric critical care medicine: a review for instructors. Pediatr Crit. Care Med. 2012; 13(2): 197-203.
- Campbell D. M. and Dadiz R. Simulation in neonatal transport medicine. Semin Perinatol. 2016; 40(7): 430-437.
- Wilson D, Kochar A, Whyte-Lewis A, Whyte H, Lee K-S. Evaluation of Situation, Background, Assessment, Recommendation Tool During Neonatal and Pediatric Interfacility Transport. Air Med J. 2017; 36(4): 182-187.
- Whyte H.E and Narvey M. Team models in interfacility and maintaining competencies. Current Treatment Options in Pediatrics. 2017: 3 (4): pp 327-341.1.
- Knowles M. The Adult Learner: A Neglected Species (3rd Ed.). Houston: Gulf Publishing. 1984.
- Kline-Krammes S, Wheeler D.S, Schwartz H.P, Forbes M, Bigham M. Missed opportunities during pediatric residency training: report of a 10-year follow-up survey in critical care transport medicine. Pediatr Emerg Care. 2012; 28(1): 1-5.
- Mickells G. E, Goodman D.M, Rozenfeld R.A. Education of pediatric subspecialty fellows in transport medicine: a national survey. BMC Pediatr. 2017; 17(1): 13.
- Becker T. K, Skiba J.F, Sozener C.B. An educational measure to significantly increase critical knowledge regarding interfacility patient transfers. Prehosp Disaster Med. 2015; 30(3): 244-248.

References

- Karlsen K, Trautman A.M, Price-Douglas W, Smith S. National survey of neonatal transport teams in the United States. Pediatrics. 2011; 128(4): 685-691.
- Tanem J, Triscari D, Chan M, Meyer M.T. Workforce Survey of Pediatric Interfacility Transport Systems in the United States. Pediatr Emerg Care. 2016; 32(6): 364-370.
- Whyte H. E, Jefferies A.L. Canadian Paediatric Society Fetus and Newborn Committee. The interfacility transport of critically ill newborns. Paediatr Child Health. 2015; 20(5): 265-275.
- King B.R. King T.M, Foster R.L, McCans K.M. Pediatric and neonatal transport teams with and without a physician: a comparison of outcomes and interventions. Pediatr Emerg Care. 2007; 23(2):77-82.
- Warren J, Fromm R.E, Jr., Orr R.A, Rotello L.C, Horst H.M. Guidelines for the inter- and intrahospital transport of critically ill patients. Crit. Care Med. 2004; 32(1): 256-262.
- Standards – CAMTS. www.camts.org. 2015
- Accreditation Canada: https://accreditation.ca. 2013
- Kempley S. T, Ratnavel N, Fellows T. Vehicles and equipment for land-based neonatal transport. Early Hum Dev. 2009; 85(8): 491-495.
- Bigham M. T, Schwartz H.P, Ohio C. Neonatal/Pediatric Transport Quality. Quality metrics in neonatal and pediatric critical care transport: a consensus statement. Pediatr Crit. Care Med. 2013; 14(5): 518-524.
- Gunz A.C, Dhanani S, Whyte H, Menon K, Foster J.R, Parker M.J. Identifying significant and relevant events during pediatric transport: a modified Delphi study. Pediatr Crit. Care Med. 2014; 15(7): 653-659.
- Schwartz H.P, Bigham M.T, Schoettker P.J, Meyer K, Trautman M.S, Insoft R.M, American Academy of Pediatrics Section on Transport Medicine. Quality Metrics in Neonatal and Pediatric Critical Care Transport: A National Delphi Project. Pediatr Crit Care Med. 2015; 16(8): 711-717.
- Romito J, and Alexander S.N. Guidelines for Air & Ground Transport of Neonatal and Pediatric Patients Manual, 4th Ed. 2015 Edited by Robert M. Insoft and Hamilton P. Schwartz

Team Composition

Composition Support Functions	Purpose

Logistics	• Moving the team from destinations
	• Retrieving equipment
	• Arranging special transport
	  • ECMO
	  • Mothers in labor
	  • Land/flight
	• Supply chain and replenishment

Biomedical Support	• Equipment design and innovation • Equipment maintenance
Communications	• Provide on-line medical control • Assist with team safety • Dispatch and control of team movement
Management	• Team strategy oversight • Financial management • Human resource functions • Stakeholder relations and partnerships

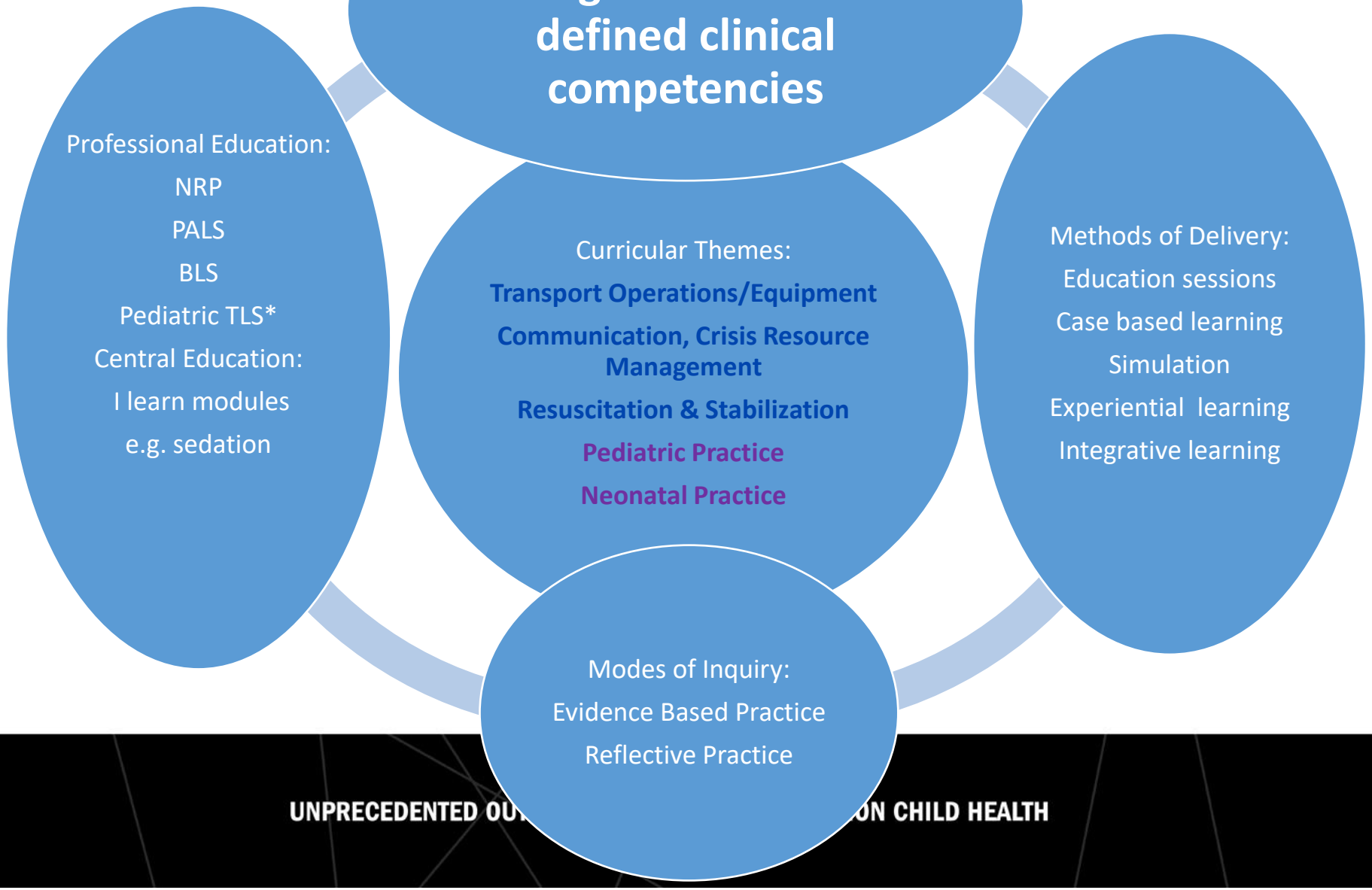
Team Composition

Composition Direct Care	Purpose
Physicians	• Medical Director and Transport Physicians • Provide medical oversight and decision making • Training and outreach education • Quality review and improvement • Leadership
Team Members	• Patient care • Outreach education • Quality review and improvement • Hospital resource

Downtime at Hospital

- Assist NICU/PICU/CCCU with tasks/skill acquisition
- Self-directed learning -Shared drive files- TEAMS
- iLearn modules – mandatory P & P
- Transport Credits - CME
- Projects – QI and Research
- Daily transport rounds/summaries -> feedback
  - Paediatric Rounds Thursdays
- Daily NICU & Critical Care Rounds - attendance
- Run reviews with peers and MDs
- Structured Debriefs
- Equipment and supplies maintenance – twice daily checks

Transport Associate Program- built on defined clinical competencies



ACTS Medical Directives

Examples of medical directives:

Initiating an order to perform a procedure
Initiating an order for airway management, mechanical or assisted ventilation
Initiating an order for a diagnostic imaging examination
Initiating an order for muscle relaxation for intubation and procedural topical anesthesia and non-pharmacological analgesia
Initiating an order for emergency drugs for cardiopulmonary resuscitation
Initiating an order for prophylactic treatment to newborns at delivery
Initiating an order for intravenous therapy
Initiating an order for surfactant and the treatment of respiratory distress syndrome
Initiating an order for volume expanders for hypovolemia
Initiating an order for investigations; interpreting and/or communicating results
Initiating an order for antibiotics at risk for/or suspected sepsis

ACTS Clinicians in Training

Education Hours

- **Orientation:** integrated over duration of program – didactic, case based learning
- **Simulations.** Total of 100 hours
- **Course certifications**: e.g. neonatal & pediatric sedation & ECG course, infant and child maltreatment course.

Knowledge Acquisition (0-3 months)

- Joint Orientation (Neonatal & Pediatric didactic sessions)
- Self-Directed learning modules: Program Materials provided (access to iShare, Dropbox, TEAMS)
- Resource reading
- Preceptor(s) identified -> first partnership begins
- Clinical placement starts, advanced skills education day(s) & skills OSCE session, clinicial education placements
- Needs assessment completed
- Develop learning plan
- Review Training progress assessment tool, certifications evaluation tool, Competencies
- Hours for independent learning activities: e.g. academic rounds, learning packages

Clinical Hours

- OR rotation: 24 hours
- Labour/Delivery rotation: 36 hours
- ED rotation: 72 hours
- PICU/CCCU or NICU rotation: 72 hours
- PICU/CCCU MD shadow shifts: 36 hours
- NICU NNP mentor shifts: 36 hours -> Total: 278 hours (adjusted based on needs)
- Transport clinical preceptorship: 9 months (1440 hours)

Evaluation

- Clinical evaluation by preceptors during training phases, assessments by educator & medical director/delegate
- Call back evaluations: monthly case reviews with physician(s),
- 2 written exams,
- advanced procedure/skills OSCEs
- High fidelity patient simulation OSCEs (on average 4 simulation cases)
- Field certification (on average 6 physician/educator observed transport retrievals)

Courtesy of Annette Martens, RN MScN: ACTS Educator