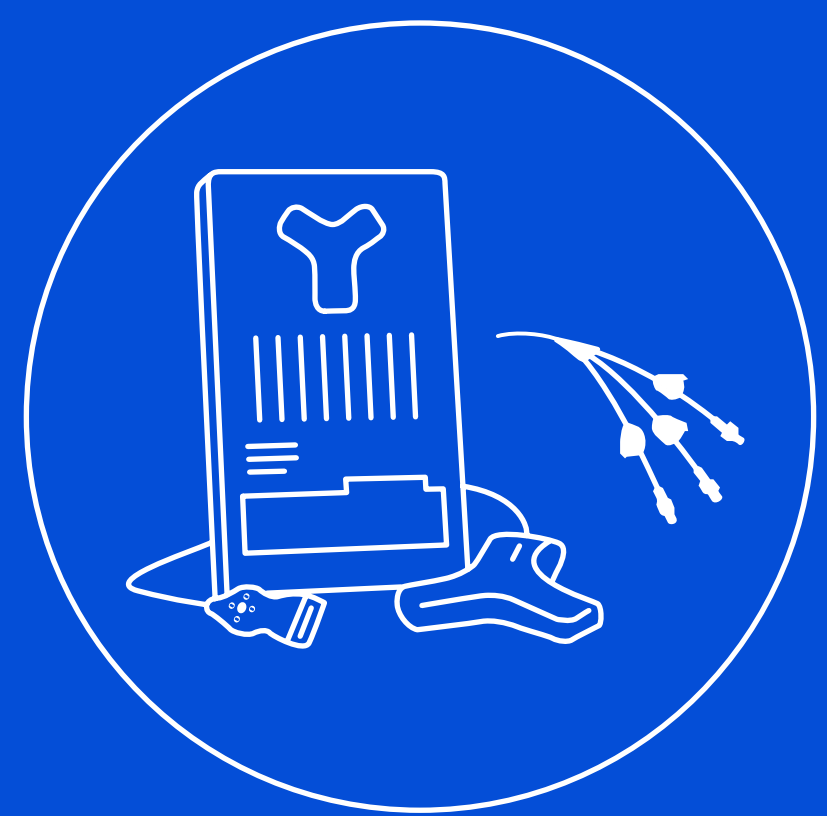




Expanding Access to Vascular Care: A Collaborative Bedside PICC Training Model to Support Rural Canadian Communities

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Background

Residents of rural and remote Canadian communities face major barriers to timely vascular care due to limited access to specialized clinicians, resulting in delayed treatment and increased complications.¹ Peripherally Inserted Central Catheters (PICCs) are essential for long-term intravenous treatment, yet skilled clinicians are scarce outside urban centers.^{2,3,4} To address this gap, a Clinical Centre of Training was established through a partnership between a leading medical device vendor and a tertiary teaching hospital.



Objective

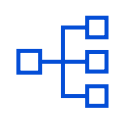
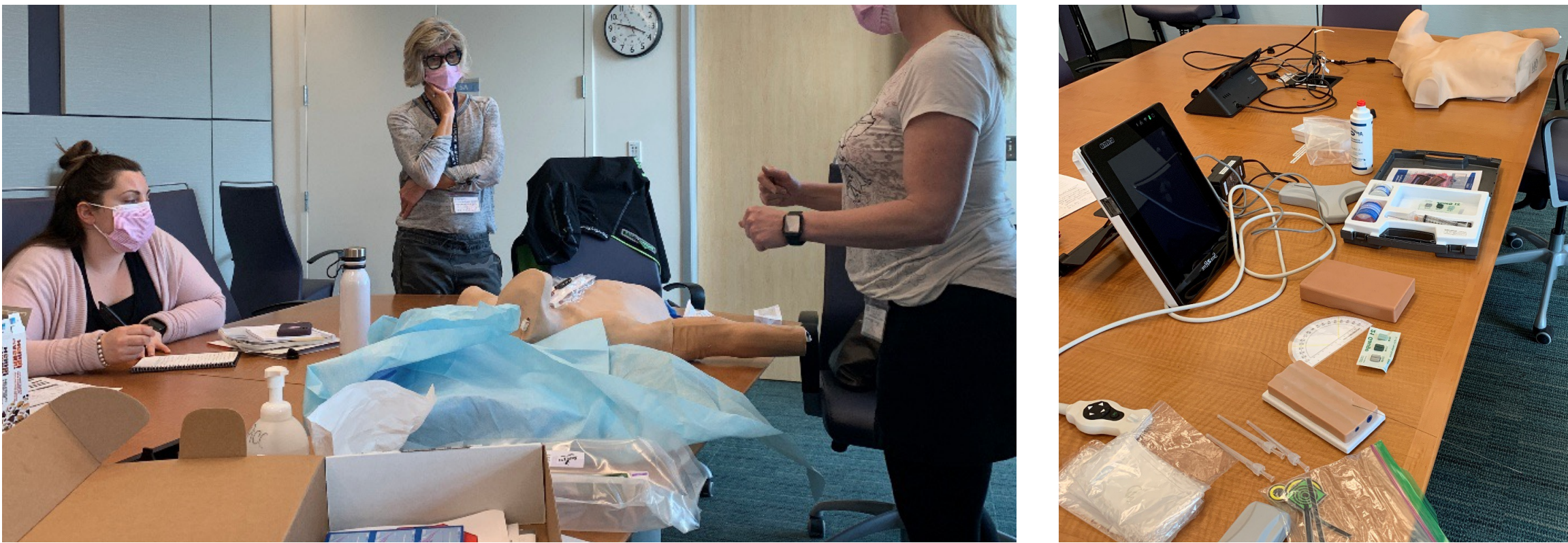
The program aimed to equip nurses and physicians from rural hospitals with advanced PICC insertion skill using the BD Sherlock 3CG™ Tip Confirmation System which includes ultrasound, magnetic tip tracking and ECG tip confirmation technologies, enabling local delivery of high-quality care and reducing patient transfers and wait times.^{5,6}

Initial and Ongoing Program Collaboration Between BD & HHS

Hamilton Health Sciences (HHS) is a large academic teaching hospital with comprehensive Cancer and Trauma departments in Hamilton, Ontario. The Vascular Access Team (VAT) inserts approximately 3600 PICCs in adult patients annually between two sites: Hamilton General and Juravinski Hospitals

This partnership has been in place since 2021, with the first Learners attending the Centre of Training in 2023. The collaboration is under a legal contract and subject to renewal each year.

BD Clinical Specialists educate the “Train the Trainer” program for the Centre of Training, which includes practice observation, teaching fundamentals, standardization between HHS trainers and instruction on the bedside Centre of training program.



Methods

1. Identification of Learner Need: BD identifies rural clinicians with insufficient insertion volume for competency development and introduces the HHS Centre of Training option
2. Stakeholder Alignment: BD notifies the HHS VAT Manager of an incoming learner.
3. Agreement: All parties sign an affirmation agreement
4. Onboarding: Learners complete HHS requirements (credentials, licensure, immunization). Ontario licensed RNs required; select Ontario licensed anesthesiologists accommodated

5. Scheduling: HHS Student Affairs confirms readiness for training dates
6. Pre-training Education: BD delivers the required 2-day didactic and simulation based training using BD Sherlock 3CG™ Tip Confirmation System prior to the Learner attending on-site training at HHS
7. Training Package: Learners receive protocols, hospital maps, and a daily/weekly agenda (8 hours/day)
8. Learner attends the HHS Centre of Training to practice PICC insertion following CVAA Guidelines relating to best practice and in accordance with HHS’s PICC insertion policy and procedure
9. BD Clinical Specialists remain available for product support and ongoing education

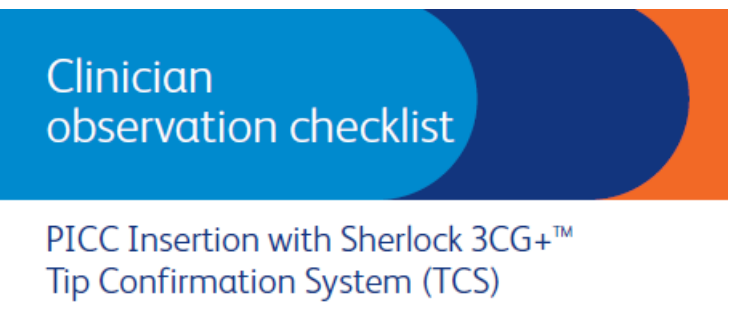
Cost: Learners cover travel, accommodations, and meals if required. All device, training, and education costs are covered by BD Canada.

Insertion Training (Begins with Simulation and Progresses to Live Patient Insertions):

1. Provides risk/benefit education to patient and family
2. Completes PICC insertion pre-assessment form and confirms information accuracy with patient and/or primary nurse
3. Completes procedural pause
4. Learner assesses what they see utilizing ultrasound (vessels, nerves, bifurcations)
5. Performs catheter-to-vein ratio with vessel in neutral state
6. Sets up to perform PICC insertion
7. Develops problem-solving skills such as when to contact Most Responsible Physician and variables that may impact insertion location such as history of thrombosis, mastectomy, pregnancy, pacemaker, weakness and skin integrity
8. Develops confidence identifying vessel anatomy and techniques to stay aligned when tracking the needle and preventing vessel collapse during insertion
9. Develops competence with complication prevention strategies such as maintaining sterility, arterial and nerve avoidance, guidewire monitoring, hemostasis prior to dressing application and limiting needling attempts
10. Learns alternatives for dressing and securement depending on patient’s skin integrity and/or allergies
11. Trainer completes documentation and Learner reviews it



Live patient insertions supported by HHS VAT members utilizing a standardized insertion checklist for competency assessment. The VAT Manager and the Learner receive the completed insertion checklists.



Case scenarios when HHS Trainer had to provide hands-on support during procedures
• Difficult to access vessel • Guidewire advancement • Navigating PICC into the SVC (required Radiological intervention) • Patient confused and non-cooperative • Possible venospasm • Extended length of procedure



Results

Since launch, 12 clinicians from rural regions have completed training, achieving a 100 % competency pass rate. Competency was confirmed through observation of 5-10 successful independent PICC insertions during final training. Post-training evaluations indicate improved local access to vascular therapy, reduced inter-facility transfers, and enhanced patient satisfaction. Nurses and Anesthesiologists reported increased confidence and autonomy in managing complex vascular access as per the feedback shared below.

# of clinicians who have gone through the Centre of Training Program	Mean # of insertion attempts by clinicians while at the Centre of Training (5 days)	Mean # of independent, observed successful insertions (5 days)
6 Registered Nurses	16.3	13.5
6 Anesthesiologists	16.1	14.7

Discussion: Learnings

Scheduling Challenges: Coordinating learner availability with the Centre of Training was difficult due to nurse staffing shortages.

Travel Barriers: Rural attendees faced significant travel needs: flights, long travel times, accommodations, and meal costs.

Variable Skill Levels: Wide differences in baseline competency required flexible, adaptive teaching approaches.

Policy Differences: Diverse hospital policies needed alignment with best practice standards and product instructions for use (IFUs).

High Clinical Demand: Time-sensitive PICC needs (outpatients, DIVA patients, high acuity) increased cognitive load for both Trainer and Learner.

Mindset & Confidence: Early difficult cases reduced confidence especially in perfection oriented learners highlighting the need for positive reinforcement and supportive learning environments.

Timing Gaps: Long delays between didactic teaching and hands-on practice slowed progression; learners trained immediately before on site sessions showed the strongest development. One anesthesiologist remained an exception, returning after an 8 month break with strong confidence and competence.

Post Evaluation by the Learner

“It was a great experience and I feel that I gained a lot skills and troubleshooting from my training at HHSC.”
– (Program Attendee)

“It was a pleasure to be able to learn (from the Trainer) and your vast vascular knowledge.”
– (Program Attendee)

Post-training evaluations concluded that this program supported local delivery of high-quality bedside PICC insertion care, reduction in patient transfers and overall PICC insertion wait times.

Within the Anesthesiologist group of Learners, the following comment about wait times was noted: *“Due to the sporadic nature of the PICC requests at our small hospital and our limited availability we found there was sometimes a mismatch between when a PICC was requested and when we were available. As a result, I don’t think we significantly reduced wait times for vascular access.”*
– (Program Attendee)

“PICC referrals are usually completed within 24-48hrs or on the day they are submitted if myself or my partner are working that day.”
– (Program Attendee)



Conclusion

This collaborative training model demonstrates that industry-academic partnerships can strengthen rural healthcare capacity, improve equity in access to infusion therapies, and enhance patient outcomes. The initiative offers a scalable framework for addressing similar gaps across Canada and globally.

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