

TECHNOLOGY ENABLED ACCESS TO CARE FOR CHILDREN (TEACC)

CREATING A PROVINCIAL TELEHEALTH SYSTEM FOR CHILDREN



UPDATE REPORT FOR CHOPS COMMITTEE

OCTOBER 5, 2015



I.BACKGROUND/PROJECT DRIVERS

STRATEGIC CONTEXT/CASE FOR CHANGE

- Ensuring equity of access to specialist and subspecialist services across BC’s vast geography is challenging. Reducing patient travel, facilitating appropriate and safe patient discharge from hospital to home and preventing admission/re-admission to hospital are important to families and providers.
- Outcome and cost-benefits analysis conducted elsewhere in Canada (with adult patients) and internationally (with adults and children) have indicated that telehealth has a positive impact on access to care and supportive services.
- Tele-health and other consumer health technologic solutions have the potential to increase access and move us toward achieving the above goals.
- Within PHSA regarding use of tele-health for children’s services:
 - Tele-health has been used for children and youth through BC Mental Health and Substance Use (BCCH CYMH services) for the delivery of their TOPS program - working collaboratively with MCFD to deliver child psychiatry services for community child and youth mental health teams. More than 400 visits now occur annually through this program. In addition, Tier 4 CYMH services are exploring the use of tele-health.
 - Child and youth mental health services, in conjunction with MCFD, have created an overarching Guideline document outlining the principles for delivery of tele-health mental health services. Most the principles outlined are equally as appropriate to other tele-health services.
 - Sunny Hill Health Centre for Children has used tele-health for extensive delivery of educational services and support for local providers. Clinical planning services and patient care visits have occurred via tele-health, primarily to child development centre sites. These visits are “one of” events arranged on a case by case basis with the local centre with bridging via PHSA telehealth. There is interest in expanding and standardizing these services.
 - While subspecialty providers (pediatric) at BC Children’s Hospital were partaking in occasional tele-health interactions, these visits had been infrequent and were all arranged and planned as “one of” events once the provider considered telehealth, linked with PHSA, PHSA tele-health linked with regional site, deemed it possible to link to a site on a given day and time, that the site had the equipment and personnel to make telehealth possible and arranged the connection. Providers expressed frustration that not all sites they needed were available, or even when “available” there were problems with the family accessing the room, making the equipment work, and ensuring that after-care was provided.
 - There were no standard protocols within BCCH pediatrics and surgery for booking, registering, dictating, or evaluating the visits if they did occur.
 - PHSA had not conducted an evaluation of its child health related clinical tele-health services.
- Within the other HA’s:
 - Each regional HA has a tele-health program. These are all technology-oriented programs

organized to equip rooms, arrange bridging functions. Each HA has created their own approach to technology use/tele-health. They have purchased different kinds of equipment and therefore the infrastructure in each HA differs and is diverse. Because the programs are technologically-oriented in nature, they are not associated with FTE's who can assist with any clinical interaction with the patient such as registering the patient, orienting them to the equipment, ensuring their safety and comfort in the room, checking vitals, weighing and measuring, assisting with the clinical interaction or assisting with provision of lab forms or prescriptions. They also do not assist with evaluation.

- There was no over-arching provincial tele-health strategy, including for children and youth.

OPPORTUNITIES SUPPORTING THE CHANGE:

- The opportunity, given Child Health BC's role and the support of the BCCHF, and in particular lead benefactors Overwaitea Food Group and donor Telus, support is available to create a tele-health system of care such that tele-health can become a viable and easy alternative for the provision of care, implementing the 'tiers of service' model for the coordination and delivery of care and services across the province. Tele-health is seen as a mechanism to extend the reach of BCCH providers into the community, along with regional outreach clinics and other enhancing technologies for future use such as m-health.
- For this to be successful, there was a need to develop clinical processes and technological processes. The PHSA Tele-health Program agreed to work in close collaboration with CHBC to jointly meet the clinical and technological needs.
- Through the CHBC Steering Committee, all child health programs from the regional HA's including the FNHA, agreed to partake in this work. (Note: Since initiation of the project, Northern Health Authority has put a "hold" on formal planning, moving forward only with specific individual clinical cases due to their concerns regarding workload amongst their tele-health personnel and strategy development within NHA)
- It was recognized that the initiative would require the collaboration CHBC leadership and telehealth personnel in PHSA (and others, such as Clinical and Systems Transformation and site redevelopment) and the Regional Health Authorities for the integration of technology and telehealth into the service delivery planning and implementation for pediatric specialty services and eventually, other child health services.
- The enabling solutions are anticipated to include clinical, educational and administrative applications but will focus on enabling, expanding and supporting the processes required to design, implement and evaluate services.
- It was recognized that a number of different technologies could be employed to deliver clinical services, including but not limited to two-way video conferencing. To be all inclusive of these technologies (particularly with respect to our donors) this project with the name "TEACC" (pronounced "teak") was created: Technology Enhanced Access to Care for Children (TEACC)

II “TEACC- PHASE ONE” PROJECT INITIATION

It was determined that a project management approach be taken to this work. The first “project” (TEACC Phase I) was identified as a substantive project in which the provincial child health clinical and technological infrastructure for two way video-conferencing for clinical purposes (tele-health) would be created provincially and then tested using three clinical areas (three “priority projects”).

Phase I Project Purpose

CHBC and PHSA Telehealth are collaborating to lead the initiative and:

- develop an overarching framework and infrastructure to support the sustainable integration of telehealth and other enabling technology into paediatric clinical service delivery across the province;
- identify opportunities to improve access to paediatric /child health specialist and subspecialist services across the province;
- select up to three ‘priority projects’ which will demonstrate the potential for enabling technology to assist in improving access to care; and
- implement and evaluate the impact of the ‘priority projects’;

Phase I Desired End State

In the desired future state there would be:

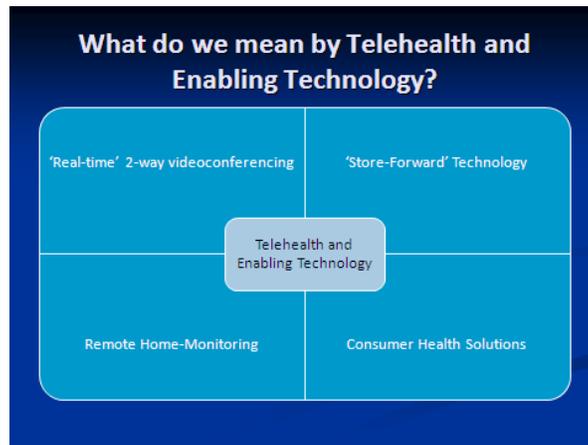
- an overarching access framework that would provide direction for health authorities and providers in the integration of telehealth and enabling technology to service delivery that outlines locations and the nature of the services;
- an evaluation report that documented demonstrated success in the use of telehealth and enabling technology to:
 - Provide specialist and subspecialist services in underserved areas;
 - Decrease wait times for service;
 - Increase efficiency of health care practitioners providing services;
 - Decrease the burden of travel for those travelling to receive services and those travelling to provide services; and
 - Strengthen health human resource capacity in areas outside of the lower mainland through use of telehealth and enabling technology for knowledge and skill transfer;
- technical and human infrastructure to support widespread adoption, utilization and support for the technical integration; and
- recommendations/lessons learned that would inform the future development of pediatric services through telehealth and enabling technology and the further development of telehealth and technical infrastructure to support service delivery and knowledge transfer.

Expected Long Term Impact

Three areas for long term impact of a successful project include:

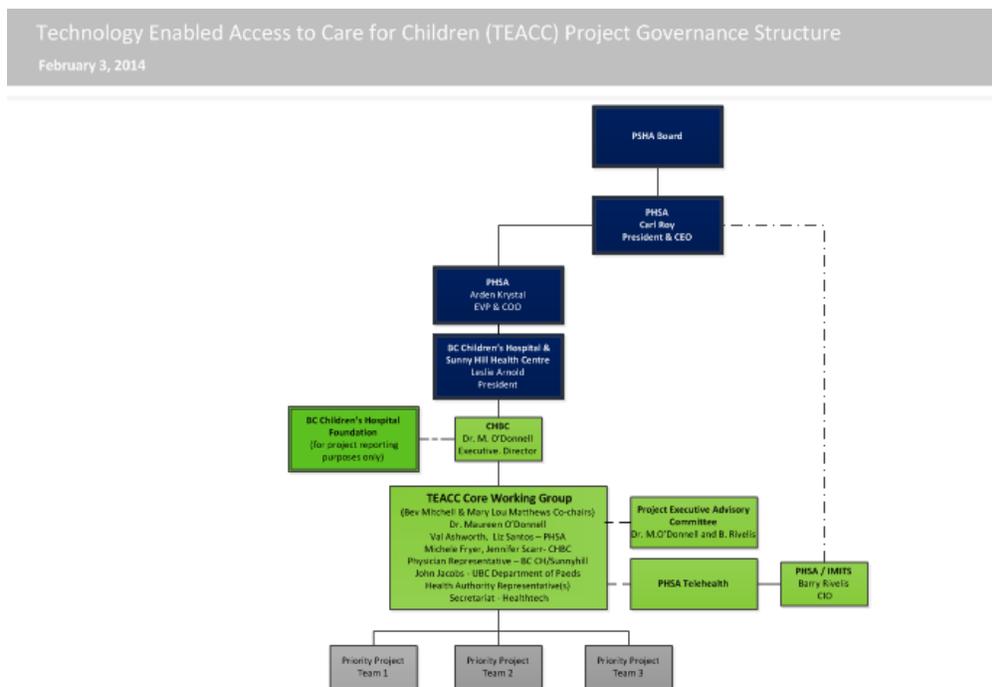
- Increased timely access to care for children and their families living in more rural and remote communities in BC through the seamless integration of technology such as videoconferencing, home health care (remote monitoring), store and forward technologies into the clinical practice of providers across the health care continuum.

- Enhanced capacity of regional providers through increased opportunities for communication and relationship building among the many child health care providers.
- Increased efficiencies, reduced cost and inconvenience, and improved satisfaction for parents who are able to have clinical services closer to home provided via technology. While Phase I is focused on two way video-conferencing, it is recognized that future initiative will include other enabling technologies once they are technologically viable in BC.



Project Governance Structure

A project governance structure was created:



III DEVELOPMENT OF MULTI- PRONGED APPROACH

It was recognized that two major avenues of work would need to be undertaken:

- The identification and development of viable regional sites through which the services for multiple clinical areas could be developed and delivered on a reliable basis. These sites would be tested in “phase I” but would be sites then established for the addition of more clinical service areas in future phases.
- The identification and development of clinical pathways/protocols for appropriate clinical areas/sub-projects.

There is direct inter-play between these bodies of work. The clinical areas demonstrate the kinds of clinical demands that will be placed on the technology (such as digital stethoscope, high definition exam camera, digital oto-scope, ability to show drawing and x-rays to families etc.) and the regional clinical site (personnel, pediatric equipment, other specific technologies, labs, and clinical acumen). The regional site development involves meeting the identified needs, anticipating and then creating sufficient volume at the site for the required clinical supports to be in place. Therefore these two avenues of work must be created in an inter-digitated fashion.

IV SELECTION OF “PRIORITY” (PHASE ONE) CLINICAL AREAS/PROJECTS

After a review of other jurisdictions and tele-health related literature, selection criteria for the first phase projects (i.e. “priority” projects) were selected using the following components were used to guide the selection of the priority projects with a rating scale created using the following key components:

- grounded in clinical need
- potential for province-wide delivery and impact (sufficient volumes in this early phase)
- based on/consistent with the Tiers of Service framework
- leverage existing infrastructure (people, process, technology) where possible
- strong and broad stakeholder support for the focus (receiving end AND consulting end)
- positioned for success
- across the three projects, different models of care to be represented (so that various clinical scenarios could be tested to ensure future utility for a broad range of additional clinical uses)

Over 30 potential projects were identified after consultation with the Steering Committee, Regional Health Planners, Regional Telehealth Coordinators, and physicians from sub-specialties at BC Children’s Hospital. A thorough review of each was undertaken.

After the review process was completed, the following list of three sub-projects was selected for implementation in the first wave of initiatives.

1.Sub-specialty Pediatric Project

After the review process was completed, the following sub-projects were identified with respect to supporting elective, scheduled paediatric consultations for:

- Neurology (epilepsy & ketogenic diets clinics)
- metabolic disorders (TIDE, PKU and General clinics) (low volume, multi-disciplinary, need high definition cameras)
- gastro-intestinal (high volume Tier 4)
- endocrinology (lower volume Tier 4)
- diabetes (higher volume, multi-disciplinary at a local level and centrally)
- cardiology (requirement for digital stethoscope)
- oncology/BMT has been added since originating the project due to specific patient need

For each of these sub-projects (clinics), Tele-health protocols are then developed. The protocols (see Diabetes example) assist in all stages of identification of appropriate patients, booking, registering, technological aspects, and clinical requirements at the regional site (e.g. what does a nurse need to do?) and follow-up aspects. Dictation and sharing of findings is included. These aspects must be developed in order to ensure that every regional site knows what specifically they must be able to deliver on for such patients.

2.Surgical Patient Journey Project:

The team felt it important to develop Tele-health capacity for surgery. The following sub-projects exist within the surgical patient journey project:

- Pre-operative assessment for general surgery
- Pre-operative anaesthesia, nursing and child life assessment
- Post-operative surgical follow-up via tele-health.

3.Tele-PICU Project:

The tele-PICU project was initiated by requests from Regional Health Authorities for support in caring for critically ill children while awaiting transfer (or if transfer is not deemed required by PICU). This request was met with interest from the PICU.

The Tele-PICU project will create on-demand 24/7 pediatric intensivist (and multi-disciplinary) consultation for patients outside of the lower mainland and for whom care may be delivered safely outside of BC Children's as well as videoconferencing connectivity to PICU to plan for patient transfers and/or provide management advice.

These services delivered via tele-health will be the first 24/7 on demand tele-health clinical services to be delivered to ANY patients of ANY age group in BC!

V REGIONAL SITE IDENTIFICATION AND SITE READINESS ASSESSMENT

After assessment of patient volumes, anticipated need by patients, and with extensive consideration of Regional requests and consideration, the following 18 sites were identified as the initial sites for development. Some (as of June 12, 2015) have their development completed, others are near completion. They are as follows:

Sites now prepared, running and ready for pediatric telehealth:

Interior Health Authority

- Caribou Memorial Hospital (Williams Lake)
- Vernon Jubilee Hospital
- Kelowna General Hospital

Island Health Authority

- Nanaimo Regional General Hospital
- Mount Waddington area:
 - Port Hardy Hospital,
 - Port McNeill Hospital,
 - Port Alice Hospital,
 - Sointula Health Centre

Sites in development/near readiness (awaiting equipment orders etc):

Interior Health Authority

- Royal Inland Hospital (Kamloops)
- Kootenay Lake Hospital (Nelson)
- Kootenay Boundary Regional Hospital (Trail)
- East Kootenay Regional Hospital (Cranbrook)

Island Health Authority

- Campbell River & District General Hospital
- West Coast General Hospital (Port Alberni)

Vancouver Coastal Health Authority

- Powell River General Hospital
- Bella Coola, Bella Bella

Tele-PICU Initiative: Plans and feasibility study is underway to provide on-demand intensivist and subspecialist consultation for patients requiring a high acuity of care and support at remote sites. Discharge planning using telehealth technology between the two major paediatric centres and regional hospitals is also being tested to facilitate patient transfers. This requires mobile tablets and additional technologies for bridging with multiple centres (e.g. regional site- Victoria PICU-BCCH PICU OR regional site – BCCH PICU – Intensivist at home overnight). Therefore the following demonstration sites are participating in the Tele-PICU initiative:

- BC Children's Hospital

- Victoria General Hospital
- Nanaimo Regional General Hospital
- Kootenay Boundary Regional Hospital (Trail)

VI PROTOCOL DEVELOPMENT

CHBC staff, the clinical telehealth staff within the PHSA Telehealth Program and representative groups of clinicians have prepared detailed protocols for each subspecialty telehealth service to support a standardized approach for the users throughout BC. These protocols are based on a comprehensive template integrating specific clinical and technological procedures. They are essential if BCCH are to be reassured that the clinical encounter will be suitable for them to provide useful opinion regarding the child. They are essential if the local staff members are to anticipate the needs of each patient. Most importantly, we hope they will allow for high levels of patient satisfaction with the visits.

VII EQUIPMENT

In addition to the clinical sub-committees created to develop the clinical needs for each area, Technical sub-committees have been required for each project. These have been led by representatives from the PHSA Telehealth Program in collaboration with CHBC staff and representation from the regional health authorities. These groups work to identify standardized equipment requirements and inventory necessary to support the efficient successful operation for the range of clinical videoconferencing events related to the expansion of the regional subspecialty telehealth services, the surgical patient journey project and the Tele-PICU demonstration project.

Detailed equipment lists have been prepared and a Memorandum of Understanding to support the collaborative arrangement with the Health Authorities is being finalized. The MOU outlines the nature of the relationships between CHBC and the RHA's and denotes the nature of the "leveraging" that is expected with respect to the equipment and its sustainability and use.

VIII TRAINING REQUIREMENTS

In order for this initiative to be successful, the operation must be easy and as seamless as possible for the clinical providers. Vigilant training mechanisms need to occur and mechanisms for sustainment be established.

Through our project charter, PHSA Telehealth Program is leading much of this work in collaboration with our partners in the Health Authorities. This includes training approaches for all users: booking clerks, physicians, physician assistants, nurses and allied health professionals, and information for families and patients.

IX EVALUATION

A review of the literature was completed with respect to evaluation of Tele-health. In addition, telephone consultation with international leaders in Pediatric Telehealth was useful in determining a practical baseline evaluation strategy. It is recognized that in addition to this, specific more academically oriented projects may and should be undertaken in the context of our academic health centre environment.

Based on the literature and key informants, and using Canada Health Infoway evaluation framework suggestions, the following dimensions are proposed to form the basis for the evaluation of this TEACC initiative:

- acceptability
- appropriateness
- accessibility
- safety
- effectiveness
- efficiency
- care coordination (for the Tele-PICU project only)

There was desire for the baseline evaluation strategy to be sufficiently generic across all TEACC projects so that sufficient numbers could be generated to draw conclusions from which quality improvement could occur. It is recognized that specific services (e.g. surgery, neurology) may have additional questions for which we wish to generate additional evaluative information, especially in the academic/research context.

The following table outlines the key target stakeholders and the mechanisms through which we are gathering baseline information for evaluation:

Table: Stakeholders and evaluation information gathering

Target Stakeholder	Proposed Instrument(s)	How will Data Will Be Captured	Frequency of Data Capture	Reporting Frequency
Patient/Family Member	Patient/Family Questionnaire (1 for each of the projects)	Hard copy survey administered by patient site and faxed to CHBC	On the first telehealth visit	Reported Quarterly
Consulting Clinician	Consulting Clinician Questionnaire (1 for each of the projects)	Questionnaire will be administered through on-line system	Three times per year at standardized, pre-determined dates.	Reported after each administration of the Questionnaire
Clinician Assisting on the Patient Side (if any)	Patient Side Clinician Questionnaire	Questionnaire administered by telephone interview	Three times per year at standardized, pre-determined dates.	Reported after each administration of the Questionnaire
Medical Office Assistant Consulting	MOA Questionnaire (1 only)	Administered by telephone interview	TBD.	Reported after each administration of the

				Questionnaire
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Indicators

It is acknowledged that the context of the priority projects may vary and that there may be nuances in how the elements are measured for each initiative. The following represents measures, indicators and data sources that could be applied to all TEACC projects.

Table: Indicators (for across all projects) (ie. “generic”)

Evaluation Dimension	Proposed TEACC Measure	Proposed TEACC Indicator	Data Source
Acceptability (Patient/Family)	<ul style="list-style-type: none"> % patient/family members reporting receiving care via telehealth acceptable (I-1) 	# patient/family members who report 'acceptable' when <u>completing a survey</u> x 100 total # patient/family members responding	<ul style="list-style-type: none"> Patient/Family Survey
Acceptability (Provider – where 'provider' includes all team members at the consulting site and those participating at the patient site)	<ul style="list-style-type: none"> % of providers reporting that delivery of care via telehealth is acceptable (I-2) 	# of providers who report perceived acceptance of telehealth for care delivery when <u>completing a survey</u> x 100 total# of providers responding	<ul style="list-style-type: none"> Consultant and Clinical Support Surveys
	<ul style="list-style-type: none"> % of consulting providers reporting ease of use of telehealth technology and related processes (I-3) 	# of consulting providers who report ease of use when <u>completing a survey</u> x 100 total# of providers responding	<ul style="list-style-type: none"> Consultant Survey
	<ul style="list-style-type: none"> % of patient-site clinicians reporting ease of use of telehealth technology and related processes (I-4) 	# of patient-site clinicians who report ease of use x 100 total# of patient-site clinicians responding	<ul style="list-style-type: none"> Clinical Support Survey
Appropriateness	<ul style="list-style-type: none"> % of providers reporting care delivered through telehealth to be appropriate (I-5) 	# of providers who report that care delivered through telehealth is appropriate _____ x 100 total# of providers responding	<ul style="list-style-type: none"> Consulting and Clinical Support Surveys
Accessibility	<ul style="list-style-type: none"> % of patient/family members reporting perception of improved accessibility (I-6) 	# of patient/family members who report perception of improved accessibility to care when completing a <u>survey</u> _____ x 100 total # of patient/family members responding	<ul style="list-style-type: none"> Patient/Family Survey
Patient Safety	<ul style="list-style-type: none"> % of providers reporting that care is delivered safely through telehealth (I-7) 	# of providers who report that care delivered through telehealth x 100 total# of providers responding	<ul style="list-style-type: none"> Consulting and Clinical Support Surveys

Evaluation Dimension	Proposed TEACC Measure	Proposed TEACC Indicator	Data Source
Effectiveness	<ul style="list-style-type: none"> % of providers reporting that care delivered through telehealth is effective (I-8) 	$\frac{\text{\# of providers who report care delivered as effective} \times 100}{\text{total\# of providers responding}}$	<ul style="list-style-type: none"> Consulting and Clinical Support Surveys
Efficiency	<ul style="list-style-type: none"> % increase in # of patients seen post introduction of telehealth (I-9) 	$\frac{\text{\# of patients seen/month post telehealth} - \text{\# of patients seen/month pre-telehealth/}}{\text{\# patients seen/month pre-telehealth} \times 100}$	<ul style="list-style-type: none"> Karen Epp to provide best source(s) for non-telehealth components
Patient and Caregiver Participation	<ul style="list-style-type: none"> # of clinical events/month # of clinical events/month per patient site 	<ul style="list-style-type: none"> % increase quarter over quarter % increase quarter over quarter 	<ul style="list-style-type: none"> PHSA Telehealth Utilization Database PHSA Telehealth Utilization Database

It is proposed that two additional indicators be captured for the Surgical Patient Journey Project as follows:

Table: Proposed Surgical Patient Journey Additional Measures/Indicators

Evaluation Dimension	Proposed TEACC Measure	Proposed TEACC Indicator	Data Source
Awareness (referring clinicians)	% increase in the # of unique sites that have hosted patients from the end of the first 3 months to the end of the first 12 months after the project 'goes live'	$\frac{\text{\# of unique sites hosting patients as of the end of month 12} - \text{\# of unique sites hosting patients as of the end of month 3}}{\text{\# of unique sites hosting patients as of the end of month 3}} \times 100$	<ul style="list-style-type: none"> PHSA Telehealth Utilization Database
Awareness (providers)	% increase in # of providers offering surgical related services via telehealth from the end of the first 3 months to the end of the first 12 months after the project 'goes live'	$\frac{\text{\# of unique providers providing surgical related services via telehealth as of the end of month 12} - \text{\# of unique providers provide surgical related services via telehealth as of the end of month 3}}{\text{\# of unique providers provide surgical related services via telehealth as of the end of month 3}} \times 100$	<ul style="list-style-type: none"> PHSA Telehealth Utilization Database

Incorporating and further developing these indicators, tools have been developed to gather this information as noted in the prior table.

In addition to this basic evaluation, an additional more academically oriented project with respect to surgical patient journey has been undertaken through successful attainment of a summer student. We hope to see additional such projects develop.

X PROJECT RISK MANAGEMENT

While the clinical services and regional sites are moving forward, the following are areas which are associated with risk/delay in meeting clinical deliverables:

- Provincial policies and procedures: This project has revealed the complexities of establishing a provincial telehealth program without a provincial strategy. To diminish risk, briefing papers have been developed.
- Provincial policy and procedures: Tele-PICU requires 24/7 technology support. While this has been now viable for 2/3 of sites, efforts are progressing with the remainder.
- Provincial procedure/Technology: Tele-PICU requires mobile/tablet solution that can bridge from outside the hospital in the ICU's for consultants. Testing is underway but solution is not yet finalized.
- Clinical: Some clinical areas are less enthusiastic re considering tele-health as a viable clinical resource for their patients
- Clinical: Using tele-health as an alternative is not yet an established "top of mind" option for booking clerks and others who might be responsible for booking even once established protocols are in place. Clinical championing is required.
- Technology: Delays in obtaining clinically important technology for all sites (e.g. digital stethoscope access for all regional sites) (service contract expiry issue for HA's)
- Regional health authorities: while negotiation regarding nature of equipment is complete, finalization of the MOU regarding equipment use and stewardship is not complete. (near completion)
- Regional health authorities: Northern Health choosing to proceed with "one of" clinical assessments only and not wanting to proceed with development of clinical regional sites until other decision making regarding services in HA is complete.
- Regional health authorities: Fraser health has a moratorium on clinical tele-health. They are using video-conferencing for education and administrative functions only.
- Evaluation is underway with live patients, but not sufficient volumes as of yet for results. Anticipate using a QI approach.

XI NEXT STEPS

The project team is enthusiastically planning the next steps/milestones:

- Complete the MOU and equipment order (both for technical and pediatric clinical equipment items) with HA's
- Finalize a sustainable strategy, protocols and resources (equipment, HR, processes, technology) to support the Phase I regional sites and Phase I clinical service areas
- Complete training of users and mock patients
- Complete successful demonstration for Tele-PICU project
- Complete evaluation and respond to recommendations

- Increase volume for patient videoconferencing for the current Phase 1 clinical services, and refine protocols
- Identify Phase II sites in regions
- Identify additional Phase II clinical areas projects within Surgery and pediatric sub-specialties
- Explore potential for use of pediatric tele-health from an established regional site (e.g. Kelowna) with their provincial sites as a means to provide Tier 3/2 peds to Tier 1.
- Explore potential for ED use regarding acutely ill children, children and youth with mental health condition in ED (once 24/7 issues resolved.)