

TIERS
IN FULL

CHILDREN'S MEDICAL SERVICES

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Children’s Medicine Services: Tiers in Full to Support Operational Planning

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HOW TO CITE THE CHILDREN'S MEDICINE SERVICES:

We encourage you to share these documents with others and we welcome their use as a reference. Please cite each document in the module in keeping with the citation on the table of contents of each of the three documents. If referencing the full module, please cite as:

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NOTE

This April 1, 2017 version has been updated to incorporate (1) pediatric medical subspecialties; and (2) the change in numbering to T1-T6. While it builds on the previously validated Children's *General* Medical Services document, this updated version has not, as of yet, been validated by a Provincial Working Group. The latter will occur prior to initiation of the self-assessment.

Children's Medicine Services: Tiers in Full to Support Operational Planning

1.0 Medical Tiers of Service

1.1 Module Development

The Children's Medicine module is made up of three components:

1. Setting the Stage for Tiers Development (provides the context)
2. Tiers in Brief to Support System Planning (high-level description of the tiers, including responsibilities and requirements)
3. Tiers in Full to Support Operational Planning (detailed description of the responsibilities and requirements at each tier) (*this document*)

This document, **Children's Medicine: Tiers in Full to Support Operational Planning**, provides a detailed description of the responsibilities and requirements of services provided at each tier by *generalist* and *pediatric specialist and subspecialist* health care providers to healthy children and children with medical conditions. It builds on and is intended to be used in conjunction with the *Children's Medicine: Tiers in Brief to Support System Planning*.

The module was developed by an interdisciplinary working group comprised of a representative(s) from each of BC's HAs (various combinations of pediatricians, a pediatric subspecialist, nurses, allied health, directors/managers and planners), the BC Pediatric Society, a Child Development Centre, Child Health BC, family physicians and a meeting facilitator. In addition to the working group, representatives from all BC HAs (including the First Nations HA) and other constituent and topic-specific groups were invited to provide feedback on the draft document. The final version was submitted to and accepted by the Child Health BC Steering Committee.

The document was informed by work done in other jurisdictions, mostly notably Queensland,¹ New South Wales,²⁻⁵ Australia⁶ and the United Kingdom.^{7,8} B.C. data was used where it was available, as were relevant BC and Canadian standards and guidelines (e.g., Accreditation Canada standards,⁹ Provincial Privileging Pediatric Medicine document,¹⁰ Provincial Privileging Pediatric Subspecialty Medicine documentsⁱ and the Royal College of Physicians and Surgeons Objectives of Training documents for Pediatric Medicine and Medical Subspecialtiesⁱⁱ).

ⁱ Current versions of the provincial privileging documents are available at:
<http://bcmqi.ca/home/privileging>.

ⁱⁱ Current versions of the Royal College Objectives of Training are available at: www.royalcollege.ca.

1.2 Module Scope

The Children's Medicine module focuses on care provided to children as follows:

1. Hospital-based and accessible as follows:ⁱⁱⁱ
 - a. New patients: Up to a child's 17th birthday (16 years + 364 days); and
 - b. Children receiving ongoing care: Up to a child's 19th birthday (18 years + 364 days).
2. Community-based: Delivered in a variety of community settings (e.g., Child Health Clinics, Child Development Centres, Public Health Units, Community Health Centres, Nursing Stations, schools and on-reserve).

2.0 Children's Medical Tiers in Full

The Children's Medicine module recognizes each of the 6 tiers in the Child Health Tiers of Service framework:

- Children's *General Medical Services*: T1, T2, T3 and T4.
- Children's *Enhanced & Subspecialty Medicine Services*: T5 and T6.

2.1 Differentiation of the Tiers

2.1.1 Definitions

"Acuity" and "medical complexity" are the terms used to differentiate the tiers from each other. Refer to Appendix 1 (Tiers in Brief document) for definitions of these terms and a description of the relationship between acuity, medical complexity, frequency and tier of service. Examples of children who would be expected to receive services at each tier are also included. Table 1 provides a "summary" version.

Table 1: Children Appropriate to Receive Services at Each Tier (Medical Complexity, Relative Frequency & Acuity)

		Prevention, Primary & Emergent Medical Service			General Medical Service			Child-Focused Medical Service			Children's Comprehensive Medical Service			Children's Regional Enhanced & Subspecialty Medical Service			Children's Provincial Subspecialty Medical Service		
		T1			T2			T3			T4			T5			T6		
Underlying Condition		Acuity of Presenting Complaint																	
Medical Complexity	Relative Frequency	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High	Low	Med	High
Healthy																			
Low																			
Med	Common																		
	Uncommon																		
High	Common													*	*				
	Uncommon																		

*Applicable only if relevant medical subspecialty team is available.

ⁱⁱⁱ BC Children's Hospital. Administration manual: Admission age, BCCH and Sunny Hill Hospital for Children. 2010.

2.2 Responsibilities and Requirements at each Tier

This next section describes the **responsibilities** and **requirements** at each tier to provide a **safe, sustainable** and **appropriate** level of service.

Sections are divided as follows:

- 2.2.1 Clinical Service
 - 2.2.1.1 Hospital inpatient services
 - 2.2.1.2 Hospital-based outpatient services
 - 2.2.1.3 Community-based services
- 2.2.2 Knowledge sharing & transfer/training
- 2.2.3 Quality improvement & research

2.2.1 Clinical Service

2.2.1.1 Hospital Inpatient Services

A. Responsibilities

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1	Service reach	Local community.	Local community/local health area. ^{iv}	Multiple local health areas/health service delivery area.	Health service delivery area/health authority.	Health authority.	Province.
2	Service focus	Supports the health & well-being of infants, children, youth & their families (<i>community-based service</i>).	Diagnoses & provides definitive treatment for children with low acuity/complexity medical conditions.	Diagnoses & provides definitive treatment for children with relatively common, medium acuity/complexity medical conditions.	Diagnoses & provides definitive treatment for children with a broad range of medium acuity/complexity medical conditions (including complex psychosocial issues).	Diagnoses & provides definitive treatment for children with high acuity &/or relatively common high complexity conditions (including complex psychosocial issues). The range of conditions is dependent upon the types of subspecialists available.	Diagnoses & provides definitive treatment for children with a broad range of high acuity &/or high complexity medical conditions (including complex psychosocial issues), many of whom require care from multiple pediatric subspecialty teams.
3	Monitoring		Provides q4h monitoring (TPR, BP, O2 saturations, input & output & blood sugars). If required beyond 48 hrs, child is usually transferred to a centre with dedicated pediatric inpatient beds. Provides enhanced level of monitoring (e.g., 1:1 or 1:2 RN/pt ratio) for a time-limited period for children expected to improve	Same as T2 plus: Provides q2h monitoring.	Same as T3 plus: Provides q1h monitoring. Refer to Children's Critical Care Module for availability of critical care services.	Same as T4 plus: Provides intensive monitoring which may be more frequent than q1h for prolonged periods. Refer to Children's Critical Care Module for availability of critical care services.	Same as T5.

^{iv} See www.bcstats.gov.bc.ca/statisticsbysubject/geography/referencemaps/Health.aspx for a listing of LHAs in BC.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
			quickly (e.g., post-procedure) &/or awaiting transfer to higher tier. Level of monitoring can be safely delivered on a pediatric unit by RNs with general pediatric skills.				
4	Deteriorating / emergency situations		Uses BC Pediatric Early Warning System (PEWS) to identify, communicate, mitigate & escalate signs of clinical deterioration. Stabilizes critically ill children while arranging & awaiting transfer to higher tier. Determines most appropriate location within facility to maintain critically ill child while awaiting transfer (dependent on local resources). Performs CPR .	Same as T2.	Same as T3. Refer to Children's Critical Care Module for availability of critical care services.	Same as T4. Refer to Children's Critical Care Module for availability of critical care services.	Same as T5. Refer to Children's Critical Care Module for availability of critical care services.
5	Mental health crises during medical admission		Assesses, stabilizes & takes action to meet immediate safety needs, including risk of harm to self (suicide) & others. Referral pathways are in place to access mental health professionals , including consultation with a general psychiatrist <i>within the HA</i> by	Assesses, stabilizes & takes action to meet immediate safety needs, including risk of harm to self (suicide) & others. Referral pathways include access to a general psychiatrist who is on-call 24/7 & available to come on-	Same as T3.	Same as T4 plus: Referral pathways include access to on-site consultation from a child & youth psychiatrist (days, M-F) & general psychiatrist (outside these hours).	Same as T5 plus: Referral pathways include access to on-site consultation from a child & youth psychiatrist 24/7 .

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
			<p>telephone, during mental health crises.</p> <p>Works with children/families to develop discharge safety plan. Links with appropriate community services.</p> <p>As required, arranges transfer to higher tier.</p> <p>If criteria for involuntary admission under the Mental Health Act are met, completes documentation & arranges transfer to designated facility. Provides safe environment until transfer is made.</p>	site as required.			
6	Child & family teaching		Provides teaching for children/families with low acuity/complexity medical presentations.	Provides teaching for children/families with medium acuity/complexity medical presentations.	Same as T3.	Provides teaching for children/families with high acuity &/or relatively common high complexity medical presentations.	Provides teaching for children/families with high acuity/complexity medical presentations.
7	Discharge planning		<p>Creates & implements discharge plans which involve referrals to local community-based services. (e.g., IDP, PT, OT, SLP, audiologist, PHN).</p> <p>Implements plans for children with complex</p>	Same as T2.	In collaboration with providers in the child's home community, creates & implements complex discharge plans which may involve referrals to pediatric specialists/	Same as T4.	<p>Same as T4 plus:</p> <p>In collaboration with providers in the child's home community, creates & implements complex discharge plans which may involve multiple pediatric</p>

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
			discharge needs that were developed by/in collaboration with services at higher tiers.		subspecialists (e.g., nursing support services, at-home program, specialty clinics). Implements plans for children with complex discharge needs that were developed by/in collaboration with services at higher tiers.		specialists/ subspecialists & resources/equipment (e.g., NG or CVC care at home, home vent, home TPN, etc).
8	Pain management		Assesses pain using age & developmentally appropriate pain assessment tool(s). Provides age & developmental stage appropriate pain relieving interventions. Administers weight-based doses of analgesics via topical, oral, enteral, intranasal & rectal routes. Manages complications of analgesia (e.g., manage airway, administer antidotes).	Same as T2 plus: Administers weight-based doses of analgesics via SQ & IM injection & intermittent IV routes.	Same as T3 plus: Administers analgesics via patient controlled IV route. Administers analgesics via continuous IV to children ages 2 years & over.	Same as T4 plus: Optional (not required): May provide epidural anesthesia/analgesia if: (a) pediatric anesthesiologist on-call 24/7, available on-site as needed & is comfortable with plan; & (b) nurses have received specific education & are comfortable with the plan.	Same as 5 plus: Manages pain for children of any age that requires an extended & innovative range of options & routes. Includes regional analgesia/ anesthesia (e.g., epidurals, nerve blocks).

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
9	Procedural sedation/analgesia <i>(in addition to services provided in the OR & ED)</i>			Administers oral sedation/analgesia . Assumes availability of appropriate staffing, monitoring equipment & resuscitation equipment.	Same as T3 plus: If a site or HA procedure is in place that is in keeping with children's needs & safety, intranasal, IM & IV sedation/analgesia may be administered. Assumes availability of appropriate staffing ^v , monitoring equipment & resuscitation equipment.	Administers oral, intranasal, IM & IV sedation/analgesia . Assumes availability of appropriate staffing ^v , monitoring equipment & resuscitation equipment.	Same as T5.
10	Parenteral fluid & medication management		Initiates & maintains continuous peripheral IV infusions with pre-mixed electrolytes . Administers common intermittent IV medications via syringe & mini-bag (e.g., antibiotics). Excludes analgesics. Smart IV pumps ^{vi} used for all children on IVs.	Same as T2 plus: Administers a range of intermittent IV medications via syringe & mini-bag (e.g., antibiotics, opiates). Maintains PICC lines .	Same as T3 plus: Initiates PICC lines . Initiates & maintains short & long-term CVCs. Accesses, maintains & deaccesses venous access devices . Initiates & maintains high risk peripheral IV medication infusions (e.g., insulin).	Same as T4 plus: Inserts venous access devices (in the OR).	Same as T5.

^v MD with PALS or equivalent + MD/RN/RT familiar with pediatric resuscitation procedures must be present during the procedure, as well as a 3rd MD/RN/RT readily available to assist in the event of an emergency.

^{vi} A "smart pump" has customizable software with a library of medications that can be programmed for different patient groups and provide alerts such as clinical advisories, soft stops and hard stops.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
11	Blood & blood component administration			Initiates & maintains infusions of blood & blood components.	Same as T3.	Same as T3.	Same as T3.
12	Nutrition management		<p>Provides health promoting nutrition advice & proactive surveillance for children with stable nutrition needs & low complexity medical conditions. e.g., normal nutritional requirements, management of food sensitivities, healthy eating & healthy weights, accurate weights & measures.</p> <p>Inserts, replaces & maintains NG tubes for short-term hydration. Verifies placement using x-ray.</p> <p>Replaces & maintains established G-tubes.</p> <p>Continues established for nutritional intake while in hospital (oral or via tube). Does not initiate new mechanism.</p> <p>Supports breastfeeding mothers & assists with breastfeeding-related challenges.</p>	<p>Same as T2 plus:</p> <p>Provides nutrition advice & growth & monitoring for children with stable nutrition needs & common medium complexity medical conditions. e.g., uncomplicated failure to thrive, fluid management, dehydration.</p> <p>Determines selection & amounts of standard oral & enteral formulas for oral intake.</p>	<p>Same as T3 plus:</p> <p>Provides nutrition advice & growth monitoring for children with stable nutrition needs & a broad range of medium complexity medical conditions.</p> <p>Determines selection & amounts of & specialized oral & enteral formulas for oral or enteral intake.</p> <p>Inserts, replaces & maintains NG tubes required for nutritional management.</p> <p>Replaces established surgically-placed J-tubes (in OR).</p> <p>Establishes & replaces NJ tubes (in radiology).^{vii}</p>	<p>Same as T4 plus:</p> <p>Provides nutrition advice & growth monitoring for children with significant (but stable) nutrition vulnerabilities & medical complexities.</p> <p>Makes decision & establishes G & J-tubes.</p> <p>Makes decision & establishes GJ tubes.</p> <p>Replaces established GJ tubes (in radiology)</p> <p>Available as a resource <i>within the HA</i> on days, M-F.</p>	<p>Same as T5 plus:</p> <p>Provides nutrition advice & growth monitoring for children with changing & complex nutrition needs & all levels of medical complexity.</p> <p>Available as a resource <i>throughout the province</i> on days, M-F.</p>

^{vii} Assumes availability of an adult or pediatric interventional radiologist who is comfortable providing care for children. If not available, refer to T5/T6.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
					<p>Establishes & maintains central venous access for delivery of parenteral nutrition for hospital & outpatient use.</p> <p>Initiates, administers & monitors TPN.</p> <p>Teaches children/families about home enteral nutrition.</p>		
13	Respiratory management		<p>Provides simple respiratory monitoring & interventions (e.g., O₂ saturations, peak flow & spirometry measures, nebulizer & metered-dose inhaler (MDI) treatments).</p> <p>Provides O₂ when stabilizing child for transfer.</p>	<p>Same as T2 plus:</p> <p>Provides supplemental O₂ up to 40% in children who are stable & showing signs of improvement. Resolution is expected within 2 -3 days.</p>	<p>Same as T3 plus:</p> <p>Provides supplemental O₂ up to 40% in children who are stable & not deteriorating. Resolution is expected within 1 - 2 weeks.</p> <p>Refer to Children's Critical Care Module for provision of critical care services.</p>	<p>Same as T4.</p> <p>If O₂ requirements exceed those described for T4, consults with PICU MD.</p>	<p>Same as T5 plus:</p> <p>Provides care to children with a stable airway & stable ventilator requirements.</p> <p>Provides care to children that require CPAP & BIPAP if:</p> <ul style="list-style-type: none"> • Child can breathe on unassisted for ≥2 hrs; & • Appropriately trained staff available for constant monitoring (RN/patient ratio at least 1:2); & • Pediatric RT available to respond within 15 minutes. <p>If above conditions not met, consults T6 PICU MD.</p>

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
14	Psychosocial & spiritual support		<p>Supports children/families with routine psychosocial/emotional needs (e.g., provides information about what to expect during hospital stay; tip sheets/picture books on helping children get through blood work/procedures).</p> <p>Consults with T3-T6 providers &/or refers to psychiatrist in situations requiring specialized support, as required (e.g., unexpected death, complicated grieving, end of life).</p>	Same as T2.	<p>Provides specialized counselling for children/families with complicated psychosocial/emotional needs.</p> <p>Undertakes targeted interventions to reduce fear, pain &/or anxiety related to a child's diagnosis, hospitalization, treatment or procedure. May be group or 1:1.</p> <p>Upon request, provides consultation to providers within the HA on ways to support the psychosocial/emotional care of children/families.</p>	Same as T4 plus: Assesses, formulates diagnoses & provides 1:1 psychological interventions for referred children/families with acute &/or complex med/surg conditions.	Same as T5 plus: Upon request, provides consultation to providers throughout the province on ways to support the psychosocial/emotional & psychological care of children/families with acute &/or complex med/surg conditions.
15	Child maltreatment (neglect & physical, sexual & emotional abuse)		<p>Recognizes suspected cases of child maltreatment.</p> <p>Takes action to ensure immediate medical & safety needs are met,</p>	Same as T2 plus: Provides consultation & follow-up for children referred for suspected maltreatment.	Same as 3 plus: Refers complex cases to regional/provincial child protection team, if required.	Same as T3.	Same as T4 plus: Provides advanced on-site diagnostic & treatment services for suspected cases of child maltreatment.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
			findings documented & appropriate cases reported to MCFD as per the Child, Family & Community Service Act. Refers cases to pediatrician or local/regional/ provincial child protection team, if required.	Refers complex cases to local/regional/ provincial child protection team, if required.			Coordinates follow-up of cases referred from throughout the province . Services often provided in consultation with multiple medical, surgical & mental health subspecialists.

B. Requirements (Hospital Inpatient Services)

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1.0	Providers						
1.1	Team overview		Physicians, nurses, psychosocial & allied health professionals (as available) come together over the <i>care of an individual child</i> .	Same as T2.	Physicians, nurses, psychosocial & allied health professionals work consistently together as a <i>pediatric interdisciplinary team</i> .	Same as T4 plus: Pediatric subspecialists are available for on-site consultation in higher volume subspecialties which includes but is not limited to neurology & cardiology. Availability is typically days, M-F.	Same as T5 plus: Full range of pediatric subspecialists available for consultation &/or patient management 24/7.
1.2	Physicians/ NPs						
	FP/NP		If child in hospital, FP/NP on-call 24/7 & available on-site as needed. This excludes the ED MD.	Same as T2.			

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
	Pediatrician		Pediatrician from <i>within HA</i> available by phone or telehealth to discuss cases 24/7.	Pediatrician on-call 24/7 & available for on-site consultation as needed (available by phone within 10 min & on site within 45 min max). ^{viii}	Same as T3.	Pediatrician or designate (e.g., resident) <u>on-site</u> 24/7. This excludes ED MD.	Same as T5.
	Other MDs		General psychiatrist <i>available within HA</i> to discuss urgent cases & provide advice by telephone 24/7.	General psychiatrist on-call & available for on-site consultation 24/7. Child & adolescent psychiatrist <i>available within HA</i> to discuss urgent cases & provide advice by telephone 24/7.	See Table 2 for specialist/ subspecialist physician interdependencies.	See Table 2 for specialist/ subspecialist physician interdependencies.	See Table 2 for specialist/ subspecialist physician interdependencies.
1.3	Nurses		RNs assigned to children have "pediatric skills" (see glossary). Practice predominantly involves adults .	RNs assigned to children have "pediatric skills" (see glossary) & are regularly exposed to hospitalized children. Practice is predominantly with adults but includes some children. RNs have completed RN Pediatric Foundational Competency E-learning course, ENPC &/or PALS. Formalized pediatric orientation & ongoing education available.	RNs have "pediatric skills" (see glossary) & are continuously exposed to hospitalized children. RN practice is exclusively or primarily with children. RNs have completed RN Pediatric Foundational Competency E-learning course, ENPC &/or PALS.	Same as T4.	Pediatric RNs are continually exposed to hospitalized children. RN practice is exclusively or primarily children . Most have " enhanced skills " (see glossary) in relevant subspecialty area(s). RNs have completed RN Pediatric Foundational Competency e-learning course, ENPC, PALS &/or other appropriate pediatric education in relevant subspecialty area.

^{viii} Refer to the medical On-Call Availability Program (MOCAP) at www.health.gov.bc.ca/pcb/mocap.html. Actual response times depend on patient need & are determined on a case by case basis.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
					Formalized pediatric orientation & ongoing education available. Pediatric educator assigned to pediatric unit.		Formalized pediatric orientation & ongoing education available. Pediatric educator(s) assigned to pediatric unit(s).
1.4	Psychosocial professionals		Generalist social worker & spiritual care practitioner available on request on days, M-F, for individual cases. Practice is predominantly with adults.	Social worker with general pediatric knowledge & skills available on request on days, M-F, for individual cases. Practice may be predominantly with adults but includes some children. Spiritual care practitioner available on request for individual cases.	Social worker(s) with general pediatric knowledge & skills available days, M-F. Practice may include both adults & children. Child life specialist available days, M-F. Spiritual care practitioner on-call 24/7 & available on-site as needed. Volunteer program available that provides services to children/families (and adults) available days, M-F & after-hours by pre-arrangement.	Same as T4 except practice is exclusively or primarily with children or, if not, team members have significant exposure to facilitate development of pediatric-specific expertise. Plus: Psychologist with pediatric expertise. ^{ix} Practice may include both adults & children.	Pediatric social worker(s), psychologist(s), child life specialist & music therapist available days, M-F. Practice is exclusively or primarily with children. Child life specialist(s) available extended hours, 7 days/wk. Most have " enhanced skills " (see glossary) in relevant subspecialty specialty area(s). Spiritual care practitioner(s) on-call 24/7. Volunteer program available that provides services to children/families.

^{ix} Psychologist with pediatric expertise: Psychologist that has completed a Psychology Residency Program and has a demonstrated special interest, knowledge and skills in pediatric psychology. Pediatric knowledge and skills are acquired & maintained through clinical experience and special pediatric-focused continuing psychology education.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1.5	Allied health		<p>Generalist PT, OT & dietician available on request on days, M-F, for individual cases. Practice is predominantly with adults.</p> <p>Pediatric dietician available via HealthLink days, M-F.</p> <p>Generalist pharmacist available as per Accreditation Canada standards, including on-call service (standards not specific to pediatrics).</p>	<p>Staff with general pediatric knowledge & skills available on request for individual cases. Practice may be predominantly with adults but includes some children.</p> <ul style="list-style-type: none"> • RT available on-site days, M-F. On-call (& available to come to the site if required) outside these hours. • PT & OT available days, M-F (may be on-site PT/OT or PT/OT arrangement via service agreement). • Dietician available days, M-F. <p>Pharmacist as per T2.</p>	<p>Staff has general pediatric knowledge & skills. Practice may include both adults & children.</p> <ul style="list-style-type: none"> • RT available on-site 24/7. • PT & OT available days, M-F. • Dietician available days, M-F. • OT or SLP available to perform swallowing assessment days, M-F. <p>Pharmacist with pediatric expertise^x available on-site days, M-F. Outside these hours, general pharmacist is available on-call for telephone consultation.</p>	<p>Same as T4 except practice on days, M-F, is exclusively or primarily with children or, if not, team members have significant exposure to facilitate development of pediatric-specific expertise. After-hours coverage (if available) is usually provided by generalists.</p> <p>Clinical pharmacy specialist(s) in pediatrics^{xi} available on-site days, M-F. Outside these hours, general pharmacist is available on-call for telephone consultation.</p>	<p>Pediatric specialists with “enhanced skills” (see glossary) in relevant subspecialty area(s):</p> <ul style="list-style-type: none"> • RT available 24/7. • PT, OT & SLP available days, M-F. • Dietician available days, M-F. • OT or SLP available to perform swallowing assessment days, M-F. <p>Clinical pharmacy specialist(s) in pediatrics available on-site days, M-F. Outside these hours, general pharmacist with pediatric expertise available on-call for telephone consultation.</p>

^x Pharmacist with pediatric expertise: Pharmacist that has completed a Pharmacy Practice Residency Program and has a demonstrated special interest, knowledge and skills in pediatric pharmacy. Pediatric knowledge and skills are acquired & maintained through clinical experience and special pediatric-focused continuing pharmacy education.

^{xi} Clinical pharmacy specialist: Same as pharmacist with pediatric expertise except practice is exclusively or almost exclusively with children.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1.5	Mental health crisis response team			In-hospital mental health crisis response team available 24/7 (for adults & children).	Same as T3.	Same as T4.	Pediatric in-hospital mental health crisis response team available 24/7.
1.6	Other: <ul style="list-style-type: none"> • IV starts • Wound/ostomy • Pain management • Lactation consultant • Feeding & swallowing team • Complex feeding & nutrition service 		<p>Algorithm in place to manage difficult pediatric IV starts.</p> <p>Algorithm in place to manage breastfeeding related challenges.</p>	<p>Same as T1 plus:</p> <p>Referral pathway in place to access wound/ostomy RN.</p> <p>Referral pathway in place to access lactation consultant.</p>	<p>Same as T3 plus:</p> <p>Wound/ostomy RN on-site days, M-F (for adults & children).</p> <p>Pain management team on-site days, M-F (for adults & children).</p>	<p>Same as T4 plus:</p> <p>Pediatric feeding & swallowing team available locally to provide oral motor & dietary assessment/consultation days, M-F.</p> <p>Capacity available locally to perform videofluoroscopy feeding studies.</p>	<p>Algorithm in place to manage difficult pediatric IV starts.</p> <p>Pediatric wound/ostomy RN on-site days, M-F.</p> <p>Pediatric pain mgt team available on-site days, M-F.</p> <p>Lactation consultant on-site days, M-F.</p> <p>Pediatric feeding & swallowing team available on-site to provide oral motor & dietary assessment/consultation days, M-F.</p> <p>Capacity available on-site to perform videofluoroscopy feeding studies.</p> <p>Pediatric complex feeding & nutrition service available on-site.</p>

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
2.0	Facilities						
2.1	Pediatric beds		"Safe pediatric bed(s)" (see glossary) available for short-term inpatient stays (in the ED or general inpatient bed). No <u>dedicated</u> pediatric inpatient resources/beds.	Dedicated pediatric inpatient resources/beds . Beds meet criteria for "safe pediatric bed(s)" (see glossary). Physical separation of children & adults recommended.	Dedicated pediatric inpatient resources/unit . Unit meets criteria for "safe pediatric unit" (see glossary).	Same as T4.	Dedicated pediatric inpatient resources/units, grouped by specialties/subspecialties . Units meet criteria for "safe pediatric unit" (see glossary).
2.2	Intensive care beds					T5 PICU.	T6 PICU.
2.3	Mental health beds				Secure room exists in ED &/or on an inpatient unit. Youth mental health inpatient beds (ages 12 & over) available within the HA.	Same as T4.	Same as T4 plus: Child & youth mental health inpatient beds available on-site.
3.0	Clinical Diagnostic & Support Services	Refer to relevant modules (under development).					
4.0	Volumes						
4.1	Minimum volumes/year			Medical visits (day care & inpatient), ages 0 - 16.9 yrs: 200/yr (excl NICU) Inpatient med/surg days, 0 - 16.9 yrs: 500/yr (excl NICU)	Medical visits (day care & inpatient), ages 0 - 16.9 yrs: 500/yr (excl NICU) Inpatient med/surg days, 0 - 16.9 yrs: 1,300/yr (excl NICU)	Medical visits (day care & inpatient), ages 0 - 16.9 yrs: 1,000/yr (excl NICU) Inpatient med/surg days, 0 - 16.9 yrs: 5,000/yr (excl NICU)	Medical visits (day care & inpatient), ages 0 - 16.9 yrs: 4,000/yr (excl NICU) Inpatient med/surg days, 0 - 16.9 yrs: 20,000/yr (excl NICU)
5.0	Other requirements						
5.1	Medications		Processes in place for safe medication	Same as T2.	Same as T2.	Same as T2.	Same as T2.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
			<p>storage, dosage calculations & administration. Pre-calculated weight-based dosing guidelines available. Dosages calculated manually first & double-checked against references.</p> <p>System measures allow for easy differentiation between pediatric & adult medications & dosages, especially in emergency situations.</p> <p>Smart IV pumps^{xii} available for all children on IVs.</p>				
5.2	Equipment & supplies		See Appendix 1.	See Appendix 1.	See Appendix 1.	See Appendix 1.	See Appendix 1.

^{xii} A “smart pump” has customizable software with a library of medications that can be programmed for different patient groups and provide alerts such as clinical advisories, soft stops and hard stops.

Table 2: Specialist/Subspecialist Physician Interdependencies

The table below refers to physician interdependencies within T4, T5 & T6 centres. Interdependencies in T1, T2 & T3 centres are identified under “responsibilities” in the main table.

✓24/7 = on-call 24/7 & available for on-site consultation as needed.

✓ M-F days = available days M-F for on-site consultation as needed.

Service	Availability		
	T4	T5	T6
Pediatrician	✓24/7	✓ Pediatrician or designate <u>on-site</u> 24/7; excludes ED MD	✓ Pediatrician or designate <u>on-site</u> 24/7; excludes ED MD
Pediatric allergy			✓ M-F days
Anesthesiologist that provides care to children & adults	✓24/7	✓24/7	
Pediatric anesthesiologist			✓24/7
Pediatric biochemical/metabolic diseases			✓24/7
Pediatric bone marrow transplant			
Pediatric cardiology		✓ M-F days	✓24/7
Pediatric cardiovascular surgery			✓24/7
Pediatric critical care medicine		T5 PICU	T6 PICU
Pediatric dermatology			✓ M-F days
Developmental pediatrics/child development & rehab			✓ M-F days
Ear, nose & throat surgeon that provides care to children & adults	✓24/7	✓24/7	
Pediatric ear, nose & throat surgery			✓24/7
Pediatric emergency medicine			✓24/7
Endocrinologist that provides care to children & adults			
Pediatric endocrinology (including diabetes)			✓24/7
Gastroenterologist that provides care to children & adults			
Pediatric gastroenterology			✓24/7
General surgeon that provides care to children & adults	✓24/7	✓24/7	
Pediatric general surgery			✓24/7
Pediatric hematology/oncology			✓24/7
Pediatric immunology			✓24/7
Infectious diseases physician that provides care to children & adults	✓24/7	✓24/7	
Pediatric infectious diseases			✓24/7
Medical genetics			✓ M-F days
Neonatology		T3 NICU	T4 NICU
Nephrologist that provides care to children & adults			
Pediatric nephrology			✓24/7
Pediatric neurology		✓ M-F days	✓24/7

Service	Availability		
	T4	T5	T6
Neurologist that provides care to children & adults	✓ M-F days		
Pediatric neurosurgery			✓ 24/7
Pediatric ophthalmology			✓ 24/7
Orthopedic surgeon that provides care to children & adults	✓ 24/7	✓ 24/7	
Pediatric orthopedic surgeon			✓ 24/7
Pediatric radiation therapy			✓ (off-site access)
Pediatric plastic surgery			✓ 24/7
Child & youth psychiatrist		✓ M-F days	✓ 24/7
General psychiatrist	✓ 24/7	✓ M-F days	
Radiologist that provides care to children & adults	✓ Diagnostics 24/7; Interventional radiology (older children) M-F days	✓ Diagnostics 24/7; Interventional radiology (older children) M-F days	
Pediatric radiologist + pediatric interventional radiologist			✓ 24/7
Pediatric respiratory medicine			✓ 24/7
Pediatric rheumatology			✓ 24/7
Pediatric urology			✓ 24/7
Pediatric child protection medical specialist	✓ (e.g., Pediatrician with enhanced training/ experience)	✓ (e.g., Pediatrician with enhanced training/ experience)	✓ 24/7

*Excludes the ED physician.

Pediatric subspecialty trained physicians are:

- Specialists that complete a pediatric subspecialty residency program and the relevant RCPSC examination (RCPSC-recognized subspecialists). Includes pediatric surgeons, adolescent medicine physicians, child & youth psychiatrists, developmental pediatricians, pediatric emergency medicine physicians, pediatric hematologists/oncologists and pediatric radiologists.
- Specialists that complete a pediatric fellowship in the relevant specialty which may range from one to four years in length. No subspecialty RCPSC examination is required.

2.2.1.2 Hospital-Based Outpatient Services

Hospital-based outpatient services are divided into 2 sections: (1) Outpatient Clinic(s); and (2) Outpatient Treatments and Procedures.

The organization of outpatient services at a given site will depend upon the volume of children and the resources available. In some sites, the same space and providers will be utilized for the pediatric outpatient clinic(s) and all pediatric procedures & treatments (e.g., an area off the pediatric inpatient area). In others, the location and providers of one or more may differ (e.g., separate locations and providers for the pediatric outpatient clinic(s), respiratory disease/asthma clinic, child maltreatment clinic and/or outpatient procedures & treatments).

2.2.1.2.1 Outpatient Clinic(s)

A. Responsibilities (Outpatient Clinics)

Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
T1	T2	T3	T4	T5	T6
		<p>Algorithm in place to manage children discharged from hospital or ED requiring short-term follow-up by a pediatrician.</p> <p>High volume sites <u>may</u> offer (not required) pediatric-focused respiratory disease/asthma &/or diabetes outpatient services.</p>	<p>Receives referrals from within the HA & provides consultation & ongoing interdisciplinary care to children in a Pediatric Outpatient Clinic(s). Clinic serves children with a broad range of medium complexity medical conditions including:</p> <ul style="list-style-type: none"> • Children discharged from hospital or ED requiring short-term follow-up. • Children with complex chronic diseases who require an urgent assessment for a specific issue (e.g., feeding tube malfunction, medication titration). • Children with common pediatric conditions (e.g., asthma, croup, feeding issues, constipation, food allergies, developmental delays/issues & behavioural challenges). • Children with vulnerabilities related to the social determinants (e.g., low 	<p>Same as T4 plus:</p> <p>Receives referrals from within the HA & provides consultation & ongoing interdisciplinary care to children with common, high complexity medical conditions in regularly occurring Pediatric Subspecialty Medicine Outpatient Clinics. Clinics are available for higher volume subspecialties which include but are not limited to:</p> <ul style="list-style-type: none"> • Neurology • Cardiology • Oncology • Respiratory • GI medicine • Endocrinology <p>Pediatric Subspecialty Medicine Outpatient Clinics may be staffed by local pediatric subspecialty providers or by T6 providers via on-site outreach.</p>	<p>Receives referrals from throughout the province & provides consultation & ongoing interdisciplinary care to children with a broad range of high complexity medical conditions in regularly occurring Pediatric Specialty/Subspecialty Medicine Outpatient Clinics.</p> <p><i>Specialty</i> medicine clinics focus on children experiencing:</p> <ul style="list-style-type: none"> • Unexplained symptoms that are anticipated to require subspecialty assessment/follow-up [General Pediatric Clinic]. • Multiple medical +/- psychosocial complexities [Complex Care Clinic]. • Complex feeding & nutrition [Complex Feeding & Nutrition Clinic] • Complex pain & somatization disorders [General Pediatric &

Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
T1	T2	T3	T4	T5	T6
			<p>income, new immigrants & refugees).</p> <ul style="list-style-type: none"> • Children requiring lifestyle assistance (e.g., healthy weights). • Children undergoing surgeries that require pre- or post-op evaluation/testing. <p>In collaboration with T5/T6 subspecialty teams, provides ongoing management/monitoring in the Pediatric Outpatient Clinic for children with high complexity medical conditions that live within the HA.</p> <p>Refer to Children's Diabetes Tiers of Service module for responsibilities related to diabetes.</p> <p>Accesses team within the HA for consultation & follow-up of children in whom maltreatment is suspected (non-acute response). [Suspected Child Abuse & Neglect (SCAN) team]. Team may be hospital or community-based.</p> <p>Hosts clinics for T5/T6 visiting pediatric subspecialty teams (on-site or by telehealth).</p> <p>Teaching is an integral component of pediatric outpatient clinics and the focus is on general pediatrics.</p>	<p>Teaching is an integral component of Pediatric Outpatient Clinics. Focus is on: (1) general pediatrics; & (2) pediatric subspecialties available on-site (e.g., neurology, cardiology).</p>	<p>Complex Pain Clinics]</p> <ul style="list-style-type: none"> • Suspected or actual maltreatment [Child & Family Clinic]. <p><i>Subspecialty</i> medicine clinics focus on children with common & uncommon, high complexity medical conditions. Examples:</p> <ul style="list-style-type: none"> • Allergy clinic • Biochemical diseases • Cystic fibrosis • Cardiology • Dermatology • Diabetes (refer to Diabetes Tiers of Service module) • Endocrine • Gastroenterology • Hemophilia • Home tracheostomy/ventilation • Oncology/hematology/BMT • Immunology • Infectious diseases • Renal • Neurology/neuromuscular/spinal cord • Respiratory • Rheumatology <p>Teaching & research are integral components of each clinic. Focus is on: (1) general pediatrics; & (2) pediatric specialties/subspecialties.</p>

B. Requirements (Outpatient Clinics)

Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service																																																																																																																
T1	T2	T3	T4	T5	T6																																																																																																																
	Clinic space & infrastructure available for visiting specialists & telehealth consultations (in ED, hospital outpatient or community-based clinic).	If pediatric-focused respiratory disease/ asthma &/or diabetes outpatient services are offered (not required), see T4 for requirements. Services are linked to T4/T5 services within the HA through administrative & quality structures.	<p>Clinic space & infrastructure (T4 & T5):</p> <ul style="list-style-type: none"> Child-friendly clinic space & infrastructure. <ul style="list-style-type: none"> T4: May be shared with adults. T5: Used only by children. Space accommodates T5/T6 outreach services (on-site or telehealth) for selected pediatric <i>subspecialty</i> services. <p>Clinic staffing (T4 & T5):</p> <table border="1"> <thead> <tr> <th rowspan="2">Staffing</th> <th colspan="2">T4/T5</th> <th>T5</th> </tr> <tr> <th>Pediatric Outpatient Clinic</th> <th>Child Maltx [SCAN] Clinic^{xiii}</th> <th>Subspecialty Clinics</th> </tr> </thead> <tbody> <tr> <td>MD/NP</td> <td>Ped'n +/- GP/NP</td> <td>Ped'n +/- GP/NP</td> <td>Subspecialist</td> </tr> <tr> <td>RN</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Cert asthma educator</td> <td>See note 1</td> <td></td> <td></td> </tr> <tr> <td>SW</td> <td>On request/referral</td> <td>✓ or psychologist</td> <td rowspan="10">Others as relevant to the type of subspecialty service provided</td> </tr> <tr> <td>Dietitian</td> <td>On request/referral</td> <td></td> </tr> <tr> <td>Child life</td> <td>On request/referral</td> <td></td> </tr> <tr> <td>OT</td> <td>On request/referral</td> <td></td> </tr> <tr> <td>PT</td> <td>On request/referral</td> <td></td> </tr> <tr> <td>RT</td> <td>On request/referral</td> <td></td> </tr> <tr> <td>Psychologist</td> <td>T4: None T5: On request/referral</td> <td>✓ or SW</td> </tr> <tr> <td>Pharmacist</td> <td>On request/referral (by phone)</td> <td>On request/referral (by phone)</td> </tr> </tbody> </table> <p><i>Notes for staffing table: see next page.</i></p>	Staffing	T4/T5		T5	Pediatric Outpatient Clinic	Child Maltx [SCAN] Clinic ^{xiii}	Subspecialty Clinics	MD/NP	Ped'n +/- GP/NP	Ped'n +/- GP/NP	Subspecialist	RN	✓	✓	✓	Cert asthma educator	See note 1			SW	On request/referral	✓ or psychologist	Others as relevant to the type of subspecialty service provided	Dietitian	On request/referral		Child life	On request/referral		OT	On request/referral		PT	On request/referral		RT	On request/referral		Psychologist	T4: None T5: On request/referral	✓ or SW	Pharmacist	On request/referral (by phone)	On request/referral (by phone)		<p>Clinic space & infrastructure:</p> <ul style="list-style-type: none"> Pediatric-specific clinic space & infrastructure available for specialty & subspecialty clinics. <p>Clinic staffing:</p> <ul style="list-style-type: none"> General Pediatric Outpatient Clinic(s): as per T5. Specialty & Subspecialty Clinics: See below. <table border="1"> <thead> <tr> <th rowspan="2">Staffing</th> <th colspan="4">Specialty Clinics</th> <th rowspan="2">Subspecialty Clinics</th> </tr> <tr> <th>Complex Care Clinic</th> <th>Complex Feeding & Nutrition Clinic</th> <th>Complex Pain Clinic</th> <th>Child & Family Clinic (Child Maltreatment)</th> </tr> </thead> <tbody> <tr> <td>MD/NP</td> <td>Ped'n +/- GP/NP</td> <td>Ped'n + GI Med MD +/- GP/NP</td> <td>Ped'n + Develop't'l Ped'n + Peds Anesthesiologist + Psychiatrist</td> <td>Ped'n +/- GP/NP +/- Psychiatrist</td> <td>Sub-specialist(s)</td> </tr> <tr> <td>RN</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>SW</td> <td>✓</td> <td>On request/referral</td> <td>✓</td> <td>✓</td> <td rowspan="10">Others as relevant to the type of subspecialty service provided</td> </tr> <tr> <td>Dietitian</td> <td>✓</td> <td>✓</td> <td>On request/referral</td> <td>On request/referral</td> </tr> <tr> <td>Child life</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> </tr> <tr> <td>OT</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> </tr> <tr> <td>PT</td> <td>On request/referral</td> <td>On request/referral</td> <td>✓</td> <td>On request/referral</td> </tr> <tr> <td>SLP</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> </tr> <tr> <td>RT</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> <td>On request/referral</td> </tr> <tr> <td>Psychologist</td> <td>On request/referral</td> <td>On request/referral</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Pharmacist</td> <td>On request/referral</td> <td>On request/referral</td> <td>✓</td> <td>On request/referral (by phone)</td> </tr> </tbody> </table> <p><i>Notes for staffing table: see next page.</i></p>	Staffing	Specialty Clinics				Subspecialty Clinics	Complex Care Clinic	Complex Feeding & Nutrition Clinic	Complex Pain Clinic	Child & Family Clinic (Child Maltreatment)	MD/NP	Ped'n +/- GP/NP	Ped'n + GI Med MD +/- GP/NP	Ped'n + Develop't'l Ped'n + Peds Anesthesiologist + Psychiatrist	Ped'n +/- GP/NP +/- Psychiatrist	Sub-specialist(s)	RN	✓	✓	✓	✓	✓	SW	✓	On request/referral	✓	✓	Others as relevant to the type of subspecialty service provided	Dietitian	✓	✓	On request/referral	On request/referral	Child life	On request/referral	On request/referral	On request/referral	On request/referral	OT	On request/referral	On request/referral	On request/referral	On request/referral	PT	On request/referral	On request/referral	✓	On request/referral	SLP	On request/referral	On request/referral	On request/referral	On request/referral	RT	On request/referral	On request/referral	On request/referral	On request/referral	Psychologist	On request/referral	On request/referral	✓	✓	Pharmacist	On request/referral	On request/referral	✓	On request/referral (by phone)
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^{xiii} May be hospital or community-based.

Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
T1	T2	T3	T4	T5	T6
			<p><i>Notes for staffing table:</i></p> <ol style="list-style-type: none"> Services to children with asthma may be provided in the Pediatric Outpatient Clinic or in a Respiratory Diseases/Asthma Clinic, often in conjunction with adult services. MD requirement applies only to clinics with pre-scheduled MD visits. Protocols exist in all clinics to respond to urgent requests, provide telephone follow-up, etc outside clinic hours. Refer to Children's Diabetes Tiers of Service module for requirements related to diabetes. 		<p><i>Notes for staffing table:</i></p> <ol style="list-style-type: none"> MD requirement applies only to clinics with pre-scheduled MD visits. Protocols exist in all clinics to respond to urgent requests, provide telephone follow-up, etc outside clinic hours. Refer to Children's Diabetes Tiers of Service module for requirements related to diabetes <p>On-site availability of:</p> <ul style="list-style-type: none"> Pediatric feeding & swallowing team to provide oral motor & dietary assessment/consultation days, M-F. Videofluoroscopy feeding studies.
			<p><i>Legend for staffing table:</i></p> <p>✓ = Consistent person(s) assigned & available on-site to participate in scheduled clinics. Consistency allows for development of "enhanced skills" (see glossary) in specialty/subspecialty area.</p> <p>On request/referral = Person(s) with general pediatric knowledge & skills is available on a limited, consultation basis to come to the clinic to assess & treat specific children. May not be a consistent person.</p>		

2.2.1.2.2 Outpatient Procedures & Treatments

A. Responsibilities (Outpatient Procedures & Treatments)

Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
T1	T2	T3	T4	T5	T6
		<p>Performs outpatient procedures & treatments that have a low risk of allergic reactions/complications which may include:</p> <ul style="list-style-type: none"> • Monitoring (e.g., vital signs, weights, O2 saturations, spirometry) • Diagnostic tests/procedures (e.g., lumbar puncture, bladder catheterization) • IV therapy (e.g., IV fluids, IV starts, blood products, antibiotics, CVC/ICC/CADD care) • Teaching (e.g., home NG, rectal valium, home IV) • Wound management/dressing changes • Selected chemotherapy medications as per provincial guideline & direction provided by T6. • Other (e.g., insertion NG tube, IM/SQ injections). <p>Provides oral sedation to children undergoing diagnostic or therapeutic procedures & treatments.</p>	<p>Performs T3 outpatient procedures & treatments plus procedures & treatments with a medium risk of allergic reactions/complications which may include:</p> <ul style="list-style-type: none"> • Infusions of steroids & antibodies (e.g., infliximab) & bisphosphonates • Administration of cytotoxic &/or chemotherapy medications (as per provincial guidelines & directions provided by T6 cancer & rheumatology services). 	<p>Same as T4 plus:</p> <p>Outpatient procedures & treatments relevant to subspecialty services available on-site.</p>	<p>Same as T5 plus:</p> <p>Outpatient procedures & treatments relevant to T6 subspecialty services.</p>

B. Requirements (Outpatient Procedures & Treatment)

Prevention, Primary & Emergent Health Service T1	General Medical Service T2	Child-Focused Medical Service T3	Children's Comprehensive Medical Service T4	Children's Regional Enhanced & Subspecialty Medical Service T5	Children's Provincial Subspecialty Medical Service T6
		<p>Pediatrician available on-site for procedures & treatments which require ongoing monitoring.</p> <p>Pediatrician available on-call 24/7 & available for on-site consultation as needed.</p> <p>RNs assigned to children have pediatric skills (see glossary). Practice may be predominantly with adults but includes some children.</p> <p>Child-friendly space & infrastructure to perform procedures & treatments. May be shared (in ED, procedure room in inpatient or outpatient area, medical day unit, etc). Capacity to provide oral sedation.</p> <p>Capacity within the operating room to provide sedation &/or anesthesia to healthy children ages 2 & over undergoing treatments/procedures (as per Surgical Tiers document).</p>	<p>Same as T3 plus:</p> <p>RN practice is exclusively or primarily with children.</p> <p>Child life specialist available for individual patient consultations, upon request.</p> <p>Capacity within the operating room to provide sedation &/or anesthesia to healthy children ages 6 months & over undergoing treatments/procedures (as per Surgical Tiers document).</p>	<p>Pediatrician or designate (e.g., resident) available <u>on-site</u>.</p> <p>RNs Practice is exclusively or primarily with children.</p> <p>Child life specialist & psychologist with pediatric expertise available for individual patient consultations, upon request.</p> <p>Pediatric-specific space(s) & infrastructure to perform procedures & treatments. Used exclusively used by children.</p> <p>Capacity within the operating room to perform procedures & treatments requiring sedation and/or anesthesia in children of any age with modest medical complexities as per the Children's Surgical Tiers module.</p>	<p>Pediatrician or designate (e.g., resident) <u>on-site</u>.</p> <p>RNs have pediatric skills (see glossary). Practice is exclusively with children, many of whom have highly complex medical conditions.</p> <p>Child life specialist & psychologist with pediatric expertise available for individual patient consultations, upon request.</p> <p>Pediatric-specific space(s) & infrastructure to perform procedures & treatments. Used exclusively used by children.</p> <p>Capacity within the operating room to perform procedures & treatments requiring sedation and/or anesthesia in children of any age with all levels of medical complexities as per the Children's Surgical Tiers module.</p>

For clinical diagnostic & support services & subspecialty physician interdependencies, refer to inpatient section.

2.2.1.3 Community-Based Services

Notes:

1. "Children" refers to infant, child & youth throughout this section unless otherwise specified.
2. Tiers are referred to as "health services" rather than "medical services" for this section to more appropriately align with the type of services provided.
3. T2 is not shown in the table of responsibilities & requirements (below) because T2 services refer to hospital-based services only.
4. T5 is not shown in the table of responsibilities & requirements (below) because T5 community-based services are the same as for T4.

A. Responsibilities (Community-based Services)

	Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
	T1	T3	T4	T6
Service reach	Local community.	Multiple LHAs/HSDA.	HSDA/HA.	Province.
Service focus	<p>Promotes healthy infant, child & youth development, injury prevention & parenting.</p> <p>Provides immunizations.</p> <p>Screens, supports & refers children at risk for or experiencing: (a) developmental, communication/language or cognitive delays; or (b) vision, hearing, nutrition or dental issues.</p> <p>Delivered in a variety of community settings (e.g., Child Health Clinics, Child Development Centres, Public Health Units, Community Health Centres, Nursing Stations, family physician offices, schools & on-reserve).</p>	<p>Assessment & community-based follow-up of children referred for vulnerabilities,^{xiv} delays & other health issues identified through screening.</p> <p>Youth-specific drop-in health care services.</p>	<p>Advanced assessment, intervention & follow-up of referred children.</p>	

^{xiv} Children & families who may be at risk for poor outcomes associated with lifestyle/ behavioural, psychosocial or environmental risk factors.

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
1	Promotes healthy child development, injury prevention & parenting.	<p>Provides information to parents/families/community about healthy child development, healthy eating, physical activity, social, emotional, spiritual & mental health & prevention of injuries.</p> <p>Provides general parenting education & support. Connects children & families with local resources as appropriate</p>	<p>Provides enhanced services & follow-up to parents/families with vulnerabilities (e.g., home visiting, care coordination, parenting support).</p>		
2	Immunizations	<p>Provides information on immunizations to parents/families & health care providers.</p> <p>Offers publicly funded immunizations to infants & school-aged children according to the BC Immunization Schedule.^{xv}</p> <p>Refers high risk infants & children to appropriate resource(s) for immunizations (e.g., RSV clinic, hospital outpatient department).</p>			

^{xv} www.healthlinkbc.ca/tools-videos/bc-immunization-schedules.

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
3	Supports children at risk for or experiencing developmental delays	<p>Screens children who are at-risk for developmental delays.</p> <p>Refers children/families to appropriate resource(s) for assessment.</p>	<p>Conducts assessments on children at risk or experiencing developmental delays up to the age of school entry (ages 4 - 6).^{xvi}</p> <p>Works with parents/children to establish goals & develop & implement plans.</p> <p>Provides intervention services to children at risk or experiencing developmental delays (e.g., PT, OT, speech/language).</p> <p>Refers children at risk or experiencing developmental delays for specialized assessment & intervention services (T4), as required.</p> <p>Provides case management support & service coordination for parents & families of children experiencing developmental delays.</p> <p>Assists families to connect with other families, as appropriate.</p>	Refer to Child Development & Rehabilitation module for community-based services.	

^{xvi} Delay may be due to a medical disorder, biological risk such as prematurity and/or psychosocial risk such as parent with mental health problem.

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
4	Promotes positive communication skills & supports children at risk for or experiencing communication/ language, motor &/or cognitive delays.	<p>Provides information to parents/children on ways to promote positive communication skills.</p> <p>Screens children at-risk or showing signs of communication/language, motor or cognitive delays.</p> <p>Refers children to appropriate resource(s) for assessment of communication/language, motor or cognitive delay.</p>	<p>Conducts communication/language, motor & cognitive assessments on referred children.</p> <p>Plans & provides speech/language, physiotherapy & occupational therapy services to children with low & medium complexity medical conditions. Consults hospital &/or specialty rehab-based therapists as required.</p> <p>Implements speech/language, physiotherapy & occupational therapy plans for children with high complexity medical conditions that were developed by hospital &/or specialty rehab-based therapists.</p> <p>Educates children/families & relevant service providers re communication/language, motor & cognitive delays & adaptations.</p> <p>Services may be provided to children directly &/or as a consultative service to parents/service providers.</p>	<p>Refer to Child Development & Rehabilitation module for community-based services.</p> <p>Hospital &/or specialty rehab-based speech/language, physiotherapy & occupational therapy services with pediatric expertise available as resource <i>within the HA</i> by telephone on days, M-F.</p>	<p>Refer to Child Development & Rehabilitation module for community-based services.</p> <p>Pediatric hospital &/or specialty-based condition-specific speech/language, physiotherapy & occupational therapy services available as <i>provincial</i> resource by telephone on days, M-F.</p>

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
5	Supports children at risk for or experiencing vision problems	<p>Screens children that are at-risk for or are experiencing vision problems.</p> <p>Refers children to appropriate resource(s) for vision assessment.</p>	<p>Conducts vision assessments on referred children.</p> <p>Works with parents to arrange for services to address vision issue(s).</p>		
6	Supports children at risk for or experiencing hearing problems	<p>Screens children that are at-risk for or are experiencing hearing problems.</p> <p>Refers children to appropriate resource(s) for hearing assessment.</p>	<p>Conducts audiometric assessments on referred children. Includes tone, speech, otoacoustic emission & tympanometry testing.</p> <p>Performs auditory brainstem response (ABR) testing on babies (up to 1 yr) if designated by the Early Hearing Program.</p> <p>Refers children/families requiring advanced diagnostic services to appropriate resource(s).</p> <p>Evaluates & fits babies/children for hearing aids & FM equipment.</p> <p>Troubleshoots problems with hearing aids & FM equipment. Refers to manufacturer as required.</p> <p>Educates children/families & relevant service providers (e.g., teachers) about hearing & hearing services.</p>	<p>Same as T3 plus:</p> <p>Performs advanced diagnostic services, including ABR testing, to evaluate the cause & extent of hearing loss in children of any age. Sedation may not be available at T4 & may require referral to T5/T6.</p> <p>Consults with pediatric audiologists as required.</p>	<p>Same as T5 plus:</p> <p>Pediatric hospital-based audiologists available as <i>provincial resource</i> by telephone on days, M-F.</p>

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
7	Promotes healthy eating & supports children at risk for or experiencing nutrition-related issues	<p>Provides information to parents/children/youth to promote healthy eating, including community-based programs & resources.</p> <p>Screens children that are at-risk or show signs of nutrition-related issues.</p> <p>Refers children to appropriate resource(s) for nutritional assessment.</p>	<p>Conducts nutritional assessments on referred children.</p> <p>Develops, implements, monitors & adjusts nutritional plans for children with low & medium complexity medical conditions. Consults hospital-based dietitians as required.</p> <p>Educates children/families & relevant service providers about nutrition & diet modifications.</p>	Hospital-based dietitians that work predominantly with children available as resource <i>within the HA</i> by telephone on days, M-F.	Pediatric condition-specific dietitians available as <i>provincial</i> resource by telephone on days, M-F.
8	Promotes dental health & supports children at risk for or experiencing dental issues	<p>Provides information to parents/children to promote dental health.</p> <p>Screens children that are at-risk for or are experiencing dental health issues.</p> <p>Refers children to appropriate resource(s) for dental assessment &/or fluoride varnish &/or dental sealants.</p>	<p>Conducts dental assessments on referred children.</p> <p>Works with parents to arrange for dental services.</p> <p>Provides fluoride varnish &/or dental sealants to children at high risk for tooth decay.</p>		

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
9	Recognizes & takes action in situations of child maltreatment (neglect & physical, sexual & emotional abuse)	<p>Recognizes suspected cases of child maltreatment.</p> <p>Takes action to ensure immediate medical & safety needs are met, findings are documented & appropriate cases reported to MCFD as per the Child, Family & Community Service Act.</p>	Same as T1.	Assesses & coordinates follow-up services for children referred for child maltreatment from within the HA [Suspected Child Abuse & Neglect (SCAN) teams ^{xvii}]. Refers complex cases to T6 services.	Provides hospital-based, advanced diagnostic & treatment services for cases of suspected child maltreatment referred from throughout the province, often in consultation with multiple medical & surgical subspecialists.
10	Provides youth-specific health services	<p>Provides information to youth & their families about healthy development, healthy eating, physical activity, promoting mental health & preventing injuries.</p> <p>Connects youth with community-based youth resources (e.g., family physicians, peer support programs).</p>	<p>Provides accessible, confidential health care services to youth on a regular drop-in basis.</p> <p>Services include:</p> <ul style="list-style-type: none"> • Health education • Contraception & emergency contraception • Pregnancy diagnosis, options counselling & referral to appropriate services. • Testing & treatment for sexually transmitted infections • Immunizations • Mental health & substance use counselling • Referrals to other services. 	Same as T3.	Provides hospital-based youth-specific services for youth with complex medical &/or psychosocial situations.

^{xvii} SCAN team available to the hospital from within the HA. Scan team may be hospital or community-based.

B. Requirements (Community-based Services)

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
1.0	Providers				
1	Promotes healthy child development, injury prevention & parenting.	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • Non-health professional community-based staff with appropriate education & training (e.g., health unit aides, maternal child health home visitors/workers). • Elders. • HealthLink BC. 	<ul style="list-style-type: none"> • Public health nurses. • Providers of parent education programs. 		
2	Immunizations	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. 			
3	Supports children at risk for or experiencing developmental delays	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. 	<ul style="list-style-type: none"> • Infant development specialists. • Aboriginal infant development specialists. 		
4	Supports children at risk for or experiencing communication/language, motor &/or cognitive delays.	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. 	<ul style="list-style-type: none"> • Physiotherapists. • Occupational therapists. • Speech/language therapists. 	<ul style="list-style-type: none"> • Physiotherapists, occupational therapists & speech/language therapists with pediatric expertise (hospital &/or specialty rehab-based). 	<ul style="list-style-type: none"> • Pediatric physiotherapists. • Pediatric occupational therapists. • Pediatric speech/language therapists (hospital &/or specialty rehab-based).
5	Supports children at risk for or experiencing vision problems	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • Health Unit Aides (basic vision testing). 	<ul style="list-style-type: none"> • Optometrists. • Ophthalmologists. 		

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
6	Supports children at risk for or experiencing hearing problems	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • Community-based SLPs/Health Unit Aides (basic hearing testing). 	<ul style="list-style-type: none"> • Audiologists • Audiometric technicians. 	<ul style="list-style-type: none"> • Audiologists with training in advanced diagnostic testing (e.g., ABR). • Audiometric technicians. 	<ul style="list-style-type: none"> • Pediatric audiologists (hospital-based).
7	Promotes healthy eating & supports children at risk for or experiencing nutrition-related issues	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • Community nutritionists. • HealthLink BC (by phone). 	<ul style="list-style-type: none"> • HealthLink pediatric dietician (by phone & e-mail). 	<ul style="list-style-type: none"> • Dieticians with pediatric expertise (hospital-based). 	<ul style="list-style-type: none"> • Pediatric dieticians (hospital-based).
8	Promotes dental health & supports children at risk for or experiencing dental issues	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • Dental hygienists & oral health aides. 	<ul style="list-style-type: none"> • Dental hygienists & oral health aides. • Dentists. 		
9	Recognizes & takes action in situations of child maltreatment	<ul style="list-style-type: none"> • All T1 providers. 	<ul style="list-style-type: none"> • All T3 providers. 	<ul style="list-style-type: none"> • All T3 providers. 	<ul style="list-style-type: none"> • All T6 providers
10	Provides youth-specific health services	<ul style="list-style-type: none"> • FPs, NPs &/or RNs with relevant certified practice designation. • Public health nurses & RNs. • HealthLink BC. 	<ul style="list-style-type: none"> • FPs &/or NPs with specific knowledge about youth health. • PHNs with enhanced knowledge about youth health. • RNs. • Social worker(s). 	<ul style="list-style-type: none"> • Same as T3. 	<ul style="list-style-type: none"> • Youth Health Clinic (hospital-based subspecialty clinic)
2.0	Facilities & clinical diagnostic & support services				
1	Promotes healthy child development, injury prevention & parenting		Space & supplies to provide enhanced services.		
2	Immunizations	Space & supplies to administer immunizations.			
3	Supports children at risk for or experiencing developmental delays.	Space & supplies to complete developmental screening.	Space & supplies to complete developmental assessments & provide follow-up.		

		Prevention, Primary & Emergent Health Service	Child-Focused Health Service	Children's Comprehensive Health Service	Children's Provincial Subspecialty Health Service
		T1	T3	T4	T6
4	Supports children at risk for or experiencing communication/language, motor &/or cognitive delays.	Space & equipment to complete communication & cognitive screening.	Space, equipment & supplies for OTs, PTs, SLPs to assess & treat children/families (e.g., Child Development Centre, Public Health Unit).		
5	Supports children at risk for or experiencing vision problems	Space & equipment to complete vision screening.			
6	Supports children at risk for or experiencing hearing problems	Space & equipment to complete hearing screening.	Audiology clinic with soundproof booth & specialized equipment & supplies for pediatric testing & repairing hearing aids.	Same as T3a plus: Supplies for ABR testing.	
7	Promotes healthy eating & supports children at risk for or experiencing nutrition-related issues	Space & equipment to complete nutritional screening.	Telephone/computer for pediatric HealthLink dietician.		
8	Promotes dental health & supports children at risk for or experiencing dental issues	Space & equipment to complete dental screening.	Space & supplies for dental hygienists.		
9	Recognizes & takes action in situations of child maltreatment				
10	Provides youth-specific health services		Youth friendly space (may be shared space).	Same as T3.	Youth-specific subspecialty clinic (hospital-based)
3.0	Other				
1	Referral pathways	Commonly understood/ documented referral pathways to early intervention services, child protection services & pediatric specialty services. Well-defined linkages between hospital & community-based services.	Same as T1.	Same as T1.	Same as T1.
2	Transition guidelines	Guidelines to support transition from children's to adult services.	Same as T1.	Same as T1.	Same as T1.

2.2.2 Knowledge Sharing & Transfer/Training

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1.0	Student learning						
1.1	Medical students, residents & fellows			If designated by UBC as a training site, provides pediatric medicine inpatient &/or community/outpatient learning experiences for: <ul style="list-style-type: none"> Undergraduate medical students. Family medicine residents. 	Designated by UBC as a training site for: <ul style="list-style-type: none"> Undergraduate medical students. Family medicine residents. Pediatric residents. Range of potential pediatric medicine experiences is broader than T3.	Same as T4 except range of potential pediatric medicine experiences is broader, including rotations in NICU & areas of subspecialty medicine available on-site.	Designated by UBC as a pediatric training site for: <ul style="list-style-type: none"> Undergraduate medical students. Family medicine residents. Pediatric residents. Range of pediatric medicine experiences is broad, including rotations in general pediatrics, pediatric ED, NICU, PICU & sub-specialty areas. In conjunction with UBC, develops model for training pediatric & subspecialty medicine residents in BC.
1.2	Nursing, allied health & other undergraduate, graduate & post-graduate students			Specific child health experiences/placements may be available & are negotiated between the site & applicable learning institution.	Provides child health experiences/placements for a broad range of undergraduate, graduate & post-graduate students. Specific experiences are negotiated between the site & applicable learning institution.	Same as T4.	Same as T5.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
2.0	Continuing education						
2.1	Physicians	Facilitates access to learning activities that support the maintenance of physician competencies in child health. e.g., on-line access to guidelines/reference materials/ continuing education courses (e.g., PALS) & participation in HA & provincial learning activities relevant to child health (e.g., pediatric rounds and conferences).	Same as T1.	Same as T2 plus: Mechanisms in place to regularly review physician education needs related to maintenance of pediatric competencies. Facilitates physician access to learning activities based on identified practice gaps, including the practice of critical clinical skills where limited opportunity exists in practice (e.g., simulation, clinical experience with T5/T6 service).	Same as T3 plus: In collaboration with T5, organizes regional activities that support the maintenance of physician competencies in pediatric care. Provides pediatric clinical experiences for T1-T3 physicians (on-site &/or via simulation).	In collaboration with T4, organizes regional activities that support the maintenance of physician competencies in pediatric care. Provides pediatric clinical experiences for T1-T4 physicians (on-site &/or via simulation).	Same as T5 plus: Organizes provincial learning activities that support the maintenance of physician competencies in pediatric care. Provides pediatric clinical experiences for T1-T5 physicians (on-site &/or via simulation).
2.2	Nurses, allied health & other care providers	Facilitates access to learning activities that support the maintenance of staff competencies in child health. e.g., on-line access to guidelines/reference materials/ continuing education courses (e.g., PALS) & participation in HA & provincial learning activities relevant to child health (e.g., pediatric rounds and conferences).	Same as T1.	Mechanisms in place to regularly review staff education needs related to maintenance of child health competencies. Facilitates staff access to learning activities based on identified practice gaps, including the examples in T1 & T2 plus: practice of critical clinical skills where limited opportunity exists in practice (e.g., simulation, off-site clinical experiences).	Same as T3 plus: In collaboration with T5, organizes regional activities that support the maintenance of staff competencies in child health (e.g., pediatric rounds, conferences). Provides child health clinical experiences for T1-T3 staff (on-site &/or via simulation).	In collaboration with T4, organizes regional activities that support the maintenance of staff competencies in child health (e.g., pediatric rounds, conferences). Provides child health clinical experiences for T1-T4 staff (on-site &/or via simulation).	Same as T5 plus: Organizes provincial activities that support the maintenance of staff competencies in child health (e.g., pediatric rounds, conferences). Provides child health clinical experiences for T1-T5 staff (on-site &/or via simulation).

2.2.3 Quality Improvement/Research

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
1.0	Quality improvement (QI)	HA QI structures & processes in place, including case reviews. If child involved, physicians & staff with child health expertise participate in the review, as appropriate. Implements recommendations & evaluates the outcomes.	Same as T1.	Same as T1 plus: Provides child health expertise for T1 case reviews, if requested.	HA QI structures & processes are in place to specifically review & improve the quality & safety of <i>children's medical care</i> , including case reviews. In collaboration with T5/T6, establishes structures & processes to track pediatric-specific medical quality indicators at a regional & provincial level.	Same as T4.	Same as T5. Provides subspecialty child health expertise for T1-T5 case reviews, if requested. Consults with child health experts within or outside BC for T6 case reviews, as appropriate.
		Concepts of child & family-centered care (see glossary) are incorporated into child health programming.	Same as T1.	Same as T1.	Same as T1.	Same as T1.	Same as T1.
		Organizational mechanisms in place to obtain child/family feedback on the services provided. Incorporates feedback, as appropriate.	Same as T1.	Same as T1.	Same as T1.	Same as T1.	Same as T1.
		Reviews trends at a local level of hazards, adverse events & near misses (including child health cases) as per reports generated from the BC Patient Safety Learning System. Takes local action to reduce future occurrences.	Same as T1.	Same as T1.	Same as T2 plus: In collaboration with T5, reviews trends at a regional level as per reports generated from the BC Patient Safety Learning System. Takes regional action to reduce future occurrences.	Same as T4.	Same as T2 plus: In collaboration with T1-T5, reviews trends at a provincial level as per reports generated from the BC Patient Safety Learning System. Takes provincial action to reduce future occurrences.

		Prevention, Primary & Emergent Health Service	General Medical Service	Child-Focused Medical Service	Children's Comprehensive Medical Service	Children's Regional Enhanced & Subspecialty Medical Service	Children's Provincial Subspecialty Medical Service
		T1	T2	T3	T4	T5	T6
					In collaboration with T5/T6, establishes structures & processes to track pediatric-specific medical quality indicators at a regional & provincial level.	Same as T4.	In collaboration with T4/T5, establishes structures & processes to track pediatric-specific medical quality indicators at a provincial level.
		Participates in regional & provincial child health quality improvement initiatives.	Same as T1.	Same as T1.	In collaboration with T5, leads pediatric medicine improvement initiatives at a regional level to address quality/risk issues in hospitals within HA. Participates in provincial pediatric medicine improvement initiatives.	Same as T4.	In collaboration with T4/T5, leads pediatric medicine improvement initiatives at a provincial level to address quality/risk issues in hospitals within the province. Participates in provincial pediatric medicine improvement initiatives.
		System supports are in place to enable health care providers to provide care that is consistent with current child health care guidelines.	Same as T1.	Same as T1.	Same as T1.	Same as T1.	Same as T1 plus: In collaboration with CHBC & HAs, develops & disseminates guidelines on relevant child health topics.
2.0	Research					Participates in child health-related research.	Conducts & supports others to conduct child health-related research.

3.0 References

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Appendix 1: Guidelines for Equipment & Supplies for Sites Admitting Pediatric Patients

This **non-exhaustive** list of equipment & supplies is provided as a reference for sites that admit children as inpatients. Local variation may be appropriate.

Accessible = accessible on-site.

Equipment	Details	Med Tiers	ED Tiers
Oxygen/ Airway	Simple oxygen masks (standard & non- rebreathing) sizes: infant, child, adult	All	All
	Nasal cannulas: sizes: infant, child, adult	All	All
	Nebulizer mask/tubing: sizes: child, adult	All	All
	MDI spacer (aerochamber) (infant, child, adult)	All	All
	Oropharyngeal airways: sizes 0-5 (50mm-100mm)	All	All
	Nasopharyngeal airways (infant, child & adult)	All	All
	Supraglottic airway device: all sizes	Accessible, all Tiers	All
	Self-inflating bag-mask device with reservoir, PEEP valve, pressure gauge & maximum pressure valve (infant, pediatric & adult sizes).	Accessible, all Tiers	All
Masks to fit bag-mask device adaptor (infant, child & adult sizes)	Accessible, all Tiers	All	
Airway/ Respiratory	Laryngoscope: 1x small handle 1x large handle	Accessible, T3 & up	T2 & up
	Blades: 1 each x Miller (straight) blades: sizes 0, 1 1 each x Mac (curved) blades: sizes 1,2,3,4	Accessible, T3 & up	T2 & up
	1 each x Magill forceps (large & small)	Accessible, T3 & up	T2 & up
	1 x Lidocaine spray & nozzle	Accessible, T3 & up	T2 & up
	Extra bulbs & batteries for laryngoscope	Accessible, T3 & up	T2 & up
	Endotracheal tubes <ul style="list-style-type: none"> 1 x uncuffed: sizes 2.5 -3.0 2 x microcuffed: sizes 3.0-4.5 2 x cuffed: sizes 5-8.5 	Accessible, T3 & up	T2 & up
	Stylets for endotracheal tubes (6f, 10f & 14f)	Accessible, T3 & up	T2 & up
	2 x ET CO2 (adult & pediatric in-line) 1 x ET CO2 detector (pediatric & adult –quick cap)	Accessible, T3 & up	T2 & up
	1 x bottle Med Adhesive Glue / Mastisol / Detachol	Accessible, T3 & up	T2 & up
	Scissors	Accessible, all Tiers	T2 & up
	Tape or securing device for endotracheal tube 2 x twill ties (wide & narrow)	Accessible, T3 & up	T2 & up
	2 x 15mm connectors 2 x 22mm connectors	Not needed	T2 & up

Equipment	Details	Med Tiers	ED Tiers	
Airway/ Respiratory cont'd	Needle decompression of chest: 21g , 23g butterfly needle or 18g, 20g or 22 g cannula over needle	Not needed	T2 & up	
	Chest Tubes: (Trocar) Sizes: 8fr-40fr, 1% Lidocaine Without Epinephrine, Heimlich valve, 3-way stopcock, chest tube clamps, dry suction water seal chest drainage system	Not needed	T2 & up	
	Tube thoracostomy tray (scalpel, sutures, clamps, sterile towels, etc)	Accessible	T2 & up	
	Cricothyrotomy tray (dilator & scalpel)	Accessible	T2 & up	
	Emergency tracheostomy tray	Accessible		
	Tracheostomy tubes (sizes 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5 mm)	Accessible		
Suction	Mechanical suction & tubing	All	All	
	Suction catheters: sizes 5/6.5F-12F	All	All	
	Yankauer suction: small, large	All	All	
GI Equipment	NG tubes (sump tubes): sizes 10,12,14,16 Infant feeding tubes: sizes 5fr,8fr,10fr	All	All	
	PH strips for checking NG placement	All	All	
	Enteral collection receptacles	All	T2 & up	
	Duoderm, tegaderm, scissors, waterproof tape	All	T2 & up	
	Cardiac monitor/defibrillator with pediatric & adult capabilities including pediatrics-sized pads/paddles	Accessible, all Tiers	T2 & up	
Monitoring	ECG leads (infant & adult)	Accessible, all Tiers	All	
	Automated External Defibrillator (AED), preferably that can detect pediatric rhythms & has a dose attenuator & pediatric pads for children <8 yrs old. While manual defibrillation is preferred for children <1 yrs old, an AED without a dose attenuator is better than not doing anything.	Not needed	T1	
	Pulse oximeter with neonate, pediatric & adult-sized probes	All	All	
	Stethoscopes: sizes: pediatric, adult	All	All	
	Thermometer with separate oral & rectal probes	All	All	
	Blood pressure cuffs: sizes: neonatal, infant, child, small adult, adult – arm & thigh	All	All	
	Doppler ultrasonography devices	Accessible, all Tiers	All	
	Vascular Access	Intravenous safety catheters: sizes 14g – 24 g	All	All
		Infusion control device (i.e., infusion pump)	All	All
Rapid infuser/tubing		Not needed	T2 & up	
IV fluid administration sets (including blood administration sets & secondary lines)		All	All	
IV caps, Y-connectors, stop cocks, tourniquets, alcohol swabs, Tegaderm, tape, t-pieces, arm boards		All	All	
IV solutions: Normal Saline (NS), Dextrose 5% in NS, Dextrose 5% in NS with 20 mmol KCL/L & Dextrose 10% in NS		All	All	
Intraosseous needles & insertion device (pediatrics & adult sizes)		Accessible, all Tiers	All	
Arm boards (infant, child & adult sizes)		All	All	
1% lidocaine without epinephrine		Accessible, all Tiers	All	

Equipment	Details	Med Tiers	ED Tiers
Thermo-regulation	Patient warming device (e.g., overbed warmer, Bair Hugger)	Accessible, all Tiers	All
	Intravenous blood/fluid warmer/tubing	Not needed	T2 & up
Fracture Management	Extremity splints, including femur splints (pediatrics & adult sizes)	Accessible	All
	Spinal stabilization: backboard & hard collars: sizes infant – adult X-Tall (9 sizes)	Not needed	All
Specialized Trays	LP tray including infant (22 g), pediatrics (22 g) & adult (18 – 21 g) LP needles	Accessible, all Tiers	T2 & up
Urinary Equipment	Urinary catheterization kit	All	T2 & up
	Urinary (indwelling) catheters: sizes (5,8,10,12,14)	All	T2 & up
	Urinary drainage set	All	T2 & up
	Sterile specimen containers	All	All
	Multi-stix dipsticks to test for wbc/nitrates, etc.	All	All
Integumentary	Dressing supplies	All	All
	Burn care dressings (as per provincial burn care guideline)	All	All
Ophthalmology	Eye irrigation equipment	Not needed	All
Miscellaneous	Syringes, gloves, blood collection tubes	All	All
	Age-appropriate non-medication pain management/distraction supplies (e.g., pacifiers dipped in sweet liquid, toys, rewards, etc.)	All	All
	Casting materials	Not needed	All
	Tool or chart that incorporates both weight (in kg) & length to assist in determining equipment size & correct drug dosing (by weight & total volume). (An example of a tool is the length-based resuscitation tape (e.g. Broslow tape)	All	All
	Weigh scale: kg only (not pounds) for infants, children & adults	All	All
	Height measuring device for infants, children & adults	All	All
	CDC or WHO Growth Charts	All	All
	Reflex hammer, tongue depressors	All	All
	Oral or enteral syringes (for administration of enteral medications)	All	All
	Pain scale assessment tools appropriate for age	All	All
	Calculator (metric converter preferred)	All	All
	Clock/timer (resuscitation room)	All	All

Appendix 2: Roles of Team Members in Pediatric Outpatient Clinic(s)

	Function	T4, T5 & T6											T5 & T6 Only	T6 Onl y
		Core Staff				On Request/Referral								
		MD/ NP	RN	Cert Asthma Educ ^{xviii}	Clerk	RD	Reg SW	Ch Life	OT	PT	Pharm	Reg Psych	SLP	
1	Prioritizes intake of new referrals, with consideration to urgency provided by the referring physician.	y	y	y										
2	Collaborates with patients/families in developing treatment & self-management plans.	y	y	y		y	y	y	y	y	y	y	Y	
3	Educates patients/families re medical condition, treatments & preparation for procedures. Supports patients/families in decision-making.	y	y	y		y	y	y	y	y	y	y	Y	
4	Communicates patient-specific information to appropriate subspecialty team upon transition(s).	y	y	y	y	y	y	y	y	y	y	y	Y	
5	Refers patients to other health care professionals/services as needed.	y	y	y		y	y	y	y	y	y	y	Y	
6	Acts as a resource to other health professionals in area of expertise.	y	y	y		y	y	y	y	y	y	y	Y	
7	Participates in program planning & quality improvement activities.	y	y	y	y	y	y	y	y	y	y	y	Y	
8	Educates peers, students & other learners in area of expertise.	y	y	y	Y	y	y	y	y	y	y	y	Y	
9	Documents patient/family communication in patient record.	y	y	y	Y	y	y	y	y	y	y	y	Y	
10	Performs initial medical assessment & completes diagnostic work-up.	y												
11	Assesses changes in medical condition of patients at each MD/NP visit.	y		y										
12	Orders diagnostic tests (blood work, diagnostic imaging tests, etc).	y												
13	Follows-up abnormal diagnostic tests as per clinic protocol(s).	y	y	y										
14	Prior to visit, reviews health record to ensure appropriate information/test results are available.		y											
15	Assesses/clarifies/updates medical history, current symptoms, treatments & medications at each visit.		y											
16	Obtains weight, height, vital signs & information about other condition-specific measurements at each visit.		y			y								
17	Performs appropriate nursing care as indicated.		y											
18	Follows up with patient/family following changes to treatment plan, as appropriate.		y											
19	Reviews patient chart after each clinic visit to ensure orders have been processed completely & accurately.		y											
20	Serves as contact person for family. Accesses other health care professionals as required.		y											
21	Performs diagnostic testing (e.g., spirometry, blood gases, & oximetry).			y										
22	Treats, educates & creates action plans for children with respiratory conditions such as asthma & croup.			y										

^{xviii} Meets requirements for a Certified Asthma Educator as per the Canadian Network for Respiratory Care. [http://cnrhome.net/certifiedasthmaeducators\(cae\).html](http://cnrhome.net/certifiedasthmaeducators(cae).html)

	Function	T4, T5 & T6											T5 & T6 Only	T6 Only	
		Core Staff				On Request/Referral									
		MD/ NP	RN	Cert Asthma Educ ^{xviii}	Clerk	RD	Reg SW	Ch Life	OT	PT	Pharm	Reg Psych	SLP		
23	Teaches children/families how to use their respiratory medicine devices.			y											
24	Establishes & maintains patient records (e.g., files consults, lab work, etc).				y										
25	Admits & discharges patients in hospital system.				y										
26	Books patients for appointments.				y										
27	Assists team in preparing for clinic visits (e.g., obtains requested consults, books interpreters).				y										
28	Obtains & sorts blood work results.				y										
29	As requested, books & coordinators appointments with other clinics, consultants, diagnostics & community resources.				y										
30	Assesses nutritional status, including analysis of medical & diet history, lab values & anthropometric measurements.					y									
31	Recommends appropriate therapeutic diet(s) & establishes a diet/feeding plan to optimize nutrition to support growth, development & well-being. Includes support for children receiving enteral or parenteral nutrition.					y									
32	Evaluates diet/feeding plan through clinic follow up & telephone.					y		y						y	
33	Responds to abnormal diet-sensitive lab test results (as per clinic protocol(s)).					y									
34	Refers patients/families to appropriate resources to assist in coping with diet/related concerns.					y									
35	Responds to patient, family & caregivers' potential or expressed food security.					y	y								
36	Gathers social & psycho-emotional data on child/family & "support" systems. Analyses the impact on the child's medical condition & the beliefs & attitudes towards treatment.		Y				y								
37	Provides therapeutic interventions for children/families related to their emotional response to diagnosis, adjustment, traumatic stress, crisis & grief & loss. e.g., provides one-on-one counselling, facilitates family support groups, organizes family meetings/care conferences.						y								
38	Works with the team to assist the child/family in understanding their condition. Provides support in managing feelings of anxiety regarding treatments, including surgery.		Y				y								
39	Addresses patient & family needs related to resources, funding & advocacy.		Y				y								
40	Resource to the interdisciplinary team in responding to challenging child/family situations.		Y				y								
41	Refers to community-based support services, as required.						y		y	y					
42	Assists with the transition from pediatric to adult care.						y								
43	Helps children understand their experiences & feelings through play.							y							
44	Assesses & provides therapeutic interventions to reduce anxiety & pain related to a diagnosis.							y							
45	Assesses & treats children with feeding and/or swallowing difficulties.								y		Y				
46	Assesses & treats speech & language in children with speech impediments or										y				

	Function	T4, T5 & T6											T5 & T6 Only	T6 Only	
		Core Staff				On Request/Referral									
		MD/ NP	RN	Cert Asthma Educ ^{xviii}	Clerk	RD	Reg SW	Ch Life	OT	PT	Pharm	Reg Psych	SLP		
	other communication-based issues.														
47	Assesses developmental level & functional performance of children & makes recommendations for treatment.								y	Y					
48	Assesses for & provides specialized aids, environmental adaptations & equipment such as: wheelchairs, walking aids, seats, splints, bathroom & other environmental adaptive aids & feeding equipment.								y	y					
49	Provides consultation to the interdisciplinary team re medication therapies.										y				
50	Assesses & treats/consults on children with acute or newly acquired musculoskeletal, neurological & cardiorespiratory conditions.								y	y					
51	Common conditions include intoeing/out toeing flat feet, torticollis, gross motor skill delay & scoliosis.									y					
52	Provide diagnostic services, consultations, & short- & longer-term psychotherapy for children & their families dealing with acute & chronic medical conditions.											y			
53	Designs behaviorally-based programs consistent with the needs of children/families (individual or group-based).											y			

Appendix 3: Glossary

Registered Nurse with "pediatric skills"

- Demonstrates a broad understanding of growth and development. Distinguishes between normal and abnormal growth and development of infants, toddlers, children and youth.
- Understands the psychological impacts of care provision (including hospitalization) at different developmental stages (infant, toddler, preschooler, school aged and youth).
- Understands how to provide a physically and psychologically safe environment appropriate to the age and condition of the child.
- Demonstrates understanding of the physiological differences between infants, children and adults and their implications for assessment and care.
- Assesses a child's normal parameters, recognizes the deviations from the normal and acts appropriately on the findings.
- Demonstrates knowledge of common pediatric conditions and their management.
- Demonstrates understanding of fluid management in an infant and child.
- Calculates and administers medications and other preparations based on weight based dosages.
- Assesses child and family's knowledge and provides teaching specific to the plan of care and condition or procedure.
- Communicates effectively and works in partnership with children and families (children and family-centred care).
- Aware of and accesses pediatric-specific clinical guidelines and protocols.
- Responds to patient deterioration/acute urgent situations in an appropriate and timely manner.
- Commences and maintains effective basic pediatric life support, including 1- and 2-rescuer infant and child CPR, AED use and management of airway obstructions.
- Provides referrals to public health nursing, nutrition and utilizes contact with the child and family to promote child health. e.g., immunization, child safety.
- Assesses pain and intervenes as appropriate.*
- Initiates and manages peripheral IV infusions on children;* consults expert clinicians as necessary. Identifies and manages complications of IV therapy.

*Refer to body of document for examples of interventions appropriate at each tier.

References: NSW's Guidelines for Care in Acute Care Settings,³ BC Children's Pediatric Foundational Competencies on-line course¹² and BC Children's CAPE tools (2008-2010).¹³

"Enhanced pediatric skills" (refers to RNs & others on the interdisciplinary team)

- Demonstrates in-depth knowledge in a specific area of clinical care (e.g., respiratory diseases, sexual assault, diabetes, wound management, etc).
- Performs comprehensive assessments & plans, provides & evaluates care in children with suspected or known issues in specific areas of clinical care.

Reference: BC Children's CAPE tools.¹³

"Safe pediatric bed"

All hospitals that admit children must take steps to ensure the environment is as safe as possible for children. For a T1 service, this includes:

- Physical safety:
 - Area is physically safe for children with any potentially dangerous equipment, medications, chemicals or fluids out of reach or in locked cupboards.
 - Physical separation of children from adult patients is recommended. If physical separation is not possible, children are not in the same area/unit as adults who are under the influence of, or withdrawing from alcohol or chemical substances, known sex offenders, a danger to themselves or others and/or are confused and/or wandering.
 - Furniture meets appropriate safety standards for children. e.g., cribs with safe side rails and crib domes (if needed) for children 2 years of age or less.
- Psychological comfort:
 - Parents/primary caregivers are able to stay with their children 24/7 during hospitalization.
 - Self-served food and drink is in close proximity.
- Knowledgeable staff:
 - Sufficient "RNs with pediatric skills" are allocated each shift to ensure adequate supervision and care relevant to the age and nursing needs of child.
 - Criminal record checks are required as part of the credentialing and/or hiring process for all staff and physicians (as per legislation).
- Equipment and supplies:
 - Pediatric emergency equipment and supplies are in close proximity (refer to Appendix 1 in the Medical Tiers in Full document for a non-exhaustive list of equipment and supplies).

Additional requirements for a T3 service:

- Psychological comfort:
 - Access to child-friendly bathrooms and space for changing diapers.
 - Facilities for breastfeeding and breast milk storage.
 - Safe space(s) and age-appropriate facilities/equipment for children and youth to play/be entertained. e.g., age appropriate media, books or board games.

"Safe pediatric unit"

T3 and T6 services are required to have a "safe pediatric unit(s)" to provide inpatient care to children. In addition to the requirements for a safe bed, a "safe pediatric unit" includes:

- Physical safety:
 - Children are cared for on a dedicated pediatric inpatient unit(s).
 - Pediatric unit is functionally separate from adult patients, preferably with a door that can be closed and not opened by young children.
 - Regulated hot water temperature and secure electrical outlets are present on the unit.
- Psychological comfort:
 - Bedside sleeping facilities and ideally a kitchenette with fridge and microwave are available for parents/primary care givers.
 - Youth-friendly facilities/activities are available.

Child & family-centred care

Child & family-centred is one of the tenants of pediatric care. For all tiers, this means:

- Services are delivered in line with the principles of the UN Convention on the Rights of the Child (version in child friendly language is at: <http://www.unicef.org/rightsite/files/uncrcchildfriendlylanguage.pdf>).
- Children and their families are actively involved in health care planning and transitions.
- Children and their families are provided information about care options available to them in a way they can understand. This allows them to make informed choices.
- The chronological and developmental age of the child is considered in the provision of information and care.
- Families are actively encouraged to participate in the care of their child.
- Education is provided to children and their families who wish to be involved in providing elements of their own/their child's care.
- When families stay in hospital to help care for a child:
 - The environment supports family presence and participation (e.g., overnight accommodation, sitting room, quiet room/area for private conversation and facilities for making refreshments).
 - Consideration is given to their practical needs, including regular breaks for personal needs, to obtain food/drink, make telephone calls, etc.
- Information and support is given to families on how to access funds for travel to and from specialist centres.
- Information is available for children and their families in several formats including leaflets and videos. Information is culturally and age-appropriate and is provided in a variety of commonly used languages.
- Children and their families have access to professional interpreter services.
- Children and their families are provided with contact details for available support groups, as appropriate.
- Transition pathways are in place to allow for seamless transition to adult services.
- Children and families are actively encouraged to assist in identifying safety risks (e.g., ask questions about medications, question providers re hand washing etc).
- Opportunities are available for children and their families to provide input on the quality and safety of care provided (e.g., surveys, committees, rounds, parent advisory council, etc).

Adapted from:

- Institute for Healthcare Improvement, the National Initiative of Children's Healthcare Quality and the Institute for Patient- and Family-Centered Care, Patient- and Family-Centered Organizational Self-Assessment Tool, 2013.¹⁴
- Welsh Assembly Government, All Wales Universal Standards for Children and Young People's Specialised Healthcare Services, 2008.¹⁵
- Maurer, M et al, Guide to Patient and Family Engagement: Environmental Scan Report (Agency for Healthcare Research and Quality), 2012.¹⁶