



**Levels of Care Approach for Hematology/ Oncology  
Care of Adolescents and Children within  
the Atlantic Provinces**

**Atlantic Provinces Pediatric Hematology Oncology Network (APPHON)  
Réseau d'Oncologie Hématologie Pédiatriques des Provinces  
Atlantiques (ROHPPA)**

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# **LEVELS OF CARE APPROACH-FOR HEMATOLOGY/ ONCOLOGY CARE OF ADOLESCENTS AND CHILDREN WITHIN THE ATLANTIC PROVINCES**

## **INTRODUCTION**

In Atlantic Canada, Pediatric Hematology/Oncology care is shared between the pediatric Sub-Specialty care centres and the child/adolescent's home community. The health care professionals in the child/adolescent's home community are especially involved with the complications and side effects of treatment, school issues, emotional and psychological support, resource support, monitoring of growth and development and provision of routine preventative care. In some home communities, health professionals are responsible for administering chemotherapy. Diagnostic investigations [including surgical investigations] will generally occur at the pediatric hematology/ oncology Sub-Specialty care centres. Occasionally supportive care surgery will be performed in other health care centres. Radiotherapy will always be administered in a Sub-Specialty centre. The accepted standard for pediatric hematology/ oncology care is participation in an applicable clinical research trial or treatment according to the standard arm of a clinical research protocol or equivalent standard. This care is often complex and demanding.

The balance between the benefits and risks of provision of services at a specific locale [home, community health centre, regional health centre or IWK/Janeway] is critical for optimal outcomes of health care. The Levels of Care approach offers an equitable system wherein the expertise and resources of each health centre can be matched with the expertise and resources required for each phase of care [Investigation, treatment and supportive care].

It is important that secure linkages be established with and among all the health care centres where an individual child/adolescent may receive care. The Levels of Care approach is built on the supposition that, when needed, Sub-Specialty centres will provide expertise and support to the other centres. The Levels of Care Approach supports the treatment of children and adolescents with cancer or serious blood disorder in their home communities within defined and accepted standards of care.

This "Approach" document is the tool to guide decision-making to ensure that pediatric Hematology/Oncology care is provided in a safe, effective, multi-disciplinary, family-centred manner, and that children and adolescents will have equitable access to effective, quality services as close to home as safely feasible.

APPHON/ROHPPA levels of care were modeled after previously established levels of care systems [British Columbia Children's Hospital, Pediatric Oncology Group of Ontario (POGO), a draft from River Valley Health Region and from Cancer Care Nova Scotia (CCNS)]. It is built on consideration of the following:

1. patient safety
2. patient volume
3. experience/ knowledge/ education supports available
4. resources required and available
5. quality care available
6. distance and transportation considerations for patients and their family

[Adapted from the Capital Health District Authority Health Services Integration Cancer Care Planning Team report, 2001].

The above imply consideration of:

1. quality
  2. access
  3. sustainability [economies of scale]
  4. retention [of health professionals involved]
  5. affordability
- [Adapted from Nova Scotia Department of Health]

Quality care is expected to provide care that is:

1. safe
  2. acceptable
  3. appropriate
  4. effective
  5. efficient
  6. accessible
  7. supportive
  8. confidential
  9. timely
  10. culturally sensitive
  11. participatory
  12. well communicated
- [Adapted from IWK Health Centre Quality Plan 2007]

## **DEFINITIONS**

### **Levels of Care (6):**

Levels of Care is an approach that refers to resources [personnel, knowledge/competencies, facilities and equipment], needed to provide care to pediatric (child/adolescent) hematology oncology patients safely and effectively. Each level builds on the components of the previous Level of Care plus the additional components added for that level, the **six** (6) levels of care are outlined below:

#### **1. Home Care:**

It is acknowledged that a significant portion of each patient's care will be undertaken by the child/adolescent and family in their home. At varying stages of the child/adolescent's course of treatment and health, the intensity of care received at home will vary.

#### **2. Physician's Office:**

Physician office care will encompass ambulatory care including routine physical examination, regular child/adolescent health monitoring, monitoring for therapy complications and side effects, emotional and psychological support, school re-integration, and provision of supportive care. The child/adolescent and family's home community physician is essential to maintaining continuity of care.

#### **3. Basic Care:**

[Available in at least one location in most Districts/Regions] Basic level care will generally include low intensity, low risk supportive ambulatory care. It also includes immediate stabilization of a critically ill child/adolescent when necessary and providing or initiating emergency treatment before transferring to a site able to provide more complex care.

#### **4. Intermediate Care:**

[May be available in several places within each of the Atlantic Provinces] Intermediate level care will include ambulatory, low risk inpatient treatment and supportive care plus administration of intermediate level cytotoxic agents [Appendix 1].

#### **5. Advanced Care:**

[May be available in one to four centres in each of the Atlantic Provinces] Advanced level care will include administration of ambulatory/inpatient intermediate and advanced level cytotoxic agents [see Appendix I], as well as supportive care for these patients including prevention and treatment of oncology and hematology complications and emergencies. Advanced sites will also have personnel able to act as resources for sites where basic or intermediate care is delivered.

#### **6. Sub-Specialty Care:**

[IWK Health Centre, Janeway Children's Health and Rehabilitation Centre] Sub-Specialty level care will include administration of complex cytotoxic agents [see Appendix I], complex monitoring regimes, supportive care for high-risk patients, administration of radiotherapy and related surgical interventions. Sub-Specialty Centres will be care, academic and research resources.

It is expected that some health care centres may be able to provide, for example, intermediate level care for treatment and supportive care and advanced level care for investigation. A child/adolescent's care will be negotiated to provide the most practical sharing of care with other centres based on the resources needed by the child/ adolescent /family for that phase of care [investigation, treatment or supportive care].

**Cancer Care:** includes all aspects of care pertaining to the child/adolescent with cancer - for example, all anti-cancer treatments, nutrition, supportive therapy, pain control, palliation and family bereavement support as applicable, patient education, coordinating care, referrals to community agencies, and psycho-social care

**Chemotherapy:** includes all cytotoxic agents, hormonal and biological agents used in the treatment of cancer.

**Child-friendly environment:** includes attention to environmental child safety [e.g. covered wall plugs, child-proof locked cupboards, etc], area set aside for play and health professionals able to respond to the needs of the young child and family<sup>1</sup>.

**Child/family-centred care:** includes recognition that each child/ adolescent's family is the constant in her or his life, facilitation of child/adolescent/ family and health professional collaboration in health care, respect for child/adolescent's/family's individuality and encouraging the design of health care delivery systems that are accessible and responsive to child/adolescent/ family needs [<http://www.familycenteredcare.org>].

**Non-Malignant Hematology Care:** includes all aspects of care pertaining to diagnosis ranging from inherited and acquired, and includes red blood cell disorders, marrow failure syndromes, disorders of thrombosis and hemostasis, and defects of the phagocyte system.

<sup>1</sup>American Academy of Pediatrics. Sigrest TD and the Committee on Hospital Care. Facilities and equipment for the care of pediatric patients in a community hospital. *Pediatr* 2003; 111:1120-1122.

### **Phases of Care (Three):**

- 1. Investigation** phase of care: Phase of care in which child /adolescent is having investigations [e.g. Lab, diagnostic imaging] done prior to diagnosis and may include investigations done at other times during course of illness.
- 2. Treatment** phase of Care: Any care given to the child/ adolescent with the goal of treating the specific diagnosis.
- 3. Supportive** phase of care: All care given to child/ adolescent and family to support them with: complications of the diagnosis and treatment and care given following treatment phase of care including follow up and long term care and/or palliation.

**Shared care:** is collaboration of health professionals in Sub-Specialty centres and home community to make it possible for children and adolescents with cancer or a serious blood disorder to receive safe, effective care as close to home as feasible.

**Supportive Care Guidelines:** are guidelines developed by clinical experts and approved by APPHON /ROHPPA to guide health professionals involved in the supportive phase of care for pediatric hematology oncology patients. APPHON/ROHPPA expects that all facilities participating in this care will be aware of and follow these guidelines to provide care that is safe and consistent throughout the Atlantic Provinces.

### **ROLES OF EACH HEALTH DISCIPLINE SPECIFIC TO APPHON/ROHPPA LEVELS OF CARE**

It is imperative that as soon as a child/adolescent is suspected of having a malignancy that contact is made with the pediatric hematologist/oncologist on call to discuss further investigations and approach. It is crucial that initial tumour samples be processed appropriately to ensure accurate diagnosis and staging. The improper handling of a pediatric tumour specimen may ultimately result in an inferior outcome for the child/adolescent. In case of inadvertent removal of a mass, each health care facility or organization, where pediatric surgery is carried out, must ensure appropriate health professionals are aware of the proper processing of the tumour tissue [see Appendix IV].

Determining an accurate diagnosis and staging significantly influence long-term outcome, therefore, the standard of practice for pediatric oncology is immediate consultation with the Sub-Specialty pediatric oncology centre to develop the plan for investigation as soon as the diagnosis of a malignancy is considered. For almost all children and adolescents, diagnostic/ staging investigations will be done at Sub-Specialty care centres. The results of these investigations are communicated to the home community care team through the pediatric hematologist/oncologist or family care coordinator's (FCC) discharge letter.

It is expected that after the child/adolescent's diagnosis and treatment plan is established, communication, negotiation and documentation for shared care around the course of treatment within each health care discipline will be initiated by the Sub-specialty health care team and maintained between the home community and the Sub-Specialty centre by each respective discipline throughout the child/adolescent's entire course of treatment and follow-up.

Health professionals must comply with all appropriate federal, provincial, institutional, and Children's Oncology Group [COG] study guidelines for record keeping and documentation.

For all patients, an appropriate primary contact person[s] must be identified at each location where the child/adolescent may receive care. In most circumstances, this would involve a designated person in the disciplines of medicine and nursing, and linkages for pharmacy, nutrition and psychosocial support.

All health professionals involved in the health care of a child/adolescent with cancer or serious blood disorder will have appropriate contact numbers [including phone and fax numbers].

#### **Pediatric Hematologist/Oncologist:**

- Develops a comprehensive treatment plan for each child/ adolescent
- Oversees and directs all chemotherapy regardless of the site of delivery.
- Signs orders for each patient as applicable
- Is readily available for monitoring complications and for consultation to respond to any questions or to provide additional information as needed
- Participates in and supports educational endeavours for pediatricians/family physicians/ health professionals as needed
- Maintains contact by phone initially with the community pediatrician (or family physician) and provides, on a timely basis, a full discharge summary (or comparable information), protocol information and clear guidelines for care
- Appropriately communicates pertinent patient information to the pediatrician (or family physician) after each visit to the Sub-Specialty centre and clearly indicates the current plan of care (including interval, duration, and assessment of therapy) and identifies specific monitoring/follow-up expected of the pediatrician (or family physician). The method of communication will depend on the urgency for exchange of information but formal documentation of the information sharing is essential.
- Obtains “Consent for Shared Treatment” and other documentation as might be required by the Children’s Oncology Group (COG)

#### **Pediatrician and/or Family Physician:**

- Has experience in the care of children/adolescents with cancer
- If not experienced, but willing to care for a child /adolescent with cancer, commits to gaining additional education, information and support for that care. Education may be provided through ‘just in time’ telephone consultation as care for an individual child/adolescent proceeds. [Note: it is recommended that delivery of cancer care be limited to a small number of physicians to maintain expertise].
- Through an understanding of the child/ adolescent’s treatment protocol and roadmap, supervises the portion of the treatment received when the child/adolescent is under her/ his care
- Through an understanding of the chemotherapy [systemic and/or intrathecal] to be administered and knowledge of possible side effects, provides the appropriate monitoring required
- Administers or supervises administration of chemotherapy, provides on-site or immediate response for agents with risk of hypersensitivity and/or extravasation (for Intermediate and Advanced Levels of Care)
- Recognizes and responds to emergency situations such as extravasation and anaphylaxis (for Intermediate and Advanced Care) or fever and neutropenia (for Basic, Intermediate and Advanced Levels of Care)
- Manages chemotherapy-related toxicity within their scope of experience or on the advice of the pediatric hematology/ oncologists as applicable, and as dictated by the resources

available, or appropriately transfers the care of the child/adolescent

- Identifies personal learning needs in relation to providing care to a child/adolescent with cancer and/or serious hematological disorder and their family, and participates in applicable pediatric hematology and oncology continuing education; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged and can be arranged.
- Provides documentation of the care delivered locally to the Sub-Specialty care center, including the results of laboratory tests and imaging, as well as the treatments administered, particularly any chemotherapeutic agents
- Communicates and documents all visits including purpose of visit, assessment, interventions and outcomes, and forwards the documentation needed for protocol-driven care by mail or fax to the IWK [1-902-470-7208] or Janeway Pediatric Hematologist/Oncologist Fax [1-709-777-4941]
- Contacts pediatric oncologist if questions or problems arise or if patient requires admission or transfer to hospital
- Obtains institutional “Consent for Shared Treatment” and other institutional documentation as required
- Provides any additional documentation that may be required by COG

#### **Nurse:**

- Using expertise and/or specialized training, the nurse providing care to the pediatric hematology and/or oncology population identifies personal learning needs and develops and maintains the nursing standards & competencies of their facility’s assessed level of care as delineated in the documents “Practice Standards and Competencies for Nurses Providing Pediatric Cancer Care in Atlantic Canada” and “Practice Standards and Competencies for Nurses Providing Pediatric Non-malignant Hematology Care in Atlantic Canada” [Appendix II]
- Note: it is recommended that the delivery of cancer and serious hematological disorder care be limited to a small number of nurses to maintain expertise; if there are nurses who are not experienced, but willing to care for a child/adolescent there must be a commitment to gaining additional education, information and support to provide that care. Education may be provided through ‘just in time’ telephone consultation as care for an individual child/adolescent proceeds, and participation in education sessions and other learning opportunities.
- Provides documentation required for shared care
- Participates in applicable pediatric hematology and oncology continuing education including available hematology or oncology education modules; attendance at the annual APPHON/ROHPPA conference and other APPHON/ROHPPA education sessions is encouraged
- Completes and maintains APPHON/ROHPPA required qualifications for pediatric chemotherapy administration [Appendix III]
- Designation as a certified oncology nurse [Certified Pediatric Hematology/Oncology Nurse (CPHON/CPON), or Certified Oncology Nurse (Canadian)/CON(C)] is encouraged
- Family Care Coordinator [FCC] at the Sub-Specialty centre contacts the community nurse by phone and provides a summary of relevant patient and family information, protocol information and clear guidelines for nursing care Communication and documentation of each Sub-Specialty care visit will be provided to the home community and will include purpose of visit, assessment, interventions and outcomes

- FCCs will be readily available for consultation as needed from 0800 hours to 1600 hours 1-902-470-8819 Monday to Friday for the IWK, and from 0800 hours to 1600 hours at 1-709-777-4668 Monday to Friday for the Janeway. At all other times, the pediatric hematologist/oncologist on call may be contacted through the switchboard at 1-902-470-8888 at the IWK, and 1-709-777-6300 at the Janeway
- Clinical Nurse Specialist [CNS] provides support to the family while the child is an inpatient in the Sub-Specialty facility. The CNS also works with the FCC to assist with support in hospital, community and school for very complex cases.
- Nurse Practitioner [NP] works collaboratively to manage the health needs of Hematology/Oncology patients and families (especially in the inpatient setting) who are receiving treatment at the Sub Specialty Centre. The NP does comprehensive health assessments, diagnoses and treats health problems, prescribes treatments, and orders and interprets appropriate screening and diagnostic tests. The NP works with patients who require complex, multi-skilled, collaborative and comprehensive care.
- Pediatric Oncology Patient Navigator (New Brunswick) is a pediatric nurse with education and experience in children's cancer, who works closely with the healthcare teams at the IWK and home community. They are a source of support and information and link patients and families to many other resources (social, financial, informational and psychological) in their home communities. Working with the schools and health care teams they coordinate transitions back to home.
- Home community nurse maintains regular contact with the appropriate FCC and provides comprehensive and accurate data on all visits including purpose of visit, assessment, interventions and outcomes, and contacts FCC if questions or problems arise

#### **Pharmacist:**

- Through an understanding of the child/adolescent's treatment protocol, provides support for the provision of their care
- Understands the medications being used and their side effects provides monitoring required and ensures that appropriate supportive care measures are in place to avoid, minimize or manage such effects
- Provides pharmaceutical care and clinical support (drug information, drug therapy monitoring and review, discharge planning, patient teaching, etc) as staff and resources permit (for Intermediate, Advanced and Sub-Specialty Care); this may be provided in part by nursing if pharmacy resources do not permit
- Ensures all personnel involved in preparation and handling of chemotherapy have appropriate training and education; encourages or mandates specialized training, (e.g. chemotherapy preparation and order verification courses) where available to ensure competence, accuracy and safety [for Intermediate, Advanced and Sub-Specialty Care]
- Provides documentation required for shared care
- Assumes responsibility for procurement, storage, safe handling, preparation, dispensing, and disposal of chemotherapy according to established standards and guidelines
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorders and their families, and participates in appropriate pediatric hematology/ oncology related continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged

#### ***In addition at the Sub-Specialty Centres:***

- An in depth knowledge of COG protocols is required.

- PharmD/clinical pharmacy specialist with understanding of current standards/evidence based practice
- Clinical pharmacy technician
- The pharmacist will initiate contact by phone with pharmacist in community and will provide a summary of relevant patient and family information and identify medication needs and drug-related issues
- The pharmacist will provide information on chemotherapy including chemotherapy orders, protocol roadmap and information (for Intermediate and Advanced Levels of Care), and will be accessible for consultation as needed.
- All involved pharmacists will maintain records of medications issued and contact other pharmacists involved when clarifications are needed
- Sub-Specialty centre and home community pharmacist will document all therapy recommendations.

### **Psychosocial:**

Psychosocial Oncology is a specialty in cancer care concerned with understanding and treating the social, psychological, emotional, spiritual, quality-of-life and functional aspects of cancer, from prevention through palliation and bereavement. It is a whole-person approach to cancer care that addresses a range of very human needs that can improve quality of life for children/adolescent and families affected by cancer [*The Emotional Facts of Life with Cancer: A Guide to Counselling and Support for Patients, Families and Friends*. First Edition. February 2003. Canadian Association of Psychosocial Oncology].

- Psychosocial professionals include: Child Life Specialist, Psychologist, Psychiatrist, Spiritual Care Provider/Chaplain, Social Worker, as applicable.

### **Child Life Specialist:**

- Assesses the child's response to hospitalization and illness.
- Supports continued growth and development while hospitalized through group and individual programming
- Provides emotional/behavioural preparation for medical procedures and treatments and facilitates coping with health care experiences
- Provides education about specific diseases and treatment in age appropriate language for patients and their siblings
- Advocates for a child/adolescents and families psychological needs and has access to appropriate educational literature for staff and families
- Educates multidisciplinary team members about the developmental/emotional impact of hospitalization and stress; includes supervising students, volunteers and child life interns
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged
- Has received certification as a Certified Child Life Specialist from the Child/adolescent Life Council and has membership in Child/adolescent Life Council

### **Psychiatrist:**

- Specializes in the prevention, diagnosis and treatment of mental, addictive and emotional disorders and. has additional training in the diagnosis and treatment of developmental, behavioural, emotional and mental disorders of childhood and adolescence

- Able to understand the biological, psychological and social components of illness
- Is qualified to order diagnostic laboratory tests and to prescribe medications
- Evaluates and treats psychological and interpersonal problems
- May intervene with individuals and families who are coping with stress crises, and other problems of living
- Provides consultation on a wide range of issues inherent in pediatric oncology, including coping with pediatric cancer, pain and symptom management, medication compliance, neuropsychological effects of disease and therapy, sibling and family relations, bereavement, and care of the dying child/adolescent
- Some of these responsibilities cross over with other psychosocial oncology professionals  
Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/ oncology related continuing education programs

#### **Psychologist:**

- Addresses the relationship between children's/adolescent's physical, cognitive, social, and emotional functioning and their physical well being, including maintenance of health, promotion of positive health behaviours, and treatment of chronic or serious medical conditions.
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/ oncology related continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged and
- Is a licensed or registered clinical child psychologist

#### **Social Work:**

- At time of diagnosis completes a psychosocial assessment for each family
- Provides social work interventions based on psychosocial assessment
- Shares the assessment with appropriate psychosocial liaison(s) in home community (if available and with family's consent)
- Sub-Specialty centre provides ongoing social work expertise in counselling, advocacy and resource for families with cancer by phone or other means when no appropriate community liaison available
- Has access to appropriate educational literature at all levels of care
- Appropriate educational literature shall be maintained by Sub-Specialty social worker
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/oncology related continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged
- Has an active membership in the Association of Pediatric Oncology Social Workers (APOSW) at the Sub-Specialty Level of Care.

#### **Spiritual Care Provider/Chaplain:**

- Joins with the patient/family in the midst of their lived experience and journey with them over the complete continuum of care
- Focuses primarily on being available to the patient/family in their spiritual, religious and emotional needs

- Focuses on religious resource and advocacy, spiritual distress, helping to build hope, exploring meaning of life concerns, end of life care and bereavement support
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/ oncology related continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged

**Allied Health Professional [radiology and laboratory technologists, physiotherapists, occupational and respiratory therapists]:**

- Access, on-site or through other means of communication, to allied health professionals is considered essential to support children/adolescents with cancer and their families (for all Levels of Care)
- *Note:* it is recommended that delivery of cancer care be limited to a small number of professionals to maintain expertise; if not experienced, but willing to care for a child/adolescent, commits to gaining additional education, information and support for that care
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/oncology related continuing education program
- With signed patient consent to sharing of information - maintain contact by phone or other means with appropriate professional liaison in community/ Sub-Specialty centre as available and provides a summary of relevant patient and family information and discusses clear guidelines and/or recommendations for care
- If an appropriate local liaison is not available, the Sub-Specialty centre will continue to provide relevant services

**Dietician:**

- Provides nutritional support through a general understanding of the drugs being used and their side effects and required monitoring,
- Provides expertise in the nutritional assessment and therapy of children/adolescents receiving care for cancer or serious blood disorder and appropriate nutritional interventions
- Identifies personal learning needs in relation to providing care to children/adolescents with cancer and/or serious blood disorder and their family, and participates in appropriate pediatric hematology/ oncology related continuing education programs; attendance at the annual APPHON/ROHPPA conference, other APPHON/ROHPPA education sessions, and available pediatric hematology or oncology education modules is encouraged.

**Home Care**  
**It is understood that each level builds on the criteria from the previous level[s].**

Care includes administration of oral cytotoxic agents that may be self-administered or administered at home by a caregiver and do not require hospital services. The requirements and the intensity of care received at home will vary with each child/adolescent and family.

**Physician's Office  
(Family physician and/or community Pediatrician)  
It is understood that each level builds on the criteria from the previous level[s].**

It is expected that the child/adolescent family's general practitioner will continue to be involved with care. Because of the complexity of care during active treatment many physicians will be involved with the care of the child/adolescent. Maintaining communication among all care givers will be key to optimal outcomes for the child/adolescent and family.

Care may include assessment, monitoring, and dose adjustment of oral cytotoxic agents by a physician in consultation with a qualified subspecialty physician, pharmacist or nurse, but does not normally include administration of cytotoxic agents.

**1. Treatment Phase of Care**

**Required Criteria:**

- A physician (family physician or pediatrician) able to manage the care of a child/adolescent with a serious hematological disease.
- A physician (family physician or pediatrician) able to carry out dose adjustments of oral chemotherapy according to the appropriate toxicity/ therapeutic guidelines after consultation with a pediatric hematologist/oncologist, appropriate professional\*( see note page 27) at the Sub-Specialty centre or an oncology clinic nurse with delegated medical function certification in dose modification for oral chemotherapy

**2. Supportive Phase of Care**

**Required Criteria:**

- Able to anticipate and recognise common therapy-related toxicities, assess for and provide care according to supportive care guidelines.
- Able to provide appropriate immunizations and Subcutaneous injections when required
- Able to access resources to address a child/adolescent's difficulty adhering to treatment protocol.
- Has a designated person within office for purposes of communication [this person may be the physician her/himself]
- Able to recognize and secure an appropriate means to address the psychosocial support of the child/adolescent and family
- Able to make appropriate referrals to community health resources

**Basic Care  
It is understood that each level builds on the criteria from the previous level[s].**

In a Basic Level Facility, care may include assessment, monitoring and dose adjustment of oral cytotoxic agents by a managing physician in consultation with a qualified subspecialty physician, pharmacist or Registered Nurse, but does not normally include administration of cytotoxic agents. Personnel must be able to initiate and stabilize emergent care (such as febrile neutropenia or bleeds) prior to transfer. The presence of appropriate resources and expertise at

a facility **may** permit selected chemotherapy to be administered after approval by the hematologist/oncologist and subspecialty health professionals, discussion at subspecialty medical rounds, in collaboration with the APPHON/ROHPPA Levels of Care Coordinator and formal agreement of the responsibility between the centres.

The criteria that are either required or recommended for a BASIC level facility for all three phases of care: **Investigation, Treatment** and **Supportive Care** are listed below:

<b>Physical Facilities</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>• Safe, child friendly area to isolate child from nosocomial infections.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<b>Personnel</b>	<b>Required</b>
<ul style="list-style-type: none"> <li>• A family physician or pediatrician in the home community willing to manage the care of a child/adolescent with cancer or a serious haematological disorder which includes:</li> </ul>	
<ul style="list-style-type: none"> <li>• Carrying out dose adjustments of oral chemotherapy doses according to the appropriate toxicity/ therapeutic guidelines <b>after consultation</b> with a pediatric hematologist/oncologist, appropriate professional* (see note page 27) at the Sub-Specialty centre or an oncology clinic nurse with delegated medical function certification in dose modification for oral chemotherapy</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>• Managing the side-effects or complications of oral chemotherapy. Able to recognize or have access to information to anticipate common chemotherapy-related toxicities (e.g. bleeds and febrile neutropenia).</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Health professionals able to provide pediatric care and monitoring such as immunizations, subcutaneous injections, insertion of nasogastric tube, GCSF administration and vital signs monitoring.</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Physician or nurse with 24/7 coverage in emergency department to initiate treatment or stabilize patient and arrange for transfer as necessary.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<ul style="list-style-type: none"> <li>• If pediatric palliative care is to be provided, a physician willing to provide care in consultation with local or sub-specialty experts as needed.</li> </ul>	For Supportive Care
<b>Personnel</b>	<b>Recommended:</b>
<ul style="list-style-type: none"> <li>• Health and/or psychosocial professionals able to provide family support and assist with arrangements for transfer as required.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<ul style="list-style-type: none"> <li>• Community Resources for Palliative Care in place</li> </ul>	For Supportive Care

<b>Pharmacy</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>• Ready access to pharmacy with appropriate antibiotics, anti-emetics, pain medications and other drugs required for provision of basic level care.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<b>Equipment Resources</b>	<b>Required</b>
<ul style="list-style-type: none"> <li>• 24/7 Emergency Department services with basic resuscitation equipment. Basic investigations to ensure child can be transferred safely.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<ul style="list-style-type: none"> <li>• Able to obtain appropriate blood samples, including micro-samples and peripheral venous blood from children and transport blood samples to lab for testing if not available on site.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<ul style="list-style-type: none"> <li>• Able to do urine dipstick.</li> </ul>	For Investigation, Treatment and Supportive Phases of Care
<b>Lab/DI</b>	<b>Required</b>
<ul style="list-style-type: none"> <li>• Not Applicable at Basic Level Facility</li> </ul>	
<b>Education Certification</b>	<b>Required</b>
<ul style="list-style-type: none"> <li>• Commitment to ongoing education related to pediatric hematology/oncology.</li> </ul>	For Treatment and Supportive Care
<b>Communication Links</b>	<b>Required</b>
<ul style="list-style-type: none"> <li>• Identification of a primary contact able to forward necessary documentation to the tertiary centre</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Ready access to pediatrician referral and access to contact numbers at Sub Specialty centre for; ED, Clinic, Inpatient unit and Pediatric hematologist/oncologist</li> </ul>	For, Treatment and Supportive Care

**Intermediate Care**  
**It is understood that each level builds on the criteria from the previous level[s].**

At the intermediate level of care a Pediatrician will be the designated physician managing the care of a child/adolescent with cancer or a serious hematological disorder in the home area. If a Pediatrician is not available; in rare circumstances and on an individual basis an exception could be made. In those cases a family physician able to care for the child/adolescent with cancer or serious hematological disorder, and committed to gaining additional education, information and support for that care may be the designated physician.

- At the Investigation phase of care personnel at an Intermediate Facility are expected to collaborate with a subspecialty centre to determine interventions to be done prior to transfer and the timing of transfer.
- Treatment may include administration of any oral cytotoxic agent and Intermediate level parenteral cytotoxic agents [per Appendix 1]. This includes chemotherapy that can be given on an outpatient basis, or given over less than a 6-hour period including hydration, and may require premedication or hypersensitivity monitoring. The presence of appropriate resources and expertise at a facility may permit selected chemotherapy not normally included at an

Intermediate level to be administered after approval by the hematologist/oncologist and subspecialty health professionals, discussion at subspecialty medical rounds, in collaboration with the APPHON/ROHPPA Levels of Care Coordinator and formal agreement of responsibility between centres.

- An Intermediate level facility is not obligated to deliver every cytotoxic agent within their assessed level if it is not felt to be safe.
- For Supportive Care the Intermediate level facility must be able to provide low risk inpatient care for treatment, disease complications and therapy related toxicities, e.g., interventions with intravenous medications, intravenous hydration, blood products, administration of IVIG and enteral nutrition
- Able to treat patients presenting in ED with low risk febrile neutropenia in collaboration with a pediatric hematologist/ oncologist.

The criteria that are either required or recommended for an Intermediate level facility for all three phases of care: **Investigation**, **Treatment** and **Supportive Care** are listed below:

<b>Physical Facilities</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>• Safe, child friendly area to isolate child from nosocomial infections. [ED/ambulatory care]</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pediatric Inpatient unit (may be shared) with isolation rooms</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Controlled quiet environment for chemotherapy administration</li> </ul>	For Treatment
<b>Personnel</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>• A pediatrician (or GP in certain circumstances) able to manage the care of a child/adolescent with cancer or a serious haematological disorder in collaboration with a pediatric hematologist/oncologist and this includes: <ul style="list-style-type: none"> <li>○ Supervision of chemotherapy administration and provision of onsite or immediate response for agents with risk of hypersensitivity reactions and/or extravasation</li> <li>○ Managing the supportive care of a child with cancer or a serious hematologic disorder E.g. treating low risk febrile Neutropenia</li> </ul> </li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>○ Supervision of chemotherapy administration and provision of onsite or immediate response for agents with risk of hypersensitivity reactions and/or extravasation</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>○ Managing the supportive care of a child with cancer or a serious hematologic disorder E.g. treating low risk febrile Neutropenia</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>• Nurses with competencies to access CVADs 24/7</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Nurses with APPHON/ROHPPA established competencies to care for this patient population at the Intermediate level [see appendix III]</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pharmacist/s on site with expertise and understanding of chemotherapy and treatment protocols/ roadmaps, able to provide chemotherapy order verification.</li> </ul>	For Treatment

<b>Personnel</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Pharmacist/s or pharmacy technician/s with direct supervision by pharmacist/s, competent in safe handling, preparation, dispensing and disposal of chemotherapy agents.</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Pharmacists and/or nurses able to provide drug information, monitoring, clinical support and patient teaching.</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Health and/or psychosocial professionals able to provide family support and assist with arrangements for transfer as required.</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>Access to social worker and/or psychologist able to provide psycho-social support</li> </ul>	For Supportive Care
	<b>Recommended</b>
	For Treatment
<ul style="list-style-type: none"> <li>Dietician on site with applicable expertise able to provide nutritional assessment, monitoring and support, including enteral feeds, in liaison with tertiary dietician.</li> </ul>	<b>Required</b>
	For Supportive Care
	<b>Recommended</b>
	For Treatment
<ul style="list-style-type: none"> <li>All nurses giving Chemotherapy to this population to have completed the <u>APHON Pediatric Chemotherapy Biotherapy Provider Course</u></li> </ul>	<b>Required</b>
	For Treatment
<b>Personnel</b>	<b>Recommended:</b>
<ul style="list-style-type: none"> <li>Pharmacists with expertise in supportive care guidelines</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Access to physiotherapy, occupational therapist and respiratory therapist able to collaborate with tertiary colleagues to deliver pediatric care as required.</li> </ul>	For Treatment and supportive Care
<b>Pharmacy</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Hospital pharmacy available on site with access to pediatric specific resuscitation drugs and</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>level appropriate antineoplastic and supportive agents [and IV Phosphate and Magnesium]</li> </ul>	For Treatment and Supportive Care
<b>Equipment Resources</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Class II biological hood externally vented, chemo precautions equipment; chemo spill kit readily available; appropriate pumps for chemotherapy administration; rapid access to resuscitation, anaphylaxis and extravasation treatment drugs and equipment</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>24 /7 on site ED with pediatric appropriate resuscitation equipment, medications, and dosing and on site physician; applicable supportive care guidelines and pre-printed orders</li> </ul>	For Treatment and Supportive Care
<b>Lab/DI</b>	<b>Required:</b>

<ul style="list-style-type: none"> <li>Guidelines for 'Processing initial malignant specimens found unexpectedly' readily available</li> </ul>	For Investigation and Supportive Care
<b>Lab/DI</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Lab: CBC/diff, BUN, Na, K, creat, gluc stat [within 1 hour] if needed; PT PTT, access to fg test results within two days if needed; uric acid, Ca, Phos Mg, AST, ALT, bili T/D, amylase within 24 hours; creat clearance.</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Microbiology: aerobic and anaerobic bacterial cultures.</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Blood bank: FFP, CMV negative, irradiated PRBC onsite; access to cryo and on site if caring for at risk patient; CMV irradiated platelets within 24 hrs; access to appropriate blood product filters, factor concentrates, IVIG, VZIG.</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Blood bank: Access to CMV negative, irradiated platelets and PRBC within 24 hours</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>Diagnostic Imaging: equipment and personnel able to obtain and interpret pediatric ECGs, chest x-rays, abdominal films, and ultra-sounds – able to adjust to deliver lower doses of radiation for diagnostic imaging tests to pediatric patients.</li> </ul>	<b>Recommended:</b>
	For Investigation Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Able to transmit ECG images to tertiary centre.</li> </ul>	<b>Required:</b>
	For Treatment and Supportive Care
<b>Education Certification</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Health professionals with experience and education applicable to intermediate level of care; RN -APHON chemotherapy provider qualifications &amp; other competencies, MD - pediatric oncology education.</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Commitment to ongoing education related to pediatric hematology/oncology.</li> </ul>	For Supportive Care
<b>Communication Links</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Ready access to contact numbers; inpatient, ED, clinic and Pediatric hematologist/oncologist at Sub Specialty centre.</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>Identification of a primary contact - able to forward necessary documentation to the appropriate tertiary centre contact; Designated physician, nursing and pharmacist contact persons; contact numbers for other appropriate disciplines; phone and access to fax.</li> </ul>	For Treatment and Supportive Care

<b>Institutional Support:</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>All Chemotherapy orders originate at the Sub-Specialty Centre</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Able to provide institutional policies for chemotherapy ordering, preparation, administration, disposal, management of spills, etc even if they are borrowed from another institution.</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Local Institutional policies for oral and parenteral chemotherapy ordering, preparation administration, disposal, management of spills etc.</li> </ul>	<b>Recommended:</b>
	For Treatment

**Advanced Care**  
**It is understood that each level builds on the criteria from the previous level[s].**

At the advanced level of care, a Pediatrician will be the designated physician managing the care of a child/adolescent with cancer or a serious hematological disorder in the home area.

Treatment may include administration of any Intermediate and Advanced level cytotoxic agents [as per Appendix 1]. This includes chemotherapy requiring greater than a 6-hour period to administer including hydration and support, and pre or post hydration requiring overnight admission. It will also include administration of intrathecal cytotoxic agents by a pediatrician (with this expertise) and procedural sedation service provided by an anesthetist. The presence of appropriate resources and expertise at a facility may permit selected chemotherapy not normally included at an Advanced level to be administered after approval by the hematologist/oncologist, subspecialty health professionals, discussion at subspecialty medical rounds, in consultation with the APPHON/ROHPPA Levels of Care Coordinator and formal agreement of responsibility between centres. An Advanced level facility is not obligated to deliver every cytotoxic agent within their assessed level if it is not felt to be safe.

The criteria that are either required or recommended for an Advanced level facility for all three phases of care: **Investigation, Treatment** and **Supportive Care** are listed below:

<b>Physical Facilities</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>A pediatric inpatient unit with isolation rooms [dedicated pediatric unit preferred].</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Intensive Care Unit capable of stabilizing a critically ill child/adolescent for transportation to a sub-specialty centre.</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Personnel</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Pediatricians prepared to manage the care of a child with cancer or a serious hematologic disorder, in collaboration with a pediatric hematologist/ oncologist, including:</li> </ul>	

<b>Personnel</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>○ treating low risk patients with febrile neutropenia</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>○ treating varicella zoster with IV Acyclovir, in collaboration with an infection disease specialist and/or pediatric haematologist/ oncologist</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>○ preventing common complications and treating oncologic emergencies such as metabolic disturbances or hemorrhagic complications, etc.</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>○ supervision of administration of advanced level chemotherapy and provision of onsite or immediate response for agents with risk of hypersensitivity reactions and/or extravasation</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>● Pediatricians able to administer intrathecal chemotherapy in collaboration with a pediatric oncologist at the sub-specialty centre</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>● Anesthetist to provide deep sedation/anesthesia resources to perform LP's and during intrathecal chemotherapy administration</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>● Pediatrician on call 24/7</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>● Nurses with APPHON/RROHPA established competencies to care for this patient population at the advanced level</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>● All Nurses giving Advanced chemotherapy to this population to have the <u>APHON Pediatric Chemotherapy and Biotherapy Provider Course</u></li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>● On-site pharmacist/s able to provide monitoring and consultation about the treatment plan, in collaboration with the Sub- Specialty Centre</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>● Nurses able to provide one-on-one care, if needed, or arrange transport.</li> </ul>	For Supportive Care

<b>Personnel</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Social worker and/or psychologist available to provide applicable psychosocial support.</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Available dietician with applicable expertise in nutritional support of children/adolescents with cancer or haematological disorder Including parenteral feeds, in collaboration with dietician at the sub-specialty centre</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Access to physiotherapy, occupational therapy and respiratory therapist with pediatric experience.</li> </ul>	For Treatment and Supportive Care
<b>Personnel</b>	<b>Recommended:</b>
<ul style="list-style-type: none"> <li>Access to a child life specialist</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Pharmacy</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Able to provide pediatric total parenteral nutrition.</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Pharmacy onsite with access to advanced level antineoplastics.</li> </ul>	For Treatment
<b>Equipment and Resources</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>24/7 onsite Emergency Department with advanced pediatric appropriate resuscitation equipment, an onsite physician, and access to an on call pediatrician 24/7.</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>applicable supportive care guidelines and pre-printed orders</li> </ul>	For Supportive Care
<b>Lab/Diagnostic Imaging</b>	
<b>Diagnostic Imaging:</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Nuclear medicine facilities for glomerular filtration rate (GFR) (preferred) or creatinine clearance.</li> </ul>	For Investigation and Supportive Care
<ul style="list-style-type: none"> <li>wall motion ejection fraction (WMEF) or echocardiogram to determine left ventricular function</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Experience in pediatric CT scanning, able to adjust to deliver lower doses of radiation for pediatric patients.</li> </ul>	For Treatment
	<b>Recommended:</b>
	For Investigation and Supportive Care
<b>Lab:</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Guidelines for 'Processing initial malignant specimens found unexpectedly' readily available</li> </ul>	For Investigation and Supportive Care
<ul style="list-style-type: none"> <li>Access to bacterial culture on site and fungal culture results in a timely manner</li> </ul>	For Investigation, Treatment and Supportive Care

<b>Lab:</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Blood Bank: access to CMV negative, irradiated platelets and PRBC for transfusion with 12 hours.</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Education/Certification</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Commitment to ongoing education related to pediatric hematology oncology</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Experience and education applicable to advanced level of care.</li> </ul>	For Treatment
<b>Communication links</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>As for basic level plus designated pharmacist contact.</li> </ul>	For Treatment
<ul style="list-style-type: none"> <li>Ready access to contact numbers; inpatient, ED, clinic and Pediatric hematologist/oncologist at Sub Specialty centre.</li> </ul>	For Investigation
<b>Communication links</b>	<b>Recommended:</b>
<ul style="list-style-type: none"> <li>Designated contact persons for dietician, child life specialist, social work and/or psychology</li> </ul>	For Supportive Care
<b>Institutional Support</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Local Institutional policies for oral and parenteral chemotherapy ordering, preparation administration, disposal, management of spills etc</li> </ul>	For Treatment

\*(Note) “Appropriate professional at the sub-specialty centre” means clinical pharmacist, sub-specialty oncology clinical nurse specialist, oncology nurse practitioner, or a sub-specialty oncology clinic nurse with delegated medical function certification in dose modification for oral chemotherapy.

**Sub-Specialty Care**  
**It is understood that each level builds on the criteria from the previous level[s].**

A Sub-Specialty centre must be a Principle Investigator Institution within the Children’s Oncology Group<sup>1</sup>. Treatment at the Sub-Specialty facility includes administration of any Intermediate, Advanced and Sub-Specialty level cytotoxic agents [as per table in Appendix 1] This level initiates all new chemotherapy protocols/regimens at diagnosis and relapse, and new chemotherapy cycles of a protocol, also all phase I and II drugs as restricted by NIH/NCI.

The Sub-Specialty centre provides pediatric surgery for diagnostic, therapeutic & supportive care and provides Radiation; both therapeutic and palliative. The Sub-Specialty facility is also able to provide complex monitoring and supportive care.

<sup>1</sup>American Society of Pediatric Hematology/Oncology [ASPHO] Position Statement. J Pediatr Hemato/Oncol 1998; 20:98-103.

The criteria that are either required or recommended for Sub-Specialty facility for all three phases of care: **Investigation**, **Treatment** and **Supportive Care** are listed below:

<b>Description/Physical Facilities</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>• Availability or access to full spectrum of investigations required for an accurate and timely diagnosis.</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>• In-patient and ambulatory care areas with appropriate isolation and reverse isolation capabilities</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Sub-Specialty care pediatric Emergency Department services with advanced pediatric appropriate resuscitation equipment available on- site 24 hours/day, 7 days per week</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pediatric Intensive Care Unit; pediatric operating rooms</li> </ul>	For Treatment and Supportive Care
<b>Personnel<sup>2</sup></b>	<b>Required: access to(*) or on site(**)</b>
<ul style="list-style-type: none"> <li>• Pediatric hematologist/oncologists** who develop a comprehensive treatment plan for each child/adolescent, available 24/7</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pediatric expertise/specialists in general surgery*,</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pediatric orthopedic surgery*, neurosurgery*, plastic surgery*, nephrology*, urology*, and availability of anesthetists and surgeons with expertise in the management of children and adolescents with cancer or serious blood disorder</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Radiation oncologists with experience and expertise in the treatment of children and adolescents with cancer*</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>• Pediatric pathologists**, hematopathologists*, neuropathologists*</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>• Pediatric diagnostic imaging specialists**</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>• Pediatric nurses** with additional education and expertise in the management of children/adolescents with cancer or serious hematologic disorder [e.g. CNS and /or NPs]</li> </ul>	For Investigation, Treatment and Supportive Care

<sup>2</sup>American Society of Pediatric Hematology/Oncology [ASPHO] Position Statement. J Pediatr Hemato/Oncol 1998; 20:98-103.

<b>Personnel</b>	<b>Recommended:</b>
<ul style="list-style-type: none"> <li>Nurses with APPHON/RROHPA established competencies to care for this patient population at the Sub- specialty level**</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>All Nurses giving Sub-Specialty chemotherapy to this population to have the <u>APHON Pediatric Chemotherapy and Biotherapy Provider Course**</u></li> </ul>	For Treatment
<b>Personnel</b>	<b>Required: access to(*) or on site(**)</b>
<ul style="list-style-type: none"> <li>Pediatric psychologists**</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Social workers** who have membership in the Association of Pediatric Oncology Social Workers (APOSW) and who have additional education and expertise in the management of children and adolescents with cancer or serious blood disorder</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Pediatric neuropsychologists*</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>School intervention/education support personnel*,</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Pediatric subspecialists in nephrology*, anesthesiology**, rehabilitation*, clinical genetics*, dermatology*, immunology*, infectious diseases*, rheumatology*, gastroenterology*, neurology*, endocrinology*, and psychiatry*</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Clinical pharmacists** with expertise in anti-neoplastic agents and therapies for serious hematologic disorders</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Dieticians** with expertise in the nutritional requirements of children and adolescents with cancer or serious hematologic disorder</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Physical therapists**, occupational therapists** and respiratory therapists** with expertise in pediatric oncology and hematologic disorders</li> </ul>	For Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Home health care professionals* with expertise in delivering health care to children and adolescents with cancer or serious hematologic disorder</li> </ul>	For Supportive Care
<ul style="list-style-type: none"> <li>Clinical research associates** with expertise in data management support of cooperative research</li> </ul>	For Treatment
<b>Personnel</b>	<b>Required: For Holistic Care</b>
<ul style="list-style-type: none"> <li>Certified child life specialists** who have membership in the Child Life Council</li> </ul>	For Investigation, Treatment and Supportive Care

<b>Pharmacy</b>	<b>Required: access to(*) or on site(**)</b>
• Medications for deep sedation	For Investigation
• Medications for a broad range of supportive care treatment	For Supportive Care
<b>Pharmacy</b>	<b>Required: access to(*) or on site(**)</b>
• Expertise in anti-neoplastic agents and therapies for serious hematologic disorders. Pharmacy capable of accurately and safely preparing, dispensing and documenting administration and disposal of investigational medications.	For Treatment
<b>Equipment and Resources</b>	<b>Required: access to(*) or on site(**)</b>
• Access to hematopoietic stem cell transplant service*	For Treatment
• Regularly held Tumour Boards** to discuss treatment planning	For Treatment
• Data collection and transfer systems** to support clinical research trials	For Treatment
• Membership in an international cooperative clinical trials group	For Treatment
• Access to radiation therapy equipment designed for state-of-the-art treatment of children and adolescents, including rotational linear accelerator, dedicated radiation simulator or CT simulator, anesthetic resources for sedation when needed	For Treatment
• Services for dialysis for children and adolescents	For Supportive Care
• Access to services for cytopheresis and plasmapheresis	For Supportive Care
• Provision of psychosocial and supportive care as per treatment plan	For Supportive Care
• Pain management program and guidelines	For Supportive Care
• Rehabilitative services	For Supportive Care
• Palliative care/ bereavement follow-up services	For Supportive Care
• Long-term follow-up and transition services	For Supportive Care
• Pediatric dental services	For Supportive Care
• Procedural deep and conscious sedation services provided by an anesthetist	For Supportive Care
<b>Lab/Diagnostic Imaging</b>	<b>Required: access to(*) or on site(**)</b>
• Diagnostic Imaging with pediatric expertise for US**, CT scanning**, nuclear medicine*, MRI*, angiography* and interventional radiology*	For Investigation, Treatment and Supportive Care

<b>Lab/Diagnostic Imaging</b>	<b>Required: access to(*) or on site(**)</b>
<ul style="list-style-type: none"> <li>Clinical laboratories with expertise in the assessment and diagnosis of pediatric hematology/oncology disorders including cell flow cytometry*, bone marrow aspirate and biopsy histological analysis**, immunohistochemistry*, cytogenetic analysis*, hemoglobinopathy diagnosis by protein and molecular methods*, specialized coagulation testing*, specialized analysis of immune function*, microbiology**/virology* services and clinical chemistry expertise in monitoring antibiotic, antineoplastic and immunosuppressant drug levels*, blood gas, routine chemistry, hematology and coagulation assays on small samples**, immediate interpretation of infectious organisms stains**, histopathology*</li> </ul>	For Investigation, Treatment and Supportive Care
<ul style="list-style-type: none"> <li>Anatomic pathology services** with ability to perform and interpret rapid frozen sections, ability to appropriately prepare tissue for complex investigations</li> </ul>	For Investigation
<ul style="list-style-type: none"> <li>Pediatric expertise in audiology, EEG, and ECG testing and interpretation</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Education/Certification</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Tertiary education qualifications and maintenance of ongoing education; support of educational endeavors for other health professionals as needed.</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Communication Links</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Established community links. Designated contact persons for all involved disciplines; able to forward necessary communication to appropriate health professional in the community in timely manner</li> </ul>	For Investigation, Treatment and Supportive Care
<b>Institutional support</b>	<b>Required:</b>
<ul style="list-style-type: none"> <li>Institutional support that was required or recommended at other levels</li> </ul>	For Treatment

## APPENDIX I

### Delivery of Parenteral Systemic Chemotherapy Agents

All pediatric oncology patients should have their diagnosis and treatment plans established at a sub-specialty level facility. Patients usually receive their initial treatments at the subspecialty facility before treatment with a shared care centre is established. This is particularly applicable in the following circumstances:

- Child less than 1 year of age
- Children/adolescents diagnosed with Acute Lymphoblastic Leukemia on a 3-drug induction - hospitalize or keep near the subspecialty level facility until day 8; then, consider sending home if the patient is stable [afebrile for at least 48 hours, with negative cultures and no mucositis or other foci of infection] and there are services within 30 minutes of home at an advanced level facility; otherwise, stay close to the subspecialty level facility until count recovery
- Children/adolescents diagnosed with Acute Lymphoblastic Leukemia on a 4-drug induction (or re-induction if post relapse) - hospitalize until after day 8 unless exceptionally favourable circumstances; keep near the subspecialty level facility until day 15; then, consider sending home if the patient is stable [afebrile for at least 48 hours, with negative cultures and no mucositis or other foci of infection] and there are services within 30 minutes of home at an advanced level facility; otherwise, keep close to the subspecialty level facility until count recovery
- All patients with relapsed disease receiving re-induction chemotherapy.
- Children/adolescents with serious co-morbidities/organ dysfunction Post-bone marrow transplant children/adolescents
- Children/adolescents who have experienced toxicity beyond that which is expected may need to initiate subsequent treatment at a subspecialty level facility
- Children/adolescents on severely myelo-suppressive protocols [expected greater than 7-10 days of severe neutropenia].
- Any agent requiring drug serum level monitoring [see table below].
- Biological or chemotherapeutic agents which the treating pediatric haematologist/oncologists feel should not be given outside the subspecialty center (e.g. some phase I and phase II agents).
- All agents that require continuous 24-hour infusion should be given at the subspecialty center (due to the requirement that APHON trained nurses must be on site during chemotherapy administration).
- Children/adolescents with complex chemotherapy regimes, monitoring requirements or supportive care needs.
- All children with underlying immunodeficiency including Down's syndrome, CVID etc.
- Children/families requiring concurrent psychosocial services not available at a regional centre

**Table of Chemotherapeutic Agents**

**(NOTE: Any new agents will be assessed and categorized by the IWK/Janeway Hematology/Oncology Groups):**

<b>Agent</b>	<b>Intermediate Level Hospital</b>	<b>Advanced Level Hospital</b>	<b>Sub-Specialty Level Centre</b>
Amsacrine	No	No	Yes
Asparaginase	Yes	Yes	Yes
Azacytidine	No	Yes	Yes
Bevacizumab	No	<b>Yes*</b>	Yes
Bleomycin	Yes	Yes	Yes
Bortezomib	No	Yes	Yes
Carboplatin	Yes	Yes	Yes
Carmustine	Yes	Yes	Yes
Cisplatin	No	Yes	Yes
Cladribine	No	Yes	Yes
Clofarabine	No	Yes	Yes
Cyclophosphamide (low dose less than or equal to 1000 mg/m <sup>2</sup> )	Yes	Yes	Yes
Cyclophosphamide (high dose greater than 1000 mg/m <sup>2</sup> )	No	Yes	Yes
Cytarabine (low dose)	Yes	Yes	Yes
Cytarabine (high dose greater than or equal to 1000 mg/m <sup>2</sup> )	No	No	Yes
Cytarabine Intrathecal	No	Yes	Yes
Dacarbazine	Yes	Yes	Yes
Dactinomycin	Yes	Yes	Yes
Daunorubicin	Yes	Yes	Yes
Docetaxel	No	Yes	Yes
Doxorubicin	Yes	Yes	Yes
Epirubicin	Yes	Yes	Yes
Etoposide	No	Yes	Yes
Fludarabine	No	Yes	Yes
Fluorouracil (5-FU)	Yes	Yes	Yes
Fluorouracil (5-FU) with leucovorin	No	Yes	Yes
Gemcitabine	No	Yes	Yes
Gemtuzumab	No	<b>Yes*</b>	Yes
Idarubicin	Yes	Yes	Yes
Ifosfamide	No	Yes	Yes
Interferon alfa-2b	Yes	Yes	Yes
Irinotecan	No	Yes	Yes
Melphalan	No	No	Yes
Methotrexate (low dose)	Yes	Yes	Yes
Methotrexate (high dose greater than or equal to 1000 mg/m <sup>2</sup> )	No	No	Yes

Agent	Intermediate Level Hospital	Advanced Level Hospital	Sub-Specialty Level Centre
Methotrexate intrathecal	No	Yes	Yes
Mitomycin	No	Yes	Yes
Mitoxantrone	No	Yes	Yes
Oxaliplatin	No	Yes	Yes
Paclitaxel	No	Yes	Yes
Pemetrexed	No	No	Yes
Rituximab	No	<b>Yes*</b>	Yes
Thiotepa	No	No	Yes
Topotecan	Yes	Yes	Yes
Trastuzumab	No	Yes	Yes
Vinblastine	Yes	Yes	Yes
Vincristine	Yes	Yes	Yes
Vinorelbine	Yes	Yes	Yes

\* Give first dose at sub-specialty level center.

The delivery of all chemotherapy outside of the IWK/Janeway should occur with the agreement of the pediatric oncologist and the local centre. Intermediate and Advanced level care hospitals/pediatricians may choose to decline administration of any chemotherapy agent if they believe that they are unable to safely administer and supervise the chemotherapy delivery for whatever reason.

## APPENDIX II

### **Practice standards and competencies for the nurse providing pediatric cancer care and non-malignant hematology care in Atlantic Canada:**

For standards and competencies for nurses providing care to children and youth in the Atlantic Provinces with cancer or hematology disorders, see the following references.

#### **References**

Atlantic Provinces Pediatric Hematology Oncology Network/ Réseau d'Oncologie et Hématologie Pédiatrique des Provinces Atlantiques (APPHON/ROHPPA) (2007). Practice Standards and Competencies for the Nurse Providing Pediatric Cancer Care in Atlantic Canada. Unpublished.

Atlantic Provinces Pediatric Hematology Oncology Network/ Réseau d'Oncologie et Hématologie Pédiatrique des Provinces Atlantiques (APPHON/ROHPPA) (2008). Practice Standards and Competencies for the Nurse Providing Non-Malignant Hematology Care in Atlantic Canada. Unpublished.

#### **Contact Information**

Atlantic Provinces Pediatric Hematology Oncology Network/ Réseau d'Oncologie et Hématologie Pédiatrique des Provinces Atlantiques (APPHON/ROHPPA) :

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## APPENDIX III

### **Pediatric Chemotherapy Administration Standards and Competencies for Practice and Education (Atlantic Provinces Pediatric Hematology Oncology Network [APPHON]/Réseau d'Oncologie Hématologie Pédiatriques des Provinces Atlantiques [ROHPPA])**

#### **Purpose**

To ensure competency of the Registered Nurse administering pediatric chemotherapy in the Atlantic Provinces.

#### **Background**

The Canadian Association of Nurses in Oncology/L'Association Canadienne des Infirmières en Oncologie (CANO/ACIO) (2001) describes the nursing roles (Generalist Nurse; Specialized Oncology Nurse; and Advanced Oncology Nurse), and the core competencies required (2001, 2006, and 2011) to provide the care all patients with cancer are entitled according to stated standards. Whether from a generalist or a specialist nurse, patients are entitled to knowledgeable and skilled care, including administration of chemotherapy. CANO/ACIO (2001) also notes that children with cancer are “a population that requires specific attention and a body of knowledge in pediatric oncology nursing”. The Atlantic Provinces Pediatric Hematology/Oncology Network/Réseau d'Oncologie Hématologie Pédiatriques des Provinces Atlantiques (APPHON/ROHPPA) (2007) delineates the competencies required to provide the nursing care required by this pediatric population in the Atlantic Provinces.

The Association of Pediatric Hematology/Oncology Nurses (APHON)] states that safe, competent, and consistent administration of chemotherapy and biotherapy to children and adolescents requires specific knowledge and specialized skills (2007, 2011). APHON has developed and maintained a curriculum for pediatric oncology Registered Nurses (RNs), with the overall objective to establish international education and practice standards. The APHON Standard of Practice is: *chemotherapy and biotherapy administered to children and adolescents should be provided by RNs who have completed the APHON Chemotherapy and Biotherapy Provider Course **and** a clinical practicum (APHON, 2011).*

CANO/ACIO has developed a *National Strategy For Chemotherapy Administration (Toolkit)* that includes standards and competencies for a RN working in oncology. Additional work is being done to complete an educational resource list for oncology RN's. This document is for both pediatric and adult based practice. In Canada, CAPHOL (Canadian Association of Pediatric Hematology/Oncology Leaders) and CPHOD (Council of Canadian Pediatric Hematology/Oncology Directors) have made recommendations requiring chemotherapy administration to children and adolescents be provided by RNs who have completed the APHON Chemotherapy and Biotherapy Provider Program.

Therefore, APPHON/ROHPPA chemotherapy administration standards and requirements will reflect both CANO's and APHON's standards and requirements.

## APPHON/ROHPPA Chemotherapy Administration\* Standards for Practice and Education

### Standard:

Chemotherapy and biotherapy administered to children and adolescents in the Atlantic Provinces will be provided by Registered Nurses who have completed the APHON Chemotherapy and Biotherapy Provider Program, have demonstrated clinical competency, and maintained knowledge and competency according to APPHON/ROHPPA specifications.

### Competency Requirements

- 1.a** The nurse will demonstrate **knowledge competency** by successful completion of the APHON Pediatric Chemotherapy and Biotherapy Provider Course – *The Pediatric Chemotherapy and Biotherapy Curriculum*. The RN will be termed a Pediatric Chemotherapy and Biotherapy Provider (APON, 2011).
- 1.b** The nurse will demonstrate **continuing knowledge competency** by:
- Reviewing the APHON Biannual renewal updates provided by APHON
  - Maintaining his/her status as an APHON Pediatric Chemotherapy and Biotherapy Provider with renewal every 2 years by an online written exam
  - Participating in continuing education specific to care of a child or adolescent with cancer including administration of chemotherapy and biotherapy is recommended. This could include, but is not limited to, participation in oncology related in-services, workshops, conferences, committees and associations, completion of oncology certification or oncology related university credits, and completion of self learning projects such as oncology related self learning packages, and video or article reviews
- 2.a** The nurse will demonstrate **initial clinical competency** in administering chemotherapy by:
- Successful completion of **at least three supervised\*\* chemotherapy administrations**, to a child, adolescent or adult. Clinical competency must be reflective of the level of care the nurse will provide at his/her institution (APPHON/ROHPPA, 2012), and local institutional policies.  
The APPHON/ROHPPA *Pediatric Chemotherapy Administration Clinical Competency Checklist* will be used to assess initial chemotherapy/biotherapy administration competencies, as well as for annual recertification.
  - A nurse who will administer **peripheral vesicants**, either by IV infusion or IV push, must have an **additional supervision** of a peripherally administered vesicant.

**Supervision** must be by a competent chemotherapy administration supervisor\*\* at the nurse's institution (or a designated provincial or intraprovincial supervisor). Competency will be assessed using the APPHON/ROHPPA *pediatric chemotherapy administration clinical competency checklist*.

**\*\* A competent chemotherapy provider or administration supervisor-** A RN who has current knowledge and clinical competence to administration pediatric chemotherapy based on the above standards and has at least two years of chemotherapy administration experience.

Note: It is recognized that some centres have institutional policies that limit who may administer any peripheral or any intravenous push antineoplastic medications, or may require extra supervisions of the nurse.

**2.b** The nurse will demonstrate **continuing clinical competency** by:

- Completing an annual administration to a child, adolescent or adult supervised by a competent chemotherapy provider or administration supervisor\*\* using the APPHON/ROHPPA *pediatric chemotherapy administration competency checklist*
- Each nurse will maintain a record of administrations and achieve a minimum of 20 administrations in a 2-year period, preferably at regular intervals. Administrations may be to a child, adolescent **or adult**.
- Both the nurse and her manager (or designate) should keep copies of the competency records.

**Grandfather clause** – In the past, RNs with previous pediatric chemotherapy administration education have not been required to complete the APHON Provider course but have been required to read the APHON renewal updates and maintain continued clinical competency as above. However, at least one APHON Pediatric Chemotherapy and Biotherapy Provider with current status was required on site and available while pediatric chemotherapy is being administered. *Going forward, it is APPHON's short term objective to have all RN's administering chemotherapy to children and adolescents have APHON provider status. Health centres using this clause must have a deliberate plan to have all grandfathered RNs become APHON providers.*

**If a nurse has been unable to maintain the demonstration of clinical skills** due to low chemotherapy administration volume or other reasons, they may again demonstrate clinical competency by successful completion of at least three supervised chemotherapy administrations. Clinical competency must be shown reflective of the level of care the nurse will provide at his/her institution (APPHON/ROHPPA, 2012), and local institutional policies.

**Dose adjustment of oral chemotherapy** is a Beyond Entry Level Competency. **Only nurses at a subspecialty level who have completed the BELC learning program** and have maintained the BELC certification, [or a pediatric oncologist, subspecialty oncology clinical pharmacist, subspecialty oncology clinical nurse specialist (Janeway Children's Health and Rehabilitation Centre, St. John's) or subspecialty oncology nurse practitioner (IWK Health Centre, Halifax)], may make oral dose modifications.

**Competency Documentation:** Health Centres that provide pediatric chemotherapy administration are expected to maintain documentation of the APHON provider status/renewal and competency achievement/maintenance of all staff who administers chemotherapy.

## Definitions

\* **Chemotherapy Administration** – refers to the whole process of providing chemotherapy to a patient. This includes: patient assessment, education, checking, administering, and safe handling of the agent as well as the ongoing monitoring of the patient while the medication is infusing.

\*\* **Competent chemotherapy administration supervisor** – a nurse who has completed the APHON Pediatric Chemotherapy Biotherapy Provider course and has demonstrated current clinical and knowledge competency, and has at least 2 years of chemotherapy administration experience.

## References

Association of Pediatric Hematology Oncology Nurses (APHON) (2011). The pediatric chemotherapy and biotherapy curriculum. 3rd ed.

Association of Pediatric Hematology Oncology Nurses (APHON), (2014). Scope and Standards of Pediatric Hematology/Oncology Nursing Practice.

APPHON/ROHPPA (2012). Levels of Care Approach for Hematology/ Oncology Care of Adolescents and Children within the Atlantic Provinces

APPHON/ROHPPA *Pediatric Chemotherapy Administration Clinical Competency Checklist* (2009).

Canadian Association of Nurses in Oncology/Association Canadienne des Infirmières en Oncologie (CANO/ACIO) (2012). National Strategy for Chemotherapy Administration: Standards and Competencies for Cancer Chemotherapy Nursing Practice. [http://www.cano-acio.ca/~ASSETS/DOCUMENT/NSCA/CANO\\_Chemotherapy\\_Standards\\_ENG\\_Oct%202012.pdf](http://www.cano-acio.ca/~ASSETS/DOCUMENT/NSCA/CANO_Chemotherapy_Standards_ENG_Oct%202012.pdf)

Canadian Association of Nurses in Oncology/Association Canadienne des Infirmières en Oncologie (CANO/ACIO) (2012). National Strategy for Chemotherapy Administration: Standards and Competencies for Cancer Chemotherapy Nursing Practice Tool Kit. [http://www.cano-acio.ca/~ASSETS/DOCUMENT/CANO\\_NSCA\\_Toolkit\\_ENG\\_Oct%202012\\_Nov%202012\\_V2.pdf](http://www.cano-acio.ca/~ASSETS/DOCUMENT/CANO_NSCA_Toolkit_ENG_Oct%202012_Nov%202012_V2.pdf)

## APPENDIX IV

### Processing Initial Malignant Specimens Found Unexpectedly:

#### Purpose

To facilitate appropriate handling of malignant specimens found unexpectedly at institutions [other than tertiary centres] where pediatric surgery is carried out.

#### Rationale

Determining an accurate diagnosis and staging significantly influence long-term outcome in pediatric oncology. It is important that initial tumour samples be processed appropriately to ensure accurate diagnosis and staging.

The proper handling of a pediatric tumour is crucial. The improper handling of a pediatric tumour specimen may ultimately result in an inferior outcome for the child.

If a malignancy is not suspected but found incidentally at an institution where pediatric surgery is carried out, a pediatric pathologist should be contacted immediately to discuss further handling of the specimen.

The studies performed at a tertiary center will include:

1. Fresh specimen
  - 1.1 Touch preparations at least 10 slides (air-dried, unfixed and stored at -20° Celsius until shipped)
  - 1.2 Immunocytology
  - 1.3 FISH
2. Fresh tissue for a cell suspension in saline:
  - 2.1 Flow cytometry
  - 2.2 Cytogenetics
  - 2.3 Establishment of a cultured cell line
3. Fresh frozen tissue 0.5 – 1 cm (-70 storage) for molecular diagnostic studies
4. Electron Microscopy
5. Routine formalin fixation

For appropriate processing, the referring center requirements are:

Glutaraldehyde required for Electron Microscopy (refrigerated lasts weeks). Saline for the cell suspension and cytogenetics if transported the same or next day. The frozen tissue can be transported on dry ice at the institution's discretion.

Optimally, the tissue is received fresh at the pediatric pathology centre.

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## APPENDIX V

### **Additional source materials used in the development of these criteria for Levels of Care:**

American Academy of Pediatrics. Sigrest TD and the Committee on Hospital Care. Facilities and equipment for the care of pediatric patients in a community hospital. *Pediatr* 2003; 111:1120-1122.

American Academy of Pediatrics, Committee on Pediatric Emergency Medicine. Guidelines for pediatric emergency care facilities. *Pediatr* 1995; 96:526-537.  
BC Children's Hospital Criteria for Levels of Care, 2011

BC Children's Hospital [homepage on the Internet]. Vancouver, BC: c2008 [updated 2007; reviewed 2008 May 26]. BC Children's Hospital oncology/ hematology/BMT department levels of care in the community. Available from: <http://www.bcchildrens.ca/NR/rdonlyres/6B320898-6521-4FEC-ABE3-9D555B64C6C6/24233/LevelsofCare.pdf>

Cancer Care Nova Scotia [CCNS] Plan for Systemic Therapy in Nova Scotia Hospitals. 2004 [draft] and 2008 revision.

IWK Health Centre "PEOPLE Determine our Reputation for Quality", 2007. Pediatric Oncology Group of Ontario [POGO]. Blueprint: Provincial Pediatric Oncology Satellite Program, 3<sup>rd</sup> ed. July, 2002.

River Valley Health Levels of Care Approach for Systemic Cancer Therapy Delivery in River Valley Health, New Brunswick. Approved by the Region 3 Cancer Care Committee, April, 2003.

The Saskatchewan Cancer Agency policies and criteria for participation in the Community Oncology Program, June, 2002.

In the development of the original document, input and feedback was received from:

- The APPHON-ROHPPA Levels of Care Working Group
- The Cancer Care Nova Scotia Pediatric Site Team
- The IWK Health Centre Hematology/ Oncology Interdisciplinary Council
- Site visit to the Dr. Everett Chalmers Regional Hospital
- The Cancer Care Nova Scotia Levels of Care Steering Committee
- Site visit to Sydney, NS
- The Psychosocial Committee of APPHON/ROHPPA
- The APPHON/ROHPPA Levels of Care Standards Review Working Group [2008]