Priority interventions to strengthen service delivery for Wilms tumour

Global Initiative for Childhood Cancer technical brief

World Health Organization

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Abbreviations

EMLc	WHO Model List of Essential Medicines for Children
COG	Children's Oncology Group
GICC	Global Initiative for Childhood Cancer
HIC	high-income country
LIC	low-income country
LMIC	low- and middle-income country
PPC	paediatric palliative care
SIOP	International Society of Paediatric Oncology
UHC	universal health coverage

Executive summary

Wilms tumour is one of the most common childhood cancers and, with timely diagnosis and access to high-quality care, is associated with high 5-year survival rates. It has been selected as one of the six "index" cancers of the World Health Organization (WHO) Global Initiative for Childhood Cancer (GICC) to support implementation, monitoring and strengthening of childhood cancer services across health systems.

This technical brief is the first in a series developed by WHO to outline priority interventions for organizing service delivery for the GICC index cancers, in line with the objectives of the GICC and its Cure*All* framework. Focusing on Wilms tumour, the brief provides practical, evidence-informed guidance to support policy-makers, hospital managers and cancer control programme managers in planning, financing and coordinating services across the full continuum of care.

The brief identifies seven priority interventions that countries can adapt to their local context to strengthen outcomes for children with Wilms tumour:

1. reducing delayed diagnosis through early detection;
2. improving access to diagnosis and staging;
3. improving access to quality treatment;
4. preventing abandonment of treatment;
5. providing access to adequate supportive care;
6. achieving an integrative palliative care approach; and
7. ensuring provision of survivorship care.

For each priority intervention, the brief outlines the rationale for action, key system-level considerations and guiding questions relevant to service organization and delivery. The document also highlights how Member States can scale and integrate these interventions within national cancer control plans, essential health service packages and universal health coverage (UHC) benefit schemes.

The priority interventions presented are aligned with the Cure*All* operational approach, supporting the development of centres of excellence and care networks, integration of childhood cancer services into essential benefit packages, standardization of treatment regimens and strengthening of monitoring and evaluation systems. By consolidating current evidence, expert consensus and practical service-delivery considerations, this brief is intended to support countries in making informed, context-appropriate investments that improve access, quality and equity of care for children with Wilms tumour, while strengthening childhood cancer services more broadly.

Introduction

Wilms tumour is one of six common childhood "index" cancers that are the initial focus of the World Health Organization (WHO) Global Initiative for Childhood Cancer (GICC) to monitor implementation and progress in childhood cancer control across health systems globally *(1)*.

Why WHO produced this brief

This is the first in a series of technical briefs focusing on priority interventions to organize service delivery for the six GICC index cancers, in accordance with the 2017 World Health Assembly resolution on cancer *(2)*. This includes the need to address inequity in access to early detection, high-quality treatment and access to pain control and palliative care, as addressed under operational paragraphs 1 and 2 of the resolution:

- to develop or adapt stepwise and resource-stratified guidance and tool kits in order to establish and implement comprehensive cancer prevention and control programmes, including for the management of cancers in children and adolescents, leveraging the work of other organizations.
- to collect, synthesize and disseminate evidence on the most cost-effective interventions for all age groups, and support Member States in the implementation of these interventions; and to make an investment case for cancer prevention and control.

The aim is that this brief will support effective implementation and assist Member States in planning and prioritizing future investments in childhood cancer care, leading to steady improvements in the quality of care for children with Wilms tumour.

About Wilms tumour

Wilms tumour, also known as nephroblastoma, is a solid cancerous tumour of the kidney that affects children. Wilms tumour is the fourth most common type of childhood cancer, affecting males and females equally. Approximately 75% of cases occur in children less than five years of age, and most children present between two to three years of age *(3).*

Wilms tumour represents one of the most prevalent childhood cancers. It is highly curable, with 5-year survival rates now exceeding 85%, and exemplifies the importance of a multidisciplinary approach for the delivery of quality childhood cancer care *(3)*. Studies in long-term survivors have demonstrated that standard therapies are effective in maximizing 5-year survival rates. However, chronic health problems occur in nearly 25% of survivors *(3,4)*. Surveillance of long-term effects in Wilms tumour survivors is an essential part of the continuum of care contributing to healthy lifestyles and better quality of survivorship *(5–7)*.

Typical symptoms of Wilms tumour include a large lump or hard mass in the child's abdomen, the abdomen itself appearing larger than usual, as well as fever, nausea, loss of appetite, blood in the urine, constipation, high blood pressure, shortness of breath and a persistent fever.

Depending on the tumour stage, treatment typically involves a combination of surgery and systemic chemotherapy. It may also involve radiation therapy for children with advanced disease.

Box 1. Strengthening the Wilms tumour evidence base for resource-limited contexts

Most interventions drawn from existing guidelines rely on experience from high-income countries (HICs). There is a pressing need for more research to identify the most effective treatment approaches for Wilms tumour that can be feasibly implemented in resource-constrained settings. Additionally, the long-term effects of current interventions are not well understood, highlighting the need to conduct additional studies to explore potential late-onset consequences for survivors. A deeper understanding of how socioeconomic factors, including treatment abandonment (failure to complete curative intent treatment), affect outcomes is essential to inform strategies to improve treatment adherence *(8)*. This will ultimately contribute to improved survival rates and a better quality of life for children with Wilms tumour and their families.

Association of Wilms tumour with genetic and familial risk factors

Around 5% of Wilms tumour cases are associated with cancer predisposition syndromes. Routine screening for Wilms' tumour is recommended in children younger than eight years old with family predisposition syndromes *(3).* The following cancer predisposition syndromes are associated with Wilms tumour:

- Beckwith-Wiedemann syndrome;
- Denys-Drash syndrome; and
- WAGR syndrome (Wilms tumour, aniridia, genitourinary problems and range of development delays).

Wilms tumour is also associated with genitourinary clinical malformations. Physical examination should focus on detecting the presence of certain genitourinary anomalies including hypospadias or cryptorchidism, and specific features such as hemihyperplasia, macroglossia and omphalocele *(4,5)*.

Failure to recognize early warning signs in the at-risk population contributes to delayed diagnosis, leading to poorer prognosis. Therefore, it is important to identify children with these congenital conditions and the associated increased risk of Wilms tumour.

Purpose and intended users of the brief

This technical brief provides practical, evidence-informed guidance to support the organization and delivery of high-quality services for children with Wilms tumour. It is intended for policy-makers, hospital managers, childhood cancer focal points and cancer control programme managers responsible for planning, financing and coordinating paediatric oncology services.

It outlines a set of priority interventions that countries can adapt to their context to strengthen timely diagnosis, staging, treatment, supportive care, palliative care and survivorship services for Wilms tumour. By consolidating current evidence and expert consensus, the document aims to help decision-makers identify the essential system requirements, workforce capacities and service delivery arrangements needed to improve outcomes for children with this index cancer.

Each WHO Member State will need to adapt the proposed priority interventions to their local context and health system capacities. As Member States prioritize childhood cancer by allocating resources and enhancing treatment capacity, the quality of service delivery should gradually improve.

The brief is designed for use in strategic planning, service configuration and quality improvement processes at national and sub-national levels, and as a companion resource for teams implementing the GICC and its Cure*All* framework *(1)*.

How the document is organized

The information presented is set out in the form of seven priority interventions. Each begins with a rationale for action, followed by specific considerations and key questions that are typically important for those designing and implementing services. There is then a section discussing ways to scale implementation of the seven interventions.

Relationship to the Cure*All* framework

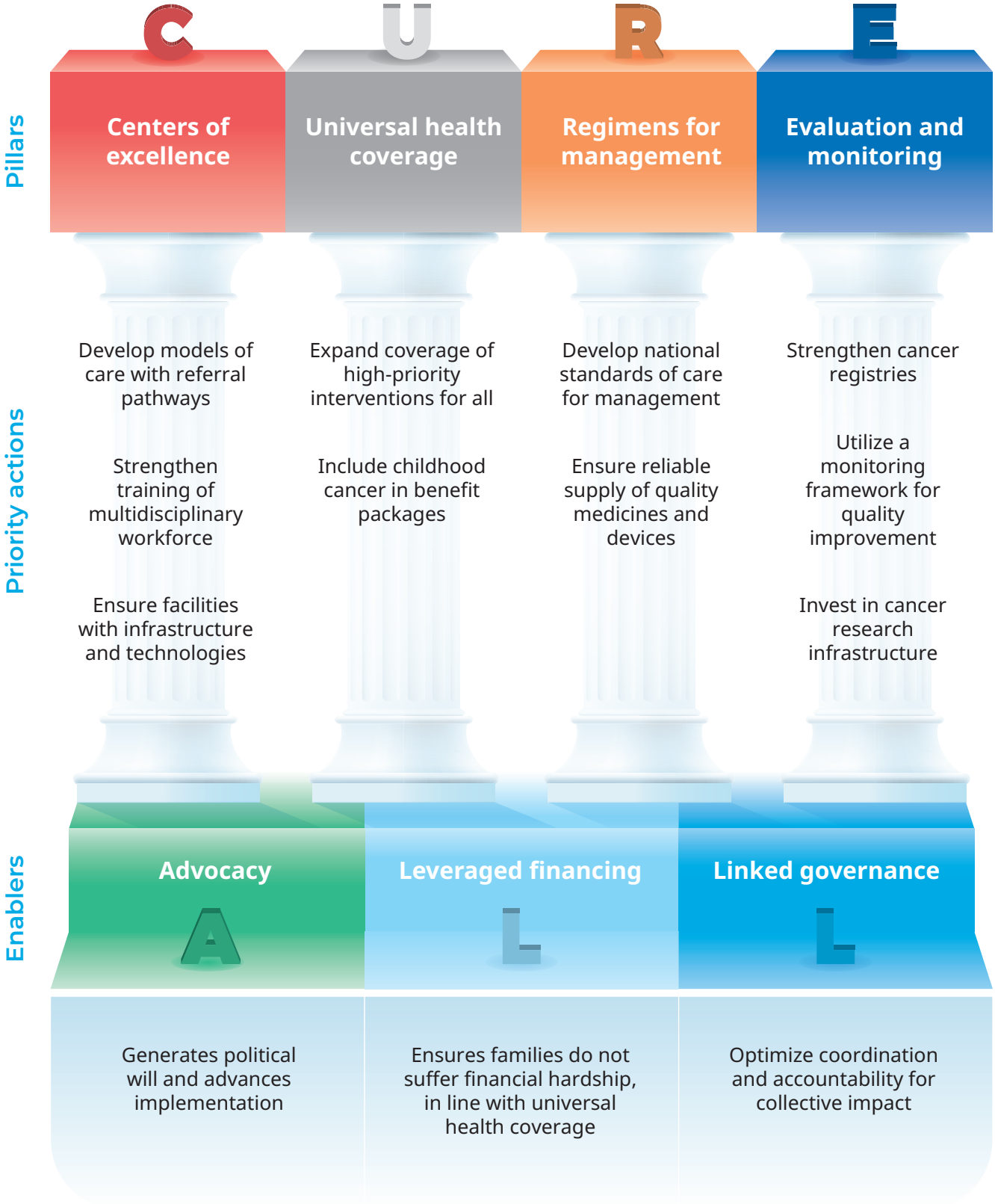
As previously outlined, this technical brief provides tailored interventions in line with the GICC Cure*All* framework (Fig. 1), a coordinated approach to strengthening childhood cancer programmes across the globe *(1)*. The Cure*All* approach strengthens childhood cancer care by establishing centres of excellence and well-functioning care networks, expanding access to priority and cost-effective interventions, and ensuring childhood cancer is integrated into essential health service packages. It promotes the development of national standards of care and reliable supplies of quality medicines and devices, together with improved evaluation and monitoring through stronger cancer registries, monitoring frameworks and research infrastructure *(1).* Through the implementation of the CureAll framework, GICC focus countries (such as Nepal, Panama and Ghana) have developed early diagnosis awareness campaigns, implemented related workforce training packages and strengthened their referral networks to improve coordination between facilities to reduce delays in care *(9,10).*

The priority interventions presented in this brief are consistent with the menu of essential services and multisectoral interventions outlined in the WHO *Universal health coverage (UHC) compendium (11)* and, in alignment with the Cure*All* pillars, are designed to support countries in integrated service delivery for childhood cancers.

The current brief is intended to guide implementation of the Cure*All* framework across the following pillars:

- **Pillar C:** Centres of excellence and care networks providing operational guidance on how to strengthen early diagnosis, workforce and treatment capacities to improve health outcomes for children affected by Wilms tumour.
- **Pillar U:** Promoting integration of the priority interventions into essential benefit packages to advance Member States' efforts to attain UHC for childhood cancer while decreasing the overall family and societal impacts of Wilms tumour in communities.
- **Pillar R:** Regimens for management, highlighting the importance of standardization of care through the development of national standards to improve access to and reliable supply of essential childhood cancer medicines and diagnostic devices.
- **Pillar E:** Evaluation and monitoring, highlighting the importance of establishing key indicators to monitor performance of childhood cancer programmes and promoting modifications for improvement and quality assurance.

Fig. 1. The Cure*All* operational approach



Source: Reproduced from CureALL framework: WHO Global Initiative for Childhood Cancer; 2021 (1).

Methods

The methodology to produce this technical brief was developed under the supervision of technical experts from the Methods and Standards unit from the Quality Assurance, Norms and Standards Department of the Science Division, WHO headquarters.

A core group of experts, comprising WHO secretariat and 25 individual external experts selected from the membership of the GICC Normative Working Group, were involved in the development of this technical brief. All external experts were selected in accordance with WHO principles of geographical and gender equity. For each expert, declarations of interests, conflicts of interest and confidentiality undertaking forms were collected and assessed, as required by the WHO individual experts policy. Only experts without conflicts of interest were selected to contribute to the development of the technical brief.

Given the generally limited body of evidence related to childhood cancers, a scoping review of the literature was used to synthesize and map available evidence on Wilms tumour diagnosis and management, and to inform packages of interventions required to provide quality services for children diagnosed with the disease. To support the mapping of priority interventions, a set of 37 priority questions or decision points to support the organization of service delivery for Wilms tumour were drafted by the Normative Working Group.

Clear inclusion and exclusion criteria were outlined to inform the scoping review. Strength and quality of the guidelines identified were appraised using the AGREE II tool *(12)*, including six domains: overall aim of the guidance; stakeholder involvement; development rigour; clarity on the formulation and presentation of the interventions; applicability; and editorial independence. For the initial appraisal, all 23 items identified were independently scored by two appraisers using a rating scale (see Annex 1).

Guidelines with a score above 70% in domains referring to stakeholder involvement and development rigour were considered good quality. Following this initial appraisal, the guidance documents were then assessed using four filter criteria, before being reviewed and approved by the WHO Quality Norms and Standards Unit. The criteria and scores obtained during the critical appraisal are detailed in the Annex 1.

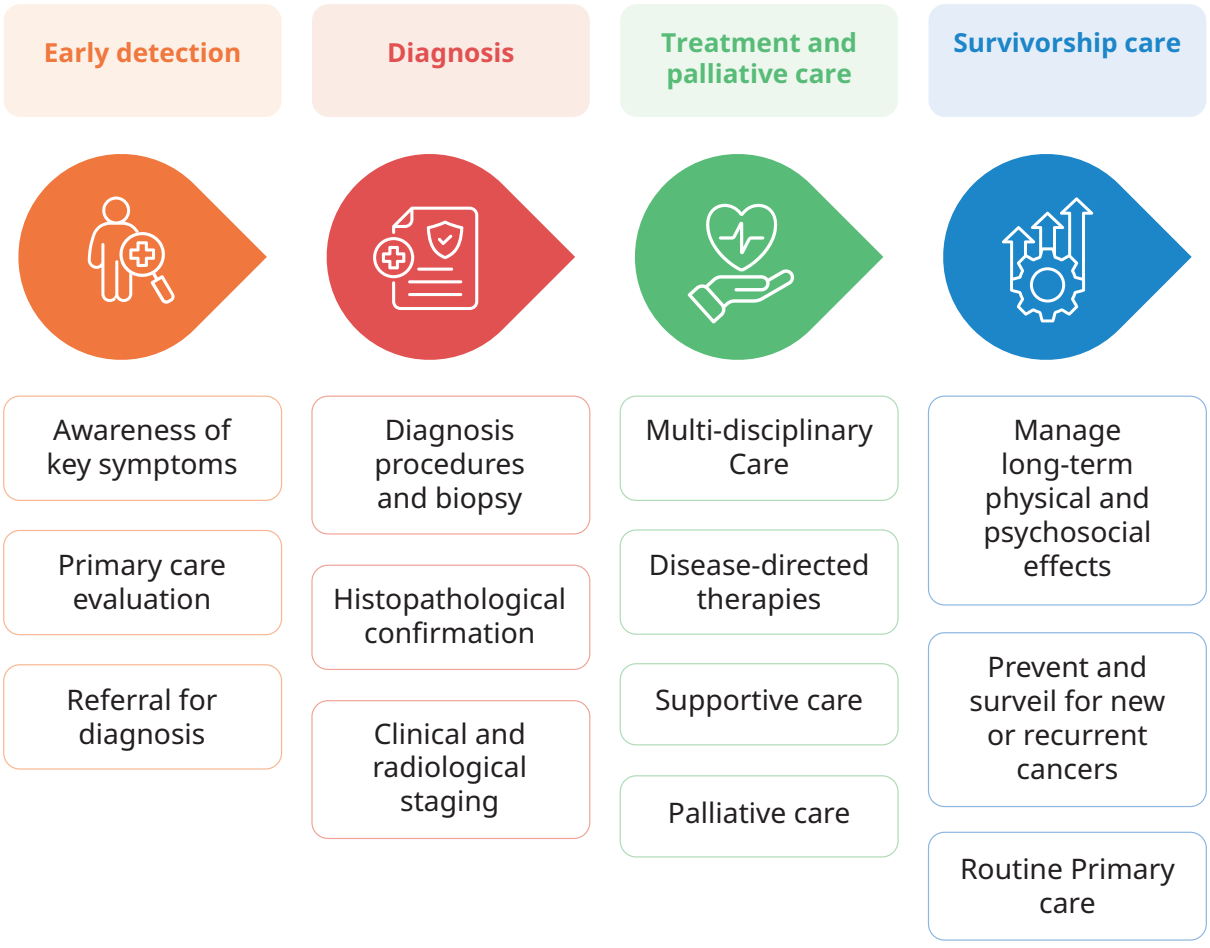
Discussions among the members of the core expert group cross-referenced the selected guidance to the 37 priority questions, and synthesized the guidance per priority intervention. This mapping of selected guidance is shown in Annex 1, with further details on the consensus-building process.

An External Review Group was established to conduct peer review of the proposed priority interventions, including their applicability in different settings. Given their substantial experience in adapting international standards in light of differing socioeconomic contexts, health care service capacities and organization models, this group played a critical role in assessing the applicability and sustainability of each priority intervention in varying contexts.

Wilms tumour priority interventions

The seven priority interventions described in this section align with the stages along a child with Wilms tumour's journey, from diagnosis, through therapy, recovery and ultimately to survivorship or end-of-life care, as illustrated in Fig. 2 below (see also Annexes 2 and 3). An understanding of this journey is essential to successfully implement the Cure*All* operational approach *(1).*

Fig. 2. Wilms tumour care pathway



Source: Adapted from CureALL framework: WHO Global Initiative for Childhood Cancer; 2021 (1).

Priority intervention 1

Reducing delayed diagnosis through early detection

Rationale

Addressing delays in cancer diagnosis, barriers to timely referral, inaccessibility of treatment and interruptions to treatment courses is essential to guaranteeing adequate cancer control (Fig. 3) *(13)*. Reducing childhood cancer mortality relies on early and accurate diagnosis, followed by adequate treatment. Lack of awareness and knowledge of childhood cancer early signs and symptoms among health professionals can contribute to delayed diagnosis. Early symptoms can be non-specific and risk being mistaken for more common childhood illnesses.

Parents and caregivers must also be aware of the early signs and symptoms of suspected malignancies to allow for earlier consultation, timely referrals and ultimately adequate diagnosis and treatment *(13–15)*.

Main considerations to support earlier detection

General practitioners and frontline health care workers should be aware that most children with Wilms tumour present with an asymptomatic abdominal mass, which a caregiver identifies during the bath or under routine physical examination *(5,14,15)*. Symptoms such as abdominal pain, malaise and macroscopic haematuria (blood in the urine) can be present in 20–30% of the cases, while hypertension can be found in 25% of children with Wilms tumour *(3)*.

In low-income countries (LICs), children present with advanced disease with large abdominal masses, which may be associated with malnutrition. If tumour rupture occurs, children may present with clinical features of an acute abdomen presentation, characterized by abdominal pain, rapidly growing mass, fever, pallor, malaise and hypertension *(3,4)*. Some patients, less than 4%, can present with signs of intravascular extension (i.e. thrombus in the renal vein or inferior vena cava).

Key questions

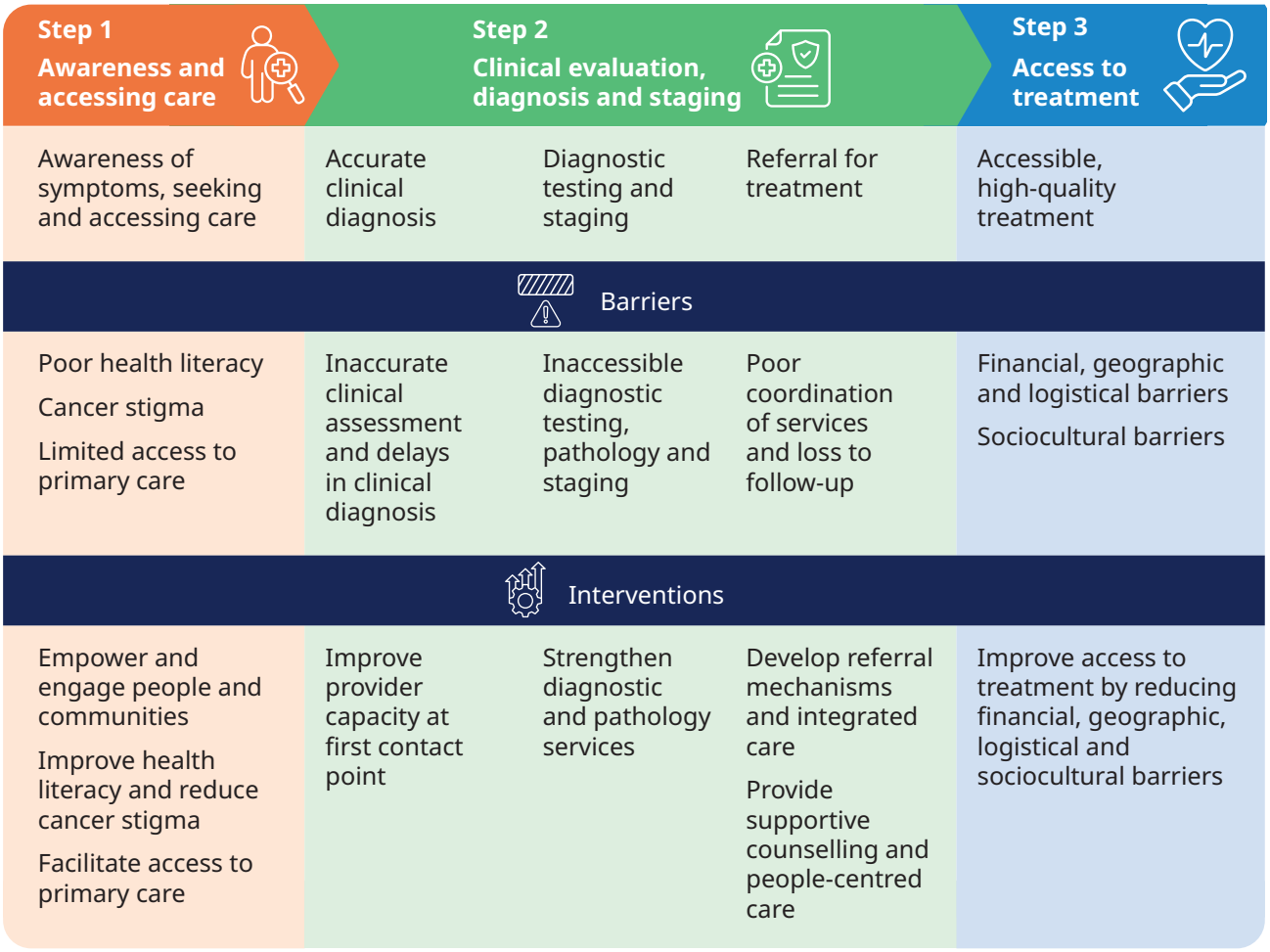
Q: How can health systems support improved public awareness of childhood cancer such as Wilms tumour?

A: Systems should focus on increasing public awareness of childhood cancer early signs and promoting appropriate health-seeking behaviour through increased community health literacy, as well as supporting families in understanding the urgency of the signs and to overcome the fear associated with cancer *(13)*.

Q: What actions should programme managers take to ensure services are configured to support early diagnosis at a system level?

A: Programme managers can prioritize access to comprehensive networks of care, with associated referral pathways to a specialized centre for childhood cancers, where physicians with expertise in childhood imaging, surgery and pathology are available. This requires implementing an adequate multidisciplinary approach and establishing a trained team of health professional to develop treatment plans. To avoid delays in the referral of suspected cases, it is essential to maintain sufficient provider capacity at first contact point, together with integrated and strengthened referral mechanisms (Fig. 3) *(13)*.

Fig. 3. Steps to early diagnosis and common barriers resulting in delays



Source: Reproduced from Guide to cancer early diagnosis, WHO; 2017 (13).

Q: What are the infrastructure requirements for an early diagnosis in children with cancer?

A: It is recommended that programme managers plan in terms of facility and human resources requirements for early diagnosis.

Ensuring clear and well-publicized referral pathways implementing referral and counter-referral guidelines, guaranteeing childhood cancer workforce training and supervision, as well as strengthening of health information systems are all crucial. Protocols to sensitize providers to childhood warning signs and symptoms should be available. The availability of equipment and materials for timely clinical diagnosis is also vital.

Guaranteeing that health workers have the skills and designated spaces to communicate clearly with families is also essential. Strong counselling and communication capacities help families to understand symptoms, navigate the referral process and seek timely care, ultimately contributing to earlier diagnosis *(13)*.

Q: How should managers go about planning for workforce requirements?

A: Programme managers should maintain a detailed inventory of available health personnel, including qualifications and work experience, and identify any related gaps. Emphasizing and promoting training for all practitioners – including specialists (paediatricians, nephrologist, paediatric surgeons, urologists, etc.) and general physicians, nurses, paramedical staff and community health workers – on when to suspect childhood cancer, including through use of tools and medical devices, is important. To avoid delays in diagnosis and treatment, health workers need to be prepared to assess, diagnose and refer children with suspected cancer to the appropriate level of care.

Priority intervention 2

Improving access to diagnosis and staging

Rationale

Wilms tumour is a highly curable disease with appropriate treatment and across a broad array of clinical settings. Key elements to improve outcomes relate to improving access to accurate diagnostic imaging, pathological evaluation and provision of timely treatment.

Achieving an accurate clinical diagnosis by performing diagnostic tests, tumour staging and referral for treatment are essential to guaranteeing an adequate treatment approach *(3)*. Guidance should be implemented to support health workers at the first point of contact to improve their diagnostic capabilities and accuracy (see Annex 4). Clearly established referral pathways are essential to support general practitioners and paediatricians in conducting rapid referral and transfer of children with suspected Wilms tumour *(5,13).*

Diagnostic work-up and staging should be based on evidence-based standards of care to support health workers in improving their diagnostic accuracy from the first point of care to the specialized treatment centre. In accordance with their local context and needs, Member States should consider establishing their own national essential diagnostics list aligning with the *Fourth WHO list of essential in vitro diagnostics (16)*. This constitutes a significant step to support procurement and improving access and quality of in vitro diagnostics while advancing towards UHC.

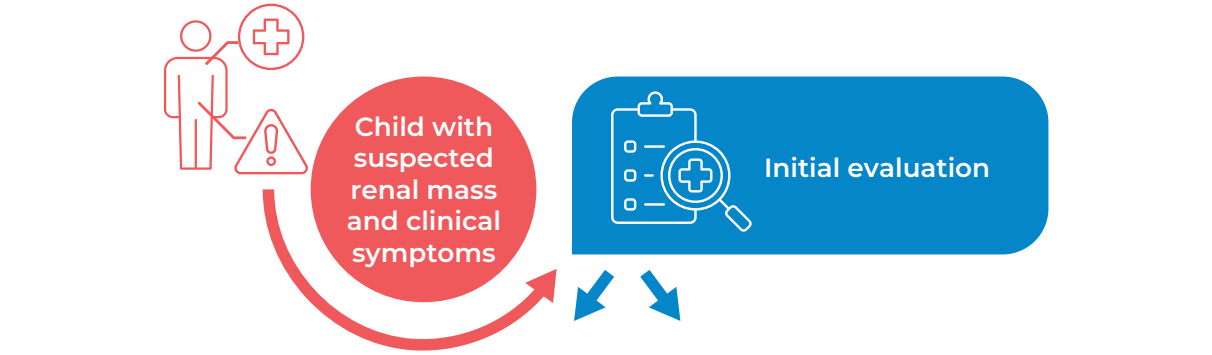
Main considerations for appropriate tumour staging

Accurate staging for Wilms tumour involves integrating clinical, radiological, laboratory and surgical findings to ensure risk-stratified treatment and improved outcomes (see also Annex 5) *(3,4,17,18)*.

Standard imaging requirements include abdominal ultrasound, computed tomography (CT) scan/magnetic resonance imaging (MRI) of the abdomen and pelvis as well as chest imaging to rule out the presence of metastases *(4,17,19)*. The minimal imaging standards will correlate to the resources available at individual cancer centres.

Fig. 4 presents a list of the priority interventions and medical devices required for adequate staging and diagnosis of children with abdominal tumours. As radiological procedures for adequate staging in infants and young children can be challenging, access to anaesthetic services should be guaranteed *(20)*. A skilled, certified anaesthetist with paediatric experience, knowledge of relevant drugs dosing and indications is required, as well as sufficient monitoring equipment (*19,21)*.

Fig. 4. Initial diagnostic workup at presentation



Clinical history and assessment

- Signs and symptoms related to tumour growth and duration of symptoms
- Family history: predisposition syndromes, urological surgeries
- Blood pressure
- Anthropometric measurements (weight, height, skin fold thickness, middle arm circumference)
- Assessment of performance status (Lansky-Karnofsky scale)
- Mass characteristics: size and position
- Characteristics associated with cancer predisposition syndrome

Laboratory and imaging

- Laboratory and imaging tests
- Complete blood count and differential
- Metabolic panel
- Urinalysis
- Assessment of coagulation
- Urine: catecholamine metabolites (to rule out neuroblastoma)
- Abdominal ultrasound
- Abdominal and pelvic CT with contrast or MRI (where available)
- Germline testing of children if predisposition conditions are found

Main considerations for effective provision of pathology services

Many low- and middle-income country (LMIC) settings lack national laboratory policies and plans, resulting in unreliable quality and delayed diagnosis *(22)*. Programmatic investments that guarantee accurate clinical assessment, histopathological diagnosis and staging, adequate sampling and specimen collection are essential to improving outcomes for children with Wilms tumour *(21–24)*.

The pathologist must follow an established local guideline that provides a minimum set of criteria for accurate pathological diagnosis and staging, including aspects related to specimen handling and collection of material *(18,22)*. Tumours should be classified and stratified into risk groups based on histological sub-classification according to the relevant local treatment strategy. Currently there are two major staging tools based on the treatment approaches of the two largest collaborative Wilms tumour treatment groups (see Annex 5).

Key questions

Q: How should managers strengthen diagnostic and staging services for Wilms tumour?

A: Quality assurance mechanisms must be developed to guarantee that diagnostic and pathology services are accurate, following appropriate standards to provide results on time *(13,22)*. Programme and hospital managers should plan what resources will be needed to strengthen diagnostic and staging capacities. Key tasks should include *(13)*:

- analysing the profile of patients attending a given health facility with suspected Wilms tumour in previous years to estimate the number of children that will need treatment and the availability of equipment and materials for diagnosis that will be required;
- strengthening the health information system to access quality data to support planning and management;
- guaranteeing sufficient numbers of trained health professionals to contribute to quality diagnosis and staging. All diagnostic, pathology and staging results should be interpreted by personnel with training and experience in the management of Wilms tumour;
- guiding procurement for improving the availability and quality of in vitro diagnostics based on their national essential diagnostic and medical devices list;
- guaranteeing availability of functional equipment, supplies and robust laboratory information systems;
- promoting standardization of imaging studies using radiological protocols to avoid unnecessary health expenditures caused by inappropriate use of expensive diagnostic studies – or unskilled use of technologies – to avoid potential harm from ionizing radiation to children *(18,22–24)*; and
- establishing occupational, safety and health standards and guarantee compliance with them, adhering to best practice standards or guidelines for diagnosis and allocating resources to deliver on the agreed guidelines.

Q: What infrastructure will be needed?

A: To deliver safe and effective care for children with Wilms tumour, programme managers should ensure that health facilities have reliable and adequate infrastructure, including appropriate clinical and laboratory space, adequate facility services (e.g. electricity, water, ventilation and sanitation), and essential communication systems.

WHO and the International Atomic Energy Agency have developed recent guidance to support Member States in estimating infrastructure requirements for setting up cancer centres (Box 2).

Q: How can managers assess workforce need for accurate diagnosis and staging of Wilms Tumour?

A: Trained and skilled workforce is critical for ensuring accurate diagnosis and staging, programme managers should analyse the structure and training of the team currently providing diagnosis and staging and identify any gaps. This includes evaluating working patterns and exploring possible changes to improve efficiency; identifying the need for new positions; and ensuring organized specialty training programmes and ongoing work-based learning structures are available to support continuous professional development.

Box 2. Key elements required in the planning phase of setting up a centre of excellence

- Population in need (i.e. cancer burden, disease estimates and projections, procedural caseloads).
- Operational assumptions, existing and planned health care infrastructure growth estimates.
- Bed capacity, equipment and workforce requirements.
- Expanding an existing facility that includes all the components of the continuum of care (i.e. systemic chemotherapy, surgery, radiotherapy, supportive and palliative care) such as number of cycles, average length of stay, conversion rates.
- Creating an integrated network of care (i.e. network of hospitals across a region or country, referral hospitals, care distribution according to demographics and patient flows).

Source: WHO–IAEA, 2022 (24).

Priority intervention 3

Improving access to quality treatment

Rationale

To provide high-quality treatment to children with Wilms tumour, evidence-informed standards of care must be developed. Standards should take into consideration the system's ability to deliver care through existing networks, including workforce capacity and training, and resources to manage treatment-related toxicities *(13,19)*.

The main goal of an efficient treatment regimen is to maximize opportunities to cure while reducing acute toxicity, long-term effects and improving the quality of life of the children treated. This is particularly relevant in LMIC settings where the optimal treatment strategy is not to implement the same regimens used in HICs, but to develop national standards stratified to that particular setting of care to maximize outcomes *(19)*. Basic, core capacities and requirements for facilities to provide safe care at each level of the service line must be defined *(25,26)*.

Selecting the most appropriate treatment strategy in the context of a specific setting does not limit possibilities for improving the environment of care *(19)*. As health systems strengthen, and resources are improved and/or re-allocated, this will facilitate scaling up capacities with the aim to constantly improve the quality of treatment and outcomes. *(1,19,26)*

Main considerations for delivery of high-quality care for children with Wilms tumour

Wilms tumour management is fundamentally multidisciplinary, involving a combination of surgery, chemotherapy and radiotherapy – in some cases – according to the surgical, histopathology and molecular risk stratification (Table 1). All children diagnosed with Wilms tumour should be managed by a trained and experienced multidisciplinary team. Adherence to evidence-based standards of care is crucial to achieve the primary goal of curing children diagnosed with the disease.

Two main approaches guide the treatment of Wilms tumour: The International Society of Paediatric Oncology (SIOP) approach emphasizes neoadjuvant systemic therapy while the Children's Oncology Group (COG) approach advocates for upfront surgical resection. Studies have shown comparable overall survival rates with either approach in most HICs.

The integration of stage-appropriate treatment strategies and adherence to established treatment regimens that are informed and reviewed by a trained and skilled multidisciplinary team, is vital for optimizing patient outcomes (see Box 3) *(26)*. It is recommended that these standards align with the national essential medicines and procurement lists to guarantee reliable supply of quality cancer products needed for the timely delivery of each of the treatment modalities (i.e. chemotherapy, surgery, radiotherapy, supportive and palliative care) *(3,4,17,18)*.

The development of a robust monitoring and evaluation system is essential to assessing programme performance and improving the delivery of services with ensured quality, safety and minimal toxicity *(3,24)*.

Box 3. Multidisciplinary workforce required to provide paediatric radiotherapy services for children with Wilms tumour

Core radiation oncology team

- Radiation oncologist
- Medical physicist
- Radiation therapist (RTT)
- Anaesthetist (to treat children under five years of age)

Extended team

- Radiologist/paediatric radiologist
- Paediatric nurse
- Psychologist
- Child life specialist
- Social worker
- Biomedical engineer

Source: Parkes et al., 2017 (27). See also Annex 7.

Table 1. Summary of core elements for the management of Wilms tumour

Intervention	Procedure	Intent	Associated risks/ Acute adverse effects[a]
Neoadjuvant chemotherapy	Combination of chemotherapy administered before surgery, adhering to specific treatment regimens	Induce tumour shrinkage and downstage Facilitates surgery and avoids complications (e.g. tumour rupture and spillage particularly with large tumour volumes) Informs on treatment response	Nausea, vomiting Constipation Neuropathic pain Febrile neutropenia
Surgery	Unilateral radical nephroureterectomy with regional lymph node sampling	Complete tumour resection Accurate lymph node staging Complete surgical-pathological staging	Tumour rupture and spillage Bleeding Resection of adjacent organs
	Nephron sparing surgery	Indicated for removal of disease in cases of bilateral Wilms tumour or in cases of high risk of renal failure	Transient urinary leakage Intestinal obstruction Pyelonephritis Tumour recurrence
	Pulmonary metastectomy	Removal of residual pulmonary nodules after systemic chemotherapy	Post-surgical pain Bleeding
Adjuvant chemotherapy	Chemotherapy administered after surgery and/or radiotherapy according to stage and histology	Disease control and prevention of recurrence	Nausea, vomiting Constipation Neuropathic pain Febrile neutropenia
Radiotherapy (external beam)	Flank radiotherapy	Eradication of microscopic residual disease	Nausea and vomiting Abdominal pain[b] Radiodermatitis
	Whole abdominal irradiation (WAI)	Eradication of microscopic disease in case of tumour rupture with diffuse spillage and/or cytology-positive ascites	Nausea and vomiting Abdominal pain[b] Diarrhoea[b] Radiodermatitis Disuria
	Whole lung irradiation	Metastatic disease control adjuvant to systemic therapy	Fatigue Pneumonitis Haematological toxicity Radiodermatitis Esophagitis

Sources: Aldrink et al., 2019 (3); Umbrella protocol, 2025 (17) and de Campos Vieira Abib et al., 2022 (28).

[a] This list of associated risks/adverse effects is not systematic or exhaustive, these refer to common findings referenced by external non-WHO guidelines. It also does not depict frequency or severity of adverse effects.

[b] Abdominal pain and diarrhoea are frequently associated with whole abdominal irradiation and flank irradiation.

Key questions

Q: Which disciplines should be involved in multidisciplinary teams to treat Wilms tumour?

A: All children with a diagnosis of Wilms' tumour require a multidisciplinary approach from an experienced team that includes paediatric oncology, surgery, radiology, pathology, radiation oncology, as well as nutrition and palliative care, which is particularly relevant for children in LMIC settings. This multidisciplinary team should be involved in the planning of optimal treatment for children diagnosed with Wilms tumour (Table 2) *(19,26).*

Surgical resection for Wilms tumour should be carried out by the most experienced surgeon, to minimize the risk of tumour rupture and ensure gross tumour resection and adequate lymph node staging *(28)*. The roles of staff involved in the care of children with Wilms tumour may vary depending on the service's level of complexity. Table 3 presents a summary example of the professionals who are essential in the provision of services for children affected with this condition.

Table 2. Example core clinical professionals to deliver care for children with Wilms tumour

Selected professional	Specialty	Selected key functions
Medical practitioner: primary care provider with paediatric oncology training, paediatrician with paediatric oncology expertise, paediatric oncologist	Paediatric oncology, medical oncology	Integrates or leads the multidisciplinary team. Oversees treatment planning and referrals to other specialists. Counsels and educates family members and patient. Provides direct care and participates in tumour board discussion to direct care decision. Prescribes chemotherapy, monitors and manages all toxicities, prescribes supportive care medications as needed and available. Integrates palliative care in a holistic approach to care.
Surgical specialist	General surgery, paediatric surgery, paediatric oncology surgery, urologists	Participates in tumour board discussions. Performs surgical procedures including nephrectomy, resection of metastatic lesions.
Pathologist: general pathologist with expertise in paediatric oncology	Anatomopathologist, paediatric oncopathologist	Participates in tumour board discussions. Performs gross and microscopical analysis of tumour tissue and cytology to complete diagnosis and staging.
Radiation oncologist	Radiation oncology/ clinical oncology	Participates in tumour board discussions. Counsels, establishes curative plan in coordination with paediatric oncology team, including dose prescription, delineation. When available performs long-term follow-up to detect and guide management of long- term toxicities.
Nursing professional: general nurses with oncology training and expertise, paediatric oncology nurses	Oncology nursing	Counsels and educates, participates in the safe delivery of chemotherapy, manages vascular devices, participates in the integral care of children, monitors for toxicities, can perform nutritional assessment when trained.

Priority intervention 4

Preventing abandonment of treatment

Rationale

Failure to complete treatment with curative intent, known as abandonment of treatment, is an important factor contributing to the marked disparities in survival outcomes between HICs and LMICs. Abandonment is very rare in HICs, while in LICs it can reach rates higher than 20%. Global survival data available for more and less developed regions show that abandonment of treatment can account for at least one third of the survival gap between HICs and LMICs *(29)*.

Main considerations for reducing the likelihood of treatment abandonment

Key factors contributing to the abandonment of treatment include high treatment costs and associated expenses such as travel, food and lodging for parents and carers during the child's hospital stay. Inadequate access to services, cultural misconceptions and treatment-related toxicities are also factors *(3,25,29,30)*.

To address these challenges, policy-makers should prioritize strategies to address socio-economic barriers and provide financial support to help families cover the direct and indirect costs of a child's treatment. This is of particular importance in LMICs where out-of-pocket expenses can constitute a significant proportion of treatment costs. Additionally, national health insurance schemes should be designed to include essential services for comprehensive coverage of childhood cancer to reduce the financial burden on affected families.

Key questions

Q: How can health system leaders reduce the risk of treatment abandonment?

A: Tackling financial, logistic, geographical and socio-cultural barriers to accessing care is essential to reduce the incidence of abandonment of therapy. Interventions that have contributed to reducing abandonment of therapy in LMICs include providing financial support to families, food subsidies, lodging, parental education, establishing a social work programme, patient navigation and tracking systems (using mobile phones), and additional support from fundraising foundations *(25,29)*. Allocating funds to be used in this way is an important step in ensuring treatment compliance.

Establishing policies to provide financial support to reduce the burden on families related to the direct and indirect cost of treatment is important for families of children with Wilms tumour. Health insurance schemes should be designed to guarantee comprehensive coverage of essential services for Wilms tumour *(11,26)*.

Q: What support and information can be provided to families to reduce the risk of treatment abandonment?

A: Encouraging effective counselling and strong media messaging about the high 5-year survival rates in childhood cancer is crucial to promote treatment adherence *(13)*.

Priority intervention 5

Providing access to adequate supportive care

Rationale

According to the Multinational Association of Supportive Care in Cancer (MASCC), supportive care refers to prevention and management of the adverse effects of cancer and its treatment. As cancer treatment is stressful for children and their families, WHO recognizes the need to provide services integrated into broader health systems to address the physical, psychosocial and spiritual needs of the child and the family. These contribute to improved outcomes and better quality of life for children and families.

Main considerations for the provision of supportive care

Children with Wilms tumour require care that addresses a broad set of physical, psychological and social needs arising throughout treatment. To strengthen the delivery of person-centred care and address the multidimensional needs of children with cancer and their families, programme managers should organize care delivery to ensure coordinated symptom management and family support, helping to improve treatment tolerance and overall quality of care.

Children with Wilms tumour may have physical needs stemming from a wide array of symptoms associated with treatment. Services should be designed so that adequate symptom management, such as nausea and vomiting control, pain management (including prevention of procedural pain), nutritional support, transfusion support and infection control, is in place where needed.

Psychological needs may arise, particularly in small children with Wilms tumour. These can relate to stress and anxiety associated with treatment in general, or with particular treatment elements such as surgery and radiotherapy, procedural anxiety, and anxiety around returning to hospital.

Spiritual needs might include addressing fears and anxiety related to the misconception of the child's illness as a punishment. Including the family's spiritual beliefs in treatment decisions where possible is important to promote respect and a healthy therapeutic relationship.

A child and their family might also experience social needs resulting from the interruption of the family dynamic due to treatment, and effects on the child's access to the community, schooling or their social network. Families may require support to overcome financial challenges directly and indirectly resulting from cancer treatment.

Addressing these needs is important for the child but also their family members, including parents and siblings. Supporting the family in communicating news to the child and siblings is also important.

Key questions

Q: What are the main areas where children with Wilms tumour might require supportive care for physical symptoms?

A: The development and implementation of supportive care guidelines for children with Wilms tumour is essential to provide quality care and reduced treatment-related morbidity and mortality. In children with Wilms tumour the main considerations for supportive care relate to nutritional support, infection prevention and control, blood product support, management of gastrointestinal toxicity and pain control (see Annex 2).

Adequate control of treatment side-effects including chemotherapy-induced nausea and vomiting, pain and radiotherapy-induced diarrhoea should also be guaranteed.

Q: How should the nutritional needs of children with Wilms tumour be supported

A: Children with Wilms tumour are often severely and acutely malnourished at diagnosis. Acute malnutrition is associated with impaired immunity resulting in an increased risk of infectious complications and higher rates of treatment-related toxicity *(25,26,31,32)*. Infectious complications are the most common cause of treatment-related mortality in LMIC settings *(30)*.

It is recommended that adequate nutritional assessment should be performed by a trained professional (i.e. nutritionist or nurse) at diagnosis and throughout the course of treatment, particularly in the phases where there is a higher risk of nutritional deterioration (e.g. radiation therapy concomitantly with chemotherapy) *(3,31)*.

Nutritional assessment at diagnosis and nutritional status classification should be performed using WHO cut-offs in children between six months and five years of age. Local guidelines should be established for the management of malnutrition at diagnosis but also for the management of weight loss during treatment.

Q: What is needed for high-quality supportive care for infectious complications of treatment for Wilms tumour

A: Prevention and control of infectious complications, particularly febrile neutropenia, a common and serious infectious complication affecting children receiving myelosuppressive chemotherapy, is crucial to reduce morbidity and mortality.

Children with fever and neutropenia should be rapidly assessed and receive broad-spectrum antibiotics without delay (i.e. within one hour of hospital arrival) as progression to severe sepsis and death can occur over only a few hours *(33)*.

A protocol or evidence-informed guideline for the management of febrile neutropenia should be available in every paediatric oncology unit, including the choices of first-line and second-line antimicrobial therapy, doses and other standing orders to guarantee the prompt administration of the first dose of antibiotics *(17,30,33)*. The WHO AWaRe (Access, Watch, Reserve) antibiotic book offers guidance to the choice of antimicrobials for empiric treatment in alignment with the current *WHO Model List of Essential Medicines for Children (33).*

Families should be provided with information and education concerning prevention and management of febrile neutropenia, including seeking medical care promptly as soon as the child has a fever.

Priority intervention 6

Achieving an integrative palliative care approach

Rationale

Paediatric palliative care (PPC) benefits children during the treatment of serious illnesses and not only at the end of life. For children with cancer, palliative care should start from the diagnosis of the disease, particularly in high risk or advanced cases, regardless of whether the child receives treatment with curative intent *(3,31,34–36)*.

Main considerations for the provision of quality palliative care

PPC and symptom relief should be integrated into the child's management alongside chemotherapy, surgery and radiotherapy (*1,4,5,34)*. Patients should be considered for palliative care support in case of *(35,37)*:

- high risk diagnosis (expected event-free survival less than 30%);
- multiple relapses;
- disease progression during treatment;
- history of prolonged intensive care hospitalizations or multiple episodes of admission in the last six months;
- patients without a curative therapeutical option.

Key questions

Q: How should PPC services for children be organized?

A: PPC can be provided by generalist clinicians with a basic or intermediate level of training. Home-based palliative care can be provided by general clinicians with PPC training (see also Annex 8) *(37)*.

Q: What is the role of specialists in PPC?

A: Paediatric specialists caring for children with cancer such as oncologists, intensive care specialists and neonatologists with intermediate level training in PPC, should be able to respond adequately to treat distress and suffering relating to the disease and treatment *(37)*. This can improve the quality of life of children and their families during treatment

Priority intervention 7

Ensuring provision of survivorship care

Rationale

Childhood cancer survivors will require lifelong surveillance. The chronic conditions most likely to affect Wilms tumour survivors include cardiovascular, renal, respiratory and endocrine conditions related to treatment.

The most observed effects are cardiac effects stemming from doxorubicin and whole lung radiation therapy, infertility and sexual dysfunction resulting from abdominal–pelvic radiotherapy and scoliosis resulting from abdominal radiotherapy *(5–7,36)*. After nephrectomy, patients should also receive education and monitoring on caring for their single kidney through their life.

Main considerations for the provision of effective survivorship care for Wilms tumour survivors

Policy-makers and cancer programme managers should establish comprehensive long-term follow-up programmes specially designed to monitor and manage late effects and chronic conditions resulting from the multimodal treatment of Wilms tumour.

Policies should also support the development of tailored long-term surveillance guidelines for regular assessments and detection of potential late-onset effects that can compromise the quality of life of survivors (e.g. impaired renal function, secondary malignancies, cardiovascular conditions).

Key questions

Q: What staff roles and skills are needed to provide effective survivorship care for Wilms tumour?

A: It is crucial to ensure that a trained multidisciplinary team including oncologists, primary care physicians, psychologists and social workers coordinate holistic service provision to ensure the best quality of survivorship (see Box 4).

Box 4. Suggested professional roles involved in Wilms tumour survivorship care and long-term follow up

- Paediatric oncologist
- Radiation oncologist
- Paediatric nephrologist
- Paediatric neurologist
- Paediatric endocrinologist
- Clinical psychologist
- Social worker
- Paediatric nurse
- General practitioner
- Adult oncologist

Source: Children's Oncology Group, 2021 (7).

How Member States can scale these seven priority interventions in line with GICC objectives

Operationalizing the seven priority interventions: considerations for scaling and implementation

This section presents key operational considerations to support the integration of priority interventions into practice. It outlines specific actions for each priority intervention, and cross-cutting actions, supporting the implementation of the interventions as a package.

Improving timely diagnosis through early detection and enhanced cancer registration to inform policy planning

Robust cancer registration systems are essential to inform policies for childhood cancer control. Strengthening cancer registries is fundamental to generating reliable data on the prevalence, stage at diagnosis, and how this burden is distributed across the population. Particularly for Wilms tumour, a more detailed understanding of population-level prevalence of the predisposing conditions associated with greater risk of developing Wilms tumour can support early diagnosis. See the introduction section for further discussion of factors associated with Wilms tumour risk.

Strengthening frontline awareness of Wilms tumour signs and symptoms, implementing targeted early diagnosis strategies, and improving referral systems, allow countries to design interventions that promote early detection and reduce delays across the diagnostic pathway. These actions help to ensure more efficient use of diagnostic resources and support greater population health impact.

Evaluating local capacity and readiness to scale up services

Scaling up services for Wilms tumour requires a comprehensive assessment of existing system capacity, including the availability of an appropriate trained workforce, medicines and technologies, and supporting infrastructure.

Programme managers should map the availability of essential diagnostic tools (e.g. such as ultrasound, computed tomography/magnetic resonance imaging), pathology service capacities for timely, accurate histology and staging, and surgical and oncology teams experienced in managing paediatric renal tumours). This mapping should extend to radiotherapy capacity, transfusion services, nutrition support, and infection prevention and control, each of which is critical for the delivery of safe, effective treatment.

Given the multidisciplinary approach required for Wilms tumour management, workforce assessments should determine whether adequate trained personnel (i.e. paediatric surgeons, oncologists, radiologists, pathologists, radiographers, nurses and anaesthetists) are available and appropriately distributed. National-level decision-makers should optimize workforce strategies focusing on training, task-sharing and networking models, ensuring that sufficient health workforce is in place to guarantee that more children and families are able to access the necessary services and achieve a timely diagnosis

Resource capacity assessments should be conducted to determine the medium- and long-term sustainability of priority interventions. These should focus on securing financing and supply-chain reliability for essential medicines and diagnostics, and the infrastructure required for accurate clinical and histopathological diagnosis of Wilms tumour, as well as the provision of safe surgical and radiotherapy services. Prompt identification of gaps allows policy-makers to plan targeted investments that strengthen Wilms tumour care specifically while improving childhood cancer service capacity more broadly.

Integrating priority actions within national policies and global commitments

Integrating Wilms tumour priority interventions into national cancer control plans, essential health service packages and insurance schemes can help ensure access to timely diagnosis, treatment and follow-up care. Consistent with the WHO UHC Compendium *(10)* and the Cure*All* framework's "Pillar U" *(1)*, countries can use these priority actions to determine which services should be included in essential benefit packages.

Embedding Wilms tumour priority interventions into national cancer policies and programmes supports the achievement of WHO *Fourteenth General Programme of Work 2025–2028* targets *(38)*. In particular, this supports strengthened health systems, and advances progress towards United Nations Sustainable Development Goals, namely targets on achieving UHC (target 3.7), reducing 5-year-old mortality (target 3.2) and premature mortality (3.4), contributing to their sustainability.

More broadly, this brief and suggested priority interventions can be used as part of advocacy work towards UHC. Specific activities described in this brief can also be incorporated as part of overall financing and organizing efforts by Member States towards cancer control (across the cancer continuum), as potential improvements can also contribute to population health gains in other areas. For example, improvement in diagnostic capacities relevant to Wilms tumour can also be used in other clinical situations, and further investment in specialization and training of the workforce can also contribute to health care workforce retention strategies.

A multisectoral approach can further support implementation. Education ministries, social protection agencies and community organizations can contribute to awareness efforts, strengthen referral pathways, and help families overcome socio-economic barriers that commonly lead to delayed diagnosis or treatment abandonment.

A whole-of-society approach is also important. Active participation of many stakeholders, including policy-makers, hospital administrators, practitioners, caregivers, families, community workers and educational bodies is essential to guarantee a comprehensive and more sustainable approach to implementation. Continuous mapping of the various stakeholders can help guide communication and participatory

strategies. Effective implementation requires strong political will, aligned governance, workforce capacity building and technologies to support continuity and coordination of care.

Using quality assurance measures to support priority interventions

Quality assurance should be integrated into all stages of implementation of these priority interventions to ensure that services for Wilms tumour are safe, effective and consistent.

Programme managers should promote establishment of standard operating procedures for imaging, pathology reporting, chemotherapy administration and surgical procedures, along with auditing mechanisms to review complications such as tumour rupture or delays in treatment initiation.

When systematically applied, quality assurance measures increase efficiency and reduce preventable complications, contributing to better outcomes for children with Wilms tumour.

Monitoring and evaluation of priority interventions

As with any strategy aimed at improving the delivery of services, monitoring and evaluating the implementation of tailored interventions is a key element to improving quality. In response to the mandate given by the 2017 World Health Assembly resolution on cancer *(2)*, WHO is developing a *Global status report on cancer* and a related global monitoring and evaluation framework proposing key performance indicators for routine assessment of progress in the implementation of WHO initiatives on childhood, breast and cervical cancers. The proposed childhood cancer core indicators can serve as a basis for quality improvement efforts by identifying areas where further action and allocation of resources are needed to guarantee early diagnosis, prompt referral and access to quality diagnosis and treatment for children with cancer (see Table 3).

Strengthening health information systems, including cancer registries and facility-level data collection, enables programme managers to monitor delays, assess referral performance and evaluate adherence to staging and treatment protocols. Over time, systematic monitoring supports more efficient use of resources, improved accountability and sustained progress in childhood cancer outcomes.

Table 3. Example core indicators to track progress in childhood cancer programmes using Wilms tumour care as tracer

Indicator domain	Indicator name	Indicator purpose	Alignment with Cure*All* pillars and enablers
Input and processes: Inclusion of childhood cancer into national cancer policy	Presence of national cancer control plan inclusive of childhood cancer	To ensure appropriate governance and high quality of clinical services management for childhood cancer	Linked governance
Input and processes: Dedicated childhood cancer financing mechanism	National cancer strategy costed with financing mechanism available	To ensure fairness, financial contribution, adequate and sustainable financing	Leveraged financing
Input and processes: Formal involvement of childhood cancer key stakeholders	Inclusion of childhood cancer survivors or advocates in the development of relevant national programmes	To advocate to national programmes and to make childhood cancer a patient-centred programme	Advocacy and Linked governance
Output: Access to and timeliness of childhood cancer care	Timeliness of referral for childhood cancer diagnosis among children with associated signs and/or symptoms of Wilms tumour who had suspicious findings from clinical evaluation	To assess the process of Wilms tumour management in facilities	Pillar 1: Centres of excellence
Output: Access to and timeliness of childhood cancer care	Timeliness of treatment for children with Wilms tumour after being diagnosed	To assess the process of Wilms tumour management in facilities	Pillar 1: Centres of excellence
Outcome: Childhood cancer effective coverage	Children with Wilms tumour who received treatment in the facility	To assess coverage (as part of UHC) in the health system	Pillar 2: Universal health coverage
Outcome: Childhood cancer effective coverage	Children with Wilms tumour who complete treatment based on standards (guideline for cancer care) in the facility	To assess the process of cancer management and quality of care in facilities	Pillar 1: Centres of excellence and Pillar 3: Regimens for management
Outcome: Childhood cancer effective coverage	Children with Wilms tumour who need palliative care and have received it	To assess coverage (as part of UHC) in the health system	Pillar 1: Centres of excellence and Pillar 2: Universal health coverage
Outcome: Availability of childhood cancer registration	Availability and quality of population-based or hospital-based cancer registry	To ensure good quality and comprehensive data for improving policy making regarding to and management of childhood cancer	Pillar 4: Evaluation and monitoring and enabler: Linked governance
Impact: Childhood cancer incidence	Wilms tumour incidence in the population	To assess the burden of childhood cancer and expected number Wilms tumour cases for health system response	Pillar 4: Evaluation and monitoring

Indicator domain	Indicator name	Indicator purpose	Alignment with Cure*All* pillars and enablers
Impact: Childhood cancer mortality	Wilms tumour mortality detected on death certificates only	To assess health system interventions on early detection of Wilms tumour	Pillar 4: Evaluation and monitoring
Impact: Childhood cancer 5-year overall survival	Wilms tumour 5-years survival	To assess health system interventions on early detection and disease specific management	Pillar 4: Evaluation and monitoring

Source: CureALL framework: WHO Global Initiative for Childhood Cancer; 2021 (1).

Conclusion

Improving childhood cancer care from early detection to survivorship care is a shared priority for Member States and WHO, aligned with the 2017 World Health Assembly resolution on cancer *(2)* and reflected by the growing commitment to implement the GICC Cure*All* framework *(1)*. Achieving progress relies on the proper application of evidence-informed standards, community action and collaboration within related networks. The seven priority interventions outlined in this brief support Member States' efforts in planning and designing quality services for children with Wilms tumour. By adapting and integrating these priority areas into national strategies, Member States can take concrete steps toward expanding access, improving quality and advancing more equitable outcomes for children with the disease.

Strengthening services for Wilms tumour directly reinforces system capacity across the entire continuum of childhood cancers. By focusing on investing in and improving core areas of Wilms tumour care – including coordinated diagnostic, surgical, pathology, oncology, radiotherapy and supportive care – countries can improve outcomes for children affected by Wilms tumour but also improve service provision for other childhood cancers.

Progress towards UHC requires more equitable health systems, so that coverage and quality of care for children with cancer can be improved. The integration of core or priority interventions that align with the GICC Cure*All* framework into national policies can contribute to attaining the GICC objectives. This should be done with due consideration of the existing resources and capacities of each Member State. Progressive scaling up of capacity to deliver quality services for children with cancer requires a carefully planned increase and/or redistribution of resources. Undertaking these steps has the potential to drive progress on meeting the target of improving 5-year survival for childhood cancer globally to at least 60% by the year 2030 and to save one million lives in the process.

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(All references were accessed on 19 December 2025.)

Annexes

Annex 1. Process for identification, collection and synthesis of external guidance on Wilms tumour

Table A1.1 summarizes the steps taken to identify, appraise and synthesize external guidance informing the priority interventions presented in this brief. The process followed WHO quality norms and standards and comprised sequential steps covering scoping, identification and screening of guidance, methodological quality appraisal, synthesis against predefined service-delivery questions, and validation through expert review and in-country piloting within GICC-engaged networks (Fig. A1.1).

Fig. A1.1 Nine-step process for identification, collection and synthesis of external guidance on Wilms tumour

Table A1.1. Steps for identification, appraisal and synthesis of external guidance on Wilms tumour

Step	Purpose	Key activities	Outputs
1. Scoping of external guidance	To map available evidence to inform organization of service delivery for Wilms tumour, in line with GICC objectives	Defined scope aligned with service delivery across the care continuum; focus on strengthening countries' capacity to deliver quality childhood cancer services	Agreed scope and review framework
2. Identification of guidance	To identify relevant external guidance documents	Comprehensive literature search of clinical practice guidelines, reviews and descriptive studies using defined search terms	Initial pool of guidance documents
3. Screening and eligibility assessment	To select guidance relevant to health service organization	Applied inclusion and exclusion criteria, including exclusion of guidance outside scope (e.g. detailed management of complications, intervention efficacy and harms)	33 guidance documents selected
4. Quality appraisal	To assess methodological quality of selected guidance	WHO and national ministry guidelines exempted; remaining documents assessed using AGREE II tool with defined thresholds	18 high-quality guidance documents
5. Additional filtering	To confirm relevance and applicability	Applied four additional filter criteria reviewed with the WHO Quality Norms and Standards team	Final set of guidance documents
6. Mapping and synthesis	To align guidance with priority service-delivery questions	Mapped guidance to 37 decision points identified by the GICC Normative Working Group; internal review rounds conducted	Synthesized evidence base informing priority interventions
7. External expert review	To validate recommendations	Tabular synthesis reviewed by a multidisciplinary external advisory group	Refined and validated recommendations
8. In-country piloting	To assess feasibility and applicability in resource-limited settings	Piloted priority actions through GICC-engaged countries and regional networks	Inputs to final recommendations

References

1. WHO handbook for guideline development, 2nd ed. Geneva: World Health Organization; 2014 (https://iris.who.int/handle/10665/145714).
2. AGREE II instrument. Hamilton: AGREE Enterprise; 2017 (https://www.agreetrust.org/).

(References were accessed on 19 December 2025.)

Annex 2. Overview of priority interventions for Wilms tumour

This annex provides a concise overview of the seven priority interventions identified to support the organization of Wilms tumour care across the continuum of services. Table A2.1 highlights the core intent of each intervention and the key system-level actions required to strengthen early detection, diagnosis, treatment, supportive and palliative care, and long-term survivorship.

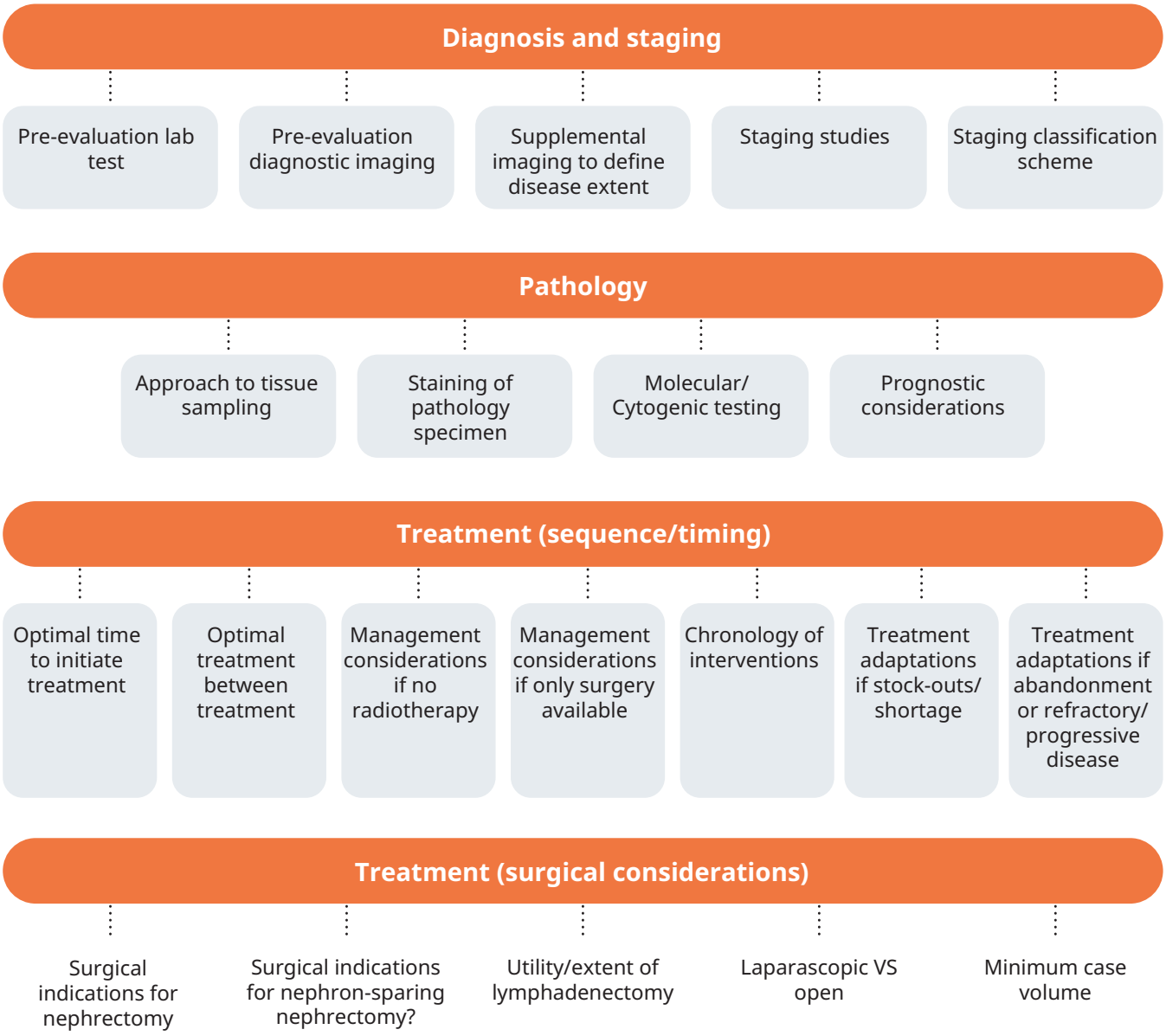
Table A2.1. Priority interventions to strengthen organization and delivery of Wilms tumour services

Priority intervention	Focus of the intervention
Reducing delayed diagnosis through early detection	Systems should promote awareness in early detection of childhood cancer signs and symptoms, and also improve health-seeking behaviour by boosting community health literacy and enhancing early detection skills among health care professionals.
Improving access to diagnosis and staging	Health systems should establish clear referral pathways, along with robust patient navigation systems, to childhood cancer specialized centres with expertise in childhood imaging, surgery and pathology.
Improving access to quality treatment	Treatment is multidisciplinary and involves surgery, systemic chemotherapy and radiotherapy, preferably via a multidisciplinary team. Management will be determined by the laterality of the disease (unilateral/bilateral), stage, histology, biological risk factors and the clinical response to therapy.
Prevention of abandonment of treatment	Decision-makers can ensure policies provide socio-economic support (logistic, transportation, financial, psychological, etc.), helping families cover the direct and indirect costs of a child's treatment. National health insurance schemes should be designed to include essential services for comprehensive coverage of childhood cancer.
Provision of supportive care	Children with Wilms tumour are often severely and acutely malnourished at diagnosis. Provision of nutritional support is a key element to improve outcomes in children with cancer. A trained and skilled health professional should perform a nutritional assessment at diagnosis and throughout the treatment course, with particular attention to treatment phases where there is a higher risk of nutritional deterioration. Other supportive care should be offered when needed to minimize treatment-related morbidity and mortality (e.g. blood product support, pain management, as required).
Achieving an integrative palliative care approach	For children with Wilms tumour, palliative care should start at diagnosis in situations where there is a high-risk diagnosis or in the case of multiple relapses, disease progression while receiving treatment, a history of prolonged intensive care hospitalizations or multiple admissions in the previous six months and for patients where there is no curative therapeutical option.
Provision of survivorship care	Policy-makers and cancer programme managers should establish comprehensive long-term follow up programmes specifically to monitor and manage late effects and chronic conditions resulting from treatment. Policies should also support tailored long-term surveillance guidelines.

Annex 3. Wilms tumour priority questions, key interventions along the cancer care continuum

This annex presents a schematic overview of the priority clinical and service-delivery questions that inform the organization of care for children with Wilms tumour across the cancer care continuum. Fig. A3.1 illustrates key decision points spanning diagnosis and staging, pathology, and treatment planning, and reflects the areas considered during the synthesis of external guidance informing this brief.

Fig. A3.1. Priority questions and key intervention areas across the Wilms tumour care continuum



Annex 4. Workforce roles and competencies for diagnosis and staging of Wilms tumour, by service level

This annex outlines indicative workforce roles and core competencies required to support diagnosis and staging of Wilms tumour across different levels of service complexity. Table A4.1 illustrates how responsibilities and skill requirements evolve as service capacity increases, and is intended to support planning, task allocation and capacity-building within paediatric oncology services.

Table A4.1. Indicative competencies and corresponding workforce roles for Wilms tumour diagnosis and staging

Service level/complexity	Competencies	Occupation
Basic (Level 1)	Assesses warning signs, performs initial clinical-radiological evaluation activates referral mechanism	Primary care physician with training in childhood cancer early detection at entry point
	Leads and participates in the multidisciplinary team to perform clinical evaluation, diagnosis, staging and provision of care	Primary care provider with training in paediatric oncology at the paediatric cancer unit
	Performs haemogram and biochemistry profile	Laboratory technician
	Available to interpret some images	General radiologist at paediatric cancer unit
	Participates in the multidisciplinary evaluation to approach patient care, assess tumour resectability, performs nephrectomy and local control of metastatic disease	General surgeon/adult surgeon with some experience in paediatrics
	Performs histopathological diagnosis in most cases. Access to hematoxylin and eosin staining, and cytology	General pathologist

Service level/complexity	Competencies	Occupation
Core (Level 2)	Leads and participates in the multidisciplinary team to perform clinical evaluation, diagnosis, staging and provision of care	Paediatric specialist with some training in paediatric oncology or medical oncologist with experience in paediatric oncology
	Interprets all images and performs certain interventional radiological procedures (e.g. guided core needle biopsy)	General radiologist
	Participates in the multidisciplinary evaluation to approach patient care, assess tumour resectability, performs nephrectomy and local control of metastatic disease	Paediatric surgeon with limited paediatric oncology experience or oncology surgeon with limited paediatric experience
	Performs histopathological diagnosis in all cases with limited access to immunohistochemistry	General pathologist with limited experience in paediatric tumours
Enhanced (Level 3)	Responsible for patient care	Paediatric oncologist or medical oncologist with significant experience or training
	Available to interpret all imaging with skills to perform advanced interventional radiology	Paediatric radiologist
	Participates in the multidisciplinary evaluation to approach patient care, assess tumour resectability, performs nephrectomy or nephron-sparing surgery where possible and local control of metastatic disease	Paediatric oncology surgeon
	Available for all cases with access to complete immunohistochemistry, molecular pathology, cytogenetics for some cases with expertise for diagnostic and staging for Wilms tumour; access to consultation with disease specific experts, able to access centralized review	Paediatric pathologist available with expertise in childhood cancer
	Performs haemograms, complete biochemistry, special exams (e.g. urine and plasma) with rapid turnaround time	Laboratory technician

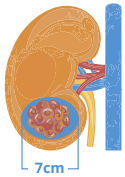
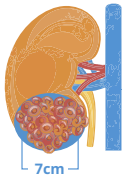
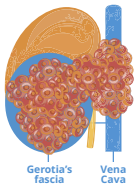
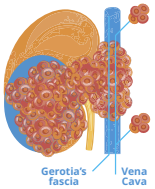
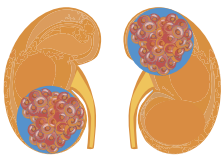
Reference

1. Howard SC, Davidson A, Luna-Fineman S, Israels T, Chantada G, Lam CG et al. A framework to develop adapted treatment regimens to manage paediatric cancer in low- and middle-income countries: the Paediatric Oncology in Developing Countries (PODC) Committee of the International Paediatric Oncology Society (SIOP). Pediatr Blood Cancer. 2017;64(suppl 5):e26879. (https://doi.org/10.1002/pbc.26879, accessed 19 December 2025).

Annex 5. Wilms tumour staging systems by therapeutic approach

This annex presents an overview of the staging systems used for Wilms tumour according to different therapeutic approaches. The figure highlights key distinctions in staging definitions applied within major international treatment frameworks and is intended to support understanding of how staging informs treatment planning and comparison across protocols.

Fig. A5.1. Wilms tumour staging systems according to therapeutic approach

Stage	NWTSG/COG	SIOP
Stage I 	• Tumour confined to kidney – complete resection • Intact renal capsule • No extension to renal sinus • No residual tumour	• Tumour confined to kidney – complete resection • Tumour encroaching, but not invading, pelvic system • No extension to renal sinus vessels
Stage II 	• Tumour extension beyond capsule – complete resection • Extension to renal sinus • Tumour present in extrarenal vessels	• Tumour extension beyond capsule – complete resection • Extension to renal sinus • Infiltration of adjacent organs or vena cava
Stage III 	• Incomplete tumour resection • Lymph node involvement • Positive surgical margin • Tumour spillage • Peritoneal implantation • Nonhematogenous tumour within • abdomen	• Incomplete tumour resection • Lymph node involvement • Positive surgical margin • Tumour spillage • Peritoneal penetration/ implantation • Tumour thrombi at margins of vessels or ureter • Surgical biopsy prior to chemotherapy or surgery
Stage IV 	• Metastatic (hematogenous) spread to lung, liver, brain, or bone	• Metastatic (hematogenous) spread to lung, liver, brain, or bone • Lymph node metastasis outside of the abdomen/pelvis
Stage V 	• Bilateral tumours	• Bilateral tumours

Note: NWTSG/COG: National Wilms Tumor Study Group/Children's Oncology Group

Source: Reproduced with permission from Gleason et al., 2014 (1).

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2. Aldrink JH, Heaton TE, Dasgupta R, Lautz TB, Malek MM, Abdessalam SF et al. Update on Wilms tumour. J Pediatr Surg. 2019;54(*3*):390–7. (https://doi.org/10.1016/j.jpedsurg.2018.09.005).
3. Flaig TW, Spiess PE, Abern M, An Y, Bangs R, Begovic J, et al. NCCN Clinical Practice Guidelines In Oncology. J Natl Compr Canc Netw. 2026 May;24(5):186-203. (https://doi.org/10.6004/jnccn.2026.0022).
4. UMBRELLA PROTOCOL SIOP-RTSG 2016. Geneva: International Society of Paediatric Oncology–Renal Tumour Study Group (SIOP–RTSG); 2016 (https://fnkc.ru/docs/SIOP-RTSG2016.pdf).
5. Vujanić GM, Gessler M, Ooms AHAG, Collini P, Coulomb-l'Hermine A, International Society of Paediatric Oncology–Renal Tumour Study Group (SIOP–RTSG) et al. The UMBRELLA SIOP-RTSG 2016 Wilms tumour pathology and molecular biology protocol. Nat Rev Urol. 2018;15(*11*):693–701 (https://doi.org/10.1038/s41585–018–0100–3).

Annex 6. Sequencing of treatment modalities for Wilms tumour across selected clinical guidelines

This annex provides a comparative overview of how key treatment modalities for Wilms tumour are sequenced within selected international clinical guidances. Table A6.1 highlights similarities and differences in the use and timing of surgery, chemotherapy and radiotherapy across therapeutic approaches, to support understanding of how treatment pathways are operationalized in different settings.

Table A6.1. Comparison of treatment sequencing across selected Wilms tumour guidelines

External guidance	Upfront surgery	Neoadjuvant chemotherapy	Surgery after presurgical therapy	Adjuvant chemotherapy	Radiotherapy	Concurrent chemo-radio therapy
SIOP-PODC-ATR (2013)	No, except selected cases.*	Yes, according to stage at diagnosis	Yes	Yes, according to stage and histology	Where available according to stage	According to stage, where available
SIOP-RTSG Umbrella Protocol (2016)	No, except selected cases.*	Yes, according to stage at diagnosis	Yes	Yes, according to stage and histology	Yes, according to stage and histology	Yes, according to stage and histology
Children's Oncology Group (COG) Treatment Standards (2019, 2023)	Yes	No, just for Stage V (bilateral Wilms' tumour)	No (except for stage V)	Yes, according to histology	Yes, according to stage and histology	Yes, according to stage and histology
Wilms Tumour NCCN Clinical Practice Guidelines (2021)	Yes	No, just for Stage V (bilateral Wilms' tumour	In specific cases for unresectable tumours, initiated after biopsy	Yes	Yes, according to stage and histology	Yes, according to stage and histology

Notes: *Selected cases: infants less than six months and children older than ten years of age, or presenting with very cystic tumours. SIOP: International Society Paediatric Oncology; PODC: Paediatric Oncology in developing countries; ATR: Adapted Treatment Regimens; RTSG: Renal Tumours Study Group; NCCN: National Comprehensive Cancer Network.

References

1. Vujanić GM, Gessler M, Ooms AHAG, Collini P, Coulomb-l'Hermine A, International Society of Paediatric Oncology–Renal Tumour Study Group (SIOP–RTSG) et al. The UMBRELLA SIOP-RTSG 2016 Wilms tumour pathology and molecular biology protocol. Nat Rev Urol. 2018;15(*11*):693–701 (https://doi.org/10.1038/s41585–018–0100–3).
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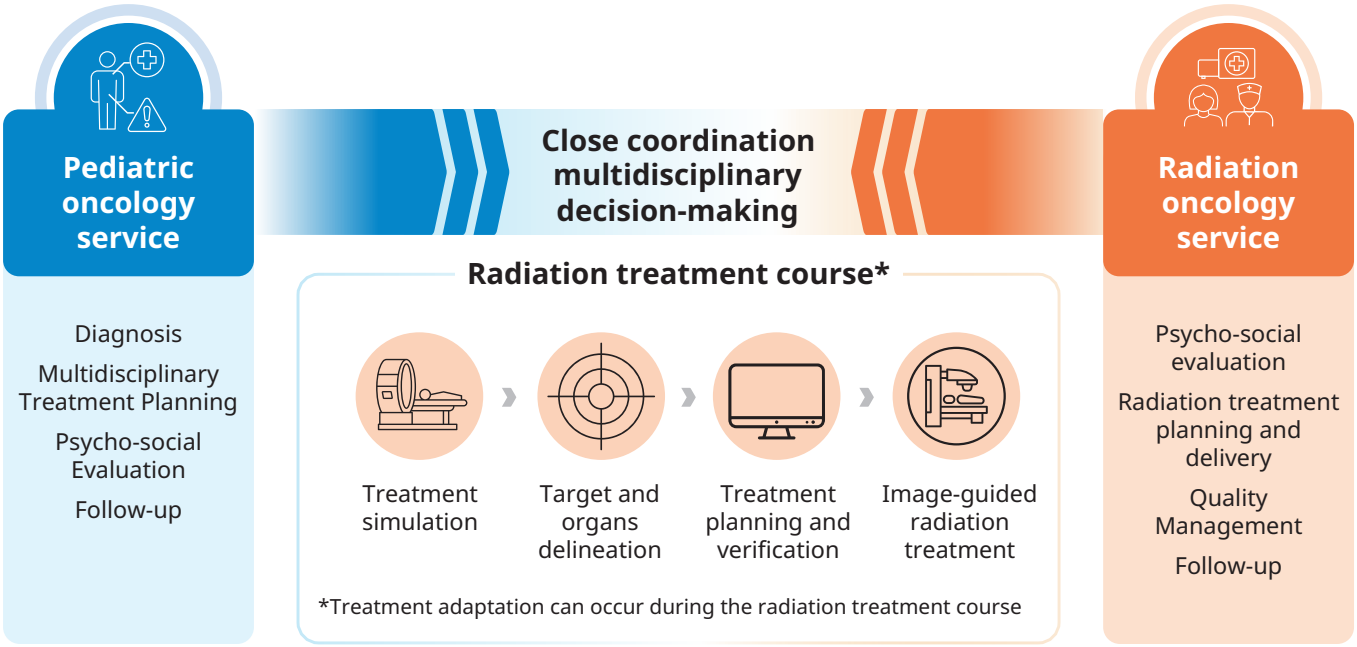
(All references were accessed on 19 December 2025.)

Annex 7. Radiotherapy care pathway for children with Wilms tumour

This annex illustrates the radiotherapy care pathway for children with Wilms tumour, highlighting key steps and decision points from referral through treatment delivery and follow-up. The pathway reflects good practice in paediatric radiotherapy and is intended to support understanding of how radiotherapy course is integrated within multidisciplinary care. Treatment adaptation can occur during radiotherapy course.

Fig. A7.1. Radiotherapy care pathway for children with Wilms tumour



Source: Reproduced from the Royal college of Radiologist, 2018 (1).

Reference

1. The Royal College of Radiologists, Society and College of Radiographers, Institute of Physics and Engineering in Medicine, Children's Cancer and Leukaemia Group. Good practice guide for paediatric radiotherapy, second edition. London: Royal College of Radiologists; 2018 (https://www.rcr.ac.uk/our-services/all-our-publications/clinical-oncology-publications/good-practice-guide-for-paediatric-radiotherapy-second-edition/, accessed 19 December 2025).

Annex 8. Indicative competencies for health workers providing paediatric palliative care

This annex summarizes indicative competencies required for health workers providing paediatric palliative care as part of an integrated approach to care. The table highlights core clinical, psychosocial and supportive competencies needed to address symptom management, communication, decision-making and family support across care settings.

Table A8.1. Indicative competencies and key components of paediatric palliative care

Key competency	Key component
Paediatric symptom assessment	Use specific tools to assess physical symptoms: pain, nausea, constipation, dyspnoea, etc.
Appropriate medication selection: dosing and administration	Implement age and weight-based dosing Use non-opioid and opioid medication according to WHO principles Develop a pharmacological and non-pharmacological plan, including emergency medications in the home and train the caregivers
Disease trajectory recognition	Include families and children according to age into the decision-making process, respecting relevant ethical principles, cultural norms and legal guidelines
Determine goals of care	Determine whether the goal is to cure, maintenance of the actual level of health, comfort or mixed Develop a care plan with patient/or family that integrates awareness of the child's symptoms, disease trajectory, desires and goals of the patient and the family
Psychosocial assessment (child and family)	Identify understanding of the disease, fears and concerns of the child, family and siblings Assure the child and the family that they will not be abandoned Use play therapy such as music, storytelling, art therapy and distraction
Spiritual concern as part of care	Consider referral to appropriate spiritual care provider Allow time for reflection in life meaning and purpose
Support tangible need	Offer and arrange assistance: • Medical equipment: wheelchairs, suction, hospital bed, etc. • Social support: food packages, transportation vouchers • Community services: mobile palliative care team, community health workers, nurses

References

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