

SIOP Africa Sub-Saharan Paediatric Oncology Nursing Network

Facilitator Handbook for the Foundation Training Programme

Introduction

The Sub-Saharan African nursing network is building on existing initiatives and partnerships focussed on nurse training and education in the region. It is affiliated to SIOP Africa.

One of the aims of the network is to develop a paediatric oncology nursing curriculum relevant to Sub-Saharan Africa, which meets the SIOP baseline standards for paediatric oncology nursing in developing countries (1). This curriculum includes the orientation or 'Foundation' programme presented here, for nurses new to the speciality, or hospitals starting to develop their own paediatric oncology programme.

Development of the 'Foundation' course outline framework.

A Delphi survey approach was used to ensure that the programme was focussed on the needs and concerns of nurses across the region (2). The course outline as shown below is based on the consensus view of survey respondents and experts from within the Network Steering Committee.

Course delivery

The course is composed of 12 modules. Each module is further broken down into topic areas, supported by a core 'PowerPoint' slide deck. This facilitator guide is intended to support nurse trainers delivering the programme. There is an aligned competence framework to support the acquisition of both knowledge and skills.

The modular presentation enables the programme to be delivered in one taught 'block', or as distinct modules over a longer period of time, depending on local requirements. When taught as an orientation programme for new staff it should be delivered alongside a period of supervised practice, in line with the SIOP Baseline Standards (1).

Standard 2 states that all new nursing employees should receive a formalised paediatric oncology induction (orientation) programme to include two weeks of theory and clinical skills training and three to four weeks spent with an experienced nurse preceptor (3).

REFERENCES

1. Day S, Hollis R, Challinor J, Bevilacqua G, Bosomprah E. Baseline standards for paediatric oncology nursing care in low to middle income countries: position statement of the SIOP PODC Nursing Working Group. *Lancet Oncol.* 2014 Jun;15(7):681–2.
2. Kiteni E, Afungchwi G, Gibson F, Hollis R. Outline for a Foundation Programme for Nurses New to Paediatric Oncology in Sub-Saharan Africa: Developed Using a Delphi Approach. In Abstracts from the 52th congress of the International Society of Paediatric Oncology (SIOP) Virtual congress, October 14 - 17, 2020. *Pediatric blood and cancer.* 2020 Dec; 6A (S4): 75
3. Day S, Challinor J, Hollis R, Abramovitz L, Hanaratri Y, Punjwani R. (2015) Paediatric oncology nursing care in low-and middle income countries: a need for baseline standards. *Cancer Control.* 2015; 111-116.

Course Outline

Module	Module objectives	Taught content
Module 1: General introduction to cancer	<ul style="list-style-type: none"> • Demonstrate understanding of the basic pathological processes which lead to cancer • Describe the presentation of common and curable childhood cancers 	<ul style="list-style-type: none"> • Introduction to cancer and cancer biology • Common types of childhood cancer • Difference between child and adult cancers
Module 2: Diagnosis of cancer	<ul style="list-style-type: none"> • Describe the presentation and 'Early Warning Signs' of common childhood cancers • Demonstrate understanding of diagnostic procedures and tests • Demonstrate ability to interpret the results of basic investigations 	<ul style="list-style-type: none"> • Early warning signs of childhood cancer • Diagnostic work up and common tests performed to diagnose childhood cancer • Basic investigations and interpretation of laboratory results
Module 3: Cancer treatment modalities	<ul style="list-style-type: none"> • Define childhood cancer treatment modalities • Demonstrate understanding of nursing care before and after surgery for common surgical malignancies • Demonstrate understanding of principles of radiotherapy • Demonstrate understanding of principles of chemotherapy • Demonstrates knowledge of pre-chemotherapy needs such as fluid management, anti-nausea medications and 'critical tests' including blood counts 	<ul style="list-style-type: none"> • Surgery <ul style="list-style-type: none"> ○ Pre- and post-operative nursing care • Radiation therapy <ul style="list-style-type: none"> ○ Preparation and nursing management of a patient on radiation therapy • Chemotherapy – includes: <ul style="list-style-type: none"> ○ Principles of chemotherapy ○ Chemotherapy drug classification ○ Chemotherapy safety <ul style="list-style-type: none"> ▪ Preparation of chemotherapy ▪ Administration of chemotherapy
Module 4: Management of Chemotherapy side effects	<ul style="list-style-type: none"> • Outline the common acute side effects of chemotherapy 	<ul style="list-style-type: none"> • Chemotherapy induced nausea and vomiting • Diarrhoea and constipation • Bone marrow suppression <ul style="list-style-type: none"> ○ Anaemia; neutropenia; thrombocytopenia ○ Blood products administration and management • Mucositis <ul style="list-style-type: none"> ○ Mucositis prevention ○ Early signs and symptoms of mucositis • Haemorrhagic cystitis • Hypersensitivity and allergic reactions

Module 5: Paediatric Oncological emergencies	<ul style="list-style-type: none"> Describe the complications arising from treatment of cancer Outline the nursing care necessary for prevention, early detection, and treatment of complications of common chemotherapy treatments Recognize the main oncologic emergencies and their management 	<ul style="list-style-type: none"> Tumour lysis syndrome; prevention and management Anaphylaxis and anaphylactic shock Spinal Cord Compression Febrile neutropenia Septic shock Hyperleukocytosis Superior vena cava syndrome Typhlitis Seizures
Module 6: Care of the sick child	<ul style="list-style-type: none"> Ability to undertake 'Top to toe' thorough physical examination and vital signs assessment for the child Identifies signs that require urgent independent and collaborative interventions for a child during admission Identifies signs of dehydration and principles of management 	<ul style="list-style-type: none"> Physical examination and assessment skills PEWS (Paediatric Early Warning Signs) Basic life support in paediatrics Venous access and IV lines
Module 7: Providing safe care	<ul style="list-style-type: none"> Able to identify key principles of infection prevention and control Identifies potential risks of handling chemotherapy 	<ul style="list-style-type: none"> Infection prevention and control Safe handling of chemotherapy <ul style="list-style-type: none"> Use of PPE Waste disposal and management (include cytotoxic waste) Cytotoxic spill management
Module 8: Psychosocial care	<ul style="list-style-type: none"> Demonstrates understanding of religious and cultural differences between families Explains the psychological/emotional effects of cancer on the child and family Identifies patients and families with extra needs for psychosocial and emotional support 	<ul style="list-style-type: none"> Pre-treatment counselling Psychological care of the child and family Effective counselling of children with cancer and their parents/family Religious and cultural practices of families of patients with cancer
Module 9: Nutritional support for children with cancer	<ul style="list-style-type: none"> Identifies and assesses anthropometric parameters necessary for treatment and supportive care Identifies education needs of child and family 	<ul style="list-style-type: none"> Nutritional education for parents Essential anthropometric measurements NG tubes/feeding
Module 10: Palliative and supportive care to a child with cancer	<ul style="list-style-type: none"> Identifies and describes the principles of palliative care and end of life care Identifies the need to assess the patient and family preferences for end-of-life care, and involve them in discussions, decision making and goals. 	<ul style="list-style-type: none"> Symptom management <ul style="list-style-type: none"> Pain assessment and management Preparation for painful procedures Quality of life Death, dying and bereavement

	<ul style="list-style-type: none"> • Recognise the need for effective pain assessment and discuss the tools available • Recognise the need to prepare children for painful procedures and discuss the techniques for doing so 	
Module 11: Outpatient and follow up care	<ul style="list-style-type: none"> • Identifies the need to explain to families potential short to medium term effects of chemotherapy • Identifies the symptoms that require patients to be brought back to the hospital following discharge • Explains recommended actions to be taken at home for common problems following treatment • Identifies education needed to dispel myths on childhood cancer, communicate warning signs and describe how to orient patients to care. 	<ul style="list-style-type: none"> • Triage of patients in Out Patient Department or other settings where they may present • Preparation of families for discharge <ul style="list-style-type: none"> ○ When to come in for an unscheduled visit ○ Fever at home • Community education on childhood cancer
Module 12: Paediatric oncology nursing and the role of the nurse	<ul style="list-style-type: none"> • Describes the role of the paediatric oncology nurse in a multidisciplinary team • Identifies potential stressors and how to mitigate them • Assesses and describes strategies to improve resilience for self and colleagues • Describes the importance of nursing research 	<ul style="list-style-type: none"> • What is a paediatric oncology nurse? • Multidisciplinary team-work and the role of a nurse • Effective communication skills • Effective documentation of nursing care for children with cancer • Evidence based practice and nursing research in paediatric oncology • Stress Management for nursing professionals in paediatric oncology

Using this guide:

The Facilitator Handbook sets out each of the 12 modules identified above, broken down into a number of topic areas. Each topic area has its own PowerPoint presentation. For example Module 1 has two presentations: “What is Cancer?” and “Common types of childhood cancer.” Some modules have up to 9 different topics and presentations within them.

When planning your teaching sessions, you should review each module and decide how long you think you may require to deliver the teachings. It is suggested that all the topics within each module are presented in the order set out in this guide.

This handbook provides additional notes related to slides in each presentation; not all slides have additional notes. It also suggests some areas of discussion, and some exercises and learning activities that facilitators can use when delivering the teachings.

At the end of most presentations there is an ‘assessment’ slide. This is expected to be used by facilitators to revise key points from each presentation.

At the end of the guide you will find some additional resources for facilitators and participants.

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Module 1: General Introduction to Cancer

The overall objectives of this module are for participants to:

- Demonstrate understanding of the basic pathological processes which lead to cancer
 - Demonstrate understanding of cell division and describe the stages of the cell cycle
 - Describe the characteristics of malignant cells
- Demonstrate understanding of the causes of cancer in adults and in children
- Describe the presentation of common and curable childhood cancers
- Describe physiological and clinical differences between adult and childhood cancer and their management

These objectives are covered in two presentations: “What is Cancer?” and “Common types of childhood cancer.”

Presentation 1 - What is Cancer

This presentation is expected to impart in participants the ability to:

- Demonstrate understanding of the basic pathological processes which lead to cancer
 - Demonstrate understanding of cell division and describe the stages of the cell cycle
 - Describe the characteristics of malignant cells
- Demonstrate understanding of the causes of cancer

Exercise: Discussion

A good place to begin is by asking the participants to tell you what they understand about cancer: You could ask them to define cancer in their own words – see definition on **Slide 3**. And ask where cancer starts - this will lead you into **Slide 4**, which introduces the concept that cancer starts in the cells of the body.

Slides 5 – 8 talks about the structure of cells, and cell division: the cell’s nucleus is its control centre.

Slide 5: the double helix structure of the DNA

The nucleus of every cell in the body contains DNA. This is where the changes happen. The bases of the double helix are held together by weak bonds, which can easily be broken by enzymes allowing the double helix to unwind into 2 separate strands which enzymes can then read to match up to new ‘daughter’ strands.

Slide 6: Replication of DNA

One double-stranded DNA molecule produces two identical copies of the molecule. Information contained in the DNA of the nucleus of each individual cell should therefore be copied exactly from one cell to another.

Slide 7: Mitosis – cell division

Once the DNA is replicated and has been checked to ensure it is correct it will enter into mitosis, when the cell actively begins to divide to produce 2 ‘daughter’ cells. This is part of the ‘cell cycle’.

Slide 8: The cell cycle

The purpose of the cell cycle is for cells to reproduce and replace dead or injured cells. The two major periods of the cell cycle are Interphase and Mitosis.

During Interphase, the cell prepares to divide, by replicating its DNA. In mitosis, the cell divides.

Slides 9 – 13 talk about the difference between 'normal cells' and cancer cells

Slide 9: The properties of healthy cells

Healthy cells live for a specific period of time, depending on the type, they have a particular job to do, and at the end of their life, they die a natural death in a process called apoptosis.

Slide 10: Apoptosis

Apoptosis can be described as an internal cell suicide process or programmed cell death.

Slide 11: Cancer and cell division

In normal tissues, the rates of new cell growth and old cell death are kept in balance. In cancer, this balance is disrupted.

Slide 12: Microscopic appearance of cancer cells

Note the definite shape and size of the normal cells while the abnormal cells are poorly shaped. The normal cells adhere to one another and make an orderly mass while the cancerous cells have the tendency to be disorganised and to form an irregularly shaped mass.

Slide 13: Macroscopic appearance of cancer cells

As cancer cells grow, they cause visible changes. They exert pressure on neighbouring cells and gain space for the growing tumour – this is called invasion. When they penetrate a blood or lymphatic vessel, they are carried to distant sites where they seed to form metastases.

Exercise: Discussion

What are the causes of cancer? Suggest causative factors and the cancers with which they are associated; this will lead you onto **Slide 14: Causes of cancer**

Slide 15

Cancer types are usually named according to the tissues from which they originate.

Slide 16:

These are cancers which are common in adults. The cancers that are seen in children are different and this will be discussed further in the next presentation.

ASSESSMENT 1

1. List the five phases of the cell cycle
2. State two characteristics of cancer cell
3. List two general cancer types and the tissues they affect

Use the assessment questions as a means to briefly revise a few key points

Topic 2: COMMON TYPES OF CHILDHOOD CANCERS

The specific objectives of this presentation are that participants will be able to:

- Describe the differences between child and adult cancers
- List common childhood cancers
- Identify the parts of the body where different childhood cancers originate
- Describe the diagnosis and management modalities for various childhood cancers

EXERCISE – Question & Answer/Discussion:

Ask participants to name any common adult cancers and the most common childhood cancers.

Ask participants to discuss the treatment modalities commonly used in adults and in children.

Ask for their knowledge of adults and children who have survived cancer. This will lead you to the objectives on **Slide 2**

Slide 3: Characteristics of cancer in children and in adults

Childhood cancers commonly affect connective tissues such as blood, lymph, muscle, while adult cancers commonly originate in organs. Therefore, for children, some cancer types can occur in different parts of the body where the tissue of origin is found. For example Burkitt lymphoma can occur in any part of the body where lymphatic tissue is found.

Slide 4: Common childhood cancers

The most common paediatric cancers in Africa are generally amongst these six. The incidence varies across countries, but leukaemia and lymphoma are generally the most common.

Slide 5: Acute Lymphoblastic Leukaemia

As this is a cancer of the blood, a discussion of the function of blood, and the production of blood cells can be a useful revision exercise for participants:

You could ask: What are the functions of blood? What are the different types of blood cell? Where is blood formed? This can lead you on to the next slide.

Slide 6: Haematopoiesis

Blood is mostly made in the bone marrow, through the process of haematopoiesis, starting with the pluripotent stem cell, which could become any type of blood cell. There is then differentiation to the myeloid line which ends in red blood cells, neutrophils, eosinophils and basophils; and the lymphoid line which results in lymphocytes. Acute Lymphoblastic Leukaemia (ALL) is the result of changes to cells in the lymphoid line; Acute Myeloid Leukaemia (AML) comes from changes to the myeloid line.

Slide 7: Acute Lymphoblastic Leukaemia (ALL)

With massive lymphocyte proliferation and high concentration in blood, little room is available for red blood cell production, resulting in pallor, fatigue and anaemia. Easy bruising is linked to the decline in platelet count. The white blood cell count may be high, but the white cells are immature and there will often be a lack of neutrophils (neutropenia). This leads to fever.

Slide 8: Diagnosis of ALL

Pressure must be applied on bone marrow aspiration and lumbar puncture sites to prevent bleeding due to low platelet count

Slide 9: Treatment of ALL

Treatment for ALL is by chemotherapy. This is usually for a period of either 2 years (girls) or 3 years (boys). Standard risk patients have less intensive treatment than high risk patients. It is a combination of intravenous, intrathecal and oral medications.

Slide 10: Burkitt's Lymphoma (BL)

Discussion: This is a cancer that most participants know. Ask them to name the lymph nodes that they know and their location. Establish that lymph nodes are widely dispersed all around the body, including the mesenteric lymph nodes in the abdomen. You could ask them to discuss the presentation of a child they have cared for.

Slide 11: BL - Signs and symptoms

The symptoms are more extensive and more severe with more advanced disease. Patients diagnosed at earlier stages show less severe symptoms.

Bone marrow involvement and brain/CNS involvement can be seen with stage IV disease.

Slide 12: BL - Diagnosis and treatment

Ultrasound and Fine Needle Aspirate (FNA) is usually sufficient to establish a diagnosis of BL. Bone marrow aspirates and cerebrospinal fluid analyses are important for evaluating metastasis.

Slide 13: Nephroblastoma (Wilms' Tumour)

Discuss the location of the kidneys.

Generally, the abdomens of children are soft. In malaria endemic settings, some children might have enlarged spleens. However, swelling of the abdomen or flank should be considered a potential kidney mass and investigated for nephroblastoma.

Slide 14: Nephroblastoma: Signs & symptoms/Diagnosis

Slide 15: Nephroblastoma: Treatment

Nephrectomy is the surgical removal of the kidney.

For bilateral tumours, the most affected kidney is completely removed while the less affected kidney is partially removed to retain some renal function.

Chemotherapy is often given before surgery to shrink the tumour before removal (neoadjuvant).

More chemotherapy is then given after surgery to get rid of residual tumour (adjuvant).

Slide 16: Retinoblastoma

Retinoblastoma is the most common sort of cancer of the eye in children.

Slide 17: Retinoblastoma – Signs and symptoms and diagnosis

When bright light is shone on healthy eye, a red reflection is seen. In retinoblastoma affected eyes, a white reflection is seen called leukocoria.

Retinoblastoma starts with malignant changes in the retina. With time, the tumour grows to into the eye ball and the eyeball might grow big and bulge out of the socket. The tumour also grows posteriorly into the socket of the eye.

Suggested Exercise:

Participants pair up and take turns observing the healthy reflection of light from the retina by pointing the telephone torch light into their eyes. It is OK to opt out.

Slide 18: Retinoblastoma – Treatment

Slide 19: Hodgkin Lymphoma – Signs and symptoms

Slide 20: Hodgkin Lymphoma – Diagnosis and Treatment

Slide 21: Low-grade glioma – Signs and symptoms

Slide 22: Low-grade glioma – Diagnosis and Treatment

ASSESSMENT 2

Use the assessment questions as a means to briefly revise a few key points

1. State two differences between paediatric and adult cancers.
2. What are the 6 'common and curable' cancers of the GICC?
3. What is the original site of:
 - a. Wilms' tumour
 - b. Retinoblastoma

Module 2: Diagnosis of Cancer

The overall objectives of this module are to:

- Describe the presentation and 'Early Warning Signs' of common childhood cancers
- Demonstrate understanding of diagnostic procedures and tests for diagnosis
- Demonstrate ability to interpret the results of basic investigations

These objectives are covered in two presentations: "Early diagnosis of childhood cancer" and "Diagnosis (assessments, tests and investigations)".

Topic 1: Early diagnosis of childhood cancer

By the end of this session, participants should be able to describe the presentation and early warning signs and symptoms of common childhood cancers.

Exercise: Discussion

A good place to begin is by reminding participants that in Module 1 it was highlighted that the causes of paediatric cancers are uncertain. This means that primary prevention is not usually discussed in paediatric oncology. Rather, emphasis is laid on early detection of the common signs and symptoms of cancer in children. Many of these signs and symptoms are seen in other diseases, but their persistence or their occurrence at an unusual age should raise a suspicion of cancer. It is better to over suspect than to under suspect as early diagnosis makes a huge positive difference for the child's chances of surviving.

This discussion can lead you to **Slide 3: Introduction**

There is minimal opportunity to prevent cancer in children .

Childhood malignancies have a short latency period – this means that they grow or advance quickly. Most children present at an advanced stage. Hence, need for high index of suspicion.

Slide 4: St SILUAN signs

There are a number of resources aimed at improving early diagnosis of childhood cancer; one of these is the 'Saint Siluan Early Warning Signs' developed by the South African Children's Cancer Study Group (SACCSG) in 1999. It is a list of the early warning signs of cancer in children for use at the primary health care level and for the general public.

Take the participants through these signs, and note in particular:

Lump - It is unusual to feel any hard lump in a child's abdomen. In malaria endemic areas, a huge spleen may be common but this is usually smooth edged as opposed to a tumour in the spleen.

With lymphomas, tumours can occur on any part of the body – wherever there is lymph tissue'

Unexplained fever present for over two weeks with fatigue and pale appearance - In many malaria endemic settings, children with recurrent fever are treated as malaria. This is usually accompanied with repeated transfusions for anaemia assumed to be malaria induced. Such children with repeated fevers and anaemia should have a peripheral blood smear analysis or a bone marrow analysis to investigate for premature blood cells (blast cells), indicative of leukaemia.

Sometimes, weakness, anaemia and pallor might raise the question of sickle cell anaemia. If a sickling test is negative or a haemoglobin electrophoresis is negative of sickle cell disease, the child should be investigated for leukaemia or lymphoma.

Aching bones might be from a primary bone tumour such as osteosarcoma or from another tumour like a lymphoma which has metastasized to the bone. Primary bone tumours or metastases to the bone cause bone tissue to soften and can result in a pathologic fracture

Abdominal tumours which are growing towards the back might cause compression and pain in the back before they become noticeable in front.

Neurological signs may result from a tumour in the brain. Paraplegia may result from compression of the spinal cord by a large intra-abdominal tumour

Slides 5-7 Poster produced by Union for International Cancer Control (UICC)

Share printed copies of the posters if you have them, or any locally produced resources, and discuss what is helpful for participants in their own practice, or whether resources need to be developed.

Slide 8: Example Leaflet on Early Warning Signs – Ghana

Slide 9: Differential diagnoses

Children's cancers can present with signs and symptoms which make them hard to distinguish from other childhood illnesses. The range of differential diagnoses can make the cancer diagnosis a challenge as shown in this table.

Slide 10: Assessment

1. What does the acronym SILUAN stand for?

Use this question to revise the main points.

Topic 2: Diagnostic and staging procedures in childhood and adolescent cancer

This presentation specifically aims to make participants able to:

- Demonstrate understanding of diagnostic procedures and tests for diagnosis
- Demonstrate ability to interpret the results of basic investigations

Slide 3: Establishing the diagnosis 1

Outline the main components/steps in establishing a patient diagnosis: Patient's complaint; history of present complaint; physical examination; laboratory investigation; imaging; pathology

Slide 4: Establishing the diagnosis 2

Discuss the importance of the baseline assessment. Diagnostic investigations and investigations of organ function are generally undertaken at the same time if the index of suspicion is high.

Slide 5: Establishing the diagnosis – Patient history

Discuss what you investigate in patient's history, including: duration, progression, variation. Always listen to the concerns of parents and care givers – they know their child best.

Slide 6: Establishing the diagnosis – Physical examination (*note this is covered in detail in Module 6*)

Discuss what you would look for in physical examination, including: observation, palpation, auscultation, percussion, and any weakness or neurological signs.

Slide 7 Blood work and laboratory studies - haematology

Discuss the components of a Complete Blood Count (CBC) and instances where CBC is usually required – for example when leukaemia or lymphomas is suspected.

Slide 8 Blood work and laboratory studies - chemistry

Serum chemistry is important for assessing risk of tumour lysis syndrome and also patient's suitability for chemotherapy drugs as well as being an indicator of impairment of the kidney or the liver as a result of disease processes.

Slide 9 Blood work and laboratory studies - Urinalysis

Slides 10 and 11: Diagnostic Imaging

Slide 12: Pathological confirmation of diagnosis

Exercise: Discussion

Ask participants what they know about the role of the pathologist.

Pathologists are doctors who perform laboratory examinations of samples of tissue to make a diagnosis. Pathology is not only used for diagnosis, but also important for determining the extent of progression and thus staging the cancer.

There are different ways of obtaining the sample of tissue which the pathologist will examine.

In an FNA, a thin bore needle (usually G25 or smaller) is used to obtain thin sections of a tumour and a smear is prepared on a slide for microscopy.

Slide 13: Pathologic confirmation of diagnosis – Bone Marrow Analysis

Examination of Bone Marrow is a branch of pathology that may be undertaken by a haematologist.

Slide 14: Pathologic confirmation of diagnosis – Lumbar Puncture

Slide 15 -17: Nursing Implications

Exercise: Discussion

What role does the nurse play in:

- Physical examination – emphasize safety and chaperoning for privacy and confidentiality
- Blood tests
- Imaging – think of nil per os for abdominal ultrasound. Think of emotional preparation
- Pathology – specimen collection, transport and follow up of results

Slide 18: Assessment

1. State two laboratory tests usually conducted in the diagnosis of cancer and their purpose
2. What are the two types of imaging most commonly used in Sub-Saharan Africa?
3. Describe two types of biopsies

Use these questions to summarize the main points of the presentation.

Module 3: Cancer treatment modalities

The overall aims of this module are to enable participants:

- Define childhood cancer treatment modalities
- Demonstrate understanding of nursing care before and after surgery
- Demonstrate understanding of principles of radiotherapy
- Explain the concept of neoadjuvant and adjuvant chemotherapy
- Describe the classes of the commonly used chemotherapy agents and their main mode of action
- Demonstrates knowledge of the different chemotherapy types, and modes of delivery

These objectives are covered in three presentations: Chemotherapy. How does it work? Radiotherapy and Surgery, and Extravasation.

Topic 1: Chemotherapy – How does it work?

Objectives

By the end of this session, participants should be able to:

- Explain the concept of neoadjuvant and adjuvant chemotherapy
- Describe the classes of commonly used chemotherapy agents and their main mode of action
- Demonstrate knowledge of the different chemotherapy types

Exercise: Discussion:

A good place to begin may be by asking the participants to tell you what they already know about chemotherapy; that chemotherapy is the use of chemical compounds to treat cancer.

Cytotoxic chemotherapy causes the death of cancerous cells (cyto refers to cell). Remind participants of what they learned about the cell cycle in Module 1. This will lead you to **Slide 3**

Slide 4: Approaches of Chemotherapy

Chemotherapy may be used on its own, as a single treatment modality, for example in most leukaemia treatment, or it may be used in conjunction with other treatments – multimodal. When used alongside other treatments, it is usually used either adjuvant or neoadjuvant – see Module 2.

Slide 5: Considerations for choice of chemotherapy regimen

Balance of efficacy and side effects of drugs guide the development of chemotherapy regimens.

Slide 6: A reminder of the cell cycle

This will help as you go through the next few slides which give the classification of different chemotherapy agents:

Slide 7: Antimetabolites – active in growth phase

Slide 8: M-phase drugs – stop mitosis (cell division)

Slide 9: Drugs that affect multiple phases of the cell cycle and cell cycle independent drugs

Slide 10: Keeping up dose intensity

Cancer cells multiply exponentially. Therefore, any interval between treatments gives room for the amount of cancer cells in the body to rise higher than it was when the last medication was given.

Maintaining treatment schedules is important to ensure consistent cell kill until eradication.

Slide 11: Overview of Side Effects

Side effects are covered in detail in Module 4

Slide 12 and Slide 13: Preparing for chemotherapy

Supportive care covered in Modules 5 & 7; Critical tests covered in more detail in Module 7. Chemotherapy doses are usually prescribed according to body surface area, or body weight. It is therefore of critical importance to have an accurate weight and height

Slide 14: Assessment

1. State two classes of chemotherapy agents and how they work
2. Differentiate between adjuvant and neoadjuvant chemotherapy
3. List three general side effects of chemotherapy

Use these questions to summarize the main points.

Topic 2: Radiotherapy and surgery

Objectives:

By the end of this session, participants should be able to:

- Describe patient preparation for radiotherapy and surgery
- Identify the side effects of radiotherapy
- Describe measures to prevent infection post-surgery

Exercise: Discussion

Ask participants to tell you which cancers they know of that are treated by surgery. Ask participants about the availability of radiotherapy in their centre and the referral route of patients to this service.

Slide 3: Radiotherapy – Introduction

The most commonly available type of radiotherapy is ionizing radiation delivered by linear accelerators.

Slide 5: Radiotherapy – Different applications

Slides 6 - 10: Radiotherapy – Patient preparation

Slide 11: Radiotherapy – (acute) side effects

Radiotherapy affects every tissue exposed to the radiation, and so the side effects depend on the site, and the size of the radiation field. Side effects are more frequent and more severe with large doses of radiation therapy. Also, cell kill occurs within the body with resultant electrolyte imbalances. Blood counts and electrolytes may be required before and during radiotherapy. The problems of nausea and vomiting and bone marrow suppression is magnified when radiotherapy is used in combination with chemotherapy. Such patients require extra caution and supportive care.

Slide 12: Radiotherapy (delayed) side effects

These side effects also depend on the site and the extent of the radiotherapy field.

Slide 13: Surgery

Biopsies (fine needle aspiration, core biopsy, and incisional biopsy, open or excisional biopsies) are used to obtain specimen for diagnosis and staging.

Debulking involves removing a portion of the tumor mass. This may be done as first-line therapy or after receiving chemotherapy or radiation.

Resection is the complete removal of a tumour. Sometimes this may be the only treatment needed.

Supportive care: for example placement of central venous access devices or enteral feeding tubes.

Palliative surgery: undertaken to relieve symptoms like pain or bleeding caused by tumors that have been unresponsive to medical therapy.

Slide 14: Pre-operative assessment

Slide 15: Side effects of surgery

The problem of immune suppression and wound infection is made worse when surgery is used in combination with chemotherapy. Extra caution and good supportive care is required.

Slide 16 and 17: Principles of post operative nursing care

Slide 18: Assessment

1. State two applications of radiotherapy
2. What is the purpose of the skin mark (tattoo) on patients receiving radiotherapy?
3. State two things to monitor in a patient post-surgery
4. State three ways to prevent wound infection post-surgery

Use these questions to revise the main points.

Topic 3: Chemotherapy Drug Extravasation

Objectives: by the end of this session the nurse should demonstrate understanding of:

- Difference between infiltration and extravasation
- Risk factors for extravasation with chemotherapy administration
- Signs and symptoms of extravasation
- Immediate action to take in event of extravasation
- How to minimize tissue damage with extravasation
- How to prevent extravasation

Discussion

A good place to begin this topic is by asking the participants to tell you what they understand by extravasation? What are the possible dangers to the tissue from drug extravasation? How can a nurse prevent a drug from flowing out of the vein into the surrounding tissues?

Slide 4: Definitions

Degree of extravasation ranges from mild to severe necrosis with long term effects such as infection, regional pain syndrome and loss of function. Very severe cases can result in amputation.

Slide 5: Risk factors

Since the vesicant effect occurs in tissues surrounding the veins, any activity or structural attribute that promotes leakage of a vesicant drug from the vein can be a cause of extravasation

Slide 6: Signs and symptoms

These signs and symptoms are related to tissue irritation and damage.

Slide 7: Consequences of extravasation**Slide 8: Presentation**

Healing is slow when extravasation occurs in areas with little muscle tissue. When it occurs in joints, it can result in decreased joint mobility when it heals.

Slide 9: How to deal with a tissue injury**Slide 10: Management - SLAPP**

S = Stop the infusion

L = Leave the needle (cannula) in place until you have aspirated it

A = Aspirate: aspirate as much of the drug as you can through the catheter before you remove it

P = Pull (remove) the needle (cannula)

P = Provider (doctor) should be notified; both for management of the extravasation as well as ensuring that the patient ends up receiving the required dosage of medication.

Slides 11 and 12

The use of cold compress or warm compress depends on the drug in question as shown on the table in **Slide 12**

Slides 13 and 14: Nursing Care**Slide 15: Assessment**

1. State two differences between infiltration and extravasation
2. State four risk factors of extravasation
3. List five signs and symptoms of extravasation
4. State four immediate actions a nurse must take in the event extravasation
5. State two ways to prevent extravasation from occurring when administering intravenous chemotherapy.

Use these questions to revise the main points from the presentation.

Module 4: Management of chemotherapy side effects

The objective of this module is to outline the common acute side effects of chemotherapy. There are six presentations: an introduction to chemotherapy side effects; nausea and vomiting; blood product support; diarrhoea and constipation; mucositis and haemorrhagic cystitis

Topic 1: Managing Chemotherapy side effects: Introduction

This presentation provides an introduction to the side effects of chemotherapy and looks at the side effects associated with specific commonly used chemotherapy agents.

Exercise: Discussion

A good place to begin is by asking the participants to tell you which chemotherapy side effects they know about, or can recall from Module 3.

Slide 2: Chemotherapy – *brief revision*

Chemotherapy acts on cells that are fast growing and have a high proliferation rate; this includes healthy cells such as those in the hair, bone marrow and the gastrointestinal tract.

While the use of combination therapy helps to prevent tumour resistance, it can also increase the toxicity associated with the treatment.

Slide 3: Side effects of treatment – short term

Note that various drugs have some side effects that occur immediately and some that occur at a later time after their use; they are generally divided into short and long term.

Slide 4: Side effects of treatment – long term

Some acute side effects, such as renal damage or cardiotoxicity can lead to long term impairment.

Slides 5 and 6: Side effects of some common chemotherapy drugs

Slide 7: Bleomycin

Patients who receive bleomycin should never receive oxygen therapy at high concentration as this puts them at risk of pulmonary fibrosis.

Slide 8: Conclusion

Topic 2: Nausea and Vomiting

Objectives

By the end of this session, participants should be able to:

- Describe the causes of nausea and vomiting in paediatric oncology care
- Outline the management strategies for nausea and vomiting
- Anticipate the dangers of nausea and vomiting to the patient and mitigate them

Exercise: Discussion

A good place to begin is by asking the participants to tell you about the possible complications of nausea and vomiting, and how the nurse can contribute to preventing or managing nausea and vomiting.

Slide 3: Important things to know

Anti-emetics are given before chemotherapy so that they achieve a therapeutic blood level before the brain and the body starts experiencing the effects of the chemotherapy.

Slide 4: Definitions

Anticipatory vomiting is usually seen in patients who have received some doses of chemotherapy before. The thought of taking the medicine again makes them nauseated and vomit even before the medication.

Slide 6: Risk factors for anticipatory nausea and vomiting

Slide 7: Effects of nausea and vomiting

Nausea and vomiting have the potential to affect nutritional status as well as fluid and electrolyte balance.

Slide 8: Emetogenicity of commonly use chemotherapy agents

Some chemotherapy drugs are known to cause more nausea and vomiting than others. The emetogenicity of the drug used (how likely they are to make the child vomit) determines the strength of antiemetic medication required and nature of extra supportive care necessary.

Slides 9 – 12: Commonly used antiemetics

Note that dexamethasone should not be used in children being treated for Acute Lymphoblastic Leukaemia as they receive a lot of steroids as part of their treatment.

Slide 13: Additional considerations

Slides 14 and 15 : Practical recommendations in the management of nausea and vomiting

Never forget to give anti-emetic medication before and after emetogenic chemotherapy. Remember that poor control with one treatment course can lead to worse manifestation of nausea and vomiting with subsequent courses.

Slide 16: Nursing considerations

If patients/carers are not pre-warned of the possibility of nausea and vomiting as a result of chemotherapy, they might become anxious and think their disease is getting worse with treatment. This can affect compliance.

Slide 17: Assessment

1. Describe two types of nausea and vomiting
2. List two highly and two mildly emetogenic chemotherapy agents
3. At what point in the chemotherapy cycle should the first dose of antiemetic be given?

Use these questions to revise the major points.

Topic 3: Blood product support

Objectives

By the end of this session, participants should be able to:

- Describe the components and functions of blood
- Explain what happens to the body in anaemia, neutropenia and thrombocytopenia
- Discuss the management of anaemia, neutropenia and thrombocytopenia
- Conduct proper monitoring before, during and after blood product administration
- Recognize and manage blood transfusion reactions

EXERCISE

Exercise: Discussion

A good place to begin is by asking the participants to tell you where blood is formed and what the main components of blood, or different types of blood cell

Slide 4: Introduction

Blood consists of blood cells, but also plasma – with nutrients and electrolytes dissolved in water.

Slide 5: Haematopoiesis

Blood cell production occurs primarily in the bone marrow. Many chemotherapy agents suppress the bone marrow suppression effect.

Slide 6: Functions of the blood

Blood has 3 primary functions – Transportation, Protection, and Regulation

Slide 7: White Blood Cells

Differences in WBC counts exist: higher in neonates and young infants and lower in African Americans compared to Caucasians.

Typically see a higher WBC w/infection, tissue necrosis, bone marrow malignancies and inflammation

Typically see a lower WBC w/infections, conditions or medications that suppress the immune system or exhaust the bone marrow. Assesses % of each subtype of WBC. Reported as % of total cells counted; % of all types reported should add up to 100

Slide 8: Differential – Neutrophils

Increase in neutrophil count can indicate bacterial infection, some inflammatory conditions & tissue damage. Bacterial infection leads to increased bone marrow activity leading to the increased presence of neutrophils in the peripheral blood.

Decreased neutrophil count can be seen in viral infections, overwhelming infection, chemotherapy agents, certain antibiotics and psychotropic drugs

Slide 9: Monocytes, Lymphocytes, Basophils and Eosinophils

Monocytes: capable of phagocytosis that respond to bacterial, viral infection, some chronic inflammatory diseases and other chronic conditions. Respond late during the acute phase of an

infection, but are stronger, can ingest larger particles and live longer-allowing them to continue to function during the chronic phase of infection.

Eosinophils: produced in response to allergic reactions; also released in parasitic infection.

Lymphocytes- responsible for the regulation of the immune system through humoral (B- cells) & cell-mediated (T-cells) immunity. Increase is seen with viral infections (primarily), but can also be seen in bacterial and allergic conditions. Decreased with corticosteroid therapy, and conditions which stimulate the adrenal gland (stress, shock).

Basophils-respond to inflammatory states; responsible for histamine release

Slide 10: Bone marrow suppression

Normal bone marrow function can be suppressed by a variety of chemotherapeutic agents and by radiation therapy. Myelosuppression, suppression of bone marrow activity, is the most common dose limiting toxicity of many chemotherapy agents and regimens.

It can lead to anemia; neutropenia; thrombocytopenia.

The lowest level the blood counts fall to after chemotherapy is called the Nadir.

Slide 11: Neutropenia

When the neutrophil count drops, the child becomes prone to infections.

Slide 12: Thrombocytopenia

Patients with low platelet counts are prone to bleeding. Injury must be prevented in such patients.

Slide 13: Nursing considerations in thrombocytopenia

Insertion of thermometer or drugs into the rectum can provoke bleeding, as well as constipation with hard stools; this should be avoided.

Slide 14: Platelet Transfusion Guidelines

Platelets are not available in all settings.

Slide 15: Red Blood Cells

Red cells contain hemoglobin and it is the hemoglobin which permits them to transport oxygen (and carbon dioxide). Hemoglobin, aside from being a transport molecule, is a pigment. It gives the cells their red color (and their name).

Slide 16: Blood Transfusion Guidelines

Slide 17 & 18: Transfusion reactions – signs, symptoms and management

Slide 19: Assessment

1. What is the function of platelets?
2. List four things to check before administering a blood product
3. Describe two transfusion reactions and their immediate interventions

Use these questions to revise the major points from the presentation.

Topic 4: Diarrhoea and Constipation

Objectives

By the end of the session, participants should be able to:

- Define diarrhoea and constipation
- Identify the causes of diarrhoea and constipation
- Describe the management of diarrhoea and constipation
- Monitor and educate patient and family in case of diarrhoea and constipation

Exercise: Discussion

A good place to begin is by asking the participants about some of the common causes of diarrhoea in children, and what effects it may have. How can the nurse and the family prevent or manage constipation in a child?

Slide 3: Definitions

Slide 4: Bristol Stool Chart

Slide 5: Diarrhoea – Causes

Slides 6 and 7: Diarrhoea – Management and treatment

The nurse should monitor the vital signs and fluid input/output closely. Intravenous hydration is recommended for patients receiving chemotherapy who have diarrhoea who cannot tolerate oral fluids. If stool test for bacteria and viruses are negative, anti-diarrhoea medications may be considered

Slide 8: Constipation – Causes

Slide 9: Constipation - Causes

Slide 10: Nursing consideration

24-hour diet reviews will enable you watch the patient's diet and advise in time to prevent diarrhoea and constipation. Daily check if bowels opened should include number and nature of stools (colour and consistency)

Slide 11: Assessment

Use this case study to revise the key points of this presentation

Topic 5: Mucositis

Objectives

By the end of this session the nurse should be able to:

- Describe the signs and symptoms of mucositis
- Identify common chemotherapy agents that cause mucositis
- Describe the stages of mucositis
- Discuss the medical prevention and management of mucositis
- Describe the nurse's role in prevention and management of mucositis.

Exercise: Discussion

A good place to begin is by asking the participants to tell you if they have looked after a child with mucositis. What problems did the patient face? How did they manage mucositis?

Slide 3: What is mucositis?

Inflammation of the mucous membranes of the mouth and Gastrointestinal Tract (GIT) by chemotherapy agents; can affect the mucous membranes from the mouth to the bowel
May present as Stomatitis: inflammation of the mouth, Oesophagitis: inflammation of the throat or Typhlitis: inflammation of the large intestine (caecum)

Slide 4: Incidence

Mucositis commonly occurs with the use of high-dose methotrexate, doxorubicin, dactinomycin, high-dose etoposide, and high-dose cyclophosphamide

Slide 5: Presentation

Slide 6: Consequences of mucositis

Mouth and throat pain resulting from mucositis makes it difficult for children to eat or drink, hence dehydration and nutritional deficits ensue.

Slides 7 & 8: Toxicity of mucositis: WHO grades

Slide 9: Complications of mucositis – secondary infections

Slide 10: Prevention

Slide 11: Management

Slide 12: Nursing role

Slide 13: Assessment

Use this case study to revise the main points.

Topic 6: Haemorrhagic cystitis

Objectives

By the end of this session, the nurse should demonstrate understanding of:

- Causes of haemorrhagic cystitis
- Signs and symptoms of haemorrhagic cystitis
- Management of haemorrhagic cystitis
- Nurse's role in prevention and management of haemorrhagic cystitis

Slide 3: Introduction

It is important to counsel patients about the possibility of haemorrhagic cystitis. This is particularly necessary for ambulatory patients who return home after chemotherapy as the signs and symptoms might only be noticed at home a few days after chemotherapy.

Slide 4: Presentation

Slide 5: Management - prevention

If urine production is good, it is more likely that the by-products will be properly cleared from the bladder, avoiding cystitis.

Slide 6: Management

Slide 7: Nursing role

Slide 8: Assessment

1. What is the cause of haemorrhagic cystitis in cancer treatment?
2. State two signs and symptoms of haemorrhagic cystitis.
3. State two preventive measures for haemorrhagic cystitis in a patient on chemotherapy.
4. State two things the nurse should monitor in a patient with haemorrhagic cystitis.

Use these questions to revise the key points.

Module 5: Paediatric Oncological Emergencies

The overall aims of this module are to enable participants to:

- Describe the complications arising from treatment of cancer
- Outline the nursing care necessary for prevention, early detection, and treatment of complications of common chemotherapy treatments
- Recognize the main oncological emergencies and their management

There are nine topic areas, each has its own presentation.

Topic 1: Tumour Lysis Syndrome (TLS) in Anti-Cancer Therapy.

Objectives

By the end of this session, the nurse should demonstrate understanding of:

- Definition of tumour lysis syndrome
- The metabolic changes occurring in tumour lysis syndrome
- The signs and symptoms of tumour lysis syndrome
- The preventive and reactive management of tumour lysis syndrome
- The nurse's role in tumour lysis syndrome

Discussion:

Recall with participants how chemotherapy works – killing of cells with resultant release of intracellular content. Ask how the body gets rid of the products of cell breakdown. Ask if they can name any intracellular electrolyte and state its functions.

Slides 3 Introduction 1

Highest risk for development is between 6 and 72 hours after the start of anti-cancer treatment. TLS can begin before treatment for patients with high tumour burden e.g. ALL with high white cell count.

Slide 4: Introduction 2

When cells die, they release their cytoplasmic content into circulation, including amino acids, and electrolytes including potassium and phosphates.

The amino acids are metabolised to produce urea, hence hyperuricemia (high uric acid)

The free potassium ions released cause hyperkalaemia (high potassium)

The phosphate ions released cause hyperphosphatemia (high phosphate) which also leads to hypocalcaemia (low calcium).

Slides 5: Risk factors – disease related.

Tumour burden is determined by the size of tumours and the number of tumours or the number of cancer cells. A disease like Hodgkin lymphoma which can cause massive tumours can have a high possibility for tumour lysis syndrome

A disease like Burkitt lymphoma which usually manifests with several tumours can have a high possibility for tumour lysis syndrome.

Diseases like ALL and BL that respond quickly to treatment have a high ability to cause TLS

Slide 6: Risk factors – patient related.

The excess ions and uric acid occurring with TLS are excreted through the kidneys in urine. Hence any activity or disease that compromises urine production and excretion will worsen the effects of TLS and increase the risk of Acute Kidney Injury (AKI).

Slide 7: Pathophysiology

The release of the products of cell breakdown happens at a rate that challenges the body's homeostatic mechanisms and the kidneys are unable to excrete the products quickly enough.

Slide 8: Management of tumour lysis syndrome

The most important aspect of the management of TLS is prevention.

Allopurinol decreases uric acid production by blocking the conversion of Xanthines to uric acid. Oral drug for 5 days; commence 24 hours prior to anti-cancer treatment with hyperhydration.

Slide 9: Intravenous hyperhydration

Hyperhydration increases the flow of blood through the kidneys and increase urine volume to decrease the concentration of solutes in the renal tubules.

Slide 10: Other management

Slide 11: Nursing role

Strict intravenous fluid management and encourage oral fluids. Monitor fluid intake and output. Daily weight to further assess fluid balance status.

Slide 12: Assessment

1. Define Tumour Lysis Syndrome
2. List three disease risk factors and two patient risk factors for tumour lysis syndrome
3. State one danger the patient faces with each of the following metabolic disorders:
 - a. Hyperphosphatemia
 - b. Hyperkalaemia
 - c. Hypocalcaemia
4. What is the rate of intravenous fluid administration required to prevent TLS?
5. State two things a nurse should monitor in a patient at risk of TLS

Use these questions to revise the key points.

Topic 2: Managing the child with cancer when they are febrile and neutropenic

Objectives

At the end of the session, participants will be able to:

- Discuss the cause of febrile episodes in children with cancer
- Discuss the management of the children with cancer who presents febrile neutropenia

Exercise: Discussion

A good place to begin is by reminding participants that bone marrow suppression is a major side effect of chemotherapy. Ask them to recall the functions of white blood cells and neutrophils.

Ask what the common signs of infection are in children, and what the normal temperature range is.

Slide 3: Definition

It is important to monitor the temperature of patients who have received chemotherapy regularly. Once fever is noticed, a full blood count is required to determine the total white blood cell and neutrophil count.

Slide 5: Causes of Neutropenia

Bone marrow suppression is at the base of neutropenia.

Any patient who is receiving chemotherapy or radiotherapy is at risk of febrile neutropenia. The risk is increased with intensity of treatment.

Slide 6: Fever is not always present

This is due to failure to mount immune response as a result of very low WBC level, age, or steroid medications which might mask the inflammatory response.

Slide 7: Treat as an emergency

Slide 8: Give antibiotics within 1 hour

Here, discuss the commonly used antibiotics at your centre

Slide 9: Treatment of Febrile Neutropenia

Sepsis is covered further in the next topic presentation

Slide 10: Some ways to prevent febrile neutropenia in a child receiving cancer treatment

Ensure clean environment (including no plants or pets) for patients at risk of febrile neutropenia. Good hand hygiene is the best way to prevent infection.

Slide 11: Summary Slide

Topic 3: Sepsis in Paediatric Oncology Care

Objectives

At the end of the session participants will be able to:

- Discuss the cause of sepsis in a child with cancer
- Recall the signs of septic shock in a child receiving anti-cancer treatment
- Explain the nursing responsibilities in sepsis management

Exercise: Discussion

A good place to begin is by asking the participants to tell you what they understand by the term 'shock', and what the signs of shock are in the human body? What can a nurse do in the event of shock to rescue life?

Slide 3: Definition of sepsis

Slide 4: Clinical presentation of sepsis

Some patients with neutropenic sepsis do not present with fever due to inadequate immune response caused by decreased numbers of WBCs.

Patients being treated for febrile neutropenia may deteriorate and show signs of sepsis after 1st dose of antibiotics; there may be a release of toxins as the antibiotics act against the bacteria.

Slide 5: Risk factors for sepsis.**Slide 6: Septic shock**

Sepsis can progress to septic shock

Slides 7 and 8: Stages of septic shock

All these efforts by the body are to ensure that sufficient oxygen supply is maintained to the cells for their metabolism.

Slide 9: Septic shock treatment

Note that when antibiotics are started, there is bacterial kill. The bacteria release toxins which can worsen the symptoms. Fluid administration is critical for maintaining blood supply and also for excretion of toxins. Oxygen is required as the body's own oxygen carrying potential is impaired.

Slide 10: Nursing Care**Slide 11: Assessment**

1. State three risk factors of sepsis in a child receiving cancer treatment
2. List three signs of septic shock
3. State two measures essential for managing septic shock
4. State two things the nurse should specifically monitor in a child with sepsis

Use these questions to revise the key points

Topic 4: Anaphylaxis**Objectives**

By the end of this session, participants should be able to:

- Identify the risk factors for anaphylaxis
- Recognize the immediate and delayed signs of anaphylaxis
- Recount the necessary medical interventions for anaphylaxis
- Explain the nursing care for a patient in anaphylaxis

Exercise: Discussion

A good place to begin is by asking the participants if they have seen a patient having an anaphylactic reaction. What did they react to? How was it managed?

Slide 3: Definition

It is important to check the allergy history of patients before administering potential allergic IV medications like antibiotics, or blood products.

Slide 4: Risk factors

Slides 5 & 6: Clinical presentation

Slide 7: Complications

Slide 8: Prevention

Slides 9 & 10: Nursing care

Slide 11: Medical management

Slide 12: Assessment

Use the case study to revise the key points of the presentation.

Order of interventions: Stop Infusion; Notify physician; Administer emergency medication; Hang normal saline to keep vein open

Topic 5: Superior vena cava syndrome

Objectives

The participant will be able to:

- Explain the pathophysiologic basis of SVC syndrome
- Determine which patients are at risk of SVC syndrome
- Implement measures to prevent SVC syndrome
- Efficiently manage the conditions of patients who are experiencing SVC syndrome

Exercise: Discussion

Ask the participants if they know where the superior vena cava is located and what its function is. What could go wrong in the body if the superior vena cava is blocked?

Slides 3: Introduction

The Superior Vena Cava is a large blood vessel which conveys venous blood from the upper part of the body back to the heart. Occlusion of SVC can be due to compression by a tumour.

Slide 4: The anatomy of the SVC

Slide 5: Aetiology

The tumours which are most likely to cause SVC obstruction are Lymphomas (both Hodgkin and Non Hodgkin including Burkitt's Lymphoma), and Germ Cell tumours; also ALL with a mediastinal mass

Slides 6, 7 and 8: Clinical signs

In slide 7 note the swelling of the face as venous drainage from the head is impaired. As treatment begins and the tumour shrinks, the venous return improves and the swelling subsides.

In slide 8 note the dilated chest veins, also due to impaired drainage of the superior vena cava.

Slide 9: Treatment

Slide 10: Nursing considerations

Limiting exertion reduces energy needs and thereby decrease demands on the heart and lungs.

Slide 11: Assessment

1. State three risk factors of SVC in a child with cancer
2. List five signs of SVC
3. State two measures essential for managing SVC
4. State two things the nurse should specifically monitor in a child with SVC

Use these questions to revise the key points from this presentation.

Topic 6: Hyperleukocytosis

Objectives

By the end of this session participants should be able to:

- Describe hyperleukocytosis
- Identify the dangers of hyperleukocytosis
- Describe the nursing intervention in hyperleukocytosis

Exercise: Discussion

A good place to begin is by asking the participants to tell you what they think might happen if there are too many cells in circulating blood? What are some of the dangers of blood clots in circulation?

Slide 3: Definition

Slide 4: Signs and symptoms

Slide 5: Potential complications

Slide 6: Management

After starting chemotherapy, the WBC count will drop and the WBC kill can cause tumour lysis syndrome. Frequent electrolyte assessment will be required due to high risk of TLS.

Slide 7: Nursing assessment and intervention

Slide 8: Assessment

1. Define Hyperleukocytosis
2. State four signs and symptoms of hyperleukocytosis
3. State three things the nurse should monitor in hyperleukocytosis
4. State 2 actions the nurse should take in the management of hyperleukocytosis

Use these questions to revise key points

Topic 7: Typhlitis

Objectives

By the end of this session participants will be able to:

- Explain the pathophysiologic basis of typhlitis
- Determine which patients are at risk of typhlitis
- Efficiently manage the conditions of patients who are experiencing typhlitis

Exercise: Discussion

A good place to begin is by asking the participants to tell you what they understand about the risks of infection in the large intestine. What signs do they think would be present if an infection of the large intestine becomes systemic?

Slide 3: Overview of Typhlitis

Slide 4: Typhlitis – signs and symptoms

Slide 5: Diagnosis of Typhlitis

Slide 6: Investigations

Slide 7: Treatment

Topic 8: Seizures in Paediatric Oncology

Objectives

By the end of this session, participants should be able to:

- Identify paediatric oncology patients at risk of seizures
- Recognize types of seizures and how they manifest
- Intervene to immediately control seizure

Exercise: Discussion

A good place to begin is by asking the participants how they would define a seizure, and any experience they have had looking after a child who has had a seizure. What are some precautions a nurse should take in a patient with seizures?

Slide 3: Introduction

Slide 4: Causes of seizures

Slide 5: Generalised seizures

Slide 6: Partial or focal seizures

Slide 7: Management 1

Slide 8: Management 2

Slide 9: Assessment

1. State four possible causes of seizure in a paediatric oncology patient
2. Describe two types of generalized seizures
3. Describe three interventions in a patient with seizures

Use these questions to revise the main points

Topic 9: Neurological oncological emergencies

Objectives

Participants will be able to:

- Explain the pathophysiologic basis of Spinal Cord Compression (SCC) and Increased Intracranial Pressure (IIP)
- Determine which patients are at risk of SCC and IIP
- Implement measures to prevent SCC and IIP
- Efficiently manage the conditions of patients who are experiencing SCC and IIP

Exercise: Discussion

A good place to begin is by asking the participants to tell you about any patients they may have nursed with spinal cord compression; what were the signs of this condition? Have they looked after a child with raised intracranial pressure? What were the signs of this condition?

Slides 4 and 5 : Overview of SCC

Slide 6: Signs and symptoms of SCC

Slide 7: Management of SCC

As the patient receives chemotherapy and the tumour begins to shrink, the pressure on the spinal cord is gradually released. Steroids reduce inflammation and reduce the pressure on the spinal cord. Surgical decompression or emergency radiotherapy may be needed.

Slide 8: Increased intracranial pressure – Risk factors and presentation

Slide 9: Increased intracranial pressure – Medical management and nursing care

Module 6: Care of the sick child

The overall aims of this module are to enable the participants to:

- Undertake 'Top to toe' clinical assessment thorough physical examination of the child
- Identify signs that require urgent independent and collaborative interventions for a child during admission
- Identify signs of dehydration and principles of management

These objectives are covered in four topics, each with its own presentation.

Topic 1: Head-to-toe-Assessment

- By the end of this session, participants should be able to:
- Describe the head-to-toe assessment of a child
- Explain essential neurological assessment of a child
- Identify signs of dehydration in a child with cancer

Discussion

Ask participants how they would prepare the patient and family, and the space around them, for assessment and evaluation? Emphasize privacy.

Ask what equipment they think they would need for a head-to-toe assessment?

Slides 3 and 4: Introduction

The role of nurses in physical assessment may vary, however, all nurses should be comfortable in undertaking a clinical assessment of their patient; to establish a baseline and assess for any changes in status and to be able to report deterioration.

It is important to use a systematic approach to assessment; from the child's 'Head-to-Toe'.

This should be carried out on admission, and at other times, for example at the beginning of the shift, when a change in status is noted, or following an intervention.

Sometimes an assessment might be focused on a particular part of the body depending on the patient's/carer's concern and guided by the findings of a previous head-to-toe assessment.

Slide 5: Head and Neck

Slide 6 and 7 : Respiratory assessment

- Respiratory effort (accessory muscle use, retractions, nasal flaring)
- Respiratory rate (how fast/slow), rhythm (regular or irregular), depth (deep vs shallow)
- Adventitious sounds, including wheezes, crackles or rubs

Topic 2 has more detail on the monitoring respirations, including normal range of respiration rate.

Slide 8: Cardiac Assessment

Topic 2 has more detail on cardiac assessment including normal rates for age.

The heart's sound is described as a 'lub-dub' - S1 "lub": closure of mitral and tricuspid valve; S2 "dub": closure of aortic and pulmonic valves. Listen for rate and rhythm (regular vs. irregular)

Murmurs: prolonged extra heartbeat, caused by vibrations in the heart chambers or arteries due to abnormal blood flow; 'swishing' sound. May be normal, but should be reported to the doctor.

Slide 9: GI Tract – Oral assessment

The GI tract runs from the mouth to the anus. A complete assessment must start with the mouth and then go through to the rectum. . Oral assessment is a key part of nursing care.

Slide 10: GI Tract – Abdominal assessment

The abdomen is divided into 4 quadrants for descriptive purposes and reporting findings:

- Left upper quadrant (contains some liver, spleen, stomach, pancreas, large intestine)
- Left lower quadrant (small and large intestine)
- Right upper quadrant (liver, gallbladder, small and large intestine, head of pancreas)
- Right lower quadrant (cecum and appendix, small intestine)

Slide 11: GI Tract – Abdominal assessment

Auscultate:

- Increased bowel sounds may be heard with hunger, gastroenteritis
- Decreased bowel sounds: peritonitis, paralytic ileus, intestinal obstruction. Absent bowel sounds associated with abdominal pain and rigidity is a medical emergency!
- High pitched tinkling suggests air or fluid under pressure, and may be a sign of early obstruction.

Palpate: (should be last as it may distort normal abdominal sounds)

- NEVER deeply palpate any known Wilms' tumour as this can cause rupture

Slide 12: GI Tract – Elimination**Slide 13: Genito-urinary assessment****Slide 14: Skin**

Signs could be seen on the skin that are indicative of problems such as respiratory difficulty, bleeding, infection, dehydration, wounds or pressure sores.

To assess capillary refill:

1. Blanch nail bed with sustained pressure for 2-3 seconds
2. Release pressure
3. Count seconds elapsed before nail regains full colour: Normal: brisk <2 seconds

Slide 15: Musculoskeletal system**Slide 16: Neurological assessment**

Most children can have their level of consciousness assessed using 'AVPU'.

If a child is not alert and responsive, they will need to be assessed using either the Glasgow Coma Scale, or the Blantyre coma scale depending on the policy of the institution.

Slides 17 & 18: Neurological assessment - Glasgow Coma Scale**Slide 19: Neurological assessment – Blantyre Coma Scale****Slide 20: Recognizing and reporting abnormal findings**

Slide 21: Documentation

Slide 22: Assessment

1. State two important things to assess in the child with cancer when examining:
A) Eyes B) Mouth C) Abdomen D) Skin
2. What is the cut-off Glasgow coma score for a patient to be considered unconscious?
3. What is usually the last stage of a patient assessment?

Use these questions to revise the main points.

Additional Resources:

Participants may also be directed to the on-line interactive course '**Nursing Physical Exam and Developmental Assessment**' which has been developed by Colleen Nixon of Boston Children's Hospital. It can be accessed (at no charge) on 'open pediatrics'. Participants need to register for an open paediatrics account (free): <https://www.openpediatrics.org/>

Once registered, there is a search facility; the course is called:

Nursing Physical Exam and Developmental Assessment or use this link:

<https://learn.openpediatrics.org/learn/course/internal/view/elearning/4962/nursing-physical-exam-and-developmental-assessment>

Topic 2: Patient Assessment and Paediatric Early Warning Scoring (PEWS)

Objectives

By the end of this session the participants will be able to:

- Recognise the importance of the correct monitoring and reporting of vital signs
- Recognise the deteriorating child
- Understand the principles of paediatric early warning scoring (PEWS)

Exercise/Discussion

Ask the participants if they use PEWS (or another system of 'early warning scores in their setting (e.g. PAWS – Paediatric Advanced Warning Scores). If such a system is not in place, the principles outlined in this presentation apply to the measurement of vital signs, and the triggering of an appropriate response to the deteriorating patient.

The points below on specific slides will support you as you work through this slide deck.

Slide 10: Respiration

It might be deceitful to observe breathing movements under garments; better to look under any bedding or clothing, particularly if the child is heavily wrapped up.

Slide 14: Respiratory distress and Respiratory failure

Some signs are indicative of respiratory distress, requiring immediate action by the nurse, and should always be reported. Other signs indicate respiratory failure and must always be treated as an emergency.

Slide 17 and 18: Oxygen Saturation

Measurement of oxygen saturation does not replace respiratory assessment.

Oxygen saturation should be >94% to be considered normal.

Slide 19: Change in respiratory rate

A change in respiratory function should cause the nurse to ask these questions which will facilitate decision on which action to take.

Slide 24: Change in heart rate

A change in heart rate should cause the nurse to ask these questions which will facilitate decision on which action to take.

Slide 31: Change in blood pressure

A change in blood pressure should cause the nurse to ask Why, and to report.

Slide 32: Reasons blood pressure may change in paediatric oncology

Slide 34: Measuring temperature

The clinical condition of a child can change very quickly. It is more concerning if trunk is warm and extremities cool as this might be indicative of a circulatory blockage or hypovolaemia as result of sepsis, or other cause.

Slide 40: Assessment

1. State two possible causes of increase in heart rate in a child with cancer
2. State one oncological emergency and one chemotherapy agent which causes a drop in blood pressure
3. What does AVPU stand for?

Use these questions to revise key learning points.

Topic 3: Paediatric Basic Life Support

Objectives

By the end of this session, participants should be able to:

- Recognize the differences in the respiratory anatomy between children and adults
- Describe cardiopulmonary resuscitation (CPR) in children and neonates
- Assess and intervene in a child with airway obstruction/ choking

Many institutions will have their own guidelines and training programme for Basic Life Support, which should always be followed.

Slide 4: Basic Life Support Algorithm

This presentation outlines the steps within this Basic Life Support Algorithm.

Always remember **ABC** – Airway; Breathing; Circulation.

Slide 21: Assessment

1. What is the first step for CPR in an unresponsive child?
2. What is the ratio of chest compressions to breaths when resuscitating a child?
3. State two signs of ineffective coughing in a child with airway obstruction

Use these questions to revise key learning points.

Topic 4: Peripheral Venous Access

Objectives:

By the end of this session, participants should be able to:

- Explain the need/indications for peripheral venous access
- Describe the steps in peripheral venous access
- Discuss the limitations of peripheral venous lines
- Explain how to administer medications through peripheral lines

Discussion:

Discuss with participants, the difference between peripheral and central lines

Ask participants some practical situations in which peripheral lines are used at their centres.

What are the commonly used peripheral access sites at their centres? What are some rare peripheral access sites they have seen?

What are some situations where peripheral venous access has been extremely difficult and what were the reasons? (Peripheral oedema, burns, previous extravasation/vesicant effect)

Slide 20: Assessment

1. State two uses of peripheral venous lines
2. List four potential access sites for peripheral lines in children
3. How often should you change a peripheral IV access site?
4. State two signs to watch for at a peripheral IV access point.

Use these questions to revise key points

Module 7: Providing safe care

The overall goals of this module are to enable participants to provide safe care and:

- Identify key principles of infection prevention and control
- Identify potential risks of handling chemotherapy

These objectives are covered in three topics, each with its own presentation.

Topic 1: Infection prevention

Objectives

By the end of this session, participants should be able to:

- Practice standard precautions in infection prevention
- Explain the principle of source isolation

Exercise: Discussion

A good place to begin is by asking the participants what the challenges are that they encounter in infection prevention and control.

Slides 3 and 4: Definitions

Slides 5 - 11: The chain of infection

- Bacteria are common causative agents for nosocomial infections.
- Children with cancer are susceptible to bacterial and other infections due to bone marrow suppression and consequent low white cell counts

Slides 13 - 19: Hand hygiene

Good hand hygiene is the best way to prevent the transmission of infection. The hands of health care workers (HCWs) play a critical role in keeping patients safe; they can transmit infection-causing microorganisms through their hands from one patient to another.

Families should also be taught to practice hand hygiene and should practice the simple rule that no one should have contact with a child undergoing cancer treatment who does not first wash his or her hands.

Slide 24: Isolation (Barrier nursing)

Protective isolation may be applied for neutropenic patients. This might not stop them from getting infections as they usually get infected by endogenous pathogens (normal flora).

Slide 25: Summary

Slide 26: Assessment

1. List the 6 elements in the chain of infection
2. State two common portals of hospital acquired infection in patients
3. State two ways to avoid transmission of respiratory infections
4. State the 5 moments of hand hygiene

Use these questions to revise the key points of the presentation

Activity: Hand hygiene test using florescent hand gel and ultraviolet light.

1 – Participants apply fluorescent hand gel following the recommended steps of alcohol hand rub. Then they observe hands under ultraviolet light and facilitator provides feedback.

2 – Participants wash hands with water and soap and observe under ultraviolet light together with facilitator to assess how much fluorescent gel is left on hands.

Topic 2: Safe Chemotherapy Administration

Objectives:

By the end of this session, participants should be able to:

- Talk about safety issues associated with exposure to cytotoxic chemotherapy
- Talk about who is at risk from cytotoxic chemotherapy
- Discuss how to minimise risks

Exercise; Discussion:

A good place to start is by asking participants about their experience in administering chemotherapy, and any concerns they have about this important aspect of the care of the child with cancer.

Slide 3: Importance of chemotherapy safety

Slide 4: Risks involved in chemotherapy handling

Slide 5: Who is at risk?

Even staff who are not involved in preparation and administration can be exposed if they are not properly educated on the risk; this includes housekeepers or domestic staff.

Slide 6: Protecting children

Slide 7: Checking chemotherapy

Remember the '5 Rights' – Right child, treated with the Right drug, at the Right dose, at the Right time, by the Right route.

Slide 8: Dose calculation

Chemotherapy doses are usually prescribed according to body surface area; body weight is used in some cases. It is of critical importance to have an accurate and up to date weight and height. Children of weight less than 10Kg or less than 12 months of age sometimes have their dose reduced by between a third to a half.

Slide 22: Handling spills

Make a spillage kit for your unit and check it periodically to be sure that all the necessary contents are always there. Avoid letting untrained staff (e.g. housekeepers) to handle chemotherapy spills.

Slide 23: Handling cytotoxic waste

Follow institutional procedures for emptying/discarding hazardous waste bins.

Slide 25: Assessment

1. State two points of chemotherapy exposure risk for nurses
2. List five things to check before administration of chemotherapy
3. State one thing to monitor during administration of oral chemotherapy and one thing for intravenous chemotherapy

Use these questions to revise key points.

Topic 3: Use of Personal Protective Equipment (PPE)

Objectives:

By the end of this session, participants should be able to:

- Identify the key elements of PPE
- Identify which articles of PPE are required for handling chemotherapy preparation
- Properly wear and safely remove PPE

Exercise:

Use **Slide 3** (Outline figure) to ask participants to identify the key elements of PEE in health care. Ask them what is available in their unit. Ask if they have been trained in the use of PPE.

Slide 12: Assessment

1. What is the recommended type of gloves for handling chemotherapy?
2. What is the recommended type of mask for handling chemotherapy?
3. State the right order for putting on PPE when reconstituting chemotherapy
4. What is the right order for safely removing PPE after handling chemotherapy?

Use these questions to revise key points

Activity

Provide full PPE for each participant to put on and remove ('don and doff') while facilitators observe and provide feedback.

Module 8: Psychosocial Care

Overall aims:

This module focuses on the psychosocial impact of cancer on children and their families. This is covered in two presentations. Participants will be able to:

- Explain the psychological/emotional effects of cancer on the child and family
- Identify patients and families with extra needs for psychosocial and emotional support
- Demonstrate understanding of religious and cultural differences between families

These objectives are covered in two topics, each with its own presentation.

Topic 1: Pre-treatment counselling

Objectives

At the end of this session, participants should be able to:

- Discuss the importance of disclosing bad news
- Participate in diagnosis and treatment counselling for a child with cancer
- Understand the cultural considerations for counselling patients and families

Discussion:

Ask participants about their experience in diagnosis disclosure and counselling. What is the usual composition of the team disclosing diagnoses? Ask them to share any dramatic reactions to diagnosis counselling that they have seen at their centre.

Slide 4: Breaking bad news

Because of the potential for drastic effects, and because of potential emotional interference with information processing, bad news is best delivered in stages, and there is need for repetition.

Slide 10: Patient and family considerations

In some cultures and for some ages, parents might be so protective of their child that they would not want the child to be told about their diagnosis. It is important to convince the parents about the psychological and emotional importance of counselling the child.

Use language and illustration appropriate for the child's age

Slides 11 – 16: The following slides outline the topics to cover in patient counselling.

It is important to structure the counselling into several seamless sections with specific sub topics

Slide 16: Traditional and complementary medicine

Traditional medicine is the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. Other terminologies for it are Complementary and Alternative Medicine (CAM) or Traditional Complementary and Alternative Medicine (TCAM). It includes physical therapies like massage, inhalations; biological therapies like herbs and teas; and mind-body therapies like healing ceremonies.

Slide 21: Assessment

1. On what occasions should the breaking of bad news be undertaken?

2. List three aspects to include in diagnosis counselling for a child with cancer.
Use these questions to revise key points.

Topic 2: Psychosocial support to children and families

Objectives

At the end of this session, participants should be able to:

- Identify psychosocial needs of patients and families
- Provide psychosocial support to patients and families

Slide 5: The holistic concept

These four aspects should be considered in the holistic care of a child with cancer and their family. The psychological component includes emotions.

Slides 6 and 7: Common psychosocial issues

Psychosocial issues are subjective. The nurse must establish good rapport with the child and family to be able to observe changes and enable them express their concerns.

Slide 8: Who should provide psychosocial care?

Quality care for children with cancer requires team work between various health care workers, the family, friends and the community. Everyone in the child's social network should be considered potentially useful for their care. However, consent and confidentiality must be considered.

Slide 10: Distraction techniques

Play therapists/child life specialists are skilled in distraction techniques. When correctly applied, they help reduce the child's anxiety.

Slide 11: Communicating with children

Use language and graduate information to suit the child's age and cognitive development.

Slides 12 – 14: The Family Conference

A family conference is a way that health care professionals can help a family work through psychosocial problems.

Activity: Counselling session – role play

Split participants into three groups.

Let each group identify one person to play the role of a parent to be counselled

The rest of the group members will assume different roles of their choice in the multidisciplinary team, one participant must play role of the nurse and lead the counselling session.

Facilitators observe counselling for 10 minutes and provide feedback.

Module 9: Nutritional support for children with cancer

Overall aim: This module is intended to enable participants to:

- Identify and assess anthropometric parameters necessary for treatment and supportive care
- Identify education needs of child and family including recommended feeding patterns and hydration.

These objectives are addressed by 3 presentations.

Topic 1: Basic nutritional assessment

Objectives

By the end of this session, participants should be able to:

- Identify the common required anthropometric measurements in paediatric oncology
- Identify and flag sub-optimal anthropometrics
- Conduct a diet review

Slide 5: Weight for height ratio

Weight for height ratio gives an indication of acute malnutrition while height for age can give an indication of stuntedness

Slide 6: Weight for height ratio

If the weight for height falls between the 15th and 85th percentile, it is considered normal. If between the 15th and 3rd percentile, it is marginally underweight and if below the 3rd percentile, it is underweight. If the ratio falls between the 85th and 97th percentile, it indicates marginal overweight and if above the 97th percentile, it is overweight.

Learning activity: Have charts available, and give several examples where you state the weight and height of a child and ask participants to plot on the chart.

Slide 7: Body Surface Area:

Learning activity: Use the same examples of weight and height and ask participants to calculate BSA – e.g. Joseph is a 4 year old boy with ALL. He weighs 15 kg and his height is 100 cm. What is his BSA?

Slide 8: Mid arm circumference/ Triceps skin fold (MUAC tapes/skinfold callipers)

The MUAC is measured in cm while the TSF is measured in mm.

Slides 9 and 10: MUAC and TSF Charts

The interpretation of MUAC and TSF charts are similar to the weight for height chart: Between the 15th and 3rd percentiles or 85th and 97th percentiles indicate marginal malnutrition while above 97th or below 3rd percentiles indicate malnutrition.

Slide 11: Factors affecting accuracy

Biceps and triceps development may be asymmetric between the two arms due to one arm being dominant. The left arm is usually used for MUAC and TSF measurements. Be consistent with the arm you use.

Slide 13: Food history

Pay attention to the classes of food in the diet recall and advice for balance diet. Ensure that fluid intake is reported in the diet and assess the adequacy. Snacks and fruits should be recorded.

Slide 18: Assessment

1. What is the anthropometric measurement commonly used for drug dosing in paediatric oncology?
2. State two other uses of anthropometric measurements.
3. What is the equipment used for measuring triceps skinfold?

Use these questions to discuss the key points.

Topic 2: Nasogastric tube feeding

Objectives

By the end of this session, participants should be able to:

- Describe the indications for nasogastric tube feeding
- Describe the procedure for safely feeding patients through a nasogastric tube

Discussion:

Ask participants what the indications are for NG tube feeding in their centre? Is there a procedure for nasogastric tube insertion? How well tolerated is it by children?

Slide 3: Introduction

Slide 4:

Raising head of bed prevents aspiration during feeding

Slide 11: Assessment

1. State two indications for nasogastric feeding in paediatric oncology
2. What is the right position for a patient to be in during gastric feeding?
3. State three things to document after nasogastric tube feeding

Use these questions to revise key points.

Topic 3: Nutrition Education for Families

Objectives:

By the end of this session, participants should be able to:

- Identify food types required to make a balanced diet
- Work with families to identify balanced food combinations for healthy feeding

Slide 3: Nutritional needs

Resting energy expenditure (REE): Amount of energy required to maintain normal homeostatic function at rest. This is higher for children with cancer.

Slide 4: Parent/family teaching

Ask the families what they know about balance diet and correct any myths or misunderstandings.

Slide 6: The healthy eating plate

When working with families use local foodstuff to illustrate the healthy eating plate

Slide 7: The major food groups

When working with families you may use 3 major food groups as set out here; if participants are more familiar with talking about 5 groups (carbohydrate; protein; dairy; fruit & vegetable; oil and fats) and have resources which refer to these groups, these can also be used.

Slide 11: Learning Activity: Classification of locally available foods

Work with participants to identify common local foods to fill the table. on this slide You may break the local foods into seasons as different foods are usually available in different seasons. Examples:

Energy Food	Body building Food	Protective Food
Yam	Beans stew (tomatoes, onion, crayfish, palm oil)	Papaya
Rice	Groundnut sauce	Pineapple, lettuce

Slide 16: Assessment

1. Ask participants to tell you how they would explain to a family the three major groups of food required for a balanced diet
 2. Ask them to give you a local available example from each food group
- Use these questions to revise the key points

Module 10

Palliative and supportive care to a child with cancer

The overall objectives of this module are to enable participants to:

- Identify and describe the principles of palliative care and end of life care
- Identify the need to assess the patient and family preferences for end-of-life care, and involve them in discussions, decision making and goals.
- Recognise the need for effective pain assessment and discuss the tools available
- Recognise the need to prepare children for painful procedures & discuss techniques for doing so

These objectives are met through three presentations.

Topic 1: Introduction to Palliative and End of Life Care

Objectives:

At the end of this session, participants should be able to:

- Define palliative care and bereavement
- Discuss fear, loss and culture in paediatric palliative care
- Explain the concept of quality of life
- Describe care at end of life and bereavement

Exercise: Discussion

Ask participants about their experience looking after children who are receiving palliative care. What support or services are there in their centres?

Slide 5: Perceptions of palliative care

Palliative care has evolved to reflect the concept that it should start at diagnosis alongside curative therapy. Although the person with the illness is removed from the care continuum after death, the family and caregivers (including professional caregivers – nurses, physicians, etc.) require support.

Slide 6: Quality of Life

QOL is influenced by individual experiences, beliefs, expectations, and perceptions

Slide 7: Quality of Life of children

Exercise:

Ask participants to list some concerns of children that have to do with things other than the disease and treatment. E.g. School, friends, siblings, pets, hair loss, self-esteem, etc.

Slide 8: Problems of parents and care givers

The concerns of the parents and family cannot be overlooked as they end up affecting the child in several ways, including treatment adherence and emotionally.

Slide 16: Care of the family

The nurse has a role in identifying and finding ways to prevent or address needless suffering for families and them. It may help to focus on the idea of bearing witness to the suffering that cannot be fixed, and doing our best to prevent or alleviate the rest.

Slide 17: Needs of the family

Impending death can cause trauma and disconnection within a family. Any weakness/rift within a relationship is exposed/exacerbated with the stress of a dying child. Families have a feeling of loss of control, and if the needs identified here are addressed this can restore some control.

Slide 18: Care of the family – what do parents want?

Co-ordinated services – everyone working together; connection to outside support (counselling, social work, home care, etc.).

Normalizing activities – support to keep time with child as normal as possible, to make memories.

Support hope – hope and acceptance can run parallel.

Slide 19: Care of the family – siblings**Slide 20: Grief and bereavement****Slide 21 and 22: Care of the family – knowing what to do and to say**

It is hard to know what to do or to say when a child is dying; here are some general principles.

Slide 23: Grief and bereavement – Siblings**Slide 24: Summary****Topic 2: Pain Assessment and Pain management****Objectives:**

By the end of this session, participants should be able to:

- Identify reasons that children with cancer experience pain
- Explain how pain scales are used to measure pain
- Identify the right scale to use for various ages
- Know how to intervene when the child is in pain

Discussion:

Ask participants about the causes of pain for children with cancer. Ask which pain assessment tools they use at their centre; how well is this tool applied?

Slide 10: PQRST assessment

You can use a framework like this PQRST tool to take a pain history.

Slide 12: FACES scale

It might be deceptive for the nurse to look at the child's face and assign a pain rating on the FACES scale. The child should pick the face that corresponds to their pain perception.

Slide 14: FLACC Scale

With the FLACC scale, the nurse does the rating based on the patient's expressions and behaviours.

Slide 15: Practice using the FLACC Scale

Talk through this example with participants and agree on the total FLACC Score (7)

Slide 24: Assessment

1. List four possible sources of pain for children with cancer
2. Which pain scale is most suitable for children below 3 years?
3. Describe the components of a complete pain assessment

Use these questions to revise the main points.

Topic 3: Preparing Children for Painful Procedures

Objectives:

At the end of this session, participants should be able to:

- Effectively prepare the child and parent for a painful clinical procedure
- Effectively prepare the care provider and environment for a painful procedure

Slide 3: Definitions

It is often difficult to separate the expression of pain, fear and anxiety in children, hence the term pain related distress to describe all three.

Slides 5 and : Preparing the child

Telling the child about the procedure allow time for them to ask questions, to process their anxiety and start rehearsing the coping strategies that they will use.

It allows you to start addressing their anxiety by informing them about any support you will provide to make the procedure less painful. It can be difficult to know exactly how much information to provide and it is often best to ask if they have any questions and answer them as fully as possible.

Slide 7: Preparing the family

Introduce all the members of the procedure team to the parents. If you need to provide more details to the parents than to the child, consider doing so away from the child to avoid increasing anxiety.

Slide 11: Medication

It should be a habit to apply pharmacological or non-pharmacological pain control to children before pain producing medical procedures.

Module 11:

Outpatient and follow up care

The overall objectives for this module are for participants to:

- Identify the need to explain to families potential effects of chemotherapy
- Identify symptoms that require patients to be brought back to hospital following discharge
- Explain actions to be taken at home for common problems following treatment
- Identify the education needed to dispel myths on childhood cancer, communicate warning signs and describe how to orient patients to care.

These objectives are addressed in 3 presentations.

Topic 1: Preparation of families for discharge

Objectives

By the end of this session, participants should be able to:

- Assist with discharge planning for patients
- Facilitate safe continuous care from hospital to home
- Encourage prompt return for subsequent appointments and emergencies

Slide 4: Discharge Planning 1

There may be a fear to disappoint the family should things not go as planned, leading to non-disclosure of the probable discharge date. However, the benefits of preparing the family and the team for the patient's discharge outweigh the risk of the patient and family feeling disappointed.

Slide 5: Discharge Planning 2

If patient is to go home with medications, start teaching the family how to give the medications while still in the ward and observe them to be sure they are doing it correctly.

Some patients with recovering paraplegia might require a walker or crutches. Bring in the physical therapy team early on to teach them how to use these walking aides.

Slide 6: Discharge counselling

Unless you have a pharmacist within your care team that dispenses medications for home, do not rely on the pharmacy alone to explain medications to patients. Explain the drugs to the patient and family at the time of discharge and have them come back after collecting their drugs from the pharmacy, to make sure there is no confusion around the prescriptions.

How to maintain good hygiene at home such as avoiding crowded environments without proper ventilation; drinking safe water and eating well cooked meat.

Slide 7: Support following discharge

The ability for the family to talk with the care team after discharge can be quite comforting and reassuring. Suggest to participants that if it is not already in place a call line can be established for the unit, with staff members taking turns in responding to calls from patients and families.

Exercise:

Ask participants to discuss the procedure for patients coming for follow up at their centre.

Identify probable loopholes in the procedure which could cause frustrations for patients and families

Discuss possible mitigation of these shortcomings with the procedure, to facilitate out-patient visits for paediatric oncology patients.

Topic 2: Triage at the Outpatient Department

Objectives:

At the end of this session, participants should be able to identify paediatric oncology patients requiring immediate attention at the OPD

Slide 6: Patients returning for follow-up visits

Master the procedure for managing febrile neutropenia at your centre, to ensure that patients get the necessary tests (including culture if applicable) and antibiotics are started as soon as possible.

Slide 8: Conclusion

While following standard hospital policies for outpatient care, a mastery of oncological emergencies is also necessary for the paediatric oncology nurse to identify patients who need priority attention. See modules 4 and 5 for chemotherapy side effects and oncological emergencies.

Topic 3: Community Education on Childhood Cancer

Objectives:

At the end of this session, participants should be able to:

- Assemble a team and materials for community education on childhood cancer
- Conduct community education for childhood cancer with good community engagement

Discussion:

Ask participants about community targets for education on the Early Warning Signs of childhood cancer (e.g. churches, schools, markets, social groups). Ask participants about their own experiences.

Module 12:

General paediatric oncology nursing and the role of the nurse

The objectives of this module are for participants to:

- Describe the role of the paediatric oncology nurse in a multidisciplinary team
- Identify potential stressors and how to mitigate them
- Assess and describe strategies to improve resilience for self and colleagues
- Describe the importance of nursing research

These objectives are addressed through 7 presentations.

Topic 1: The Paediatric Oncology Nurse

Objectives:

The participants will be enabled:

- To clarify the essence of paediatric oncology nursing practice
- To review and discuss the 'baseline standards' for paediatric oncology nursing care
- To consider the application of the 'baseline standards' to nursing care and practice

Slide 4: The Paediatric Oncology Nurse

The paediatric oncology nurse has three basic characteristics:

- They provide compassionate care, no matter how sick the patient is and not matter what the prognosis
- They take responsibility for their own education and professional development and also seek to educate patients and families about disease, treatment and survivorship.
- Thirdly, they must advocate for access to treatment and care for their patients and families

Slide 5: The paediatric oncology nurse and improved outcomes for patients

Slide 6: The Six Baseline Standards for Paediatric Oncology Nursing

The baseline standards are a set of recommendations identified as essential for provision of quality paediatric oncology nursing care. The standards were developed by nurses of the international society of paediatric oncology. There are ongoing activities aimed at promoting these standards.

Slide 7: Publication of the Standards

These publications established the standards, followed by further publications and presentations.

Slide 8: Baseline Standards Endorsements

These standards have received endorsements from professional associations, paediatric cancer foundations, and hospitals. They are highlighted in the WHO Global Initiative for Childhood Cancer.

Slides 9 – 14: *Each slide sets out one of the 6 Standards*

Slide 11: Standard 3

Continuous education can be through clinical meetings, online trainings, workshops & conferences.

Slide 12: Standard 4

This addresses the acknowledgement of nurses as core members and leaders and in the care team.

Slide 13: Standard 5

It is an ethical responsibility of hospital managers to provide safety equipment for paediatric oncology nurses as they exercise compassionate care.

Discussion:

Ask participants whether in their centre, it is nurses or pharmacist who prepare chemotherapy? If nurses, are there any possibilities/prospects of getting pharmacists involved?

Slide 14: Standard 6

These nursing policies and procedures should be based on evidence and adapted to local realities.

Slide 16:

1. State two ways in which a trained, specialist nurse contributes to paediatric oncology care
2. State the six baseline standards for paediatric oncology nursing

Use these questions to revise the key points.

Topic 2: Nursing Documentation

Objectives:

By the end of this session, participants should be able to:

- Recall the reasons for documentation in nursing
- Explain the principles of documentation
- Discuss various documentation formats in nursing

Slide 5: Principles of Documentation

Institutional policies may include: who documents and how they identify themselves

- what to include and exclude
- when to document, for example, frequency
- where to document, for example, on temperature sheets, medication sheets, infusion sheets, narrative or progress notes
- how to document, for example, type of format used to organize health records.

Slide 6: What to document

Some things to document include

- a clear, concise statement of the patient status
- the relevant assessment data used to determine the patient status
- the care interventions (including advocacy and teaching) delivered in response to the patient status
- an evaluation of the care including the patient and family's response to the care

Slide 8: Documentation formats

The most complete is the SOAP format, but this requires more time. Focus documentation is often recommended in practice as it strikes a good balance providing complete necessary information without taking much time.

Slides 11 - 12: Examples of poor documentation

The first chart shows a patient's temperature measured every 4 hours. There is a single temperature of 38.2 degrees and gaps in temperature recording in the 24-hour periods before and after this reading. The definition of febrile neutropenia is a single of 38.5 degrees or two temperatures above 38 degrees within 24 hours; febrile neutropenia might have been missed in this patient.

Slide 12:

An incomplete form of this nature in a patient's folder might not affect the patient's care directly, but if conducting research, there is a lot of useful information that is missing from this record.

Slide 14:

1. State three principles of good documentation
2. State two difficulties that may result if nursing care is not properly documented

Use these questions to revise the key points.

Topic 3: Evidence Based Practice and the role of the nurse in research

Objectives:

By the end of this session, participants should be able to:

- Explain the process of evidence-based practice
- Describe the role of the nurse in research

Slide 5: Identify Specific Question(s)

PICOT is an example of one framework you can use for identifying a specific question.

Slide 6: Search the evidence

It is important to keep up to date with the paediatric oncology literature, especially related to nursing care from around Africa and other low-and-middle-income settings.

Slide 7: Analyse the evidence

The quality of evidence is strongest at the top of the pyramid. It is important to consider every source of evidence that is relevant to the setting, until there is other evidence of better quality.

Slide 8: The GRADE system of evidence classification

This is one framework you can use for classifying evidence. When methods higher up on the evidence-based pyramid are used, the GRADE is higher.

Slide 9: Apply the evidence to practice

The process of guideline development usually combines the use of expert opinion, reports and research findings.

Slide 10: Evaluate the evidence

Slide 15: Assessment

1. Define evidence-based practice
2. What steps of the evidence-based would have been conducted before guideline development?

3. State three types of research a paediatric oncology nurse might be involved in
 4. Describe three aspects in which a paediatric oncology nurse may contribute to research
- Use these questions to revise the main points

Topic 4: The role of the nurse in the Multidisciplinary Team (MDT)

Objectives:

By the end of this session, participants should be able to:

- Recognize the essential members of a multidisciplinary paediatric oncology team
- Describe the role of the nurse in the multidisciplinary team

Slide 3: Who makes up YOUR Multidisciplinary team

Ask participants about the current membership of the Multidisciplinary team at their centre.
How often does the team meet and what are the activities carried out?

Slide 4: What is the role of the Nurse in the MDT

While the doctors might focus a lot on the lab investigations, imaging, treatment and prognosis, the nurse must remember to draw attention to the day-to-day physiological and psychosocial experiences like pain, nutrition, anxiety, etc.

Slide 5: Challenges in fulfilling the nursing role in the MDT

Ask participants what challenges they experience in fulfilling their role in the MDT.
When the nurse consistently demonstrates mastery of their patients, their contribution become invaluable to the MDT.

Slide 6: Addressing the challenges

The Nursing Now campaign that ran from 2018 to 2020 was led by the ICN and the WHO. In 2020, the State of the World's Nursing Report was released which calls for nurses to be recognized in leadership roles in health care delivery.

The baseline standards stipulate that the paediatric oncology nurse must be an integral part of the MDT. If some nurses are lacking in their contributions to MDTs, they can learn from more experienced nurses. Likewise, the more experienced and more confident nurses should take the responsibility to groom the others and improve nursing presence and contributions for the benefit of the profession, the team and the patients.

Discussion: Thinking about the knowledge gathered from this course, what, if anything, would participants change in the constitution and functioning of the MDT? in their centre

Slide 7: Assessment

1. State five members of a paediatric oncology multidisciplinary team
 2. State four contributions of a paediatric oncology nurse to the multidisciplinary team
 3. List three sources of information or support to guide the nurse's contributions to the MDT
- Use these questions to discuss the main points

Topic 5: Family-tailored Effective Communication in Paediatric Oncology Nursing Care

Objectives:

By the end of this session, participants should be able to:

- Recall the stages in effective communication
- Recognize the barriers to effective communication and how to mitigate them
- Discuss ways in which nurses can facilitate effective communication with patients and families
- Recognize and consider sociocultural differences and realities in communication

Slide 5: Context is critical

There is no “one size fits all” with regards to communication. The context within which communication happens is critical. For communication to be effective, one needs to consider the audience, the information to be communicated, and the circumstances at that point in time.

Slide 6: Effective communication cycle

This slide sets out the process of communication; the way in which a message (Msg) is passed from 1 person (the source) to other(s) – (the receiver).

‘Encoding’ the message could be in voice, text, gestures, gaze, etc

The ‘Channel’ could be by letter, phone call, face-to-face, etc

‘Decoding’ is influenced by abilities to read, hear, see, or sometimes, understand within the context.

Until the right message is properly packaged, transmitted, decoded received, and feedback provided or observed, we cannot claim communication has been effective.

Slides 15 – 19: Cultural considerations for communicating with children and families

These slides are an account of a conversation between African Paediatric Oncology nurses about disclosure of cancer diagnosis to children. We see how nurses believe in the importance of the child to know their diagnosis. The controversy is around the parent’s desire to protect their children from information they consider harmful to them, which is well within the scope of parental care and protection.

Slides 20 – 25: Let’s look at the literature

These slides give an overview of the literature in this area.

Topic 6: Time management

Objectives:

By the end of this session, participants should be able to:

- Identify when they are lacking in their time management
- Identify strategies for better time management
- Effectively balance work, social and personal life
- Apply advance planning to improve quality of life and work experience

Slide 3: Why ‘manage’ time?

The aim of time management is to be able to successfully plan activities necessary for meeting professional goals as well as personal priorities.

Slide 8: Prioritise Goals

Exercise:

Facilitator tries to fit some irregularly shaped pebbles in a jar together with some beads.

Start by fitting in all the beads at the bottom of the jar, then try to add in the pebbles. Notice that the jar cannot contain all the pebbles in addition to the beads.

Next, first put in the pebbles, then add the beads to find their way through the spaces between the pebbles. Everything (or at least more) now fits in the jar.

The lesson here is to always start by doing the things of high priority (e.g. meetings, study, writing) and then the other less important things (e.g. friendly phone calls, social media, hobbies) can find their way to fit in.

Slide 9: The urgent/important matrix

Once you have a list of activities you would like to do, try to categorize them into this matrix. This will provide a guide on how to prioritize (*identify the pebbles and the beads*).

Slide 10: The action/priority matrix 1

This slide shows recommended decisions regarding activities in various categories of priority.

Slide 11: The action/priority matrix 2 - explains the use of this matrix in more detail.

Topic 7: Resilience - Looking after ourselves and each other

Objectives:

By the end of this session, participants should be able to:

- Identify the sources of emotional stress in paediatric oncology nursing
- Recognize signs of burnout in oneself or in colleague
- Understand the ten characteristics of resilience
- Identify support systems in the paediatric oncology multidisciplinary team

Slide 3: A Professional Nurse

These are 7 key characteristics for a nurse to possess to be considered a professional nurse.

Slide 4: 20 Stories of Paediatric Oncology Nurses

Interlude:

Play this YouTube Video in which paediatric oncology nurses express what it means for them:

<https://www.youtube.com/watch?v=BSWM-6ZOetU&t=36s>

Slide 5: The Oncology Nurses

Slide 6: In Paediatric Oncology....

In paediatric oncology nursing, the nurse has to consider not just the sick child, but also the family, including siblings, parents, grandparents, and friends, class mates and school teachers. A big group of people are affected by the illness of one child. This additional burden increases the predisposition to compassion fatigue and burnout.

Slide 10: Burnout

Burnout results from a combination of different pressures

Slide 11: Burnout is real

These signs are indicative of probable burnout in a paediatric oncology nurse.

Slide 15: Dealing with stressful situations**Slide 17: Empty your cup**

Paediatric oncology nurses have to bear the concerns of so many people that their 'cup' easily becomes full. It helps to open up to others as a means of 'emptying the cup'.

Slide 18: The 10 Resilience characteristics**Slide 19: Assessment**

1. Describe three signs of burnout
2. State four characteristics of resilience
3. List five possible sources of emotional support for a paediatric oncology nurse

Use these questions to revise key points.

Additional Resources for facilitators and participants

Physical examination course: Boston Children's Hospital

An on-line interactive course 'Nursing Physical Exam and Developmental Assessment' has been developed by Colleen Nixon of Boston Children's Hospital. It can be accessed (at no charge) on 'open pediatrics'. Participants need to register for an open paediatrics account (free):

<https://www.openpediatrics.org/>

Once registered, there is a search facility; the course is called: Nursing Physical Exam and Developmental Assessment or use this link:

<https://learn.openpediatrics.org/learn/course/internal/view/elearning/4962/nursing-physical-exam-and-developmental-assessment>

The Texas Children's Hospital Global HOPE Learning Academy Open Courses are focused on education opportunities for professionals caring for children with cancer and hematology disorders in Sub-Saharan Africa. The Learning Academy includes didactic courses that consist of modules that provide a series of presentations and videos discussing the didactic information.

First Time Global HOPE Learning Academy Users need to register for these courses:

Go to <https://txchglobalhope.moodle.school>

Click on the course that you want to take. This will take you to the login page.

- Go to: "Is this your first time here" and create a new account.
- This will bring you to Moodle's policies. Click next at the bottom of the page while navigating through the policies. On the consent page, check agree to the Moodle policies.
- Create a username and password. Then enter the requested information and click "CREATE MY NEW ACCOUNT".
- You will receive an email with more details about your registration. Be sure to confirm your account.
- Continue to the Home page. Click on the course you want to take and click on the self-registration button.
- Once self-registered, you will receive a welcome email from the course instructor with more information about how to proceed through the course.

Cure4Kids is an online resource for healthcare professionals dedicated to enhancing the care of children who have cancer and other life-threatening diseases in countries around the globe.

Cure4Kids offers online education and collaboration tools that are freely available to registered users, including many nursing resources. It is free to register, and you can do so by following this link: <https://www.cure4kids.org/>