



Kent and Medway Cancer Network

Chemotherapy Workbook 1

Cancer Introduction

Status:	Published
Expiry Date:	September 2013
Version Number:	2
Publication Date:	September 2011

**PERSONAL DETAILS AND
RECORD OF LEARNING**

Name of Learner	
Name of Mentor	
Name of Assessor	
Date Commenced Workbook	
Date Completed Workbook	

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Document Administration

ACKNOWLEDGEMENTS

With grateful thanks to the **North London Cancer Network** for their permission to adapt this workbook for use across the **Kent and Medway Cancer Network**

Approval Record

Approval		
Date	Name / Title	Signature
09-2011	Network Chemotherapy Group, and Nursing sub-group	Circulated for comment, virtual ratification as agreed at meeting 2011-09-15

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Document Location

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Review Date

This workbook is next to be reviewed in September 2013 Network Nursing and Pharmacy sub group of the Network Chemotherapy Group

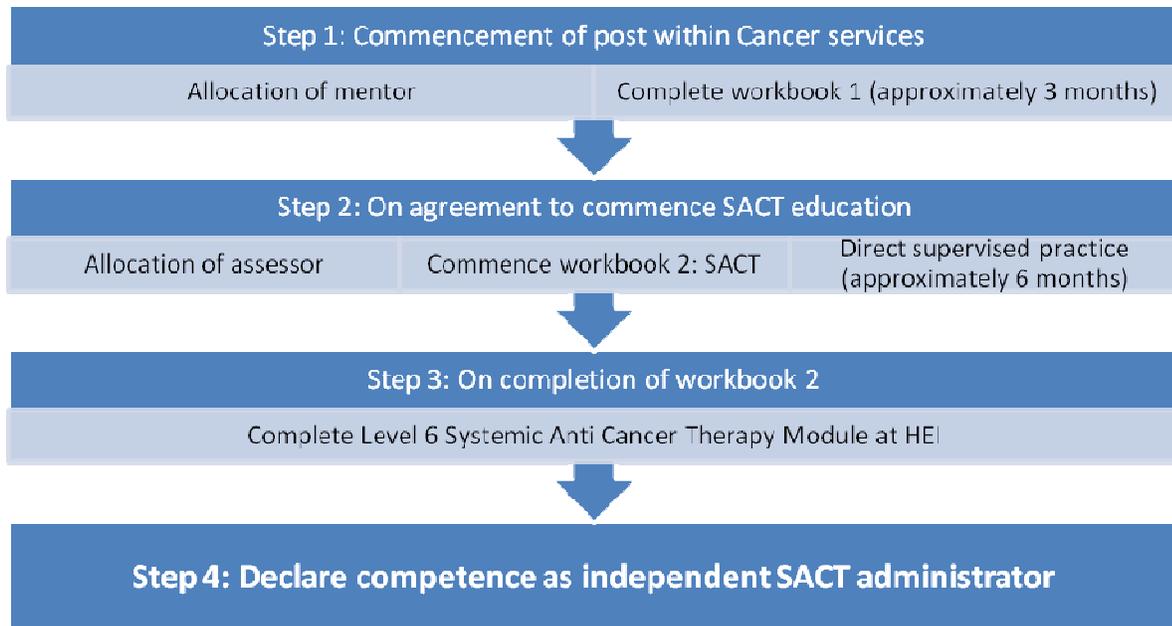
Revision History

Date	Version	Status	Author	Summary of Changes
08/11	2	Draft	Paula Kuzbit	Major Revision
09/11	2	Published		

INTRODUCTION TO WORKBOOK 1

How to use the work book

- The work book is intended to introduce nurses new to cancer care to key issues in oncology and is part 1 of the network agreed process for becoming a competent cancer nurse and SACT administrator.
- It is intended that through enhancing your theoretical knowledge in conjunction with developing your clinical nursing and technical skills, that a high standard of considered nursing care and intervention will be provided.
- The workbook is a step-by-step guide to cancer care. The aim is to provide you with the relevant introductory information, and then to set out tasks and questions for you to independently pursue more detailed information. Access your resources and seek guidance from your mentor.
- Successful completion of Workbook 1 and approval by your line manager will enable you to continue your professional development into the administration of Systemic Anti Cancer Therapy:



NB Experienced cancer/SACT nurses may be able to skip directly to step 3 or 4 with agreement from their line manager and proof of competence

GUIDELINES FOR LEARNER, NOMINATING MANAGER, ASSESSOR AND MENTOR

The Learner

The learner will have been nominated by a line manager to undertake further study into cancer care. The learner must fulfil the following criteria:

- Be a registered nurse
- Have identified an interest and learning need with line manager
- Have undergone staff development review with line manager
- Have an identified mentor/ assessor

Professional, Trust and Legal Requirements

The professional position is the NMC Code of Professional Conduct : Standards for Conduct, Performance and Ethics (2008), which places specific responsibility on registered nurses / midwife practitioners. The registered nurse / midwife is personally accountable for their practice and in the exercise of his or her accountability must acknowledge any limitations in their knowledge and competence. They must also decline any duties or responsibilities unless they are able to perform them in a safe manner.

The Trust position is that it accepts liability for the action of those practitioners who have completed the identified training for this skill and are deemed competent by their clinical supervisor, and who have updated their knowledge and skills according to policy.

Mentor – Definition of role

A mentor must fulfil the following criteria:

- Be a registered nurse
- Have completed mentorship training
- Be aware of and adhere to health and safety policies and procedures including COSHH
- Be aware of and adhere to local and/or network policy for cytotoxic medication administration
- Demonstrate a positive commitment to being a mentor

Assessor – Definition of role

An assessor must fulfil the following criteria:

- Be a registered nurse
- Have successfully completed a recognised teaching and assessing course

- Be aware of and adhere to health and safety policies and procedures including COSHH
- Be aware of and adhere to local and/or network policies for cytotoxic medication administration
- Be familiar with the content and standards set out in this workbook

INTRODUCTION TO THE ASSESSMENT PROCESS

Assessment has been defined by Nicklin and Kenworthy, 2000, as a 'Measurement that directly relates to the quality of learning and as such is concerned with student progress and attainment'.

The Assessment Process

- The Learner and Mentor should meet regularly, ideally twice a month. The Learner and Assessor should aim to meet 3 times during the learning process to ensure the learner is achieving standards expected. These meetings should ideally take place prior to commencing the workbook, when half of the workbook has been completed and on completion of the workbook and records of practice prior to requesting final assessment.
- Theoretical knowledge and practical experience are gained simultaneously. The aim of this learning package is to introduce you to the nursing issues to be considered when caring for patients undergoing treatment for cancer, to enable you to plan and implement and evaluate care more effectively and sensitively. The assessment of theoretical knowledge (including completed workbooks) should be carried out by the named Assessor.
- All sections of the workbook should be completed over a period of at least 3 months and no more than 4 months if the Learner is starting the workbook with no previous experience of cancer nursing.
- Once workbook 1 has been completed and reviewed by the Assessor, the Assessor should meet with the Learner to provide feedback on the completed workbook
- A copy of the completed workbooks may be retained for audit purposes.

RESOURCES

- Policy & Guidelines for the Safe Prescribing, Handling & Administration of Cytotoxic Drugs
Available at: <http://www.kentmedwaycancernetwork.nhs.uk/home-page/for-professionals/>
- Department of Health (2008) National Guidance on the Safe Administration of Intrathecal Chemotherapy
- Royal College of Nursing (2005) RCN Competencies: an integrated competency framework for training programmes in the safe administration of chemotherapy to children and young people
- Local Trust policies
- NMC (2010) Standards for Medicines Management
- NMC (2008) The Code – Standards of conduct, performance and ethics for nurses and midwives
- Resuscitation Council (UK) (2005) The Emergency Medical Treatment of Anaphylactic Reactions for First Medical Responders (Available at: www.resus.org.uk/pages/reaction.htm)
- Patient Information on cancer and cytotoxic medication used in your area
- KMCN and Local central venous access device policies available at <http://www.kentmedwaycancernetwork.nhs.uk/home-page/for-professionals/>
- Manual of Cancer Services available at: http://www.dh.gov.uk/en/Healthcare/Cancer/Treatment/DH_101998

AIMS and OBJECTIVES

This workbook is designed for registered nurses who have some basic experience in cancer care and in order to fulfil their job role are required to develop their knowledge in cancer development, treatment and supportive care.

The Learner should use the Workbook with the guidance and support of a named Mentor and Assessor. Practical and theoretical learning should take place simultaneously.

Organisational Aim:

- To develop high quality, evidence based and standardised care for all patients receiving cancer care.
- For all nurses at band 5 or above working in a designated clinical areato have an understanding of the nursing care needs of patients undergoing treatment for cancer.

Learning objectives for the individual:

The following objectives apply to workbook one and will be further developed in workbook two.

1. To understand the normal physiology of the cell,
2. To develop an understanding of the pathophysiology of cancer.
3. To understand the actions of a range of cancer treatments including radiotherapy and systemic anti cancer therapy.
4. To be able to assess the information and support need of patients (and their carers) receiving routine cancer therapies.
5. To maintain a safe environment where patients are receiving treatment for cancer
6. To demonstrate sound knowledge of the commonly occurring side effects and complications of cancer therapies
7. To assess, plan, implement and evaluate nursing care for patients receiving cancer therapy
8. To understand the role of clinical trials within the cancer setting.

CANCER EPIDEMIOLOGY AND PATHOLOGY

Introduction

One in three people in the UK will develop cancer at some stage in their life-time and it is responsible for over a quarter of all deaths in the UK. Each year over 250,000 people are diagnosed and 150,000 will die.

There are over 200 different types of cancer however; breast, lung, colorectal and prostate cancers make up half of all new cases. The population is aging and, as a consequence, it is estimated that by the year 2025 an additional 100,000 people will be living with cancer (Cancer Research UK, 2011).

“Cancer is a group of diseases characterised by unregulated cell growth and the invasion and spread of cells from the site of origin, or primary site, to other sites within the body” (Pecorino 2008 pg 2). 85% of cancers come from epithelial cells and are classified as carcinomas. Cancers from mesoderm cells are called sarcomas (bone and muscle) and cancers from glandular tissue are referred to as adenocarcinoma.

Most agents that cause cancer (carcinogens) cause alterations to the DNA sequence (mutations), thus similar to all genetic diseases, cancer results from alterations in DNA. A large amount of evidence indicates that the DNA of tumour cells contains many alterations. The accumulation of these mutations in cells over time represents a multi step process (Pecorino 2008)

Characteristics of a normal functioning cell

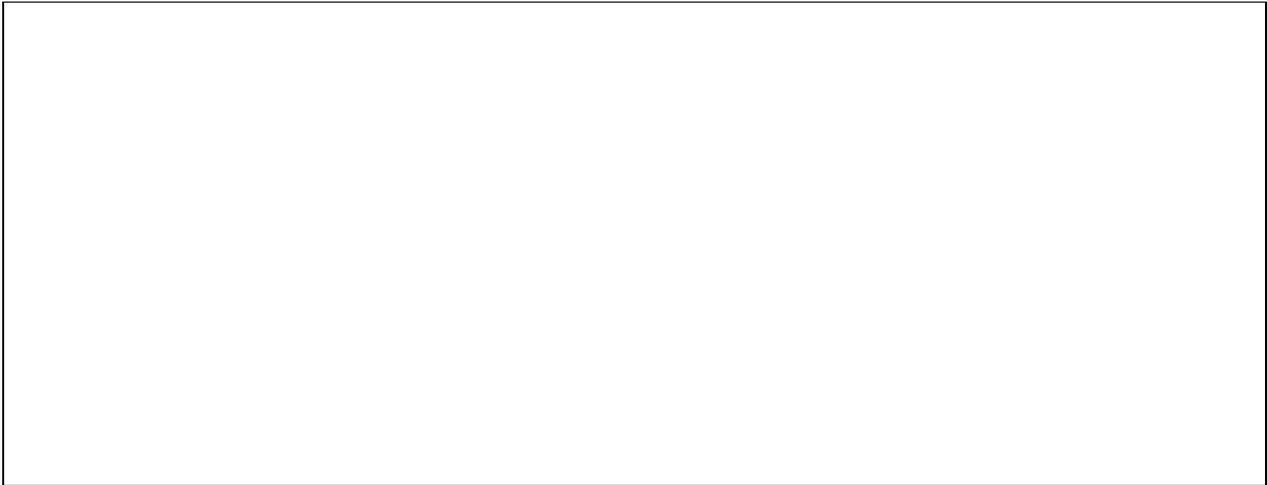
It is important to recognise the characteristics of normal functioning cells, and appreciate how they differ from malignant cells (cell kinetics). The following section asks you to identify the characteristics of a normal functioning cell, and compare that with the characteristics of a malignant cell.

The cell is the basic structural and functional unit of life (Tortora and Derrickson 2011). The adult human body comprises of over a 100 trillion individual cells. There are many different types of cells with a variety of functions, dependent on the organisation of the cells, but all have the same common structure. Two key distinctions are somatic cells and germ cells.

Define:

- i. Somatic cell:
- ii. Germ cell:

Draw a normal cell, naming & describing the basic structure and organelles:

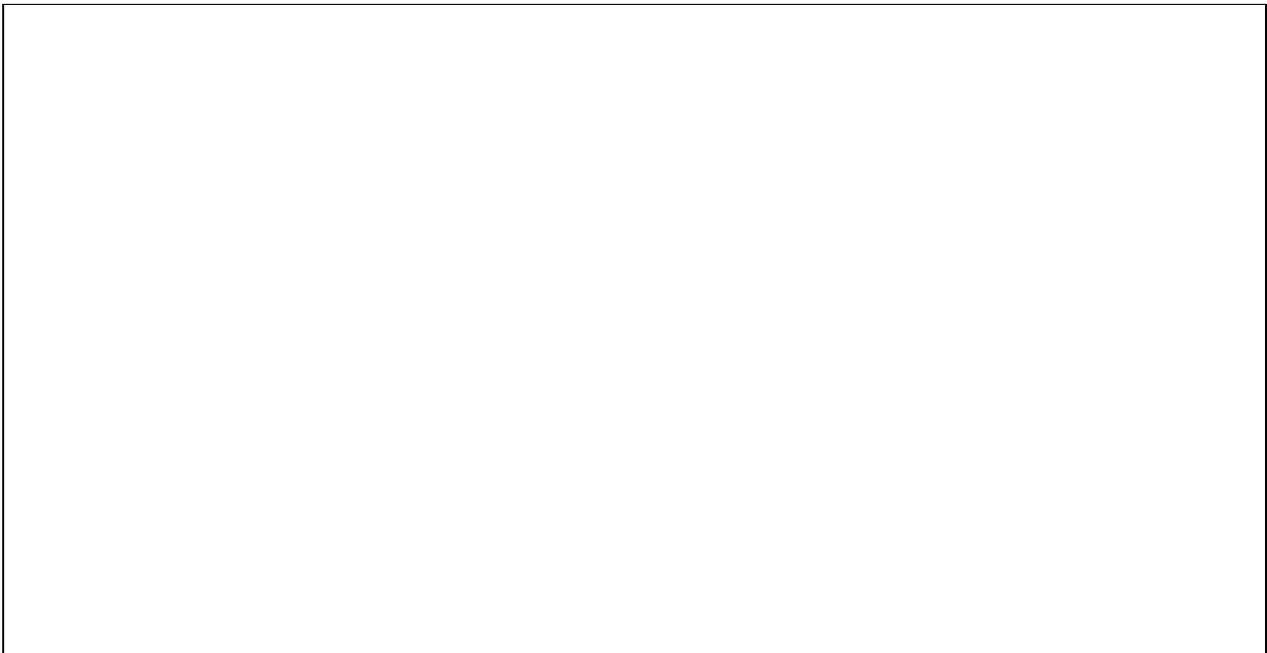


DNA

“Deoxyribonucleic acid (DNA) forms the inherited genetic material inside each human cell” (Tortora and Derrickson 2011, pg 56). DNA nucleotides form a spiral ladder known as a double helix and have 3 distinct parts:

- i. Nitrogenous base (Purines: adenine, guanine; Pyrimidines: thymine and cytosine)
- ii. Pentose sugar
- iii. Phosphate group

Draw a diagram of the DNA double helix and label the parts:



DNA bases always pair in a specific pattern, which base pairs with which?

Adenine

Adenine

Guanine

Guanine

Thymine

Thymine

Cytosine

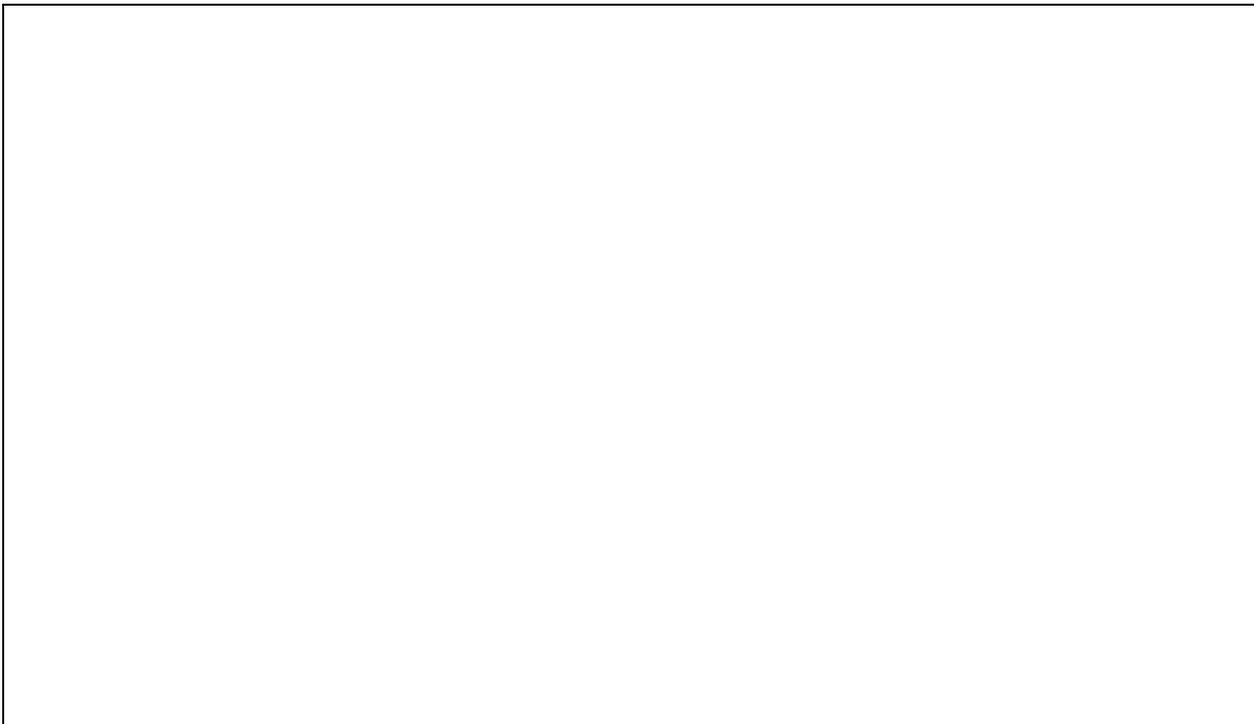
Cytosine

The cell cycle

“The cell cycle is an orderly sequence of events in which a somatic cell duplicates its contents and divides in two” (Tortora and Derrickson 2011, pg 96). There are 3 clearly identified phases within the cell cycle:

- i. Interphase – This is the period of cellular growth detailed by the replication of DNA in the nucleus. There are 3 stages in this phase called G1, S and G2.
- ii. Mitosis – This is the point where the nucleus divides.
- iii. Cytokinesis – The point where the cytoplasm splits.

Using the space below draw a diagram of the cell cycle and describe in more detail the specific stages listed above.



A somatic cell has 3 possible futures:

- i. To function without dividing
- ii. To undergo regulated cell replication (division) and produce an identical daughter cell
- iii. To die (apoptosis)

What do you think would be the consequences, for the body, if one of the 3 possible futures of a somatic cell did not occur?

REGULATION AND DIFFERENTIATION

There are certain mechanisms employed by the body to ensure it produces the correct number of specific cells and that those cells behave in a civilised and orderly manner. These mechanisms are governed by regulatory and differentiation processes.

Regulation

The cellular reproductive activity of a cell is affected by its' surrounding environment, that is, the presence or absence of growth hormones, essential nutrients to allow growth and enough space to grow in. Normal cells characteristically like to remain in their own environment, that is, renal cells in the kidney capsules, hepatocytes within the liver wall, and breast tissue cells in the breasts.

In malignant, or cancerous, cells the 'rules' are broken, the cells do not behave in a conformist manner and do not have the same control mechanisms influencing their activity. Cancer cells proliferate without organisation and often without differentiation. There are many characteristic differences between 'normal' and malignant cells that account for cancers' invasive behaviour:

- i) Cancer cells have the ability to establish new growth at surrounding ectopic sites (metastasis);
- ii) Cancer have functional difficulties and behave in an uncontrolled way, this is called anaplasia;

- iii) Cancer cells are 'greedy', and consume more nutrients than they require, starving surrounding cells from essential nutrients required for survival; some cancers have angiogenic properties, allowing new blood vessels to grow within the cancer bulk;
- iv) Malignant cells lack the ability to mature and perform specialist functions – with decreased cell differentiation;
- v) Cancer cells undergo uncontrolled proliferation, the rate of cell reproduction and renewal out numbers natural cell death in malignant;
- vi) Cancer cells lack contact inhibition and cell recognition and exhibit the inappropriate ability to invade surrounding tissue

Differentiation

This is the process a cell goes through to develop its specialised characteristics enabling it to perform a specific role, that is, the control that governs the physical and functional properties of a cell.

Different malignant tumours develop from different tissue types. This information can be helpful when diagnosing and staging the disease, as it identifies a tumour source.

Can you match up the tissue type, with related malignant disease? There may be more than one malignancy related to one tissue type.

TISSUE SOURCE	MALIGNANT TUMOUR
Epithelium	Lymphoma
Nerve	Sarcoma
Lymphoid	Myeloma
Muscle	Leukaemia
Haemopoietic	Carcinoma
Connective	Various

Metastasis

Metastasis means the spread of cancer. Cancer cells can break away from a primary tumour and travel through the bloodstream or lymphatic system to other parts of the body.

Cancer cells may spread to lymph nodes near the primary tumour (regional lymph nodes). This is called nodal involvement, positive nodes, or regional disease. Cancer cells can also spread to other parts of the body, distant from the primary tumour. The term metastatic disease or distant disease is used to describe cancer that spreads to other organs or to lymph nodes other than those near the primary tumour.

When cancer cells spread and form a new tumour, the new tumour is called a secondary, or metastatic, tumour. The cancer cells that form the secondary tumour are like those in the original tumour. That means, for example, that if breast cancer spreads (metastasizes) to the lung, the secondary tumour is made up of abnormal breast cells (not abnormal lung cells). The disease in the lung is metastatic breast cancer (not lung cancer).

The process of tumour metastasis was described using the "seed and soil" analogy by Paget more than 100 years ago. His landmark paper in 1889 examined 735 patients with breast cancer at autopsy and showed that the distribution of metastases did not occur by chance, but was regulated by the predisposition of congenial soil. For example, the liver had a 14-fold higher incidence of metastases compared with the spleen, although these organs roughly possess the same circulatory volume. Paget proposed that tumour cells, or "seeds," were randomly scattered by vascular routes, but could only form metastatic deposits if they landed in congenial territory, or "soil." He hypothesized that tumours have a "seminal influence" on the metastatic microenvironment, and thereby act together with the distant organ to effect tumour metastases.

Where does cancer spread?

The most common sites of metastasis from solid tumours are the lungs, bones, liver, and brain. Some cancers tend to spread to certain parts of the body. For example, lung cancer often metastasizes to the brain or bones, and colon cancer frequently spreads to the liver. Prostate cancer tends to spread to the bones. Breast cancer commonly spreads to the bones, lungs, liver, or brain. However, each of these cancers can spread to other parts of the body as well.

How do we know whether a cancer is a primary or metastatic tumour?

Is it possible to have a metastatic tumour without having a primary cancer?

Causes of Cancer

The process of cancer development is referred to as carcinogenesis and a cancer causing agent is known as a carcinogen. Carcinogens can be initiating agents, which cause direct and irreversible damage to DNA; promoting agents, which encourage the cell to express the damage that has occurred to its DNA, but do not directly cause cancer, and complete carcinogens which do both. Carcinogens can be classified as chemical, viral, familial or physical as well as environmental, occupational, dietary and lifestyle.

CHEMOTHERAPY

Intent of Treatment

There are a number of strategies in the administration of chemotherapeutic drugs used today. Chemotherapy may be given with a curative intent or it may aim to prolong life or to palliate symptoms. Combined modality chemotherapy is the use of drugs with other cancer treatments, such as radiation therapy or surgery. Most cancers are now treated in this way. Combination chemotherapy is a similar practice which involves treating a patient with a number of different drugs simultaneously. The drugs differ in their mechanism and side effects. The biggest advantage is minimising the chances of resistance developing to any one agent.

Define the following terms:-

Neoadjuvant

Adjuvant

What is cytotoxic chemotherapy?

Chemotherapy simply means 'chemical' or 'drug' therapy – although is generally associated with cytotoxic drug therapy.

Define the word **CYTOTOXIC**

Chemotherapy is best known for its effectiveness in treating cancer cells, but it is used as an immunosuppressant therapy for non-cancerous conditions.

What other diseases may be treated with chemotherapy?

How cytotoxic chemotherapy kills cancer

The action of cytotoxic chemical therapy was first noted when the effects of chemical warfare were observed in World War I. Following exposure to Mustard Gas soldiers became profoundly myelosuppressed.

The key to the effectiveness of Cytotoxic chemotherapy is related to cellular reproduction and the cell cycle.

Cytotoxic drugs work by interfering with cell division and reproduction, that is, they effect a cancer cell at some point during its' period of reproduction. Some cytotoxic agents are most active during the cell cycle. Very few agents are active against cells in the resting G0 phase. Cytotoxic chemotherapy doesn't necessarily kill the cell at the time of exposure, but by virtue of the prevention of reproduction, the malignant cell will die at the end of its life span without allowing the reproduction of any further cancer cells.

What does **cell cycle phase specific** mean?

What does **cell cycle non-specific** mean?

The rate of cell proliferation varies depending on the individual cell. Some cells cease reproduction once reaching maturity, whilst others produce millions of new cells every day. Cytotoxic chemotherapy is most effective against frequently dividing cells, thus aggressive and acute malignancies tend to be very sensitive to chemotherapy and respond well, for example, acute leukaemia.

Unfortunately Cytotoxic chemotherapy cannot discriminate between malignant frequently dividing cells, and healthy frequently dividing cells. This is one of the primary dose limiting factors in chemotherapy administration.

The 'normal' cells that are most frequently affected by Cytotoxic chemotherapy include, bone marrow cells, hair follicles, mucosal lining of the GI tract, skin and germinal cells. Consider the clinical impact, describing signs and symptoms, a patient might experience following treatment with cytotoxic medication.

- Bone marrow cells
- GI Tract
- Skin
- Germ Cells

Cytotoxic chemotherapy agents are generally classified into 5 groups.

Complete the table below:

Cytotoxic drug classification	List 3 examples of drugs in each group	Describe the mode of action of the drugs in this group
1) Alkylating Agent	* * *	
2) Plant Alkaloid	* * *	
3) Antimetabolite	* * *	
4) Cytotoxic Antibiotic	* * *	
5) Miscellaneous	* * *	

Cytotoxic medication can be administered via a variety of routes:

- Intravenous (IV)
- Subcutaneous (SC)
- Intracavity (IC)
- Orally (PO)
- Intraperitoneal
- Intravesical
- Intramuscular (IM)
- Intrathecal
- Intraarterial (IA)
- Topically (TOP)
- Intrapleural (IP)

Give one advantage of using each method of administration, and one example of a drug administered by each route?

IV		
IM		
SC		
Intrathecal		
IC		
IA		
PO		
TOP		
IP		
Intravesical		

Cytotoxic medication can be administered in a variety of ways. Please complete the table below, providing the definition of the various methods of treatment listed.

Method of Treatment	Definition
Single agent	
Combination	
Adjuvant	
Neo adjuvant	
Consolidation	
Salvage	
Palliative	

Cytotoxic medication can be administered in combinations of drugs. What benefit can you see in giving cytotoxic medication in combination?

In addition to the use of cytotoxic drugs in combination, the effectiveness of cytotoxic medication is enhanced by the use of cytotoxic drugs in treatment cycles.

What benefits might cyclical treatment offer:

INTRATHECAL CHEMOTHERAPY

STOP! THINK:

**Have you had your Intrathecal Induction Training Yet? If not tell your Mentor.
You need it now!**

Certain chemotherapy agents can be administered into the cerebrospinal fluid (CSF) safely, as a specific type of treatment for malignant disease that exists in the central nervous system (CNS). Intrathecal chemotherapy is required because most agents given by any other route are unable to cross the blood brain barrier, a barrier designed to prevent toxic damage to the brain. When a patient has, or is at risk of having CNS disease it is essential that toxic therapy is delivered to this sensitive area in a safe and controlled manner.

Intrathecal chemotherapy is **ONLY** administered by qualified assessed senior doctors who are **registered** with the Trust as competent practitioners.

At least 55 incidents are known to have occurred around the world (a number in England) where the intravenous vinca alkaloid drug has been injected intrathecally during the chemotherapy treatment of a cancer patient. These incidents have resulted in the **paralysis** or **death** of the patients involved.

Updated National Guidance on the Safe administration of Intrathecal Chemotherapy was issued in 2008 (HSC 2008/001) replacing guidance HSC 2003/010. This document sets out the minimum that should be expected from an NHS Trust providing an Intrathecal service. Please ensure you have located and read both the relevant documents and can demonstrate your understanding of the potential clinical hazards associated with intrathecal chemotherapy.

REMEMBER:

You must **NOT** be involved in this process at any stage unless you are fully chemotherapy competent, specifically trained in this area AND **have your name entered on the current register.**

SIDE EFFECTS INDUCED BY CYTOTOXIC MEDICATION & NURSING CARE

As mentioned previously, despite the effectiveness of cytotoxic medication on malignant and non-malignant disease, there are side effects associated with all treatment. These side effects can themselves be treatment limiting and their significance should never be underestimated.

Work through the following questions to explore the impact of cytotoxic medication on an individual and consider the relevant side effects.

Name 3 sources of information which you could use to help inform a patient about the side effects of cytotoxic drugs.

-
-
-

Bone Marrow Suppression

There are different types of blood cells with different functions. From the list below identify the cell function and the normal life span of each?

- Erythrocytes:

- Neutrophils

- Platelets

Most cytotoxic medication is myelosuppressive, that is, it is toxic to the bone marrow and suppresses its function.

Which component of the blood is affected first:

- a. red blood cells
- b. white blood cells
- c. platelets

Why is this clinically significant?

What are the normal ranges for the following blood components:

- a. haemoglobin
- b. white blood cells
- c. neutrophils
- d. platelets

What is 'neutropenia' and what precautions would you suggest for a patient?

What is meant by the 'nadir'? When, generally does it occur?

What essential nursing care would you undertake for a patient admitted with febrile neutropenia?

What is "sepsis 6"?

Define the 6 elements of "sepsis 6"

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

The Gastrointestinal Tract and Mouth

Name 2 cytotoxic drugs that cause constipation.

Name 2 cytotoxic drugs that cause diarrhoea.

What advice would you give a patient who was at risk of:

diarrhoea:

constipation:

List 4 things you would monitor when assessing the condition of a patient's mouth.

What is mucositis and what advice would you offer a patient?

Nausea and Vomiting

List 5 potential causes of nausea and vomiting in patients undergoing treatment which involves cytotoxic medication.

What does 'highly emetogenic' mean?

Give an example of 3 highly emetogenic cytotoxic drugs?

Give an example of 3 'moderately' emetogenic cytotoxic drugs

Name 3 groups of anti-emetics, and give an example of each

List 5 anti-emetic drugs, give their normal dosage, mode of action and the key side effects or cautions

Drug and normal dose	mode of action	side effects and cautions

Diet and Nutrition

What advice regarding eating and drinking would you give a patient who has a problem with nausea?

Taste changes are common with some cytotoxic drugs, give an example of a drug that causes taste changes, and suggest some dietary advice to help manage this problem.

In what circumstances would you refer a patient to the dietician?

What can you do as a nurse to improve the nutritional intake of your patient?

Body Image and sexuality

Many chemotherapy agents can affect a person's body image

List examples of how body image can be affected by chemotherapy

What help can nurses offer patients with body image concerns?

Sexuality and sexual activity can also be affected by chemotherapy

What do you think are the key concerns of patients regarding sexuality and sexual activity?

What resources are available to patients to help them answer their questions and concerns?

How can nurses help patients?

Certain cytotoxic drugs can affect the skin. Explain how the following drugs affect the skin?

Cytarabine

Methotrexate

Fatigue

Fatigue is described as the most disturbing symptom experienced by patients receiving treatment with cytotoxic medication.

List 3 pieces of advice you would give to a patient who is suffering from fatigue, tiredness or lethargy

Disposal of cytotoxic waste

Cytotoxic waste should be disposed of in a designated receptacle designed for that purpose.

Locate your local policy for the safe disposal of cytotoxic waste and evaluate your own clinical area to ensure you are following legislative requirements.

Bodily fluids may also be considered as cytotoxic waste, depending on which cytotoxic agents are used and the time lapse post administration.

Members of staff who are pregnant or trying to conceive should be informed about the potential hazards of handling cytotoxic medicines and waste. In discussion with their line manager and occupational health it is important to consider how they can be supported and protected within the work environment.

What precautions should you take when dealing with the excreta and bodily fluids of a patients receiving cytotoxic medication?

Where should cytotoxic drugs be reconstituted?

What would you do in the event of a cytotoxic spill?

Where is the cytotoxic spillage kit in your area?

What is 'extravasation'?

What action should you take on discovering an 'extravasation'?

RADIOTHERAPY

Mode of action

Radiotherapy has been part of the cancer treatment armoury for approximately 100 years. 50% of patients will require it during their cancer journey, and 60% of these receive it with the intention of curing the disease (Burnet et al., 2000).

Radiotherapy uses high energy X-rays to destroy cells within a treatment area. It will kill both cancerous and healthy cells. The main target of the radiation is DNA. Radiation will cause a break in one, or both, of the strands of the DNA double helix, resulting in either immediate cellular death, or death during replication (Faithfull, 2006). Cells that undergo frequent replication are most affected by radiotherapy (Watson et al., 2006). The effects of radiotherapy are largely confined to the area being treated, it is therefore considered a local treatment. The side effects that the patient experiences are related to the area, for example diarrhoea may occur when the bowel is being irradiated (Kuzbit 2008).

The unit of measure for dose of radiation is the Gray (Gy); 1 gray = 1 joule/kg.

There are differences in the ways that tumours respond to radiation; this is referred to as radio-sensitivity, some cancers are more sensitive to irradiation than others.

Outline the impact of the following on radiation sensitivity:

- Oxygenation:
- Cell division;
- tumour repopulation:
- Cellular repair:

Define the following terms:

- Simulation:
- Planning:
- Fraction:
- Standard fractionation:
- Total body irradiation:
- Altered fractionation schedule:
- Hyperfractionation:
- Accelerated fractionation:
- Conformal RT:
- Brachytherapy:
- Teletherapy

Brachytherapy

Name 3 cancers that can be treated with Brachytherapy:

- 1.
- 2.
- 3.

choose one of the above cancers and outline common side effects or potential complications of this treatment:

What support, advice, interventions can be offered to help with the issues you have listed above?

Side effects

Radiotherapy side effects develop and worsen over the period of the treatment and often continue for weeks or months after it has finished and a small proportion of patients may develop late side effects occurring six months to two years after the treatment has finished (Colyer, 2003)

Side effect	Site treated	outline possible management strategies
Xerostomia		

Radiation skin reactions		
Mucositis		
Eosophagitis and dysphagia		
Nausea and vomiting		
Diarrhoea		
Tenesmus, cystitis and urethritis		
Fatigue		

Skin care

What advice would you give to patients regarding skin care prior to commencing their radiotherapy?

TARGETED THERAPY

The newest of the cancer treatment and has been called the fourth modality, but unlike surgery, radiotherapy and chemotherapy it has not fully matured as an approach and is still undergoing major investigations. However some breakthroughs have been made and are now fully integrated into cancer therapy.

Targeted, or biotherapy as it is sometimes known, is defined as the use of naturally occurring biological molecules, including antibodies and cytokines, to target cancer cells in order to inhibit, control, or destroy, the tumour (Kerr et al., 2006).

Types of targeted therapy

Give a brief explanation of the treatment group's mode of action and one example of a drug in that group

Treatment	mode of action	example drug
Monoclonal antibody		
Kinase inhibitor		
Hormone therapy		
Cytokine therapy		

Side effects

Targeted therapies have very diverse and potentially severe side effects; as nurses caring for patients receiving these we need to be fully conversant with how to manage any adverse event that may occur during the therapy and also provide information and support to the patient at home.

Common side effects include chills and rigors, fever, body pains, fatigue, allergic reactions and skin reactions. Management of these depends on the specific therapy and other concurrent treatments, following local guidelines is therefore essential.

Skin reactions

Which group of targeted therapy drugs are most likely to cause skin reactions?

What information would you give a patient about skin reactions from targeted therapy?

Adverse reactions

Some targeted therapies have the potential to cause severe allergic reaction and anaphylaxis

Name 3 targeted therapy drugs known to cause severe adverse reactions

describe the signs and symptoms of:

allergic reaction

anaphylaxis

What actions would you take if you discovered a patient having a severe adverse reaction/ anaphylaxis?

INFORMATION AND SUPPORT

Information gives reassurance, reduces anxiety and stress, improves the patient experience, increases concordance with treatment and results in more effective self care behaviours being adopted (Kuzbit 2008, Rutten et al., 2005). With the increase in ambulatory care, patients also need to be prepared to make decisions and deal with problems in the home (McCaughan and Thompson, 2000).

Information needs to be of the right sort and given at the right time. During the diagnosis and treatment phases patients want information regarding their disease, treatment options and treatment side effects (Rutten et al., 2005). Information should be provided in both written and verbal form (Oakley et al., 2000);

Consider the fears and anxieties people may have about receiving cancer treatment, and list them below.

What information and support is available in your area for patients (consider written and verbal information / support), and how do they access it?

Name 2 charitable organisations that provide support and information to patients receiving cancer treatments and their families.

The Internet

A study by James et al (2007) looking at the information seeking behaviour of cancer patients and their carers has highlighted the growing importance of the Internet. They found that 48% of the 200 carers interviewed had accessed this resource and half of the 800 patient participants had used information from the Internet. These findings have implications for nurses in ensuring that the information patients are reading comes from valid and reliable sources.

What advice would you give a patient about accessing information on the internet?

How do you evaluate the validity of a web resource?

Consent

Who Gains Consent?

According to the Department of Health, the best person to seek consent is the person carrying out the procedure. It is possible for this to be delegated but only if the person is both capable and specifically trained (Reeves & Orford, 2003).

Consent requires:

Voluntariness i.e. it is given freely, the patient is not under sedation or manipulated into a situation of agreement

Capacity, in law there is no fixed criteria to assess competence but there are laws and specific instructions which must be adhered to of who can give consent

Knowledge that the type of treatment, risks involved, subsequent consequences and alternatives are given truthfully.

For consent to be valid all three must be present (Mayberry, 2003).

Capacity is an essential element of the consent process. What does the law say with regards to capacity in consent in the following groups of patients?

Adults:

Minors

Vulnerable clients

Patients who are mentally ill

Right to Refuse

The basic principle in law is that an adult, mentally competent person has the right to refuse treatment contrary to medical advice. Thus an adult who is deemed mentally competent can refuse, even when there is overwhelming medical reasons in favour, even if means putting his or her life at risk. However, this refusal can be overturned by the courts if it is felt that the patient's decision is caused by undue influence. It is important to note that the presence of a mental disorder does not automatically mean that the person is incapable of making a valid decision in relation to treatment.

Learning Point

List three reasons why a person may refuse treatment

Health and Safety

Key to the safe delivery of cancer treatments including Ionising Radiation and SACT is health and safety legislation.

The Health and Safety Commission and its operating arm, the Executive (HSE/C) has spent the last twenty years modernising the structure of health and safety law. Its aims are to protect the health, safety and welfare of employees and to safeguard others, mainly the public who may be exposed to risks from work activity (HSE, 2003).

The HSE/C provides three types of action:

Guidance: which aims to help people interpret and comply with the law and gives technical advice. Following this guidance is not compulsory, but if they do then normally they will be doing enough to comply with the law.

Approved Codes of Conduct: offer practical examples of good practice and gives advice on how to comply with the law.

Regulations: which are law approved by Parliament, usually made under the Health and Safety at Work Act (1974) following proposals from the HSE. This applies to regulations based on European Commission (EC) Directives as well as 'home-grown' ones. (HSE, 2003)

Amongst the entities that can prompt action from HSC/E are:

- Changes in technologies, industries or risks
- Evidence of accidents and ill health plus public concern
- EU Directives (HSE, 2003)

Reflect on your role within maintaining health and safety within the workplace with regards to radiotherapy, targeted therapy and chemotherapy:

CARE PLAN

Imagine you are caring for a patient who has been admitted to the ward with a neutrophil count of 0.1 and pyrexia of 39.3 C. Referring to any policies used in your area; write a brief care plan for your patient. Consider all aspects of patient care and individualised needs.

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