FIP knowledge and skills reference guide for professional development in cancer care

A companion to the FIP cancer care handbook for pharmacists

2022

FIP Development Goals

Cancer

FIP Practice Transformation Programme on NCDs

ADVANCING PHARMACY WORLDWIDE

Colophon

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ESCP
European Society of Clinical Pharmacy

ISOPP International Society of Oncology Pharmacy Practitioners
A global community of oncology pharmacy practitioners striving for excellence in cancer care.

1 Background

According to the World Health Organization (WHO), cancer is the second leading cause of death globally, accounting for an estimated 9.6 million deaths, or one in six deaths, in 2018.[1] The global burden of cancer is only increasing and requires a more robust response from healthcare systems worldwide. About 60% of the total incidence of cancer occurs in low- and middle-income countries, with increasing instances of morbidity and mortality relative to high-income countries.[2] Although cancer treatment has progressed and increased life expectancy, cancer care occurs across a continuum and requires more intentional coordination within healthcare systems.[2] The WHO has passed a resolution for "cancer prevention and control in the context of an integrated approach", to encourage countries to set goals, collect data, and improve outcomes. Mobilising and empowering pharmacists can help facilitate these goals.[1]

The International Pharmaceutical Federation (FIP) is the international organisation that represents pharmacists, pharmaceutical scientists and educators around the globe. As part of the federation's support for the Astana declaration, FIP encourages pharmacists around the world to act upon non-communicable diseases (NCDs), from prevention and screening activities to patient referral when appropriate, and to pharmacist-led, patient-centred NCD management to improve outcomes and quality of life including in the area of cancer care. FIP efforts include the "FIP cancer care handbook for pharmacists" published in 2022, which provides evidence-based recommendations on integrating pharmacists into cancer care and summarises important outcomes in cancer treatment.

Pharmacists are in a unique position to improve access to and facilitate preventive and screening measures, counsel on the complex regimens and associated supportive care medicines used in cancer care.

Despite challenges associated with cancer care, like structural and systems-level barriers, and cost, pharmacists need to increase their engagement in cancer care service provision to mitigate these barriers. Another significant barrier to increasing the availability of pharmacist-provided cancer care services is a lack of training, which can lead to a lack of confidence in providing counselling and treatment management in cancer services. If topics related to cancer are not adequately covered in pharmacy curricula, pharmacists will graduate without the necessary skills to provide these services to their patients. This leads to a shortage of trained pharmacists who can provide services to complex patients who need assistance managing their intense regimens. There are steps that can be taken at both individual and systems levels to overcome these barriers and increase pharmacists' participation in cancer care, including the provision of continuing professional development (CPD) opportunities for pharmacists in cancer.[4]

Building on the need to support pharmacists worldwide in providing services and offering interventions safely and effectively in cancer care, this guide aims to:

- Outline the knowledge and skills recommended in cancer care for pharmacists;
- Provide a structure to support and enhance pharmacists' CPD in cancer care, and;
- Highlight key considerations for CPD providers and educators in the area of cancer to support pharmacist professional development.

2 FIP global competency and professional development frameworks

As medication experts, pharmacists are key members of the wider healthcare team. Through CPD, pharmacists maintain and extend their competence to practise and remain responsive to the increasingly complex healthcare environment. FIP defines CPD as "the responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes, to ensure continuing competence as a professional, throughout their careers".[5] One approach to developing and maintaining competence is to embrace competency-based training, which is a structured approach to training and assessment that is directed toward achieving specific outcomes. As such, pharmacists must be assisted to acquire skills and knowledge to enable them to perform a task to a specified standard under certain conditions.[5] In competency-based training, the outcomes to be achieved are clearly stated so that learners know exactly what they must be able to do, trainers know what training or learning is to be provided and organisations know the skill levels required of their people. The emphasis in competency-based training is on "performing" rather than just "knowing".[6,7]

With wide acceptance of implementing competency-based training and education in health professions, competency frameworks are useful in organising educational curricula, regulating career entry, benchmarking standards of practice and facilitating expertise development.[5] FIP has developed two global frameworks that describe the generic competencies for foundation and advanced pharmacy practice.[6,8]

The FIP Global Competency Framework (GbCF), updated in 2020, is a set of competencies and core behavioural statements that are intended to be generally applicable for the pharmacy workforce worldwide, particularly targeting early-career (foundation-level) pharmacists.[8] The GbCF includes 124 behavioural statements grouped under 23 competency domains and four broad competency clusters: pharmaceutical public health; pharmaceutical care; organisation and management; and professional and personal competencies.

The FIP Global Advanced Development Framework (GADF) is a complementary framework to the GbCF. The GADF is intended to support the professional development and recognition of pharmacists and pharmaceutical scientists and maps broad-based, advanced practice stages across developmental competencies.[9] Six developmental competency clusters are in the GADF: expert professional practice; working with others; leadership; management; education, training and development; and research and evaluation.

The GbCF and the GADF are intended to act as mapping tools for individuals to progress towards effective and sustained performance and to pave the way to advanced and specialist practice, enable flexibility in career development, and facilitate transfer of key knowledge, skills and wider competencies.[8]

As such, FIP recommends that individuals use the knowledge and skills reference guides with the FIP competency and developmental frameworks to identify the knowledge, skills and behaviours that will be relevant to support them in developing their practice (Figure 1). It is expected that pharmacists will need to harness knowledge, skills, attitudes and values previously acquired that may intersect with other competency areas to perform the tasks at hand. A FIP reference guide provides guidance on knowledge and skills on a specific topic. In this way, cross-learning and transfer of key knowledge and skills is encouraged and embedded. The tools developed by FIP provide competency frameworks and knowledge and skills reference guides that inform CPD practices, including approaches to self-assess one's practice as part of registration or licensing requirements, one's professional development and self-directed learning.

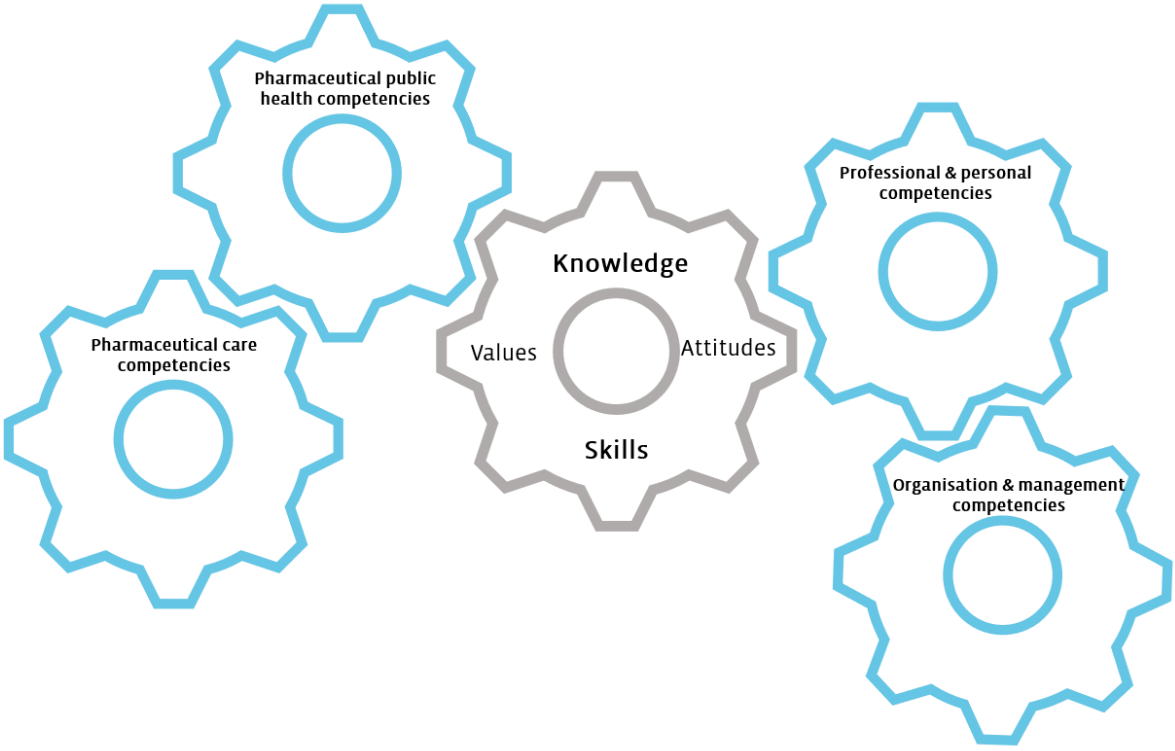

Figure 1. Competencies encompass an array of knowledge, skills, attitudes and values to enable effective performance. Competency clusters are based on the FIP Global Competency Framework.[8]

3 Pharmacist professional development: knowledge and skills reference guide

3.1 About the content of the guide

This knowledge and skills guide provides a comprehensive reference list of required knowledge and skills in pharmaceutical and related care to support pharmacists to develop, upskill and refresh knowledge in cancer care and related roles in pharmacy. The guide supplements the document entitled FIP handbook on cancer for pharmacists and was developed in consultation with a global reference group (see Acknowledgments).

Tables 1 and 2 below build on existing FIP resources on cancer care to date,[8,9] current learning and teaching tools, curricula and expert review through a reference group. The reference group, made up of educators and practitioners with experience in professional development in cancer, reviewed the statements in the tables and agreed on the content.

3.2 How is the information organised?

The guide is organised in two parts

The first part (Table 1) describes the knowledge required by pharmacists to deliver cancer care. In the knowledge guide, topics are grouped into three categories (Figure 2):

- Broad topic area— includes main categories such as body systems, pharmaceutical care, public health and advocacy; ethics and collaborations. Many of these categories are linked to the GbCF competency clusters.
- Core topics — identifies key topic areas (knowledge areas) related to the roles and services provided in the management of cancer.
- Specific topics — describes specific topics stemming from the core topics.

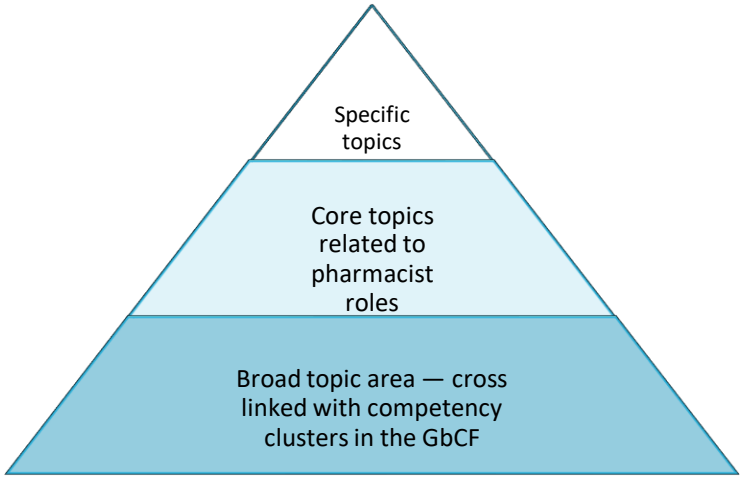

Figure 2. Hierarchy of topic grouping in the knowledge guide

The second part (Table 2) describes the skills required by pharmacists in cancer.

3.3 Who is this for?

This reference guide is intended to guide practice in cancer care by pharmacists rather than to be a prescriptive list that has to be adhered to in all cases. It is relevant to pharmacists focusing on cancer care. It may be relevant at any stage of professional development and may be adapted as appropriate to individual practices. It is intended to support pharmacists in performing cancer-related roles and interventions and CPD providers and educators in developing courses and programmes in the area of cancer to support pharmacist professional development.

3.4 How to use it

This reference guide can be used:

- To support pharmacists to upskill in cancer care and as part of their course of career development;
- To help pharmacists with an interest in providing cancer care-related services in their area of practice; and
- To inform the design and delivery of education and training programmes by CPD providers and educators.

3.5 Contextualisation, and regulatory and training requirements

It is crucial to recognise that pharmacists will have to follow their local, national and jurisdictional requirements for training, certification and regulatory/professional and ethical standards to fulfil their specified roles. These may include:

- Appropriate training relevant to their scope of practice and level of specialisation in the management of cancer;
- Codes of conduct;
- Nationally developed certificate training programmes or board certification;
- Registration or licensure status;
- Professional affiliations; and
- Healthcare jurisdictions (laws) regarding the education, competencies and responsibilities of pharmacists and other healthcare professionals.

Table 1. Knowledge guide for pharmacists in cancer care [11–30]

Therapeutic area	
Body systems (biology of cancer)	**Demonstrate knowledge and understanding of:**
General concepts	• Physiological, immunological, hormonal and genetic components of cancer. • The process of carcinogenesis, mechanisms of invasion and metastases. • Major systems for classifying and staging cancer. • Common clinical, radiological, laboratory and pathological investigations involved in diagnosing, staging and grading cancer. • The differences between benign and malignant growth. • Signs and symptoms of cancer. • General principles of cancer treatment, including surgery and radiotherapy.
Cellular processes	• Human cell structure, function, components and the cellular processes that lead to malignancies. • The cell cycle and the points where chemotherapeutic drugs can interrupt. • Cytogenetics and mutations that lead to cancer
Haematological processes	• The role of blood and vasculature in solid tumours. • The role of bone marrow and what changes in the bone marrow are indicative of cancer. • Relevant laboratory investigations such as white blood cell count, haemoglobin, neutrophil count, and knowing normal and abnormal cut-offs.
Immunological processes	• The basic functions of the immune system and how it interacts with cancer cells. • Basic markers that cancer cells use to mitigate detection from the immune system.
Public health	
Public health strategies	**Demonstrate knowledge and understanding of:**
Prevention	• How to educate patients and providers on the role of nutrition, alcohol consumption and weight management in cancer. • How to educate patients and providers on the role of smoking in cancer and smoking cessation options. • How to educate patients on safer sexual practices to prevent development of cancer from sexually transmitted infections. • Vaccination and how to educate patients on importance of vaccination to prevent infections that can lead to cancer.
Screening	• Engagement with patients and participation in risk factor assessments. • Increasing accessibility to screening programmes and promoting pharmacy-based campaigns to enhance participation in screening services.
Practice-based research	**Demonstrate knowledge and understanding of:**

Evidence-based practice	• Evaluation of current practices with local and national standards.
	• Promotion and design of quality improvement activities to facilitate the safety of patients and health care practitioners.
	• Local, national and international guidelines and best practice recommendations for treatment and supportive care in oncology, for example:
	  ○ American Society of Clinical Oncology
	  ○ European Society of Medical Oncology
	  ○ National Comprehensive Cancer Network
	  ○ Multinational Association of Supportive Care in Cancer

Pharmaceutical care	
Physical health	**Demonstrate knowledge and understanding of:**
Functional status	• Validated scales to assess a patient's physical abilities, such as the scoring on the Eastern Cooperative Oncology Group Scale of Performance and the Karnofsky Scale.[12] • The role performance status plays in selecting chemotherapy regimens and how they impact treatment goals.[12]
Cancer types	**Demonstrate knowledge and understanding of:**

Cancer types	• Risk factors, pathophysiology, and clinical presentation of each cancer type:
	  ○ Sarcomas
	  ○ Carcinomas
	  ○ Leukaemia
	  ○ Lymphomas
	  ○ Multiple myeloma
	  ○ Melanoma
	  ○ Brain and spinal cord tumours
	  ○ Germ cell tumours
	  ○ Neuroendocrine tumours

Treatment and patient care	• Appropriate treatment plans specific to patient factors, with supportive care and monitoring parameters for patients with cancer. • Current clinical trial data pertaining to evaluating safety and efficacy of treatment options. • Patient-centred short- and long-term treatment goals. • The importance of counselling patients on chemotherapy toxicities and ways to mitigate side effects. • Appropriate information to be shared with health care providers regarding commonly used drugs and toxicities associated with cancer type. • Cytogenetic and pharmacogenetic testing and their role in cancer prognosis, treatment and dosing. • Development of contingency plans that allow for prevention and monitoring of severe and moderate adverse effects to promote medication adherence and patient well-being.
Supportive care strategies	**Demonstrate knowledge and understanding of:**
Cancer-related infectious diseases	• Designing of appropriate treatment plan specific to patient factors with supportive care and monitoring parameters based on current data and with special consideration to safety. • Role of antiviral agents, antibacterial agents and antifungal agents.

	• Appropriate stewardship of agents to prevent antimicrobial resistance and ensure patient safety and public health.
Antiemesis	• Ranking of chemotherapeutic agents' emetic risks. • Risk factors for emesis sensitivity. • Types of emesis: acute, delayed, anticipatory, breakthrough and refractory. • Different drug classes: 5HT3 antagonists, NK1 antagonists, dopamine-receptor antagonists, corticosteroids, benzodiazepines, phenothiazines, and other miscellaneous agents. • All aspects of oral and parenteral formulations for antiemetics, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements.
Cancer-associated venous thromboembolic disease	• Risk factors of thromboembolic disease. • Pharmacological and non-pharmacological anticoagulation counselling and management. • All aspects of oral and parenteral formulations for anticoagulants, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements.
Cancer-related pain	• Differences between neuropathic and nociceptive pain and respective treatments. • All aspects of oral and parenteral formulations for analgesics, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements.
Smoking cessation	• Different forms of nicotine-replacement therapy. • Pharmacological interventions to support nicotine replacement. • Motivational interviewing and non-pharmacological counselling.
Survivorship* *refers to persons navigating their life experiences and challenges resulting from their cancer diagnosis	• Appropriate ways to engage in conversations with patients and caregivers on survivorship. • Principles of survivorship care and contributing to care as a pharmacist across the healthcare continuum.
Palliative care	• Tailoring treatment plans specific to end-of-life care goals. • Principles of palliative care and the role of the pharmacist in palliative care.
Medicines	**Demonstrate knowledge and understanding of:**
All cytotoxic medicines, including: • Alkylating agents • Antimetabolites • Antitumour antibiotics • Topoisomerase inhibitors • Mitotic inhibitors • Plant alkaloids	• All aspects of oral and parenteral formulations, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements. • Calculation of patient-specific dosing according to protocols, guidelines, renal and hepatic function, and weight. • Safety profile and adverse effects of medicines.

Immune checkpoint inhibitors	• All aspects of oral and parenteral formulations, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements. • Immune-related adverse events that require prompt identification and treatment.
Small molecule inhibitors and targeted therapies	• All aspects of oral and parenteral formulations, including: mechanism of action; pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements.
Monoclonal antibodies	• All aspects of parenteral mechanism of action, including: pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements. • Reacting appropriately to the safety profile and adverse effects. • Calculation of patient-specific dosing according to protocols, guidelines, renal and hepatic function, and weight.
Haematopoietic stem cell transplant	• Understand the process of transplant and requirements for a patient to receive transplant. • Understand the role of immunosuppressive drugs in haematopoietic stem cell transplant. • Design an appropriate treatment, monitoring, and supportive care plan that utilises relevant data and safety outcomes. • Apply strategies to prevent and treat toxicities associated with chemotherapy regimens pre-transplant. • Create a plan for managing complications of graft-versus-host disease and management of immune responses.
CAR-T (chimeric antigen receptor T-cell) therapy	• All aspects of the mechanism of action, including: pharmacology; pharmacokinetics; pharmaceutical aspects; adverse effects, contraindications and interactions; usual doses and routes of administration; place in therapy; and monitoring requirements. • Understand the process of CAR-T therapy and different products associated with this technology. • Monitor and develop a plan for neurotoxicities and ensure availability of rescue medicines. • Monitor for and counsel on signs of cytokine release syndrome.
Other treatments	• Principles and toxicities of radiotherapy. • Principles and toxicities of surgical intervention.
Health and medicine information	**Demonstrate knowledge and understanding of:**
Handling, storage, and disposal of medicines	• Identifying the classes of medicines that are hazardous and need special considerations for handling. • Counselling patients and caregivers on appropriate methods to handle and dispose of hazardous medicines to mitigate harmful effects. • Ensuring adherence to policies and precautions regarding dispensing and handling of hazardous medicines.

	• Educating patient on appropriate storage of medicines to prevent temperature excursions and ensure protection from disintegration. • Specific measures for appropriate and safe handling, storage and disposal of cytotoxic medicines, such as use of Yellow Hand safe labelling by the European Society of Oncology Pharmacy.[30]
Adverse drug reactions	**Demonstrate knowledge and understanding of:**
Haematologic toxicities	• Patient's baseline for complete blood count levels. • Appropriate use of granulocyte colony stimulating factors in a patient. • Anticoagulation strategies with solid tumours and malignancies. • Management of neutropenia, anaemia and thrombocytopenia.
Gastrointestinal toxicities	• Medicine classes, dosing, and monitoring parameters for acute, delayed, anticipatory, refractory and breakthrough chemotherapy-induced nausea and vomiting. • Appropriate measures to treat and prevent mucositis. • Other gastrointestinal toxicities (e.g., constipation, diarrhoea), their prevention and management, and their impact on adherence and bioavailability of drugs. • How gastrointestinal toxicities can lead to significant weight loss and impact on nutrition and medication dose adjustments.

Oncological emergencies	• Appropriate measures to treat and prevent:
	  ○ Tumour lysis syndrome
	  ○ Febrile neutropenia
	  ○ Hypercalcaemia of malignancy
	  ○ Cytokine release syndrome
	  ○ Mucositis
	  ○ Extravasation
	  ○ Hypersensitivity
	  ○ Spinal cord compression
	  ○ Superior vena cava syndrome
	  ○ Malignant pleural effusions

Neurotoxicities	• Neurotoxicities due to conventional chemotherapy. • Immune effector cell-associated neurotoxicity syndrome associated with CAR-T therapies and treatments. • Changes from baseline and appropriate adjustment of drug use and dose.
Dermatological toxicities	• Methods of drug administration to prevent extravasation from occurring at the time of injection for many chemotherapeutic drugs, and methods for treating extravasation if it occurs. • Monitoring and development of a contingency plan for emergent allergic reactions such as rashes or Stevens-Johnson syndrome. • Pharmacological and non-pharmacological recommendations for alopecia.
Other adverse drug reactions	• Laboratory abnormalities and appropriate times and methods to intervene. • Chemotherapy that contributes to peripheral neuropathy, and management strategies. • Appropriate pharmacological and non-pharmacological strategies to manage musculoskeletal pain. • Opioid stewardship in the cancer population.

Non-pharmacological support in cancer	Demonstrate knowledge and understanding of:
Psychosocial support	• Patient's support system and emphasising the importance of mental health care with a cancer diagnosis. • Programmes with mental health services, social work services and patient support groups to facilitate support in coping with cancer diagnosis and treatment.
Self-care education	• Patient's self-monitoring parameters and when to disclose worsening condition or symptoms to a health care provider. • Non-pharmacologic therapies to address adverse effects and mental health within the context of cancer care.
Lifestyle modifications	• Lifestyle modifications to promote patient's nutritional needs and appropriate physical activity. • Patient's social and physical environment and suitability and adaptability to treatment plan
Supporting people living with cancer	**Demonstrate knowledge and understanding of:**
Medication adherence	• Medication adherence assessment methods. • Factors that may contribute to non-adherence, including socio-economic, health system/health care team-related, condition-related, therapy-related, and patient-related factors such as behavioural or health beliefs and psychological factors. • The impacts of non-adherence (e.g., evidence of link with relapse and poorer treatment outcomes). • Strategies to support adherence, such as counselling techniques, motivational interviewing, teach-back method, ensuring patient access to providers, implementing team-based care, empowering patients on the benefits of the treatment, reducing barriers to treatment (e.g., cost, location, accessibility to internet), and use of health information digital tools.
Developing and implementing a care plan	• Evidence-based care to support the healthcare provider in developing the care plan and critically assessing treatment plans and prescriptions review. • The rational use of medicine (i.e., the medicine appropriate to fit the clinical needs of an individual cancer patient, in doses that meet their own requirements) for an adequate period and at the lowest cost to them and their community.
Monitoring	• Monitoring the patient's cancer condition, including identifying monitoring parameters, prioritising monitoring parameters and advising on suitable actions to ensure appropriate monitoring. • Physical health monitoring, including weight, waist circumference, body mass index, medication adherence, blood pressure, liver functions, electrocardiogram for QT prolongation, liver function test, bone mineral density, side effects, full blood examination, electrolytes, vitamin D, vitamin B12, folate, zinc and magnesium.
Patient communication	**Demonstrate knowledge and understanding of:**
Communication	• Communication barriers, including cultural and language barriers. • Frequency of medication counselling and the necessary means. • Need for regular re-education with the patient and caregivers. • Need for consistent follow-up with the patient and caregivers. • Use of easy-to-understand language in verbal and written formats.

Cultural considerations	• Cultural considerations to better patient interactions and allow individuals to be comfortable and truthful, and to continue seeking out care; how to help underrepresented minority communities to use healthcare services. • Communication and system-based barriers hindering a patient's need for cross-cultural and cross-language communication strategies and services. • The emotional and spiritual preferences in self-management of health care and how to support patients by taking into consideration their ethnicity and culture.
Patient information	• Pharmacological and non- pharmacological recommendations to support improvement of disease state and quality of life.
Special population groups	**Demonstrate knowledge and understanding of:**
Neonates	• Assessment of the risks and benefits of treatment in this population. • Adverse events in the neonatal population. • Rare cancers and the need for specialised services and studies for cancers in the neonatal population. • Trends of tumours most common in the neonatal population.
Children and adolescents	• Differences in pathophysiology of cancer and prognosis of cancer type. • Dosing and safety profiles of chemotherapeutic agents. • Common cancer types.
Pregnant and lactating women	• Teratogenicity of chemotherapeutic drugs and impact on fertility. • Fertility preservation methods and counselling on protecting women of child-bearing age. • The risks associated with treatment with chemotherapeutic agents and fetal toxicity. • Options for women lactating and undergoing chemotherapy and counselling on measures to prevent transmission of toxicities. • Appropriate options for effective contraception and counselling on duration of use both during and after therapy for males and females of child-bearing potential.
Older adults	• Assessment of a patient's ability to undergo chemotherapy. • Interpreting the level of hepatic and renal function to recommend appropriate dose of drugs.
End-of-life care	• Specific information needed to treat and monitor end-of-life care of patients with terminal cancer, including optimal target ranges of medication — the aim of cancer treatment in the last few days of care is to prevent discomfort. • Policies on end-of-life care regarding cancer issues and a recognition that palliative care may vary depending on time and environment, drug interactions with other medicines that may be important for end-of-life care, and medication discontinuation at end-of-life care.
Organisation and management	
Budget and reimbursement	**Demonstrate knowledge and understanding of:**
	• The relevant pharmaceutical law, regulation and guidance regarding budget and reimbursements for medicines, and how they apply to various pharmaceutical settings or doctor visits, new

	services and protocols for reimbursement (e.g., collaborative care agreement, primary care clinical pharmacist setting). • The current cost and reimbursement methods for cancer treatment and facilitate use of patient assistance programmes.
Policies and regulation	**Demonstrate knowledge and understanding of:**
Policy development	• Research intelligence that supports policy change and implementation of new care models in health care and access. • Pharmacist-led services and support the implementation of these through advocacy and influencing policy. • Creation of institutional policies and standard operating procedures for oncology pharmacy practice and medication safety
Regulations	• Relevant pharmaceutical law, regulations and guidance regarding cancer treatment provision to patients and how they apply to various pharmaceutical settings and work environments.
Professional	
Medication errors	**Demonstrate knowledge and understanding of:**
Dosing	• Calculation of creatinine clearance and estimated glomerular filtration rate to adjust for renal dysfunction. • Analysis and interpretation of liver function tests to adjust for hepatic dysfunction. • How to calculate chemotherapeutic dosing based on weight or body surface area, and adjust to changes in weight and height. • Principles of dose-banding and recommending and implementing this strategy appropriately.
Medicine safety	• Common errors and strategies to prevent these errors using evidence-based methods. • Checking for sound-alike and look-alike medicine names. • Identification of dosing errors and ways to mitigate such errors. • Appropriate identification, treatment and reporting of medication adverse effects. • Participation and promotion of medication reconciliation practices.
Drug interactions	• Identification and counselling on drug-drug interactions. • Identification and counselling on drug-herbal interactions. • Identification and counselling on drug-food interactions.
Pharmacovigilance	• Adverse event reporting strategies and databases. • Prevention and handling of misinformation. • Education and promotion of clinical trial participation to advance knowledge of adverse reactions.
Interprofessional collaborative practice	**Demonstrate knowledge and understanding of:**
Role of pharmacists within the multidisciplinary team	• Optimising drug therapy, dispensing, providing medicines information, educating other members of the health care team, working in outpatient clinics, and emerging roles like independent prescribing. • Ensuring safety of administration and practices to protect patients and health care workers from hazardous agents

	• Current evidence to support pharmacists' roles, and the training, remuneration and policy changes needed to recognise these roles and embed pharmacists as core members of the healthcare team. • Pharmaceutical care interventions, including medication reviews. • Role of pharmacists in a shared decision-making approach in collaboration with patients and other members of the healthcare team.
Ethical practice	**Demonstrate knowledge and understanding of:**
Patient care	• Requirements pertaining to obtaining consent from a person before starting treatment for any condition. • The issues for clinicians to consider when assessing consent to treatment in a person with a cancer condition, such as capacity and legislation, especially in paediatric or end-of-life cases. • Shared decision-making approach when contributing to the treatment plan of patients. • Incorporating end-of-life care goals into treatment.
Clinical research	• Ethics of clinical trial enrolment and participation. • Disclosure of information relevant to patient. • Employment of shared decision-making.
Professional/personal	
Professional/personal attributes	**Demonstrate knowledge and understanding of:**
	• Interdisciplinary collaboration between physicians, nurses, pharmacists and other healthcare professionals. • The importance of providing holistic patient care by developing personal and professional skills like self-assessment, leadership, innovation and entrepreneurship, and professionalism. • The need for pharmacists to be life-long learners.
Continuing education and continuing professional development	**Demonstrate knowledge and understanding of:**
	• Clinical pharmacy knowledge and skills that need to be up to date in order to identify, prioritise and resolve complex pharmaceutical problems in a range of healthcare systems. • Using appropriate clinical references and databases for finding information about medicines, drug interactions, etc. • Reading and interpreting primary literature and clinical trial data.

Table 2. Associated skills for pharmacists in cancer care [14,31–33]

Public health	
Advocacy	• Advocate the role of pharmacists in cancer prevention and treatment to promote accessibility to underserved populations. • Form strategic partnerships with key stakeholders, including physicians, cancer specialists, nurses, patient support groups, pharmaceutical companies, health insurance companies and others with a role in the delivery of cancer services. • Establish a structured proposition to address shortfalls in the current matrix of practice, including community assessment and referral of cancer patients, medication reviews, adherence and counselling, with an aim of establishing an integrated health services ecosystem for improved access to quality services. • Model best practices across the continuum of care for patients living with cancer to serve as source of evidence of this contribution to cancer care. • Advocate policy changes that promote autonomy and impact of pharmacists to make helpful interventions. • Engage in social prescribing (when healthcare providers refer patients to support services in their community) where appropriate. • Support people experiencing mental health problems and crises, and link patients to appropriate resources and programmes. Educate other healthcare professionals and care workers on the importance of mental health care with a cancer diagnosis.
Screening	• Implement cancer screening where possible and in accordance with local or organisational guidelines. • Analyse and report population trends on cancer and screening results to key stakeholders. • Initiate and facilitate pharmacy-based cancer screening programmes.
Pharmaceutical care	
Prevention strategies	• Identify people at risk of cancer (e.g., smokers) and engage in counselling activities. • Counsel on and advocate preventive measures such as physical activity and proper nutrition when interacting with patients in the pharmacy or in community settings
Clinical skills	• Interpret relevant test results such as white blood cell count, haemoglobin, neutrophil count, and know the normal and abnormal cut-offs. • Calculate doses as per treatment protocol and recommend relevant dose adjustments, where necessary. • Recommend supportive medication,. e.g., antiemetics, within scope of practice
Communication skills	• Apply motivational interviewing strategies and techniques to enhance adherence and recommend preventive health measures. • Display empathy when counselling and providing patient care.
Ethical practice	

Considerations	• Provide all information for a person's informed consent including:
	  ○ Purpose of the treatment and why it is being proposed;
	  ○ Specifics of the treatment, including frequency and mode of administration;
	  ○ Benefits and risks of the treatment;
	  ○ Potential alternatives to the proposed treatment;
	  ○ Side effects or other potential effects the treatment may have on a patient's daily life;
	  ○ Cost of the treatment or insurance coverage;
	  ○ Consequences of forgoing the proposed treatment; and
	  ○ Who will be providing the treatment.
	• Consider the patient's mental capacity.
	• Respect privacy and confidentiality.
	• Respect patient's decision-making capacity when accessing involuntary treatment.
	• Ensure least restrictive clinical approach when accessing involuntary treatment.
	• Ensure equal and fair care is provided to all patients.

Policies and regulations	
	• Contribute to policy making to support the advancement of pharmacists' roles in prescribing power, symptom management and other clinical services they can provide. • Participate and educate governmental agencies on health disparities and public health issues.
Professional/personal development	
Education and training	• Support the development and delivery of educational and training programmes to upskill pharmacists in cancer care services within scopes of practice. • Develop partnerships between patients or consumers and pharmacists to support pharmacist education and development in cancer prevention and care.
Mental health of self and colleagues in the workplace	• Be cognisant of physical and psychological health of self and peers. • Manage and reduce stress effectively through evidence-based strategies. • Recognise emotional and spiritual needs of people living with cancer. • Foster and sustain professional and meaningful relationships with patients and colleagues. • Achieve balance in different areas of life and maintain a work-life balance.
Clinical decision making	• Develop and incorporate clinical reasoning processes in practice. • Practise shared decision-making (or collaborative decision-making) by sharing information and expertise to help individuals living with cancer understand and jointly with health care providers decide on treatment and management plans. • Extrapolate data from emerging studies to relevant populations in a safe manner. • Collaborate with experts and grow in clinical confidence.

4 Considerations for providers of CPD courses and programmes on cancer for pharmacists

FIP recognises that training and professional programmes for pharmacists and health workers play a key role in the development and maintenance of competence in cancer care and service provision. It is recommended that training and professional programmes, in the form of continuing professional development (CPD), include educational material and training on existing and future pharmacist roles in cancer care. Underpinned by the "FIP cancer care handbook for pharmacists" and the information in Chapter 3 of this knowledge and skills reference guide, training programmes should focus on pharmacists' roles and services in cancer care. At the completion of training, a pharmacist should be able to demonstrate knowledge and apply skills in the following areas:

- Dispensing medicines;
- Medication reconciliation;
- Medication therapy management;
- Medication review;
- Medication counselling and education;
- Adherence promotion and education;
- Monitoring safety and efficacy of chemotherapeutic agents through pharmacovigilance strategies;
- Management of toxicities associated with chemotherapeutic agents;
- Promoting screening services; and
- Team-based care in cancer departments (e.g., hospitals and clinics).

The new frontiers of practice for pharmacists in cancer care may include:

- Early intervention for cancer, including expanded roles in promoting screening for cancer;
- Policy development to improve access to cancer care and medicine;
- Projects and programme management;
- Medication prescribing and monitoring within the context of a collaborative agreement with a primary care provider;
- Involvement in specialty clinics (e.g., paediatric oncology clinics, leukaemia clinics, breast cancer clinics, etc.);
- Expanded roles as part of team-based care in hospitals or outpatient clinics; and
- Provision of preventive cancer services in the community.

The following considerations will support the development and implementation of robust training, guidelines, and transformative CPD programmes that are focused on improving the competence and capacity of pharmacists in cancer care.

4.1 A needs-based approach to addressing education, CPD and training gaps

CPD in cancer care should address local and national needs and reflect individual professional development needs and learning endeavours. The following should be noted:

- The diversity of health systems and contexts may hinder access to cancer healthcare services by consumers. Pharmacists should play a critical role in adequately managing cancer and cancer-related conditions in the context of their local and national needs.
- CPD is lifelong and must be relevant to one's area of practice. As such, CPD in cancer care should focus on addressing individual professional needs and provide a holistic approach to gaining knowledge, learning skills and embracing attitudes and values that allow pharmacists to execute their roles.

- A need-based approach to professional development should consider learning gaps in undergraduate curricula, then build professional development programmes for foundation level pharmacists and advanced and specialist practice filled through curricular and CPD education and training.

4.2 Fostering national and international collaborations on training projects in cancer care

Collaboration on training projects in cancer care for pharmacists allows for:

- Sharing of resources; and
- Increasing the inclusion of relevant international organisations, such as the World Health Organization, United Nations, FIP, and the International Society of Oncology Pharmacy Practitioners in lobbying key decision-makers to facilitate the inclusion of pharmacists well equipped with the knowledge and skills within multidisciplinary healthcare teams to manage patients' cancer illnesses.

4.3 Quality assurance and accreditation of training programmes

CPD programmes in cancer for pharmacists require accreditation to demonstrate that the learning activities have achieved the required standards and benchmarks set by regulatory or professional bodies. Accreditation ensures that the learning value is of high quality and meets the expectations of pharmacists, employers and the community. Certification of training courses and programmes facilitates the standardisation of the crucial knowledge and skills required to upskill. CPD programmes should be aligned to support pharmacists working in cancer care settings and meet their learning needs and development goals. A guide for CPD providers could be based on identifying gaps in knowledge and skills from Tables 1 and 2 and developing programmes mapped to these.

5 FIP Seal for programmes and CPD providers

The FIP Provision and Partnerships Programme provides a global platform to help FIP members address the professional support and development of the pharmaceutical workforce according to local and national needs and priorities.

By offering a global platform for collaboration and partnerships among members and partners, FIP provides opportunities to bridge training and professional development gaps. FIP can identify with members transformative opportunities to accelerate the advancement of pharmacy across all sectors and roles.

In 2021, FIP developed criteria to assure the quality of professional development and training programmes and their alignment with FIP's mission, vision and its 21 Development Goals.[34] The FIP Seal recognises the overall quality and alignment of a programme to FIP goals, vision and mission. Application forms and details of the process to be followed are available to interested parties to undertake self-assessment for the FIP Seal upon request (email Dr Dalia Bajis at dalia@fip.org) and in the FIP handbook for providers of programmes.[34]

The knowledge and skills outlined in this guide provide pharmacists with a baseline against which they can assess their capacity in cancer-associated roles. Combined with the FIP Global Competency Framework, it is also reference point for CPD programme design and delivery. As comprehensive as this guide is, we acknowledge that it may not be entirely relevant to all areas of pharmacy practice. As such, we encourage pharmacists and CPD providers to individualise their programmes to fit the roles and needs of pharmacists.

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