

2018

Training Program and Criteria for the Radiation Oncology Specialty

Translated & Edited By: Iranian Society Of Clinical Oncology





Ministry of Health and Medical Education

Secretariat of the Medical and Specialized Education Council

Training Program and Criteria for the Radiation Oncology Specialty

Educational Planning and Development Department

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In the Name of God, the Merciful, the
Compassionate

Part I

Radiation Oncology Training Program



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List of Attendees at the Meeting of the Educational Planning and Development Commission



Dr. Hassan Hashemi (radiologist) and Dr. Mohammad Ismaeil Akbari (surgical oncologist)

Introduction

The prevalence of cancer is increasingly escalating due to several reasons, and according to the international statistics, cancer is the second cause of mortality in the developed countries (after cardiovascular diseases). In Iran, approximately 100,000 people develop cancer every year, and cancer is the third cause of mortality in this country after cardiovascular diseases and accidents. Meanwhile, the WHO estimates suggest that the number of patients with cancer in all countries will total approximately 20 million people in 2020 with an increase from the 10 million patients in 2000 (with a 100% increase). The highest increase in the outbreak of cancer will be 180% in the developing countries. As a developing country, the outbreak of cancer in Iran will be multiplied by 2 or 3 in the next 15 years, and solid tumors will account for 90% of these outbreaks. The most important causes of the increased incidence of cancer in Iran are aging, lifestyle changes, and environmental factors. On the other hand, cancer has several social, economic, family, and personal impacts. Hence, to provide care to cancer patients there is a need for experienced human forces and financial resources to take the required diagnostic and therapeutic actions and provide constant care. It also calls for comprehensive measures in collaboration with the oncologist, internist, surgeons, pathologist, and radiologist specialized groups.

Furthermore, the patient survival rate has increased considerably by dint of the growing scientific advances in the past years, and currently over 50% of the patients are cured definitively. The most important cause of patients' complete recovery is the development of nonsurgical treatments for cancer.

As the oldest oncology discipline in Iran, this field has been among the most active fields involved in the development of nonsurgical treatments for cancer and oncologic training in the past 50 years.

Discipline's titles in Persian and English:

Radiation oncology	رادیو انکولوژی
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Definition:



This discipline is a clinical specialty enabling the students to understand the basics of cancer prevention, oncology (including etiology, epidemiology, molecular genetics, molecular biology, immunology, clinical pharmacology, medical statistics, radiotherapy physics and protection, and radiobiology), diagnostic procedures, and stages of patients with cancer and to examine and study the standard nonsurgical treatments for different solid cancers of the body organs.

The radiation oncologists substantially work as members of a multidisciplinary team (MDT) to plan the different stages of treatment for cancer cases in accordance with the standards.

Training Course Term

This training takes 5 years to complete.

Summary of the need assessment or change proposals:

- Assessing the number of the required inpatient and outpatient chemotherapy beds
- Assessing the number of the required accelerators and brachytherapy equipment -
Assessing the number of the required specialists

Major modifications to this program as compared to the previous program:

The following major modifications were made to the current program as compared to the previous one.

- 1- Adding palliative care
- 2- Adding and stressing issues such as medical ethics and professionalism
- 3- Improving training in communication skills
- 4- Reexamining the specialized training course
- 5- Adding an internal training course

History and Evolution of the Discipline



A) In the world

Since the early 20th century and the discovery of the destructive or static effects of X-ray on cancer tumors in the late 19th century, radiotherapy has been used to treat some types of cancer. Moreover, as the role of the nitrogen mustard blister agent in reducing the white blood cells in chronic myeloid leukemia and solid tumors was unveiled, this medicine was recognized as the first chemotherapy medication. Moreover, the pre- and post-operative treatments were introduced and applied clinically with the introduction and examination of the effects of the chemotherapy medications on tumors in the 1950s-1960s. Radiotherapy was originally introduced as therapeutic radiology and it was presented with radiology in the European countries and the United States from the 1950s to the late 1960s. With the dawn of systemic medications and therapies and the clinical approaches to cancer (i.e. diagnosis, pathology, chemotherapy, radiotherapy, surgery, etc.), radiotherapy was introduced in the 1960s as a primary clinical discipline involved in the nonsurgical treatment of cancer. This field was known as radio therapeutic oncology in the French countries and as radiation oncology or radiotherapy and oncology in the English countries. Currently, it is referred to as clinical oncology and radiation oncology in some other countries.

B) In Iran

In Iran, Professor Maleki was the first scientist to treat cancer patients using the cobalt machine in the 1960s. Afterwards, in Shiraz, Isfahan, Tabriz, and Mashhad cities other centers started to treat cancer patients using radiotherapy devices and Indian (Tabriz) and English (Mashhad) specialists. In the late 1960s and the early 1970s, ten Iranian oncologists, who were graduates of English universities, returned to Iran and started to serve in the five major universities. They trained professional interns and treated cancer patients through radiotherapy and chemotherapy medications. According to the statistics on these five universities (Tehran, Isfahan, Shahid Beheshti, Mashhad, and Shiraz), over 90% of the patients with solid tumors were treated and followed in the radiotherapy and oncology centers of the aforesaid five universities. Fortunately, most graduates of this specialty are currently the skilled professors of this field and some of them also practice non-surgical treatment of cancer cases in countries such as the United States, Canada, Australia, England, France, Deutschland, and other countries. The first accelerator was installed in Hadrat Seyyed al-Shohada Hospital in Isfahan, and given the recent technological advances all academic centers are now equipped with linear accelerators. Moreover, currently over 260 specialists are performing the non-surgical treatment of cancer patients, and over 100 interns are studying and undergoing training in systemic treatments in the Iranian medical universities. These centers are similar to the developed countries being equipped with new radiotherapy equipment for advanced treatments (radiosurgery, chemoradiation, and conformal and modulated radiation therapy) and systemic treatments. The curriculum of this specialty has



been updated several times in the past years, and it has been also recently modified using the following references and documents.

- The curriculum approved by the 1974 Ministry of Science
- A similar curriculum approved by the Ministry of Health and Medical Education (1985)
- Shiraz University's curriculum (1974)
- The curriculum shared by Tehran, Shahid Beheshti, Isfahan, Shiraz, and Mashhad universities (2000)
- Seven foreign curricula (from England, France, Denmark, Malaysia, Egypt, India, etc.)
- And several examination meetings with the professors of this field and similar fields to explain the teaching approach and professional obligations of the cancer multidisciplinary team (MDT)

The Need for Trained Radiation Oncologists in the Next Ten Years

Given the increasing prevalence of cancer, it is estimated that 30 radiation oncologists must be trained for the next ten years.

Philosophy (Values and Beliefs)

We believe "health", including its physical, mental, and social dimensions, is a fundamental public right. In this regard, specialized radiation oncology serves to destroy the cancer cells with different methods while protecting the healthy cells to the possible extent. On the other hand, we are set to improve the psychological condition caused by "cancer", increase survival rate, and improve the life quality of the patients. We will make every possible effort to achieve this goal and treat patients. Moreover, our services are provided to the public considering the country's economic and social conditions given the high costs of the equipment, medicine, and technologies used in this field. We respect the values and beliefs of our patients and emphasize and resort to notions such as human interests, patient's freedom and independence in taking medical decisions, and ethics and professionalism. We also cover comprehensive health orientation and community orientation approaches, respect the living or seemingly dead tissues, focus on research, lifetime learning, and interdisciplinary cooperation, and try to apply the following principles to the training program on radiation oncology.

- Making active improvements in cancer treatments by increasing the knowledge of the causes and treatments of cancer



- Engaging in clinical research and developing useful technologies for the treatment of patients
- Focusing on the patients and protecting patient health
- Growing the interest and patience required for dealing with the patients
- Having communication skills to communicate with the patients, colleagues, and specialists in other fields and engage in teamwork
- Gaining an accurate understanding of the notion of cancer as a personal issue and a family and social crisis
- Offering cooperation for developing and improving cancer services provided to patients

Finally, the graduates of this field will God willing display growing conscientiousness for their interactions with patients, families, and society. Meanwhile, they increase their knowledge and skills of diagnosis, treatment, and provision of comprehensive care to the cancer patients.

Vision

The 10-year vision of this specialty is described hereunder.

- Providing accessible high-quality fair services across the country
- Improving the quality of training and research
- Excelling in the training and research standards and providing the related services in EMRO
- Training organ-based fellows in the cancers affecting important organs such as the digestive system, orology, and head and neck

Mission

This specialty is designed to train clinical oncologists who are ready to take roles in the policy making, research, and training steps for cancers and who try to practice cancer screening and prevent cancer in society by adhering to the medical ethics and their knowledge and skills. They must also improve public health by selecting the best and most effective diagnostic and therapeutic methods, examining the costs and effectiveness of the treatments, and stressing the life quality and life duration of patients.



Expectations from Graduates

The graduates of this field are expected to

- Collaborate in the prevention and early diagnosis of cancer and public screening
- Carry out clinical assessments, diagnoses, and staging of solid tumors
- Determine the patient-specific prognosis and outcome for patients suffering from solid tumors in different disease stages
- Carefully diagnose emergency oncologic states and take actions to rapidly and properly treat, refer, and provide care to the patients
- Take actions to treat patients with solid tumors using the standard non-surgical techniques
- Carefully diagnose the early and late side effects of therapeutic methods and properly treat or refer the patients
- Adapt the treatment plan to the patient's personal needs or the advice from a multidisciplinary team depending on the complications and clinical condition of each patient
- Select and propose suitable follow-up methods with maximum utility and minimum costs for the treatment of patients
- Select the best treatment method through the timely diagnosis of the recurrence and differentiation of the disease from the late side effects of the treatment
- Know the basics of the physics of radiobiology radiations and protection from radiation and put this knowledge to work
- Participate in the design and implementation of clinical interdisciplinary research on cancer

Graduates' Roles in Society

The trainees completing this training take the following roles in society:

- Assessor and differentiator
- Therapist
- Researcher
- Prevention
- Consultant
- Trainer



- Manager

Trainees' Professional Duties

The trainees completing this training fulfill the following duties in society.

- As an assessor and differentiator
 - o Establishing effective communication
 - o Gaining the case history
 - o Performing clinical examinations
 - o Requesting and interpreting the results from the paraclinical experiments
 - o Diagnosing and staging cancer in collaboration with specialists in the related disciplines
 - o Assessing the patient prognosis
 - o Preventing and diagnosing cancer timely in collaboration with specialists in other disciplines
- As a therapist
 - o Determining the order and details of the treatment plan in an MDT
 - o Demanding the actions required for disease staging
 - o Performing different types of radiotherapy coupled with chemotherapy, auxiliary hormone therapy, biologic treatments, radiopharmaceutical treatments for cancer patients, and other systemic treatments
 - o Performing different types of chemotherapy for solid tumors in adults
 - o Understanding different palliative treatments

Note: This discipline is not involved with pediatric chemotherapy and blood cancers.

- As a researcher
 - o Participating in cancer research teams
 - o Designing and implementing cancer research proposals
 - o Participating in national cancer projects
 - o Designing and conducting prevention and screening studies
 - o Collaborating in the recording of cancer information
- As a trainer
 - o Training the technical personnel and team
 - o Training the patients and companions
 - o Training groups, populations, and society (if necessary)
 - o Training specialized and super-specialized interns, fellows, and students from different medical categories
- As a manager
 - o Participating in the management of the centers for cancer diagnosis, treatment, and research
 - o Participating in the policy making and implementation of cancer prevention, diagnosis, and treatment plans
 - o Contributing to the establishment of cancer control centers



- As a counselor
 - o Providing specialized advice to the health system policy makers and executives
 - o Providing specialized advice to the patients, companions, and colleagues in other fields
- Prevention
 - o Taking preventive diagnostic actions for patients, family members, and society

Expected Competencies and Procedural Skills

A: General Competencies

Competency	Teaching method
Collecting and recording information <ul style="list-style-type: none"> - Establishing effective professional relationships 	Running training workshops
Specialized acquisition of medical history	Bedside training
Specialized assessment and examination of patients	Bedside training
Requesting paraclinical experiments with rational reasons	Holding training workshops
Opening files, recording the information, and arranging medical documents	Holding training workshops
Performing clinical reasoning, diagnosis, and decision making for the patient <ul style="list-style-type: none"> - Interpreting paraclinical experiments - Integrating clinical and paraclinical findings - Clinical deduction and judgment - Diagnosing the disease - Making clinical decisions to solve the patient's problems 	Bedside patient training
Patient management: Patient care	Self-study theoretical class
Rational prescription of medication (writing a prescription and an order)	Holding training workshops
Selecting the best diagnostic-therapeutic approach and implementing it for the patient	Self-study theoretical class
Requesting and providing medical advice	Holding consulting and counseling workshops



Making the required arrangements and referring the patients Training the patient Following the patient	Exercising during the course
Other competencies: Research	Holding a research method and paper writing workshop
Providing professional advice	Supervised exercise
Supporting and defending patient rights	Holding workshops or classes
Practicing evidence-based medicine	Holding workshops or classes
Using computers and doing scientific research in electronic resources	Issuing an ICDL certificate or an approval

B: Procedural Skills (Diagnostic-Therapeutic Actions) Note: The rounds specified in this table apply to “learning”, but there is no limitation to the iterations of each action during a course (i.e. the iterations vary by need). The team size can also be increased if necessary.

Procedure	Observation	Assistance in implementation	Independent implementation	Total
Different types of radiotherapy techniques (external, brachytherapy, radiosurgery ¹ , stereotactic radiotherapy, intraoperative radiotherapy ² , nonionizing radiotherapy such as photodynamic therapy and electric field therapy)	100	300	100	500
Operating different types of radiotherapy machines	100	300	100	500
Using methods of regulating the standard cancer treatments (hyperthermia therapy)	20	15	15	50
Aspiration or diagnostic, palliative, and therapeutic drainage	20	15	15	50
Prescribing and injecting different types of chemotherapy medications and other intravenous, intra-arterial, intrathecal, local, and intracavitary ³ in solid tumor cases	200	600	200	1000
Prescribing and injecting nuclear medicine for cancer patients	20	15	15	50

Using infusion pumps	40	30	30	100
Thoracentesis and pleurodesis	20	10	10	40
Simulations required for radiotherapy using MR Sim, CT Sim, digital X ray, and pet CT Sim	100	300	100	500
Different treatments for external radiotherapy, internal radiotherapy, and brachytherapy	100	300	100	500
Placing different external applicators, brachytherapy devices, and interstitial catheters ²	20	60	20	100
Designing and manufacturing accessories for radiation therapy (fixator, shield, and blouse)	50	150	50	250
Using and maintaining the infusion port	20	10	10	40

1. It is carried out in the operating room in the presence of a surgeon.
2. It is accomplished as a multidisciplinary task.
3. Chemotherapy of blood cancers (lymphoproliferative and myeloproliferative) is an exception.
4. The method of prescribing and injecting nuclear medicine in accordance with international rules and regulations on the administration of nuclear medicine and making arrangements with the appropriate groups by following the instructions prepared by the secretariat

Educational Content

Core Procedure Skills Topics

No.	Skill	All of the required iterations	1 year	2 year	3 year	4 year
1	Body organ contouring	400	0	100	100	200
2	Planning the treatment of tumors and assessing and optimizing them	400	0	100	100	200
3	Implanting different brachytherapy applicators	80	0	20	20	40
4	Injecting nuclear medicine to treat cancer	30	0	10	10	10
5	Intracavitary injection of medicine to treat cancers	30	0	10	10	10
6	Local injection for cancer treatment	20	0	5	5	10



7	Intravenous and intra-arterial injection of medicine to treat cancer	750	0	150	250	350
8	Using infusion pumps	60	0	10	30	20
9	Aspiration and diagnostic, palliative, and therapeutic drainage	30	0	10	10	10

Educational Strategies

This program was formulated based on the following strategies.

- Task-based learning
- Problem-based learning
- Subject-directed learning
- Evidence-based learning
- Disciplinary learning and topic integration (if required)
- A combination of students and professors
- Community orientation
- Hospital-based training
- Systemic learning
- Compulsory training and limited remote elective training

Training Methods and Techniques (Teaching and Learning Methods)

The following training methods and techniques are utilized in this course.

- Collective teaching methods such as hospital-based conferences, lectures, morning reports, tumor board, CPC, journal club, paper criticism, etc.
- Small-group training
- Self-study
- Demonstration for treatment planning
- Case-based discussion
- Supervised clinical experiences
- Problem-based learning (PBL)



The list of fields or courses that overlap with or hinder some procedures:

- Professional interference

Suggestions for solving professional interference problems:

The trainees need to accomplish team tasks in the following complicated condition. As a member or team leader they accomplish the tasks depending on the task type as a team. Given the main mission of the specialists in this field, which include nonsurgical cancer treatments especially for solid tumors, this discipline has no interference with other fields. However, cancer is treated through MDT teams, wherein specialists with different specialties (surgery, internal medicine, women's diseases, pathology, radiology, and other specialties) collaborate and interact closely. It is worth stating that except for patients with solid tumors radiotherapy will be administered only for the referred patients.

Training Course Overall Structure

Internship years	Ward, unit, or training department	content	Duration
Internal medicine no. 1	General internal medicine	Explanation is provided on page 14.	3 months
	Internal medicine – Heart	Explanation is provided on page 14.	2 months
	Internal medicine – Digestion	Explanation is provided on page 14.	2 months
	Internal medicine – nephrology	Explanation is provided on page 14.	2 months
	Internal medicine – Lungs	Explanation is provided on page 14.	2 months
	Internal medicine – infections	Explanation is provided on page 14.	1 month
Second	Radiation oncology	The principles of	12 months

	ward	treating malignancies, radiotherapy principles, chemotherapy principles, systemic treatments, palliative and maintenance treatments, specific treatments of solid tumors (diagnosis, staging and treatment), and complication control	
Third	Radiation oncology	Specific treatment of malignancies (diagnosis, staging, and treatment)	10 months
	Blood and adult cancers ²	Explanation is provided on page 14.	2 months
Fourth	Radiation oncology	Specific treatment of malignancies (diagnosis, staging, and treatment)	9 months
	Radiology	Cancer imaging principles (advanced and 3D)	1 month
	Nuclear medicine	Explanation is provided on page 14.	1 month
	Pathology	Explanation is provided on page 14.	1 month
Fifth	Radiation oncology	Specific organ-based training in oncology through the selection of an organ including the breasts, digestive system, female reproductive system, neck and head, urinary tract, and brain	12 months

Notes:



1. Those parts that are offered as classes are taught by professors as lesson plans once or twice a week.
2. In each rotational section, the assessment score is assigned by the appropriate group as part of the continuous assessment score.
3. The intra-course assessment is carried out at the same time with the assessment of other interns through different questions covering the contents of the courses and the clinical training topics including the principles of diagnosis and treatment of cancer.
4. At the end of year one, the interns take the internal diseases exam to be promoted from rank 1 to rank 2.

Topics addressed by interns in the rotational sections (classified by section):

Ward, section, or training department	Content
General internal medicine	Principles of internal medicine with an emphasis on oncology, emergency, and endocrines
Nephrology ward Digestion ward	Understanding and controlling the renal side effects of treatments, water, and electrolyte, Methods of diagnosing tumors of the digestive system and treating the digestive side effects of cancer treatments
Hematology ward Radiology ward	Understanding the common blood diseases and blood cancers, Principles of cancer imaging (advanced and 3D)
Pathology	Principles of cancer pathology and histology
Nuclear medicine	Understanding the use of nuclear medicine and diagnostic tests
Infectious diseases	Understanding the general principles of infectious diseases, antibiotic treatments, and infections immunodeficiency
Cardiovascular ward	Understanding heart diseases and side effects of chemotherapy medications for heart diseases

Content

Core Curriculum

No.	Syllabus	Time (hour)	Internship year
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1	Principles of communication with patients	1 or 2-day workshop	First
2	Counseling and consulting	1-day workshop	Second
3	Study methods and self-development	1 or 2-day workshop	First
4	Medical ethics and declaration of patients' rights in oncology	1 or 3-day workshop	Second
5	Laws and cancer medicine	1-day workshop	Second
6	Rational medication prescription	1 or 3-day workshop	Second
7	Clinical cancer pharmacology	During the year	Second
8	Cancer epidemiology, cancer research methods, and statistics	During the year	First
9	Palliative care	During the year	Second
10	Cancer radiobiology	During the year	Second
11	Radiotherapy physics (basics)	During the year	second
12	Radiotherapy physics (advanced)	During the year	Third
13	Radiotherapy physics (brachytherapy)	During the year	Fourth
14	Advanced radiotherapy planning principles	During the year	Fifth

Notes: These training workshops are designed, implemented, and evaluated as subject-oriented workshops by this group in collaboration with EDO of the faculty or the EDC. In addition, training may be planned in joint workshops attended by other interns.

General, basic specialized, and clinical specialized courses:

Syllabus

Overview of cancers:

- Risk factors and etiology (biological/physical chemical factors, the role of nutrition, the role of genetics, the role of proto-oncogenes, etc.
- Epidemiology (prevalence and incidence of the relative risk of survival, transmission mechanism, ...)
- Side effects
- Recording
- Screening
- Genetic counseling
- Preventing on different levels

Biology and genetics in cancer:

- Natural biology of cells
- Basis and mechanism of synergogenesis
- Cellular kinetics
- Cell division
- Planned cell death
- Molecular genetics of cancers
- Role of proto-oncogenes
- Tumor-inhibiting genes
- Genes involved in planned cell death
- Angiogenesis
- Invasion and metastasis
- Role of chemical factors
- Role of physical factors
- Major family malignant syndromes
- Chromos analysis – Molecular techniques such as PCR

Tumor immunology

- Humoral and cellular immunity
- Role of cytokines in immunomodulation
- Tumor antigens
- Killing tumor cells via the immunity system

Cell physiology

- Principles of transfer of chemicals into cells

- Metabolism and secretion
- Cell performance in the presence of carcinogens

Cancer pathology

- Pathology of types of malignancy
- Methods of biopsy
- The role of cytology in the diagnosis of malignancies
- Exfoliative cytology
- Application of aspiration cytology
- Application of frozen sections
- Immunohistochemistry
- Electron microscope
- The role of autopsy in cancer pathology
- Pathology in the diagnosis of cancer
- Malignancies and staging – the importance of grading - Tumor indices

Anatomy

- Functional anatomy
- Circulatory system
- Lymphatic system
- Sectional anatomy
- Relationship of imaging findings with body topography

2. Basic principles of treating malignant diseases

Cancer diagnosis and staging methods

Imaging methods:

- Mechanical and physical principles of different imaging methods
- Interpretation of simple radiographs especially malignancy-related radiographs
- CT-scan interpretations with or without the radicontrast agent especially in malignant cases -
Interpretation of malignance MRI results
- Interpretation of the radioisotope scan findings especially in the case of malignancy
- Endoscopic ultrasonography imaging methods and their applications
- Proper application of each imaging method to the diagnosis, staging, and follow-up phases and the sensitivity and specificity of each method
- The cost of effectiveness of each imaging technique

Endoscopy and laparoscopy

- Indications of different endoscopy methods



- Indications of laparoscopy, mediastinoscopy, and thoracoscopy and their applications to the diagnosis, staging, and treatment of cancer

Overview of oncologic treatments: General principles

- Basic cancer patient treatment principles
- Planning treatment and sequences of various therapeutic methods for each patient
- Determining the treatment policy through group decision making
- Patient role in making decisions on the treatment





- Palliative care and definitive care notions and skilled selection of each type of care
- Patient life quality and its role in the determination of the palliative or definitive treatment choice
- Treating and controlling the acute and late side effects of cancer treatment
- Treating and controlling oncologic emergency cases
- Psychological principles of cancer patients

Principles of surgical oncology:

- Indication and contraindications of surgery in various malignancies
- The role of surgery in the definitive and palliative treatment of various types of cancer and its relationship with other oncologic treatments
- The role of surgery in staging
- Indication and importance of organ preservation surgeries
- Postoperative side effects and their skilled management
- Interaction of surgery with other therapies (such as pre- and post-operative chemotherapy and radiotherapy)

Radiotherapy principles

- Basics and applications of different radiations and indications of radiotherapy
- The place and order of radiotherapy techniques in the patient-specific plans
- Application of nuclear medicine to the treatment plan and side effect control - Palliative radiotherapy
- Control and management of acute and chronic side effects of radiotherapy in different organs
- Patient- and disease-specific design of radiotherapy plans (optimized and customized plans)
- Adoption of the proper radiotherapy technique (including external beam radiotherapy, brachytherapy, radiosurgery, and intraoperative radiotherapy), device, and energy

Principles of chemotherapy, hormone therapy, biologic therapy, and other systemic therapies

- Pharmacokinetics and pharmacodynamics of systemic treatments
- The place and order of different systemic treatments in the patient-specific plan
- Application of systemic treatments to cancer (chemotherapy, hormone therapy, and biology therapies)
- Concurrent application of systemic treatments with other treatments
- Identification and prescription of the medication type and dose based on the comorbidities and renal, kidney, and cardiac functions
- Treatment and control of acute and late side effects of systemic treatments

Principles of palliative and maintenance treatments

- Basics and principles of palliative treatments
- Application of palliative treatments



- General principles of cardiac diseases and proper treatment of cancer cases
- General principles of respiratory diseases and proper treatment of cancer cases
- General principles of digestive system diseases and proper treatment of cancer cases
- General principles of endocrine diseases and metabolism and proper treatment of cancer cases
- General principles of infectious diseases and proper treatment of cancer cases
- General principles of renal diseases and proper treatment of cancer cases
- Principles of using blood and blood products and factors affecting the haematopoiesis agents



and immune system

- Special considerations and care for severely ill patients
 - Etiology, epidemiology, risk factors, molecular genetics, molecular biology, tumor immunology, prevention, screening, diagnostic methods, staging, and treatments of organ-specific malignancies
 - Head and neck tumors
 - Respiratory system and mediastinum tumors
 - Digestive system tumors including the esophagus, stomach, colon, rectum, anus, liver, pancreas, bile duct, small intestine, and other digestive system appendices
 - Urinary tract tumors such as the testicles, bladder, prostate, kidney, urinary tract, penis, and urethra
 - Female reproductive system tumors including the uterus, cervix, ovaries, fallopian tube, vagina, pudenda, peritoneal tumors, gestational carcinoma, and other appendices of the female reproductive system
 - Breast tumors
 - Endocrine tumors including the thyroid, parathyroid, adrenal, pancreas endocrine tumors, carcinoid tumor, carcinoid syndrome, and other male endocrine tumors
 - Soft and bone tissue tumors
 - Skin tumors, appendices, and melanoma
 - Malignant and benign mesothelioma
 - Central nervous system tumors
 - Hodgkin's lymphoma and non-Hodgkin's lymphoma, plasma cell and leukemic neoplasms
 - Oncologic emergency cases
 - Unknown primary metastasis
 - Metastasis in different organs such as the lungs, liver, bones, oocyte, and malignant pleural effusion
 - Paraneoplastic syndromes
 - Malignancies in patients with immunosuppression
 - Treatment of some benign diseases with radiotherapy
 - Recurrence of cancer
 - New treatments for cancer including gene therapy and cancer vaccines
 - Focused imaging therapy and cell transfer therapy
-
- Cancer radiobiology and biology
 - Radiotherapy physics and treatment plan
 - Clinical pharmacology
 - Medical statistics and research method



Note: If the aforesaid centers are not available at the university, the team can make arrangements with other universities or academic centers to send the interns to their centers.

Expectations of Professionalism from Interns

Professionalism Expectations from Interns

I- Principles of Professionalism

The interns and graduates of this field are expected to:

A) Concerning altruism

- 1) Prefer the patient's interests to their own interests
- 2) Treat the patients fairly
- 3) Consider the physical, psychological, and social dimensions of the patients they deal with
- 4) Spend adequate time on each step of provision of care to patients
- 5) Value the patients' demands and pains
- 6) Follow and promote the patient rights charter in all conditions

B) Concerning conscientiousness

- 1) Fully commit to their obligations
- 2) Answer the patients' questions
- 3) Provide the information on the patient's conditions to the patients and their companions in the most appropriate way
- 4) Avoid interfering with their colleagues' jobs and have constructive interactions with the healthcare team members
- 5) Function responsibly in all of the phases of care provision and transfer of patients



- 6) Obtain the patient's permission for any interview, examination, and any other therapeutic-diagnostic action
 - 7) Provide the patients with proper training in the prevention of the exacerbation of diseases, outbreak of complications, reoccurrence and transmission of diseases, and improvements in their life quality
- C) Concerning honesty and righteousness
- 1) Be honest
 - 2) Be righteous
 - 3) Be trustworthy
 - 4) Respect the patient's privacy
- D) Concerning respect for others
- 1) Respect the patients' beliefs, customs, and habits
 - 2) Treat the patient as a human and mention his/her name and information with respect
 - 3) Respect the patient's companions, the medical team, and their colleagues
 - 4) Alter their appearance to match the professional ethics
- E) Concerning occupational excellence
- 1) Be open to criticism
 - 2) Know their scientific flaws and seek help and advice when needed
 - 3) Improve their knowledge and competencies continuously
 - 4) Properly take therapeutic-diagnostic actions in accordance with the available scientific achievements and facilities
 - 5) Live up to the complementary standards for the creation of medical records and reporting

II- General Solutions for Correcting the Professionalism Teaching Process in Academic Environments

(Please read the proposed solutions carefully and rule out the solutions that do not conform to the course.)

Interns are expected to make the following attempts to establish professional ethics in the academic environments with the aid of the professors.

Contributing to the provision of proper settings



- Setting the scene for the personal and private tasks in the academic and therapeutic environments by, for example, using curtains and partitions during the examinations, etc.
- Presence of a nurse of the same gender or the patient's companion in all medical examinations next to the physician (intern) and patient
- Providing a room to the patient and his/her companion (e.g. for mothers and neonates in pediatric wards)
- Creating an appropriate, reliable, and safe environment in accordance with the religious and cultural beliefs of the patients, companions, professors, and trainees (by for example providing a prayer room)

Contributing to the correction of executive processes

- Collaborating with the executive managers of the hospital to correct the executive processes such as the processes in the reception, hospitalization, pharmacy, equipment, and release departments and to prevent the confusion of the patients and facilitate the process for them
- Respecting the hospital personnel and clients
- Paying attention to the executive processes of the hospital to facilitate the provision of services, maximize patient welfare, and offer corrective suggestions to the hospital managers

Contributing to the establishment of a suitable academic environment

- Participating in the establishment of an intimate and respectful academic environment
- Attempting to eliminate any threat and humiliation in the academic environments
- Fostering proper and effective collaborations between the departments and disciplines
- Organizing and participating in teamwork
- Timely admiration of the personnel performance, junior interns, and other trainees
- Actively participating in the introduction of models to the academic authorities
- Actively participating in role modeling
- Attempting at the reinforcement of interpersonal communications
- Participating and collaborating in the development of training instructions for the trainees (priming)
- Observing the material, spiritual, and social rights of the professors, students, and members of the health team



Promoting Patient-Oriented Strategies

- Supporting the material, spiritual, and medical rights of the patients including their physical, mental, and social rights (regardless of race, religion, age, gender, and socioeconomic class) in all conditions
- Winning the trust of patients to protect their rights
- Establishing suitable social relationships with patients such as saluting, being friendly, being empathic, and being promising
- Patiently answering the patient questions in all conditions
- Teaching the junior interns and trainees how to respond properly to the patients' questions
- Introducing oneself as the corresponding physician to the patients and also introducing the junior interns, trainees, assistants, and nurses fully to them
- Asking questions about the eating, sleeping, and bathing habits of the patients and their preferences, and meeting their requirements
- Paying attention to the patients' personal hygiene
- Paying attention to the quantity and quality of patients' food in the training and working rotations
- Paying attention to the patients' needs for easy excretion of urine/faeces with an emphasis on their private conditions
- Paying attention to patient safety in all diagnostic and therapeutic actions
- Providing all patients in all wards with a peaceful environment for saying prayers regardless of their religion (especially the patients in the bed-rest mode)
- Respecting patients in all conditions
- Providing proper clothing to the patients during the medical examinations
- Respecting the patient families and companions
- Prescribing medication, experiments, and therapeutic equipment considering the economic status and insurance coverage of the patients and avoiding unnecessary expensive tests
- Using the health insurance cards and facilities properly
- Communicating with the units and appropriate authorities of the social work department to discuss the solvable problems of the patients
- Winning the permission and consent of the patients for examinations and performing all diagnostic and therapeutic procedures
- Respecting patient independence and freedom in making decisions
- Avoiding disclosure of patient secrets
- Providing adequate information to the patients on the diagnostic-therapeutic issues such as the costs and estimated hospitalization duration



Application of STEEP principles:

- Providing safe services to the patients
- Providing timely services to the patients
- Providing services with expertise to the patients
- Providing effective and efficient services to the patients
- Adopting a patient-centered approach in all conditions

Participating in and encouraging training and communicating ethical rules:

- Teaching the junior interns and trainees how to maintain effective and proper professional communications
- Providing training in professional ethics to the junior interns and students
- Communicating or teaching the patient bill of rights, dress code, and ward ethic codes to the junior interns and trainees
- Constantly applying the ethical principles in all theoretical and practical training activities and processes such as morning reports, rounds, conferences, clinics, and operating rooms
- Criticizing the ethics of current processes in weekly meetings with the professors, interns, and trainees
- Setting the scene for training discussions and investigations into all malpractice in the weekly meetings with professors, interns, and trainees
- Involving the trainees of different ranks in the patient training programs

Pointing out other ethical principles to the junior interns and trainees:

- Treating the dead or living tissues with respect
- Treating corpses with respect
- Sympathizing with the family of the deceased
- Maintaining and preserving the patient body organs, the organs natural performance, and the beauty of the patients as much as the science and technology allows
- Respecting fetus rights (from the inception to birth) when there is no legal and religious permission for abortion
- Valuing the golden time of helping the patients and avoiding the waste of time to protect the patient's life chances or save his/her body organs
- Rationally prescribing medicine and making rational paraclinical requests



- Observing clinical governance rules in all clinical decision makings, prescriptions, and diagnostic/therapeutic actions

Constant Monitor and Supervision of Trainees

- Participating in all training programs (morning reports, working and training shifts, clinic shifts, night shifts, tumor board, CPC, etc.) and supervising the attendance of other trainees by assigning responsibilities, making phone calls, and visiting different shifts, clinics, emergency rooms, etc. to gradually evoke conscientiousness in the trainees
- Paying timely bedside visits to the patients in the emergency room
- Paying attention to one's own and other trainees' performance (i.e. social communications, clothing, and discipline) by enforcing the dress code, providing feedback to the other trainees, and stressing one's role as a role model
- Emphasizing one's own and trainees' professional performance (in, for example, acquiring the specialized medical histories of the patients, requesting rational tests, interpreting and integrating the clinical and paraclinical findings, clinical deduction and judgment, diagnosis, clinical decision making, rational medication prescription, selection and adoption of therapeutic actions, seeking medical advice, referring patients, completing research projects, using computers and professional software, and doing patient follow-up programs) by valuing the constant completion of the logbooks and seeking professors' direct supervision to reduce the malpractices and medical errors
- Respecting the research ethics rights in writing theses based on the ethics committee instructions
- Avoiding research at the expense of the patients and methods that are not fully mastered by the interns
- Valuing the method of completion of medical records so that they are easily accessible in the present and future

III- Professionalism Considerations

(Please write down the ethical issues specific to this discipline.)

Notes:

- Professionalism teaching basically involves role modeling and priming (process design and presentation).
- An intern's ethical performance is assessed through direct supervision, which is carried out through logbook assessments and 360-degree assessments by the faculty members.



- Each department is obliged to draft plans for the theoretical and practical training of the interns and trainees.
- One faculty member in each department shall be in charge of the optimum enforcement of the above provisions.

References for Teaching this Curriculum

A: English references

- Principles and Practice of Radiation Oncology ,Edward C Halperin, Carlos A Perez, Luther W Brady, David E Wazer, Carolyn Freeman
- Oxford Text Book Of Oncology
- Principles & Practice of Oncology ,Vincent T DeVita, Theodore S Lawrence, Steven A Rosenberg (Ronald A DePinho, Robert A Weinberg
- Cancer Medicine ,Holand serri
- Radiobiology for the Radiologist, Eric J Hall, Amato J Giaccia
- The Physics of Radiation Therapy, Faiz M Khan
- Oxford Treatment Planning Of Radiotherapy
- Clinical Radiation Oncology, Gunderson and Tepper
- Uptodate /Oncologysection

English Journals

- Journal Of Clinical Oncology
- International journal of Radiation Oncology . BIOLOGY. PHYSICS
- Radiotherapy & Oncology . journal of the European society for Therapeutic Radiology and Oncology
- Annals of Oncology
- Clinical Oncology- England
- Seminars in oncology
- Seminars in Radiation oncology



- <http://www.bccancer.bc.ca>
- [http:// www.nccn.org](http://www.nccn.org)

The above websites are only suggested to introduce the state-of-the-art topics and notions.

Notes:

- 1) If the promotion and final exams are held, the textbooks are identified by the examining board in accordance with the existing codes, and the references listed on this page provide a guide to these plans (the references for the national official exams are selected by the members of the related examining board in accordance with the national instructions from the above references).
- 2) The last published versions of the aforesaid books are required.
- 3) “Journals” also refer to journals published during the internship.

Student Assessment

A: Assessment Methods

- 1) On-the-job assessments (novel assessment techniques) ○
 - Mini-clinical evaluation exercise (mini-CEX)
 - Direct observation of radiotherapy planning skills (DORPST) ○
 - Direct observation of systemic therapy (DOST) ○ Multi-Source Feedback (MSF) ○ Case-based Discussion (CbD) ○ Patient Survey (PS) ○ Audit Assessment Tools (AA) ○ Teaching Observation (TO) ○ Logbook ○ DOPS
- 2) Multiple Choice Tests
- 3) OSCE
- 4) Professional behavior

B: Periods of Assessment

Interns are assessed during the following periods.



- Constantly
- Between and at the end of each part or round
- At the end of each year (annual promotion exam)
- At the end of the course (preboard and board)

Interns' Duties

The description of the intern duties is provided in the related codes.

Minimum Faculty Member Requirements (Number, Minor, Rank)

The recommended minimum number of faculty members is 4, and at least one professor or two interns are needed.

Trained Personnel Required for Program Implementation

- Radiotherapist
- Bachelor, master, and PhD of medical physics (minor: radiotherapy)
- Trained social worker (palliative care)
- Trained cancer psychologist (palliative care)
- Trained cancer nutritionist (palliative care)
- Trained general medicine practitioner (palliative care)
- A nurse trained in oncology

Required Specialized Spaces

The specialized spaces required for this course, which must be available at the related university, are as follows.



Ward section: hospitalization ward, chemotherapy outpatient ward, radiotherapy and palliative chemotherapy outpatient clinic (at least 4 clinics), palliative hospitalization ward, linear accelerator and accessories room, brachytherapy and accessories room, and cancer nuclear medicine and accessories room

Rotational sections: internal medicine (hematology, nephrology, digestion, and respiration) wards, infectious and tropical diseases, cardiovascular diseases, nuclear medicine center, radiology, pathology, genetics, orthopedics, women's diseases, urology, neurosurgery, surgical oncology, medical physics and rehabilitation, pediatric oncology and general surgery

Diversity and minimum number of major diseases per year:

Disease	Quantity
Digestive system cancers	250
Breast cancer	120
Reproductive system cancers	100
Head and neck cancers	100
Lymphoma	50
Women's cancers	50
Lung and mediastinum	30
CNS cancers	50
Sarcoma	30
Skin cancers and melanoma	50
Child cancers	20
Side effects of oncologic treatments	500
Oncologic emergency states	40
Cancer of unknown primary	30
Endocrine cancers	30
metastatic cancers	200
Leukemia	50
Other tumors	100

Number of beds required for each intern during the course: At least 12 beds are required per intern and 2 beds are added per extra intern.

The number of chemotherapy outpatient beds required per intern each year: 3



The Required Supplementary Facilities

- Ward classrooms
- A conference hall available for collective training
- High-speed Internet connection
- A ward library containing all necessary references
- Archives organized by the ICD system 10
- Professors office
- Separate pavilions for interns
- Classified medical records maintenance system and internship portfolio
- Ward head and educational affairs secretary and expert rooms
- Facilities required for the internship program management
- An available computer running the required specialized software

The necessary specialized equipment

- At least 2 accelerators at each center with at least one high-energy accelerator
- At least 1 CT simulator at each center
- The necessary priming for every 2 admitted interns: 1
- Digital simulator and CT simulator
- Brachytherapy machines: 1 (intracavitary or interstitial PDR or HDR or MDR or LDR)
- Dosimetry and priming equipment and ray detectors: At least 1 series (and more in proportion to the accelerators)
- Chemotherapy medications preparation equipment: At least 1
- Chemotherapy infusion pump: At least 6 (and more in proportion to the number of inpatient chemotherapy beds)
- Equipment required for the systemic and local infusion of nuclear medicine, infusion pump, port, and hood: at least 1

Required specialties and disciplines

A) Required disciplines



Emergency, nephrology, infectious diseases, digestive system, hematology, endocrines, lungs, heart, general surgery or surgical oncology, radiology, and nuclear medicine

B) Specialties

Emergency, women, anesthesia, neurosurgery, otorhinolaryngology, head and neck surgery, radiotherapy physics

The criteria used by the universities that are authorized to implement this plan as listed hereunder.

Universities must meet the following requirements to be granted the permission to implement this program.

- 1) Meet the minimum requirements specified in this program
- 2) Have graduates in at least 4 general medicine courses

The role of trainees in the reference system and family medicine:

These trainees are referred on three levels.

Program Evaluation

A: Program Evaluation Criteria

This program is evaluated on the following conditions.

- Following a four-year period
- If recommended by the appropriate ministry
- If recommended by the examining board
- If recommended by the faculty members or interns or approved by the board

Suggestions are offered to the Program Development Committee and other legal authorities that make the decisions.



B: Program evaluation method

- Seeking the opinions of the faculty members involved in this program as well as the interns and students with the available questionnaires
- Using the existing questionnaires of the Evaluation and Accreditation Unit of the secretariat

C: Program evaluator

The Evaluation and Accreditation Unit of the secretariat of the Medical and Specialized Education Council is in charge of evaluating this program in collaboration with the Program Development Committee.

D: Program Revision

This program is revised through the following steps.

- Extracting the information from the interviews, comparative and field research, and expert opinions
- Asking the secretariat to form a Program Revision Committee
- Presenting the collected information to the Program Revision Committee
- Revising the flawed parts of the program and providing new drafts of the educational planning and development commission

E: Program evaluation criteria and indices

Index	Criterion
Students' satisfaction with the program	70%
Faculty members' satisfaction with the program	80%
Satisfaction of the health system managers with the program	80%
Satisfaction of the needs and elimination of the health problems by the students	At the assessor's discretion
The quantity and quality of the intellectual and research productions by the students	At the assessor's discretion



Program Evaluation Framework

Note: The checklist hereto attached may be used in the program evaluation phase.

This program is evaluated within the following framework. The answer to each question calls for thorough research, and assessors evaluate the program after developing the required tool.

No.	Question	Data collection source	Method	Expected criterion
1	Has the program been provided to all faculty members and	Interns – professors	Questionnaire	> 80%
	interns?			
2	Has the program content been communicated properly?	Documents	Observation	> 80%
3	Are the faculty members and interns informed of the implementation of the program?	Interns – professors	Questionnaire	> 50%
4	Has the program been supported by the appropriate ministry, university, and faculty members?	Professors and managers' approval	Interview and observation	> 70%
6	Have the beliefs and values been observed during the implementation of the program?	Process assessment	Questionnaire	> 80%
7	Has the discipline mission been accomplished as regards training?	Outcome assessment	Questionnaire	> 70%
8	Have the production of science and publication of articles increased in line with the vision?	Article assessment	Observation	(yes)+
9	Have the predicted outcomes been achieved?	Interns performance assessment	Questionnaire	> 80%
10	Is there a faculty for the implementation of the program?	Documents	Observation	100%

11	Has the patient diversity been adequate for training in this discipline?	Documents	Observation	100%
12	Has the predicted specialized equipment been procured and supplied?	Equipment assessment	Observation	100%
13	Have the educational sections, wards, and units required for the implementation of this program been provided?	Domain assessment	Observation	100%
14	How much have the active teaching methods been used?	Interns	Interview	>50%
15	Has the training content been provided?	Documents and programs	Observation	>80%
16	How much has the structure of the course and rotational sections been respected?	Interns	Interview	>80%
17	Have the moral expectations been satisfied?	Professors- patients	Interview	>90%
18	Are the identified references available?	Documents	Observation	100%
19	Have the interns been evaluated as planned?	Documents	Observation	>80%
20	Has the number of the relevant positions taken by the students been satisfactory?	Students	Questionnaire	>90%
21	Do the students fulfill their duties optimally in society?	Workplace managers	Questionnaire	>70%
22	Has the interference between the duties in this discipline and other disciplines caused any problem?	Professors	Interview	<10%
23	How are the interns and professors satisfied with the program?	Interns- professors	Questionnaire	>70%
24	How are the workplace managers satisfied with the students' performance?	Managers	Questionnaire	>80%



Binding Curriculum Standards

- The evaluated program must be provided to the faculty members and interns.
- The course term mentioned in the evaluated program must be respected by the executive universities.
- The intern requirements for taking the course of concern must match the requirements identified in the program.
- The intern admission capacity for the course must match the approved capacity.
- The intern admission capacity must match the overall national needs identified in the program.
- The interns must have acceptable logbooks matching the general and specific competencies identified in the program.
- The interns' logbooks must be continuously corrected and monitored by the professors who provide feedbacks.
- The interns must complete the required amount of procedures depending on their internship year. They must record the results and have the logbooks signed by the supervisors.
- At least 70% of the teaching methods and techniques specified in the program must be adopted in the course of training.
- The interns must be actively present in the clinic on the days specified in the program. They must fulfill their duties under the supervision of their professors or senior interns and must have access to the clinic's weekly or monthly programs.
- The surgical oncology interns must be actively present in the operating rooms on the specified week days and must operate under the supervision of their professors and senior interns. The nonsurgical treatment interns must also be actively present in the procedure rooms. The weekly or monthly schedules of the operating rooms must be available.
- Interns must actively participate in the morning reports, internal conferences, lower rank training sessions, and on-call shifts in accordance with the ward schedule. The weekly or monthly schedule of the on-call shifts must also be available.
- Interns must actively participate in the training rounds and the inpatient working shifts or the training periods in accordance with the ward schedule.
- The quality of the medical records completed by the interns must be approved by the assessing team.
- Interns must serve in the rotational sections identified in the program depending on their internship year and shall receive a certificate issued by the ward head. The documents must be presented to the assessing team.



- There must be predetermined and preplanned scientific collaborations between the ward section and the rotational sections. The documented evidence of these collaborations must also be available.
- Interns must enforce the dress code.
- Interns must be aware of the patients' bill of rights and enforce it, and their performance must be approved by the assessing team.
- The references (including textbooks and journals) required by the interns and faculty members must be available on the book shelves in the ward section.
- Interns must be assessed as specified in the program during their internship and the documents must be presented to the assessing team.
- Interns must take part in at least one research program during their internship period.
- The training records of all interns in the ward section must be kept and the evaluation results, rotational section certificates, letters of encouragement, notices, and other documents must also be archived.
- To train the interns, the required number of faculty members (with the desired minors and ranks) must be available to the ward and the documents must be presented to the assessing team.
- To train the interns, the adequate number of trained personnel must be available to the ward in accordance with the program contents.
- The necessary general training spaces must be available for the course (including separate classrooms, separate bookshelves in the ward and hospital library, a computer center, and a scientific archive system).
- The necessary specialized training spaces must be available for the course on the university level.
- The number and diversity of the inpatients and outpatients of the university that hosts the interns must match the specifications in the program.
- The predicted number of active inpatient beds (if required) must be available for each intern.
- The equipment identified in the program must be provided to the executives and the quality of the equipment must be approved by the assessing team.
- The rotational sections must be definitively approved by the Evaluation and Accreditation Unit of the secretariat.
- The related university must meet the criteria specified in the program.

The above standards addressing 31 areas are approved by the Educational Planning and Development Commission and are imparted to the Evaluation and Accreditation Unit of the Secretariat of the Medical and Specialized Education Council for implementation. In addition, a copy is attached to all approved programs.



Secretariat of the Medical and Specialized Education Council

Educational Planning and Development Commission

References used in the preparation of this document are as follows.

(Please list every reference used in the preparation of this program in accordance with the standards.)

- Guide to the development of specialized discipline programs, Secretariat of the Medical and Specialized Education Council, Educational planning and development commission, 2009
- Radiotherapy specialized training program approved by the Ministry of Health and Medical Education
- Description of duties of radiotherapists approved by the Ministry of Health and Medical Education
- Guide to managed care approved by the Ministry of Health and Medical Education
- Principles and Practice of Radiation Oncology ,Edward C Halperin, Carlos A Perez,
- Luther W Brady, David E Wazer, Carolyn Freeman
- Principles & Practice of Oncology ,Vincent T DeVita, Theodore S Lawrence, Steven
- A Rosenberg (Ronald A DePinho, Robert A Weinberg
- Curriculum of clinical oncology in united kingdom
- Curriculum of radiation oncology in United States of America
- Curriculum of radiation oncology in Canada
- Curriculum of radiation oncology in Australia
- Curriculum of radiation oncology in Ireland
- Curriculum of radiation oncology in France
- Curriculum of radiation oncology in India
- Curriculum of radiation oncology in Malaysia
- Curriculum of radiation oncology in Japan
- Curriculum of radiation oncology in China
- Practical guide for medical teachers, Harden

Minutes

The radiation oncology internship program was approved with the efforts of the following signatories on 22/2/2017 and is maintained in the Secretariat of the Medical and Specialized Education Council.

Full Name	Signature-Stamp

