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Oncology teaching in undergraduate medical school - Proposed discipline

Ensino de oncologia na graduação em medicina - Disciplina proposta

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ABSTRACT

Cancer is the main public health problem in Brazil and the world, and if the National Oncological Care Policy is not modified, cancer will become the leading cause of death in the country in 2029. However, the guidelines of the Ministry of Education do not have oncology as a necessary or mandatory discipline in medical schools. It means despite all the importance of cancer globally and, not unlike in Brazilian society, there is no obligation for the discipline of oncology in Brazilian medical graduation, which incurs in the incomplete training of academics, not allowing them to develop concepts and skills with a vision integrated cancer. In this article, a group of specialists in oncology in the primary, clinical, surgical, radiotherapy, and cancer research areas, proposes a Cancerology discipline syllabus for undergraduate medical students in Brazil. We sought to present the objectives of the discipline, the subjects to be addressed, the format of the classes, and the workload in a systematic way.

Keywords: Education, Graduate; Education, Medical; Medical Oncology; Radiation Oncology; Integrative Oncology; Basic Research.

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RESUMO

O câncer é o principal problema de saúde pública do Brasil e no mundo, e se Nacional de Assistência Oncológica não for modificada, o câncer se tornará a principal causa de morte no país em 2029. No entanto, as diretrizes do Ministério da Educação não definem oncologia como disciplina necessária ou obrigatória nas escolas médicas. Apesar de toda a importância do câncer globalmente e, ao contrário das necessidades da sociedade brasileira, não existe obrigatoriedade da disciplina de oncologia na graduação médica brasileira, que incorre na formação incompleta de acadêmicos, não permitindo o desenvolvimento de conceitos e habilidades com uma visão integrada do câncer. Neste artigo, um grupo de especialistas em oncologia nas áreas de pesquisa básica, oncologia clínica e cirúrgica, e radioterapia, propõe um programa da disciplina de Cancerologia para alunos de graduação em medicina no Brasil. Neste trabalho apresentamos os objetivos da disciplina, os tópicos a serem abordados, o formato das aulas e a carga horária, de forma sistemática.

Descritores: Education, undergraduate; Education, Medical; Medical Oncology; Radiation Oncology; Integrative Oncology; Basic Research.

Cancer is the main public health problem in the world, and even so, the guidelines of the Ministry of Education do not have oncology as a necessary or mandatory discipline in medical schools. Globocan data estimated about 18.1 million new cases of cancer and 9.6 million deaths globally for 2018[1]. The increase in cancer incidence and mortality is related to population growth and aging, and the prevalence of risk factors associated with the development of socio-economic factors[2].

It is estimated that, in Brazil, from 2020 through 2022, 625,000 new cases will occur each year, being currently the second leading cause of death in Brazil[2]. It is important to note that if the National Oncological Care Policy is not modified, cancer will become the leading cause of death in the country in 2029, and, for the first time, it will be ahead of cardiovascular diseases[3]. Despite this, with the advance of diagnostic methods, the development of new therapeutic approaches and better clinical care, an increase in the number of cancer survivors is expected, a scarce reality a few years ago.

However, notwithstanding all the importance of cancer globally and, not unlike in Brazilian society, oncology is not a mandatory discipline in Brazilian medical schools, which incurs the incomplete training of academics, not allowing them to develop concepts and skills with a cancer-integrated vision. Some medical courses offer the oncology discipline as optional, often inconsistently and incompletely, or with a partial approach according to the interest and availability of the faculty.

In the current context, cancer is studied in a fragmented way in several non-integrated disciplines, related to different medical specialties. Surgical, clinical, and most of the fundamental concepts of oncology, such as the process of carcinogenesis, tumor spread, immunology, among many others, are seen in a way that is not integrated with oncology and clinical settings, generating a superficial understanding of the reality of cancer patients. This fact has prompted students to create oncology leagues to fill these gaps.[4]

Silvestrini et al., in Brazil, evaluating 110 medical schools, showed that 70% of these did not have oncology in the curriculum[5]. There are currently 342 medical schools in Brazil, totaling more than 35 thousand students, 39% of which are public.[6] This data point was corroborated by Amgad et al. who concluded that there is a teaching deficiency in the scientific, clinical, and psychological aspects of oncology and palliative care among medical students in developing countries, due to limitations in undergraduate curricula.[7] Another critical point to be discussed is the teaching of cancer as a sub-specialty of the medical and surgical clinic, distorting learning, and showing oncology as a watertight area and not a vast area that should be interconnected and interrelated to the others. In the same area of risk in education, students observe, after graduation, a clear trend: the practice of sub-specialization in the development of subspecialties within oncology. The best formula for this development is still open. There is a clear tendency and practice for oncologists, as with many other areas of medicine, to focus on limited areas in care and research. In this situation, there are favorable factors (such as scientific development) and risks (such as care deficiencies), but undergraduate education should not receive these examples.[8]

Similarly, in other countries, such as in the United States, the teaching of oncology is often underestimated and fragmented, with considerable variability in content and structure among medical schools, suggesting the need for reform.[8]

A review study conducted in Australia also showed that oncology is generally not well represented in medical school curricula, that few medical education institutions offer mandatory rotations in palliative care or oncology, and that newly trained doctors have little knowledge and skills in that specialty. To circumvent these issues, it was recommended that Australian medical schools implement an oncology curriculum, with mandatory clinical rotations, for further evaluation of the impact of different approaches to student learning[9].

Therefore, adequate training in oncology should be an integral component of medical education- so that students achieve learning that meets the expectations and needs of the population, from prevention to palliative care through clinical oncology, oncology surgery, radiation therapy, and care for cancer survivors and their families.

In this article, a group of specialists in oncology in the primary, clinical, surgical, radiotherapy, as well as in cancer research areas, propose a Cancerology syllabus for undergraduate medicine in Brazil. We sought to present the objectives of the discipline, the subjects to be addressed, the format of the classes, and the workload in a systematic way.

Oncology teaching plan

The oncology teaching plan was developed with the objective of training and enabling medical students to acquire the basic concepts of oncology and to understand the interdisciplinary and interprofessional oncology care holistically. With this, students are expected to understand oncology care and oncology research.

The main thematic areas of the oncology discipline were divided into five subjects: cancer biology, public health, diagnosis, treatment with an emphasis on multidisciplinarity and research. It is recommended that the following content be covered:

Cancer biology: Cancer genetics, mechanisms of carcinogenesis and tumor dissemination, tumor immunology, and tumor pathology. Predictive and prognostic factors in oncology

Public health: Cancer epidemiology, screening, primary, secondary, and tertiary cancer prevention; pharmacoeconomics and access to treatments.

Diagnosis: Clinical examination, complementary exams (image), molecular tests and functional evaluations; staging rules and systems

Treatment with emphasis on multidisciplinarity: Principles of clinical oncology (chemotherapy, hormone therapy, immunotherapy, and target drugs), principles of oncological surgery (biopsies, curative and palliative surgery, minimally invasive surgical procedures and locoregional treatment); principles of radiotherapy, classification and management of adverse events, pain and palliative care; psycho-oncology (psychosocial aspects of illness from cancer), management of cancer survivors. In this topic, the most prevalent tumors would be addressed, namely: skin tumors, female breast, urological cancer, gastrointestinal tract, lung, gynecological, head and neck, and hematological tumors.

Search: Development of new treatments in oncology, phases of clinical research and outcomes in oncology, critical scientific analysis, and scientific evidence.

The classes would be expository with the discussion of clinical cases, in a total of 30 hours/class, and the workload would be distributed as follows: cancer biology (20%); public health (20%); diagnosis (20%); treatment (30%); research (10%).

As a criterion for assessing learning, students would make an exam (60 points), and carry out extension activities, in the community, through the development of materials for prevention and early cancer diagnosis campaigns (40 points).

The course would be offered to students who have already completed disciplines considered as prerequisites, namely, genetics, pathology, pharmacology, physiology, semiology, medical clinic, and surgical technique. Therefore, students in the third or fourth year of medical school would be considered, depending on the curriculum of each higher education institution.

The model for the oncology discipline teaching plan is presented in Supplement 1.

Final considerations

It is a great challenge to seek to teach the referred content in just one discipline, especially considering the large amount of information and innovation that are published daily in oncology, especially when taking into account the full breadth of this medical specialty.

In this article, we tried to present the concepts of basic and clinical oncology so that the teacher can adapt and update the content continuously. The course can be even more detailed if divided into two disciplines that would be basic oncology, inserted in the curriculum of the first or second years of medicine, and clinical oncology in the curriculum of the fifth and sixth year of medical school.

We suggest that the faculty of the discipline should consist of research professionals and basic sciences areas, as well as professionals who actively deal with cancer care and treatment. It would be recommended that the discipline coordinator be a professional actively involved in the care of cancer patients, preferably with medical training, with

the title of specialist in oncological areas such as oncology surgeon, clinical oncologist, or radio-oncologist. We believe that this coordination, after the establishment of the discipline, can create and offer internships in oncology, in which students can better understand the functioning of the five main oncological topics.

We hope with this work to contribute to the discussion, maturation, and, mainly, greater incorporation of oncology to medical education. It is an initial step, and we understand that we must follow models that are already in full application, like the one already practiced in Canada, where the scope of the oncology curriculum has been growing in the last decade[9].

The news now shows us the importance of joining these concepts and professionals dealing with cancer and ideally under the banner of an Oncology department with its implications and academic and university consequences.

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Supplement 1 - Model of the subject's teaching plan

MODEL OF ONCOLOGY TEACHING PLAN

DISCIPLINE: Basic and Clinical Oncology.				**TOTAL WORKLOAD:**	30
				PRACTICAL HOURS:	0
				THEORETICAL HOURS:	30
SERIES/ PERIOD:		**HALF:**		**SCHOOL YEAR:**	
COORDINATOR OF DISCIPLINE: Professor					

1 MACROCOMPETENCES			
Health care		**Health education**	
X	Attention to individual health needs	**X**	Identification of learning needs individual and collective
X	Attention to public health needs	**X**	Promotion of the construction and socialization of knowledge
Health management		**X**	
X	Organization of health work		
	Monitoring and evaluation of work in teams	**X**	Promotion of scientific and critical thinking and support for creating knowledge

2 SPECIFIC SKILLS

The skills included in the student profile at the end of the course will be:
• Health care with an integrated focus on diagnosis, treatment, primary, secondary, and tertiary cancer prevention.
• Communication of diagnosis, prognosis, and treatment to cancer patients and family members.
• Knowledge of professional integration and concepts of multidisciplinary cancer care.
• Administration, management, and concepts of cost-benefit and pharmacoeconomics of cancer treatments.
• Application of evidence-based medicine, critical analysis of scientific data; performance evaluation of patients; geriatric assessment concepts; oncology staging
Competencies will be addressed to develop the following knowledge, skills, and attitudes:
• Provide global assistance to the patient from the perspective of comprehensive care, from an interdisciplinary and multidisciplinary approach in oncology care.
• Develop educational actions in individual and collective approaches for more better population knowledge and earlier diagnoses with a higher chance of cure.
• Practice and disseminate health policies with an emphasis on cancer care among health professionals.
• To relate, in a humanized and ethical way, with the team and with the patients with a view to comprehensive, proactive care and focused on the best interest of the patient.
• Develop integrated practices, seeking to improve the quality of care for cancer patients in the various types of care.

3. MENU

Basic approaches to cancer control; molecular bases of cancer; solid and hematological tumors: characteristics and diagnosis.
To present the multiple interfaces of assistance to cancer patients, promoting the appreciation of the health professionals involved and qualifying for better results from interdisciplinary practice.

4 LEARNING OBJECTIVES

4.1 Objectives related to cognitive knowledge and skills (cognitive domain)
• Identify cancer as a serious public health problem in Brazil. • Discuss the importance of the multi-professional and interdisciplinary roles in the treatment of cancer patients. • Bases of comprehensive clinical assessment of patients: prognostic and predictive factors in healthcare use • Bases of cancer treatment. • Interdisciplinary assistance in oncology.
4.2 Objectives related to the motor or procedural skills (psychomotor domain)
• Inform the patient, family and/or caregiver data about what cancer is, with an approach that allows them to understand their disease, clarifying them about the implications and consequences of the established diagnosis. • Know signs and symptoms for anamnesis and clinical examination with knowledge and tools for the diagnosis of cancer.
4.3 Objectives related to behavior and attitudes (socio-affective domain)
• Refrain from prejudices and previous judgments in understanding the disease, understanding that the diagnosis of cancer is not synonymous with death, but rather the search for a cure, quality of life and even quality of death with palliative care and information. • Develop an attitude of empathy for cancer patients and their families to present the diagnosis and therapeutic options clearly and proactively. • Develop an attitude of solidarity with the cancer patient and his family, understanding their reality as well as the health system where they are included, to offer integrated care for cancer. • Develop availability and interest in qualified and respectful listening to cancer patients.

5 SYLLABUS
1. Cancer genetics and molecular tests. 2. Mechanisms of carcinogenesis and tumor dissemination. 3. Tumor immunology. 4. Tumor pathology. 5. Epidemiology of cancer. 6. Screening, primary, and secondary cancer prevention. 7. Pharmacoeconomics and access to treatments. 8. Clinical examination and functional assessments. 9. Complementary exams (image) and staging. 10. Staging and prognostic factors in oncology. 11. Bases of clinical treatment (chemotherapy, hormone therapy). 12. Basis of immunotherapy and target drug therapy). 13. Principles of oncological surgery (diagnosis, curative, minimally invasive, regional locus). 14. Principles of radiotherapy. 15. Skin tumors and clinical cases. 16. Breast cancer and clinical cases. 17. Genito-urinary tumors and clinical cases. 18. Tumors of the gastrointestinal tract and clinical cases. 19. Respiratory tract cancer and clinical cases. 20. Gynecological tumors and clinical cases. 21. Head and neck cancer and clinical cases. 22. Oncopediatrics and hematological tumors; 23. Syndromes for neoplastic and tumors of unknown primary. 24. Classification and management of adverse events. 25. Pain and palliative care. 26. Psycho-oncology (diagnosis, regret, and grief). 27. Management of cancer survivors; 28. Development of new treatments in oncology. 29. Phases of clinical research and outcomes in oncology. 30. Evaluation

6 EVALUATION CRITERIA AND DISTRIBUTION OF POINTS
- At the discretion of each higher education institution.

7 EXTENSIONIST AND RESEARCH PRACTICES
- Actions will be carried out with students in the community to disseminate habits for preventing different types of cancer, signs, and symptoms that can assist in early diagnosis.

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