



Global curriculum in research literacy for the surgical oncologist[☆]

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Accepted 30 July 2017

Available online 11 December 2017

Abstract

Background: The ability to provide optimal care to cancer patients depends on awareness of current evidence-based practices emanating from research or involvement in research where circumstances permit. The significant global variations in cancer-related research activity and its correlation to cancer-specific outcomes may have an influence on the care provided to cancer patients and their outcomes. The aim of this project is to develop a global curriculum in research literacy for the surgical oncologist.

Materials and Methods: The leadership of the Society of Surgical Oncology and European Society of Surgical Oncology convened a global curriculum committee to develop a global curriculum in research literacy for the Surgical Oncologist.

Results: A global curriculum in research literacy is developed to incorporate the required domains considered to be essential to interpret the published research or become involved in research activity where circumstances permit. The purpose of this curriculum is to promote research literacy for the surgical oncologist, wherever they are based. It does not mandate direct research participation which may not be feasible due to restrictions within the local health-care delivery environment, socio-economic priorities and the educational environment of the individual institution where they work.

Conclusions: A global curriculum in research literacy is proposed which may promote research literacy or encourage involvement in research activity where circumstances permit. It is hoped that this will enhance cancer-related research activity, promote awareness of optimal evidence-based practices and improve outcomes for cancer patients globally.

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Keywords: Global research curriculum; Surgical oncology; Surgical oncology research; Cancer research

Introduction

The paired paper in this same issue highlighted the correlation between cancer-related research activity and cancer-related mortality. Despite the limitations of this work, it is intuitive that cancer-related research activity stimulates the implementation of best practices of care. These best practices, continually modified based on the

[☆] The Global curriculum was approved by the Executive Council of the Society of Surgical Oncology and the European Society of Surgical Oncology in March 2017 for simultaneous publication in the Annals of Surgical Oncology and the European Journal of Surgical Oncology.

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most current evidence, may lead to an improvement in quality of care and cancer-related outcomes.

The field of oncology is in a phase of extremely rapid evolution, with research advances leading to clinical breakthroughs in immunotherapy, targeted medicine, radiation delivery and novel surgical techniques. Surgeons who are involved in the care of cancer patients, need to have a general knowledge of the basic principles of research. This knowledge is essential for all cancer surgeons, although its use will depend on the geographic location and economic realities of their country of practice. In high-income countries (HICs), involvement in high-quality basic science/translational or outcomes research is both practical and feasible. Whereas in low and middle income countries (LMICs), the economic realities may prevent universal participation in research of any kind. Nonetheless, health services research, which is not intrinsically expensive, is vitally important to ensure these countries optimize their resources and engage with the local population in health care delivery. It is also essential that doctors practicing in LMICs should keep up to date with the latest research and should have a basic understanding of the principles of research. This basic understanding will help them interpret the results of research conducted elsewhere which may help in delivery of evidence-based care locally, within the constraints of the local health economy.

This curriculum is not intended to suggest mandatory research participation, but rather it is intended to lay the foundations of research literacy that every surgical oncologist should aspire to regardless of their geographic location and socio-economic constraints. It is likely that some of the requirements may be very basic or redundant for some practitioners, whereas some may be completely out of reach for surgical oncologists in some regions or countries.

The concept of surgical oncology as a separate discipline does not exist in all countries. In addition, cancer surgery is performed by a variety of surgeons that complete their training in an equally diverse set of training paradigms. Finally, in many parts of the world, cancer surgery is predominantly performed by general surgeons. It should be noted for convenience that the term surgical oncologist will refer to any surgeon who provides surgical care to cancer patients regardless of their training paradigm or specific professional designation.

The curriculum is divided into eight sections covering some of the basic principles of research methods. The curriculum mostly covers the basic principles of research in broad generic terms to satisfy the minimum tenets of research literacy. In addition, the curriculum includes some advanced tenets of research literacy (basic science and some advanced statistical principles) which should be considered optional. It is not intended to delve into the comprehensive details which would be beyond the scope of this article. We hope that these basic principles of research literacy will set minimum standards to enhance

cancer-related research activity and improve the care of cancer patients and their outcomes globally.

Knowledge on how to get research started

The essential first stage in developing a research proposal is to have a clear research question in mind and to develop an aim and hypothesis to test. This will then lend itself to selection of the optimal research methodology to use. The method must be feasible, both within the time frame and budget of the project and also be ethical. Some of the research principles that a surgical oncologist should be aware of include:

1. Knowledge of hypothesis generation techniques and the difference between hypothesis generating and hypothesis testing research methods: A hypothesis is an educated guess or logical supposition based on available evidence. The first stage of research is to use available observations or data to propose a hypothesis, for example one might use a large population dataset to observe that people who are overweight are more likely to develop breast cancer. There may be evidence suggesting a numeric association within a dataset and a biological theory to causally explain the association. Study of epidemiological data is an excellent example of hypothesis generating research. This type of research is often very broad in range, often observational, and may look at multiple issues. The next phase is to test the hypothesis, using a wide range of hypothesis testing study designs. These must be carefully planned to answer a much more precise question. Hypothesis testing research usually has a very tight focus often to answer a single key question, such as: is neoadjuvant chemoradiotherapy for rectal cancer associated with an improved 5-year survival. The whole project will be designed and powered to answer this one question, although other secondary objectives may also be achieved. Understanding of the type of research study most feasible to test the hypothesis should be readily apparent (see section on Types of Research).
2. Knowledge of methodological principles: When designing a trial, it is important that the correct methodology, trial design and analysis is used otherwise the research may result in biased or incorrect findings. It is important to involve a statistician at an early stage to advise on study design, power calculation and the correct statistical tests to use to avoid bias or statistical error. Surgical oncologists should ideally have a good basic knowledge of trial design and statistical analysis (see section on Statistics) to permit them to be able to assess the quality of published research and whether it has drawn valid conclusions. A good reference text is 'How to read a paper: the basics of evidence based medicine' by Trisha Greenhalgh, 2014, Wiley-Blackwell [1].
3. Knowledge of regulatory approval and research ethics (see section on Ethics): This is increasingly important

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