# Cancer Informatics: Needs and Challenges in Cancer Research

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## Abstract

Oncology practises confront numerous hurdles in designing and implementing an informatics strategy, whether it is shifting from paper to electronic records or attempting to harness data from existing systems for outcome studies. With the rising costs of oncology treatments and anticipated changes in reimbursement laws, such as the necessity for evidence to back physician judgments, collecting data on treatment decisions and treatment efficacy will become critical to running a successful programme. This study assesses the current state of oncology informatics systems and focuses on building an informatics strategy to address the problems posed by anticipated changes in reimbursement rules as well as medical and information technology.

**Keywords:** Cancer research • Oncology • Informatics • Healthcare • Medicine

## Introduction

Biomedical and health research and development require the use of informatics tools. Cancer research, like most scientific disciplines, is dealing with an avalanche of data that is becoming increasingly difficult to collect, keep, access, analyse, and exchange. To facilitate personalised medicine approaches to cancer prevention and treatment (e.g., tailoring treatment based on an individual patient's genetic makeup as well as that of the tumour), and to allow for more rapid learning from patient experiences, there is a particular need to integrate research and clinical data [1].

Oncology practises confront numerous hurdles in designing and implementing an informatics strategy, whether it is shifting from paper to electronic records or attempting to harness data from existing systems for outcome studies. With the rising cost of oncology treatments and anticipated changes in reimbursement standards, such as the demand for evidence to back physician judgments, collecting data on treatment decisions and treatment efficacy will become critical to running a successful programme.

In the speciality healthcare software sector, the capacity to quantify care efficacy and identify actionable areas for improvement has proven elusive. Oncology EMRs are primarily workflow-centric, concentrating on a set of tasks rather than supporting real-time decision-making and thorough outcomes gathering [2-4].

Cancer treatment necessitates long-term patient management, which can last decades. Each patient's case may contain a substantial quantity of data, ranging from test findings to medicinal administration records, clinical evaluation notes, and insurance and billing records, among other things. As a result, there is a plethora of data on diagnosis, treatment, and results that has been collected over time, but much of it is only on paper. For data input, training, and maintenance, switching from paper to an electronic medical record system, or simply supplementing paper records with an EMR, requires a significant amount of time and personnel [4].

Oncology information systems must enable for the collecting of relevant data for today's medical practises as well as the incorporation of future medical breakthroughs. As technology advances, more personalised medicine with rapid feedback systems will become available. It's critical for an electronic oncology system to be able to connect with these technologies in order to diagnose therapy response and, when appropriate, incorporate new knowledge into standard of care. Maintaining accurate and full patient information will require interoperability with new clinical instruments and systems [4,5].

**The needs of today's oncology practices are met by informatics**

There are a number of systems that specialise on various duties in today's healthcare information technology environment. Some technologies can be employed in oncology practises since they are suitable for any type of ambulatory setting. Only a few technologies, however, have been created expressly for the cancer field. Systems used with oncology treatment equipment that rely on integrated software to control and support radiotherapy and infusion administration are an example of the latter [5].

The following are the categories of informatics technologies that assist oncology business practise and patient medical records:

- Systems for Managing Practices
- Systems for Electronic Medical Records
- Clinical Decision-Making Software
- Outcome Studies Authoring Clinical Standards of Care
- Management of Clinical Trials

The formulation of an oncology informatics strategy must begin with an examination of systems in terms of achieving business demands and objectives.

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