

# Can an Oncology Information System Improve Radiation Therapy Safety and Patient Confidence?

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## Abstract

Radiation therapy has become one of the safest and most effective methods for treating cancer. Over half of all cancer patients undergo radiotherapy, either as the sole treatment technique or combined with other therapies. As technologies evolve and improve, radiotherapy techniques become increasingly sophisticated, requiring more time and skill to ensure delivery as prescribed. Such is the increasing complexity of treatments that technology providers are trying to keep up with demand for more and more advanced computing power to manage the need for immensely precise and powerful tools. Today the need for oncology information systems and electronic medical records is paramount in providing the tools for image management, data and workflow control supporting individual patient demographics, treatment planning, delivery and follow-up.

## Keywords

Radiation therapy, chemotherapy, oncology information systems, cancer IT solutions, radiation safety, radiation treatment, integrated oncology systems

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## Streamlining Workflow Efficiencies

An oncology information system (OIS) (see *Figure 1*) can help clinicians to verify that they are treating the right patient, the right site and with the right procedure, giving patients more confidence in their care. Patient identification (ID) matching, validity checks, multi-level approvals, image registration and review alerts, timeouts and quality checklists all play their part in helping to deliver safer radiation therapy treatment.

In treatment planning, exporting treatment plans quickly and efficiently via digital imaging communication in medicine (DICOM) radiotherapy (RT) to an OIS provides quick and easy to use tools to perform image review and comparison. As DICOM RT is the standard platform for plans and images, the format is the same across vendors, ensuring consistency and efficiency. From this information, confident and efficient treatment decisions can be made.

State-of-the-art systems have created their own challenges in treatment planning and patient workflow management – not of the individual patient but planning across a number of patients and a number of treatment sessions. This has accelerated the need for electronic medical records (EMR). Automating clinical and administrative processes via an EMR gives clinicians the point-of-care tools they need to deliver better patient care. But does this go far enough?

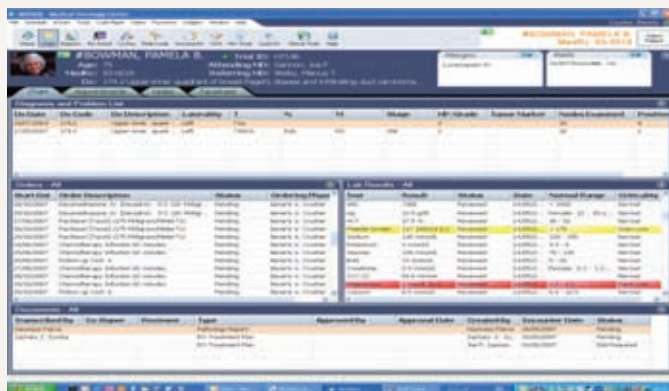
To improve clinical practice overall, a comprehensive oncology information system enables clinics to move beyond basic automation and convert EMR data into aggregated, multidimensional information to support important decision-making in treatment of, and improving, patient outcomes. The University Medical Centre Mannheim in Germany uses an OIS solution throughout their radiotherapy department.

Professor Frank Lohr, University Medical Centre Mannheim, said: “Centralised integrated systems enable the distribution of patient data, treatment plans, etc., between departments, hospitals (e.g. for a second opinion) and even countries, ensuring safer treatment and reducing the opportunity for human error and lost information.

Safety is now further increased by the addition of biometrical or radio frequency identification (RFID) of patients and auxiliary devices. The ability to circulate plans to treatment centres can enable treatment closer to patients’ homes and avoids the need to travel to major centres, ultimately improving patient quality of life.

“Clearly, in such a progressive and flexible treatment environment, having a reliable but open oncology information system such as MOSAIQ from Elekta, that works across multiple centres is essential, and is fast becoming the gold-standard approach.”

**Figure 1: An Oncology Information System From Elekta**



## What Can an Oncology Information System do Tomorrow?

In the future, new technologies will enable clinicians to define their own experiences and change the behaviour of their OIS to meet their clinical workflow needs.

A modular-design approach to fit a clinic's specific workflow and efficiency goals, through user-defined workspaces and defined windows, will enable quick previews of all necessary patient and treatment information in a single window, prior to the physician seeing the patient.

At a reporting level, data mining and data interrogation from within the oncology information system will empower use of evidence-based medicine to track patient outcomes and optimise the best treatment techniques for the best possible outcomes. Evidence-based medicine will drive more reproducible and comparable quality of care across clinics, with treatments provided that are personalised to each patient's particular disease and/or treatment need – all documented in a concise, accurate and safe way.

In the future, rules-based workflows and configurable scripts will provide extreme customisation and configurability of OIS to match the specific department needs – and will not be limited to a standard system structure. Service-oriented architecture and web services will enable external communication to and from sites, departments, staff and patients. Patients will be better informed and more confident about their treatment and outcomes. OIS are enabling paperless and filmless clinical environments to become a reality, by removing almost all paper processes and replacing them with EMRs.

If becoming super-efficient in the future through technological advancement means greater patient throughput, will greater patient throughput mean a compromise on safety?

## Case Study

### Centre Medical de Forcilles-Grupo Instituto Madrileño de Oncología – Cancer Centre, Paris

Following a detailed workflow analysis of its processes and procedures, it was evident that the Centre Medical needed to change their concepts of work efficiency, patient safety and treatment tracking system. Although an EMR from the hospital information system (HIS) was already being used, they clearly identified that having a specific radiation therapy and chemotherapy EMR was essential, since specific interactive scheduling systems, recording and verification of linac parameters and billing/administrative systems had to constantly interact in order to properly carry out the patient treatment coordination throughout the usual five to six weeks. They were also aware that all their procedures had to be audited and reviewed, that is why the decision was made to go paperless and filmless and to use quality checklists from the first day of treatment, using Elekta's OIS; MOSAIQ. In order to establish a tracking system of all the treatment steps and all the processes involved during the treatment preparation, execution and follow-up, MOSAIQ user profiles were configured to take into account the different users rights and securities allowing or limiting access – according to levels of responsibility and seniority – of view, modification or approval of every single step of treatment course entered as part of their quality checklists.

From the very beginning, their choice was to use the treatment calendars in terms of site dose tracking and warnings together with strict tolerance tables for treatment parameters including couch values.

Karla Torzsok, Chief Medical Physicist and Technical Director at Centre Medical de Forcilles-Grupo Instituto Madrileño de Oncología, explained: "We gained lots of confidence in our track record, department organization and ability to identify incidents precursors through the integration of the Committee of Return upon Experience (CREX) directly to MOSAIQ. This enabled us to minimise sources of random or systematic errors to a level we felt would increase the technicality of our practice and start implementing new innovative techniques while preserving optimal patient safety.

"Furthermore what we are most proud of is to have built a team in which now all actions flow seamlessly and efficiently, with optimal patient throughput, and where all our efforts are focused towards constant practice quality improvements in a friendly work atmosphere." ■

Elekta Ltd, a longtime leader in the radiation therapy, neuro-oncology and neurosurgery communities, simplifies the processes of planning, patient setup, treatment verification and delivery – providing clinicians with greater confidence to define and raise the standard of human care.