Decision Support and Information Management System for Breast Cancer

Result in Brief

Project information

DESIREE

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IT support tool facilitates decisive action on breast cancer

A pioneering new decision support tool intuitively presents clinical breast cancer cases and provides personalised recommendations based on evidence, previous cases and decisions. This will help breast cancer specialists to make informed choices and select the most effective therapies.

Breast cancer remains the most common type of cancer affecting women in the EU, with an estimated 562 500 cases in 2018. A total of one in eight women in the EU will develop breast cancer before the age of 85. The complexity of digital data available nowadays requires efficient tools for multidisciplinary case management. Developed through the EU-funded DESIREE (Decision Support and Information Management System for Breast Cancer) project, a prototype IT decision support system is designed to make the decision-making
process far more consistent and efficient, and ultimately help save lives.

**Big Data challenge**

Multidisciplinary Breast Units (BUs) are a well-established means of dealing with breast cancer cases. They consist of medical experts – radiologists, pathologists, surgeons and oncologists for example – who meet about once a week to review patient cases and decide on treatments. Dealing with cases in a systematic manner and involving different medical perspectives ensures that the best possible courses of treatment are followed, ensuring a high quality of care.

A key challenge is making sense of the sheer amount of medical data available for each patient. Current IT systems are often not adequately equipped for this task, which means that pulling together and reviewing this heterogeneous information can be complex and time consuming. Making comparisons between cases and therapies can also be difficult to achieve, even though the raw data is there.

“The aim of this project was to develop an information and decision support system to help BUs,” explains DESIREE project coordinator Dr Iván Macía, Director of eHealth and Biomedical Applications at Vicomtech in Spain. “It is impossible for medical staff to remember so many variables and remember previous cases and decisions, so we wanted to find a way of presenting all this information in a nice way.”

**Decision-making support**

From the very beginning, the needs and requirements of the four hospitals involved in the project influenced the development of the DESIREE system. Consensus was required to incorporate expertise and patient variables, and to digitally implement clinical guidelines. This ensured that only quality data was collected and integrated into the system and that recommendations were according to existing evidence.

The end result is a prototype IT tool that incorporates clinical guidelines, clinical experience and important patient context information, and can help experts evaluate the outcome of previous decisions. Reviewing the decisions and results of similar cases also ensures that patients are treated in a consistent manner.

The tool presents individual cases in an intuitive way and contains diagnostic images relevant to each case. It also includes a timeline of diagnoses and treatments. “This is a really important aspect of the system. The timeline allows practitioners to closely follow each case. The decision support functionality ensures informed decision-making based on evidence, experience and previous similar cases,” says Dr Macía.

Another innovative strand has been the project’s modelling work on surgical therapy, built on previous research with a US partner. Through a combination of healing and mechanical modelling patient imaging data, the aesthetic impact of surgery on the breast can be predicted and simulated. “This is something really tangible for patients. You can imagine that if, say, you have a fear of surgery or its aesthetic outcome, the doctor can show you what the results will look like,” adds Dr Macía.

The whole IT system is currently undergoing clinical validation, with the DESIREE project officially ending in
July 2019. Nonetheless the results achieved within DESIREE will continue to be built upon. A project workshop involving IT specialists was recently held, to identify possible R&D collaborations in the future. External technology companies have also been contacted to discuss possible commercial exploitation further down the line.

"Another point is that this system is transferrable to other types of cancers. First however, there has to be full clinical validation to convince others that the system actually works. This is the challenge of being a pioneer in developing this kind of system," Dr Macía concludes.

**Keywords**

DESIREE, cancer, breast, data, modelling, surgical, imaging, technology, BUs, radiologists, pathologists, surgeons, oncologists

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