

# The Icelandic Cancer Society goes digital

The Icelandic Cancer Society (ICS) is a nationwide voluntary organisation, established in 1951 with the purpose of promoting knowledge and education about cancer and cancer prevention. The Society furthers cancer research by collecting and analysing relevant data, by organising and promoting cancer screening and by supporting progress in the treatment and care of cancer patients.

Since 1964 the ICS has organised a nationwide screening programme for cervical cancer for women between 20 and 69 years of age, which has resulted in a marked decrease in incidence and death from the disease. A nationwide mammography screening programme for women aged 40 to 69 years has been in operation since 1987. Annual mammography procedures currently number around 20,000 from a total Icelandic population of some 320,000 people.

## Automated workflow

In 2007 ICS management decided that all existing screening operations should become totally film- and paperless, using only the best available technology. The resulting requirement for PACS and RIS solutions called for higher productivity from automated workflow, effec-

tive information and image management and web access for referring physicians. This process subsequently led to the purchase of five new DR mammography units - three for the main site in Reykjavik, one at a remote site in Akureyri and one unit for mobile use. A CARESTREAM PACS with six high resolution mammography workstations and integrated CARESTREAM RIS were chosen from several proposals to provide diagnostic mammography and give enterprise-wide support to the mammography screening programme.

Through Petersen ehf, their distributor in Iceland, Carestream Health proposed an open and scalable system, tailored to meet the Society's needs. Ragnhildur

Asmundsdottir, Director of Petersen ehf, said: 'This was an extremely important project for us. Our CARESTREAM PACS and RIS solutions are already widely used and acknowledged in Iceland, but it was clear that for a dedicated mammography system, a number of different and special solutions needed to be applied. We were therefore both pleased and proud that Carestream Health was chosen to provide the PACS/RIS part of this project'.

Implementation of the new technology was a demanding task, involving a major redesign of the Cancer Detection Clinic building, and the re-engineering of all workflow. There were several additional requirements to meet ICS' specifications, including use of the Icelandic language throughout. The new equipment had to integrate with existing IT systems using HL7 and, specifically, there had to be full workflow integration between cervical and breast cancer screenings. Allowance also had to be made for double blind reading by two independent radiologists and for the automatic creation of 'pending orders' at several points within the workflow. Remote connectivity for radiologists was to be achieved through low bandwidth and up to 40 Cervical and Breast Cancer Screening centres outside of Reykjavik and Akureyri were to be supported by a mobile operation.

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**Gudrun Agnarsdottir MD**, Director of the Icelandic Cancer Society



**New mobility**

In order to meet ICS' requirements, Raförninn Medical Imaging Technology Consultant Service developed a number of unique solutions, including the creation of a totally new method of temperature controlled transportation for mobile mammography. This means that an FFDM unit with accessories can be moved by one person to any facility and made fully operational and connected to the central network within two hours of arrival. When a scan leads to a need for a recall, a site specific pending order is automatically created which can be accessed by local staff at each Health Care Centre using the CARESTREAM RIS.

Both ICS and Raförninn were invited to work with Carestream on developing a 'Mammo RIS Roadmap' with the Scandinavian Carestream Health group, through Nordic Mammo RIS user meetings with the Carestream Health R&D department.

'These meetings are extremely valuable, as they give us the opportunity to influence the R&D process by representing the customer's needs', said Smari Kristinsson, CEO of Raförninn. 'We covered areas such as improved automated monitoring and control mechanisms; automatic escalation of all process exceptions and the definition of new web services for future upgrades and versions.'

'It was crucial for the ICS project implementation that we had an experienced Mammography Radiologist from ICS on board during the process of creating and documenting all workflow and design details. The Radiologist had a leading role in defining the 'acceptable' solution and in communicating the solutions to both the CSH and Raförninn engineers', Smari added.

Radiologist MD Anna Björg Halldorsdottir is one of the most experienced radiologists at ICS. 'The transition from analogue to digital was a very important and positive step for us,' she said. 'The new workflow enables us to work faster, with more accuracy and with consistent quality images.'

Palmar Hallgrímsson, another radiologist at ICS, agreed: 'I am very satisfied with our new system. This is a big leap forward for us. Productivity has improved significantly and image quality is better. Workflow is very efficient and easy to work with and our requirements have been met very well.'

Overall project management of the ICS installation was undertaken by Icelandic consultants Raförninn. They worked with ICS staff to create detailed workflow diagrams that were used as roadmaps by Carestream Health in creating the actual clinical solutions.

Finally, Gudrun Agnarsdottir MD, Director of the Icelandic Cancer Society said: 'We were very pleased with the co-operation from both Carestream Health and Petersen ehf. during this fundamental change into a digital, paper-free environment. It was a demanding process for all our staff and everybody concerned, but it was concluded in a satisfactory way.'

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