ESR iGuide implementation in Sweden - a pilot study

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Background/Introduction

The EU Council Directive 2013/59/Euratom states in article 58c that referral guidelines for medical imaging, taking into account radiation doses, shall be available to referring physicians by February 2018 in all member states. Currently clinical decision support (CDS) for referral physicians does not exist in Sweden.

The main purpose of a CDS system is to improve the appropriateness and justification of referrals for radiological procedures, in order to reduce unnecessary radiation exposure and financial costs.

The European Society of Radiology (ESR) and its expert senior radiologists, have adapted the American College of Radiology clinical decision support (CDS) system: ACR Select. This European clinical support system has been named ESR iGuide.

ESR iGuide contains evidence-based and patient-tailored referral guidelines for medical imaging (exams within the fields of Radiology, Nuclear Medicine and Clinical Physiology).

The aim is to cover 80% of the daily requests from referring physicians, by reviewing clinical scenarios, indications and recommendations for the topic groups breast, cardiac, gastrointestinal, musculoskeletal, neurologic, thoracic, urologic, vascular and women’s imaging.

A clinical decision support system like ESR iGuide will thus help with the reduction of radiation by standardising and implementing evidence-based appropriateness criteria, as well as meeting the EU Council Directive.

ACR Select has been implemented in many hospitals and states in the USA, and is well integrated in leading Electronic Medical Records (EMRs). Before the implementation of ACR Select the behaviour of the referring physicians has been mapped, so measurements of the impact a CDS system had on the number of unnecessary exams were measured as well as the resulting cost reductions.

- Mass General Hospital had a reduction in CT examinations of 21%. The yearly growth rate in CT exams was lowered from average 12% per year to 1% (Sistrom et al., 2009)
- The state of Minnesota (population 5,3 M) lowered its healthcare spending over 3 years with 168 M$ (ICSI, white paper accessed online 2017).
• It has also been shown in studies in USA that the implementation of CDS decreased the time for the referrers to order the appropriate exam, as well as for the radiologist to judge the appropriateness of the exams.

The ESR guidelines have been incorporated in ESR iGuide and therefore can be integrated into the electronic medical journals and electronic referral systems to make the guidelines available at the point of ordering in the form of a simple scoring tool (1..9). The electronic format makes it easier for the referral physicians to use, and, as the system resides in the European cloud, new guidelines are available instantly to all referrers.

It will also be possible to monitor referral behaviour, which will help identify physicians that need more training as well as being a tool for the Healthcare Regions in Sweden to establish their true needs for radiological equipment.

The ESR iGuide system from the ESR is currently piloted in several countries in Europe and the Middle East. In Sweden, it has been endorsed by the Swedish Society of Radiology (SFMR) and Swedish College of General Practitioners (SFAM). Several healthcare regions and counties are interested in ESR iGuide, and the region Jönköping county is implementing a pilot project, to reduce the number of unnecessary exams as quickly as possible, as well as to facilitate implementations of a CDS system in the rest of the country.

The purpose of the CDS system testing is to evaluate a CDS system, ESR iGuide, in order to study:

• If there are any changes in the behaviour of referring physicians in prescribing diagnostic examinations when using ESR iGuide.
• If there is a time increase or decrease for referring physicians when requesting exams via ESR iGuide.
• The overall potential to decrease the total Swedish population radiation dose, by decreasing unnecessary radiological exams.

Specifically for this poster, the purpose is to describe how to implement a CDS pilot in the Swedish healthcare environment, and how to facilitate implementations elsewhere in Swedish and Nordic healthcare systems.
Fig. 1: Trends in Swedish radiology 2006 - 2015, showing an increase in CT and MRI Scans across the country.

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Description of activity and work performed

The ESR iGuide project in Region Jönköping county started with two parallel tracks. Meetings with technical and IT personnel together with the vendor of the computerised radiological order entry (ROE) were held, with the motive to create a seamless integration of ESR iGuide with the current referral workflow. Two technical integration alternatives were evaluated, and the region ultimately decided to use a loose integration with our current ERS system. This technical solution has many advantages, but one of the drawbacks (as opposed to a complete integration) is that the pre-implementation phase of gathering referral data cannot be performed.

Parallel to this, discussions were held with ESR/NDSC and regional leaders and physicians, to create an ESR iGuide implementation that is as close to the desired way of referral writing from the physicians as possible. An absolute condition was that the referring physicians should not have to log in at additional websites. Five clinics are included in the pilot: four primary health care clinics and one internal medicine department, including emergency patients.

This was followed by the integration of ESR iGuide into our ROE. Translations from English into Swedish were done by professional radiologists, who are familiar with the medical and radiological terms. ESR iGuide needs to be adapted to the national and regional guidelines (preferably including Standardised Cancer Patient Pathways). Although ESR iGuide provides tools to easily change, update and extend guidelines, incorporating it as part of a pathway proved to be more complicated and time consuming than anticipated, and is planned for a future update after the pilot period. An unforeseen consequence was that the guidelines do not adhere fully to scientific guidelines, and rather than adapt iGuide to these guidelines, suggestions have been made that the guidelines should adapt to the ESR iGuide recommendations.

During the whole process, communication is of vital importance. A communication plan has been established, and contains all channels of communication necessary.

Region Jönköping county is the first healthcare region in the Nordic countries performing an ESR iGuide pilot, and many countries and counties want to be able to follow our progress.

In order to facilitate ESR iGuide spread, the translation is made public and the pilot progress is continuously updated on the Swedish Society of Radiology's web site. We
have also created an implementation guide for those wishing to implement ESR iGuide in Sweden.

E-mails are going out to all persons interested in the details of our work, and a Health Technology Assessment report has been made.

The pilot is planned to start in the end of February, and thus, no evaluation of the results of ESR iGuide implementation can be performed at this time.
Images for this section:

![Graph showing trends in Swedish radiology 2006 - 2015](image)

**Fig. 1:** Trends in Swedish radiology 2006 - 2015, showing an increase in CT and MRI Scans across the country.

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**Fig. 2:** ROE with the ESR iGuide integrated interface showing the clickable scores and the possibility to retrieve the full guideline report written by the ESR and ACR experts.

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Conclusion and Recommendations

To conclude, a pilot of the ESR iGuide CDS system is feasible, but in a country as administrative-heavy as Sweden, the preparation phase is longer than expected. However, ESR iGuide can be satisfactorily integrated into advanced pre-existing ROE systems.

No results of the actual pilot phase are available for the time being, but communication has proved to be very important to the success of creating a satisfactory implementation environment. Pilot clinics are looking forward to getting the benefits of a clinical decision support system.
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