THE ROLE OF RADIOGRAPHERS AS GATEKEEPERS IN THE JUSTIFICATION PROCESS
Project initiative and possible impact

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Abstract

The contribution of radiographers in the process of justification can improve the quality of care, and facilitate radiation protection as well as the resource utilisation in radiology. The paper present a project aimed to develop the skills of the radiographers in assessment of medical imaging referrals. It involves survey of the expectations on roles from a professional and management point of view, identifying knowledge gaps, and the design of new courses on bachelor and master level, implementation on selected university radiographer colleges in Europe and Australia, and research to evaluate the outcome. The project ideas are shared as input to the next IAEA action plan for radiation protection in medical sector.

1. INTRODUCTION

Diagnostic imaging is a core element in modern medicine; most other medical disciplines would be almost unrecognisable in the absence of these services. Radiological services is needed to exclude and detect diseases, and to assess responses to therapy. It also expands beyond diagnostic purposes by supporting or replacing traditional treatment technologies. The increased demands for services combined with a lack of radiologists, are reasons why the radiology department can become a bottleneck in health care [1]. We are challenged by inappropriate and unjustified imaging, i.e. examinations that are not medically useful, necessary or indicated (i.e. overutilization). The proportion of unjustified CT examinations is estimated to be 20 - 30% [2, 3]. Inadequate referrals is a substantial problem causing unjustified imaging, and the quality of the information in the imaging referral is the centre of this problem [4, 5]. The negative consequence in shape of ineffective use of health care resources is obvious. The other main problem involved is the potential hazards from exposure to ionising radiation. The principle of justification applies to three levels [6], of which justification of a procedure for an individual patient is of special interest here. Excessive utilization and unnecessary examinations also represents a practical and moral challenge for radiologists and radiographers [7], partly due to radiation protection considerations.

Measures to ensure appropriate investigations for each patient delivered in a timely manner will therefore be beneficial for many reasons. The referral is the key source of information that enable radiographers and radiologists to provide good quality services i.e. to conduct appropriate examinations (using proper modalities and techniques) and provide appropriate radiology reports [8]. This means that vetting and justification of referrals need to be a team work including radiographers, radiologists and referring clinicians. Radiologists play a critical role in justifying and accepting examination requests as, by virtue of their medical training, to ensure the clinical question is answered. However, increasingly [in UK] these roles are shared with radiographers and delegated to other team members that have undertaken appropriate training [9]. A study of Norwegian radiologists show that they act upon inadequate referrals regularly, mainly by searching for more information [4]. Nevertheless, the radiographers' contribution to vetting and justification of referrals is largely on unknown. As they are the first and often only health care professional interacting with the patient in the radiology department, they are in a good position to recognise cases of duplicate examinations, questionably indicated examination, and patients undergoing multiple similar examinations [10]. Radiographers are responsible for notifying the radiologist in cases suspected unjustified referrals, and their role can be to discuss imaging requests with the referring clinicians [11]. The referral process is illustrated in FIG. 1 showing the various actors involved. – The question is if the tasks and responsibilities for vetting and justification of referrals can be shared between health professions in a more efficient manner, and what preparation, precondition and premises this would require.

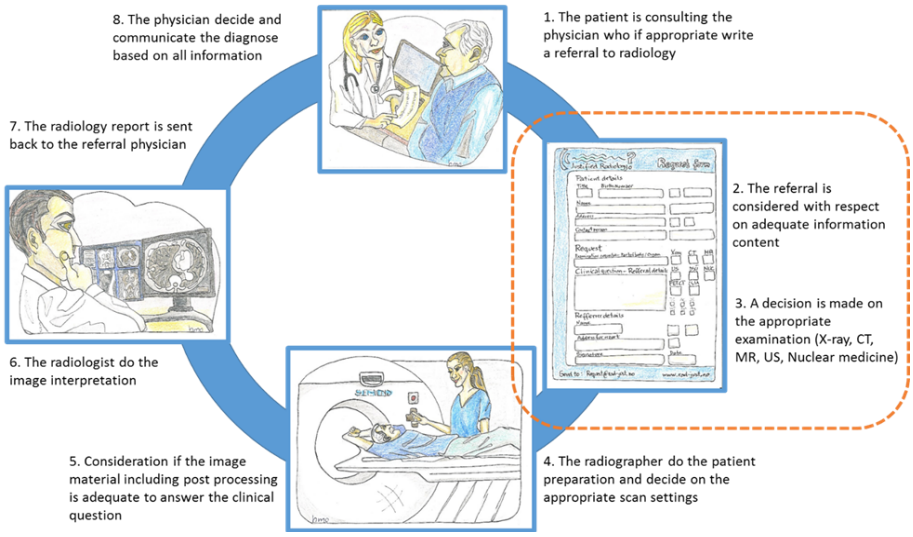

FIG. 1. The referral process explained in eight steps – the project proposal concerns step 2 and 3.

1.1. Research aim and objectives for the project abbreviated RAD-JUST

The primary objective is to develop the role of the radiographers as gatekeeper for referrals to the radiology department; to ensure the radiographers are sufficiently skilled and trained to contribute in the process of vetting and justification of radiological examinations, and by that improve the quality of services and the resource utilisation in radiology and health care services as a whole. The secondary objectives are (FIG 2):

- To understand how actors in the radiology department perceive the current situation on roles, responsibilities and collaboration in the referring processes (WP1)
- To evaluate the radiographers perceived abilities and preferences in vetting of referrals (WP2)
- To survey the content of justification issues in the syllabuses in radiographers education, and design tailor-made training on bachelor and master level in the education of radiographers (WP3)
- To evaluate the initiative with respect to how it will increase the radiographers ability and confidence when contributing in a multidisciplinary team with physicians and radiologists to ensure the quality of the referrals, and give advice on the appropriate choice of examination (WP4)

2. APPROACHES AND CHOICE OF METHOD

2.1. The role of radiographers and radiologists in the referring process (JUST-ROLES)

The initial study will make use of qualitative focus-group interviews; groups of radiographer, radiologists and leaders in Norway, recruited based on variations in professional positions, education, age and gender, as well as covering different locations, medium sized radiology departments, delivering various common examinations. The outcomes of the initial focus-group study will feed into the construction of the questionnaire to survey the radiographers' attitudes and experiences of vetting and justification of referrals. Members of the radiographers association in Norway and Sweden will be invited (6000 possible respondents).

2.2. Evaluating the radiographers vetting of referrals (JUST-VETTING)

A number of hypothetical but yet credible patient cases and referrals will be created. The referrals will address issues concerning a) patient data – connected to the executing of the examination b) medical indications – connected to the radiology report and c) diagnostic modality and specification of examination – connected to justification. We will create about five referrals for a number of frequent radiological examinations, such as the examinations of the brain, lungs, abdomen and extremity. We will consult radiologists for validation of these sample referrals. The abovementioned issues of concern will be tested by use of electronical quest back.

2.3. Learning objectives, curriculum and teaching material (JUST-SYLLABUS)

The content of current bachelor curriculums in western countries will be studied as input to the design of a tailor-made syllabus on justification to inspire both bachelor and master level radiographer educations. One master level course will be designed for a digital learning environment to recruit students internationally.

2.4. Implementation at selected radiography schools (JUST-IMPLEMENT)

W4 aims to implement the new syllabus and training programme created in WP3 to selected university radiography colleges and evaluate the initiative. The colleges will be selected in collaboration with the ISRRT; as planned currently this will involve educational institutions in Australia, Norway, Sweden, Turkey and UK. Evaluation from the students' perspective will be done based on focus group interviews in the start, middle and end of the course. An assessment tool organized for the university radiography colleges will be created.

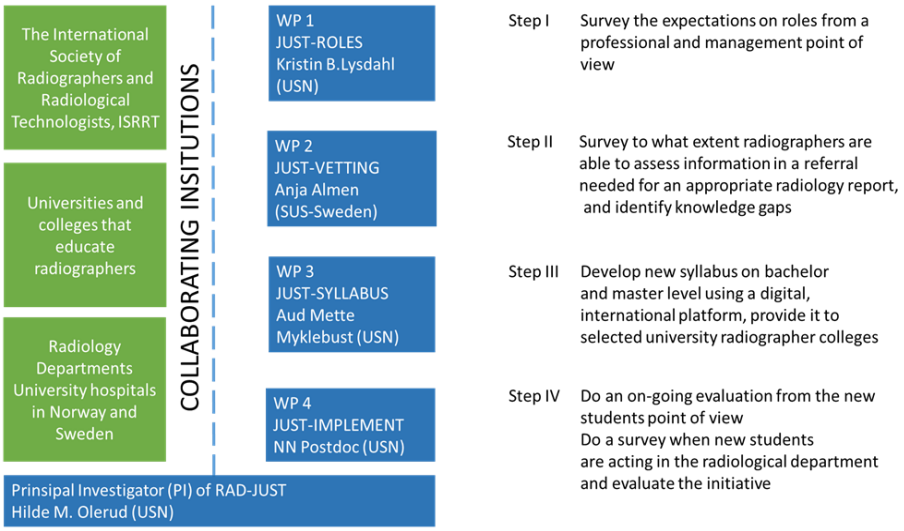

FIG. 2. How the proposed project RAD-JUST are planned in work-packages chaired by experts representing both the University College- and University Hospital sector.

3. PRELIMINARY RESULTS

There are recognized differences in syllabuses between radiographer educations in Europe in the content of justification. The level and length of the education is different, from high school level to bachelor, four - year education to master level. WP3 will therefore provide a long list of topics that other universities can supplement from. Even though the scope will vary between bachelor and master level, the following topics are relevant:

- The normative foundation of justification of medical exposures as addressed by the international organizations in regulations and recommendations
- Typical work flow from doctors office to appropriate investigated patients – health professionals involved in various steps in the flow chart
- Radiological equipment and modalities with pro- and contras on what sort of clinical questions they can answer
- Update technology knowledge: Planar X-ray radiographs and fluoroscopy, angio/intervention, Flat detector CT, Computed Tomography (CT), Magnetic Resonance Imaging (MR), Ultrasound
- Improve anatomy and pathology skills for radiographers
- Referral criteria and guidelines. What are the clinicians' needs, about what are their concerns?
- A good referral – what kind of information should be included. Appropriateness criteria [12]
- The radiographer as gatekeeper for the justification process; how to work in a multidisciplinary team
- Radiation risks and risk communication in a person-centred perspective

4. DISCUSSION

There is a comprehensive use of radiology in western part of the world. When a patient suffers from certain clinical symptoms, the physician may need answers from radiology to decide on diagnosis and further treatment. Several modalities are used in imaging, that is conventional planar X-ray, computed tomography (CT), nuclear medicine, magnetic resonance imaging (MR) and Ultrasound (US); the two latter do not involve ionizing radiation but have other pro and contras. It is obviously of major importance to select the appropriate modality and procedure for the clinical question. Projects like the presented should be part of the next action plan for radiation protection in the medical sector, since it will have impact in all the following three perspectives:

(a) Insure that the patient are referred to the most appropriate examination and thereby can get the right diagnose
(b) Reduce the number of unnecessary examinations that will reduce negative health consequences for patients and costs for the public healthcare system, and
(c) Reduce the radiation dose to individual patients and collective dose to the population.

Despite the many useful applications of ionizing radiation in society there are harmful effects addressed by bodies like the World Health Organization (WHO), the International Atomic Energy Agency (IAEA) and the International Commission on Radiological Protection (ICRP). One issue of concern is the increasing use of radiology and the collective dose burden to the population in western parts of the world [13]. The pillars of radiation protection in medical exposures are justification, optimization and dose limitation. The principle of justification applies to three levels: Justification of a practice, generic justification of a defined procedure, and justification of a procedure for an individual patient [6]. The latter is exactly what this research application address: *how to improve the process of justification of the individual patient procedure in radiology*.

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