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### Dealing with Inappropriate Medical Imaging

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As technological advances and knowledge progress, imaging techniques continue to grow at a fast pace. Utilisation of different radiology services varies significantly. A study performed in the United States demonstrated that these variations are not totally related to economic development. The costs of medical imaging have been rising steadily in the last decade due to several other factors, especially the evolution of new technologies and population changes. In a study of Medicare spending, its authors concluded that higher spending regions did not have better health outcomes or satisfaction with care.

It is estimated that between 20 and 30 percent of all imaging examinations are not justified. The causes have been thoroughly analysed in the literature, and have been linked to the aging population, defensive medicine, selfreferral and radiologist's need for additional certainty in their diagnosis.

#### Unnecessary Testing Means Rising Costs

The result of unnecessary testing is therefore a rise in costs. These high costs brought the United States Senate Finance Committee this year to propose higher payments for physicians that refer to appropriateness criteria. Aside from higher costs, other negative issues associated with unnecessary imaging studies are an increase in radiation to the population, delays in treating patients and the risk of false positive diagnosis. The rapid technological evolution of imaging makes it difficult to keep clinical colleagues and even radiologists up-to-date.

The good news is that new developments are replacing some previously useful tests such as in the case of intravenous urography being substituted by ultrasound, CT urography and magnetic resonance. The bad news is that quite often, new technologies are added instead of replacing others, summing complexity and costs. PET-CT is probably a good example of the latter as in the case of lung cancer staging where the redundancy of CT and PET-CT should be addressed.

Most authors have proposed recommending specific measures to diminish the impact of unnecessary imaging examinations. The results of these measures, when isolated, have varied, and in general, unnecessary imaging studies have not diminished. In one study, only one third of radiologists used ACR musculoskeletal appropriateness criteria. In a recent publication, although nearly 80 percent of radiologists knew the Fleishner criteria for follow-up of pulmonary nodules, only 50 - 60 percent of them used these criteria properly.

#### What Can be Done?

Inappropriate imaging must itself be treated in a similar way to the diseases it attempts to diagnose. The steps we must follow are: 1) diagnosis 2) communication and 3) treatment.

1. In order to establish diagnosis, we must have appropriate data collecting (RIS-HIS integration) and adequate internal organisation. The radiology department must be organised according to clinical problems, and be organ- system oriented, to allow more solid grounds for justification of our imaging studies.

2. Communication needs to be able to transmit to the involved parties the specific problem, its consequences and our diagnosis. A good communication protocol is essential as is establishing a common language between clinicians and radiologists. Radiologists have a fundamental role educating clinicians in the advantages, disadvantages, and costs of imaging techniques in each specific situation. In general there is a lack of knowledge of costs and morbidity (including radiation) of different imaging procedures.

3. Treatment combines several steps:

**A. Preventive:** Setting clinical guidelines and algorithms with partner clinicians and primary care physicians. ACR guidelines are a good example. In Spain the consensus guidelines of the SEDIA, the abdominal section of the Spanish Society of Radiology (SERAM) have become an excellent tool to avoid unnecessary studies.

*Our experience:*

- Primary Care: Relations with primary care physicians are most crucial if we want to avoid excessive demands for unnecessary imaging studies.
- After local health authorities decided to permit primary care physicians to order imaging studies, including MRI and CT, we organised brief

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lectures in seventeen primary care centres in our area. Our objective was to explain the indications of imaging techniques in the most common pathologies encountered in primary care. At the same time we indicated how to communicate with the radiologists and expressed our intention of acting as referral doctors rather than as providers of techniques, especially regarding the utilisation of MRI, CT, ultrasound and interventional radiology. The result has been a containment of the demand of imaging examinations compared to other health departments in our community.

**B. Curative:** We must know when to exchange one imaging test for another, how to reject a study that is unnecessary and how to communicate these measures to patients and clinicians. Patient safety is mandatory, and therefore hard decisions must be taken sometimes, especially regarding radiation dose.

*Our experience:*

- Intravenous urography: A well established procedure that has been replaced in most cases by ultrasound, plain abdominal radiographs and CT or MR urography. Yet the traditional use of this technique poses some problems at the time of changing to new protocols, especially with urologists. We elaborated a consensus document based on published data. A significant reduction (70 percent) of intravenous urograms has occurred although we still have some reluctant urologists that should be convinced.

**C. Palliative:** Agreements with other parties on the implementation of guidelines, and the approach to a progressive elimination of unnecessary exams. Sometimes, especially when the issue is certainty in the diagnosis and may have medico-legal implications, we have to arrive at an agreement with other clinicians.

*Our experience:*

- Preoperative chest radiograph: A routine chest x ray was obtained in all patients that were scheduled for surgery regardless of age, gender or clinical history. We defined the problem, detected the origin of the demand (anaesthesiologists) and proceeded to negotiate an agreement based on the scientific evidence and the legal implications in Spain. As a result we eliminated 60 percent of all preoperative chest radiographs.

**D. Follow-up:** Decisions regarding necessary measures must be maintained to guarantee that there is no return to the previous situation. Quite often guidelines change as new technology and scientific evidence appear. We must keep up to date and review our protocols.

*Our experience:*

- We defined algorithms and protocols for our medical department in 1992 and reviewed them periodically. Despite this, the adherence to these algorithms has been low and has depended mainly on the degree of involvement of our radiologists with other medical departments. We believe that the clue to a proper follow-up of guidelines and algorithms is a well-organised organ-system radiology department, and established systematic discussions of protocols with clinicians.

## Conclusions

Ineffective use of radiology increase medical costs may have negative results on the patients' health and creates serious problems in healthcare organisations. Radiologists should know how to detect, prevent and eliminate unnecessary studies using a global approach, consensus and wisdom with all the implicated parties.

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