

## Strategies to optimize the appropriateness of MRI and CT requests

Strategies and tools for optimal use

English summary

Une production de l'Institut national  
d'excellence en santé  
et en services sociaux (INESSS)

This is the English summary of the guidance entitled *Stratégies d'optimisation de la pertinence des requêtes concernant l'IRM et la TDM - Stratégies et outils favorisant une utilisation optimale* - published in January 2018.

The complete version of this guidance (in French) is available on the website of INESSS in the *Publications* section.

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# SUMMARY

## Background

Advanced diagnostic imaging techniques such as magnetic resonance imaging (MRI) and computed tomography (CT) play a prominent role in modern medicine. They occupy an important cross-sectional place in the health system and have a significant impact on the access to several types of specialized services and consultations. Quebec, like the great majority of comparable provinces or countries, faces a problem of access to MRI and CT. In addition to potential consequences for patients' health and quality of life, the economic impacts of excess waiting could be significant. On the other hand, the issue of examinations considered inappropriate is frequently raised. Some estimate that in Canada overuse represents between 10% and 20% of the examinations performed, which imposes a considerable burden on the health network. In an effort to improve patient access and to ensure for the population the appropriateness of these examinations, the Ministry of Health and Social Services (MHSS) entrusted INESSS with the mandate of documenting the various strategies for optimizing the appropriateness of the MRI and CT related requests.

## Method

In order to achieve this, a comprehensive search of the scientific and gray literature was conducted. A synthesis of more than 130 documents was carried out to gather all the evidence.

## Results and possible avenues for action

This review of the literature found that many health authorities in Canada and abroad are currently looking to improve the appropriateness of using expensive imaging devices whose accessibility is often limited. Unfortunately, the scientific literature provides little evidence to support the various initiatives described in this report. What seems to be clear, however, is that overuse is a multifaceted issue where no one-sided approach would be sufficient. Several initiatives, therefore, should be taken forward to achieve a significant and lasting impact. In order to help make choices in the Quebec context, it would be very important to obtain data on the extent of the issue of inappropriateness regarding the imaging requests in Quebec practice. However, such data are currently inexistent. Based on the available literature, some possible avenues for action may, however, be suggested:

1. First, in order to promote and document the appropriateness of diagnostic imaging requests, it is important to establish guidelines in this regard.
  - The adaptation of well-recognized, frequently updated and widely accepted at the international level guidelines (e.g. ACR Appropriateness Criteria, iRefer) is likely to be the most efficient approach. Adaptation is required in order not to import practices that would be irrelevant in the Quebec context.

- The collaboration of multidisciplinary groups, which would include all the disciplines involved in the adaptation process, is essential to facilitate the adoption, dissemination and implementation of the recommendations.
  - Continuous updates are required to ensure long-term adherence to the guidelines.
2. Priorities should be determined for clinical situations where the use of imaging is highly prevalent and expensive and where the rate of inappropriate exams is likely to be high.

To assist the clinician in the overall care of patients, tools should be designed for each of these priorities. In this case, imaging would appear as a key node in the decision algorithm.

Other authorities have recognized the following clinical priorities:

- Coronary artery disease (suspected or diagnosed)
  - Suspected pulmonary embolism
  - Headache (traumatic and nontraumatic)
  - Cancer of the lung (primary or metastatic, suspected or diagnosed)
  - Low back pain
  - Cervical or neck pain
  - Knee pain
  - Hip pain
  - Shoulder pain
3. Measuring the rate of compliance with the desired practice is fundamental to support the change in practices and specify future areas of intervention. Various organizations have developed several imaging appropriateness indicators, some of which are currently adopted by federal programs in the United States.
4. Interventions with professionals such as the dissemination of educational materials (e.g. imaging guidelines), reminders, continuing medical education and audit and feedback are recognized values for driving change in practices. The rate of median impact reported in the literature is about 6% improvement regarding the compliance with the desired practice. For example, an initial appropriateness rate of 75% would increase to 81%. The amendment of order forms to include the relevant guidance regarding certain clinical conditions (e.g. low back pain) has also shown some potential.
5. Clinical Decision Support Systems (CDSS) coupled with Computerized Provider Order Entry (CPOE) is an effective way to support adherence to imaging guidelines (moderate level of evidence), but their impact on use is rather limited. The rate of median impact reported in the literature is about 8% improvement regarding the compliance with the desired practice. Very little data have been made available about the effects on the clinical outcomes for patients and the system-wide costs. More studies will be needed to draw reliable conclusions about these parameters.

In the United States, the use of CDSS has recently been made mandatory to ensure Medicare reimbursement (MRI, CT, nuclear medicine).

6. In some health systems, when the patient is referred by a family doctor or when the examination is performed in a private facility, the public reimbursement of an advanced imaging examination is limited to some clinical indications deemed to be appropriate. This decision is sometimes made on a regional basis (e.g. in the UK) depending on needs, available resources and the local services organizational structure or on a national basis (e.g. in Australia). The available scientific literature on this subject is limited and comes mainly from the United Kingdom.
7. Utilization management programs (e.g. pre-authorization and pre-notification) are implemented by a number of insurers in the US to control demand and ensure the appropriateness of advanced imaging requests. A low level of scientific evidence suggests a reduction in use, but the range varies widely from study to study. These programs appear to be financially beneficial to a third-party payer, but the data are too limited to draw conclusions about the effects on the clinical outcomes for patients and the system-wide costs.

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