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Development of a Performance Improvement Program: A Workplace-Based Educational Intervention on Magnetic Resonance Imaging in Spinal Trauma

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OBJECTIVE: Performance improvement (PI) programs are an educational tool used to analyze clinical performance of clinicians. The effect of this tool has not been fully explored in orthopedic and trauma surgery.

DESIGN AND SETTING: A needs assessment was conducted in connection with a worldwide webinar on magnetic resonance imaging in spinal injuries to identify the clinical need for an educational intervention. A 3-step PI process was defined and implemented over a 6-month period in 1 hospital department. Opportunities for improvement were identified by applying a 10-item quality checklist to 26 cases. A focused educational intervention was delivered to address the identified gaps, and a set of 22 posteducation cases was compared.

PARTICIPANTS: The department of radiology and the department of trauma surgery of a level I university hospital participated in this study.

RESULTS: A total of 26 cases collected before the educational intervention showed several areas for potential improvement. Important information was not provided by the surgeons in their communication with the radiologist. The educational intervention outlined the data and suggested actions. Comparing the information transfer of the preintervention and postintervention data, there was a significant improvement following the intervention ($p = 0.0013$).

CONCLUSION: Our PI program was able to demonstrate a significant influence on the behavior and the attitude of surgeons and radiologists. (J Surg Ed ▮:▮▮▮-▮▮▮. © 2015 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: performance improvement program, educational intervention, interprofessional learning, information transfer, magnetic resonance imaging

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Interprofessional and Communication Skills

BACKGROUND

The complexity of medical procedures, diagnostic tools, and therapeutic approaches is constantly growing. In addition, there is a clear tendency to sub-specialize even more within the different medical specialties. Consequently, there is a growing need to communicate between different groups in a hospital and to transfer knowledge to be able to work on a common basis.

Failure to communicate between different groups and teams in a hospital finally can endanger patient health and lead to poor outcomes.[1]

In a time where health care systems focuses on efficiency, time constraints often hinder educational endeavors that is one of the primary responsibility of teaching hospitals.

Modern teaching is not only about knowledge transfer but takes the performance of all participants under certain circumstances into account.

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FIGURE 1. A performance improvement program consists of 3 steps. It can be used to address clinically relevant problems and can integrate an interprofessional educational approach.

Many different studies examined educational intervention in the medical field to improve certain outcome criteria, with many studies using virtual settings or simulations.[2]

Programs addressing performance improvement (PI) are implanted in industrial companies and in the business world for many years but are relatively new in medical education. The American Medical Association defines a PI program as "a 3-stage process where a physician or group of physicians learn about specific performance measures and implement improvement. Participants assess their practice using selected measures, undertake an educational intervention to improve performance related to these measures and then reassess their practice using the same measures"[3] (Fig. 1). A very important step in the process of developing improvement programs is the identification of measurable parameters. These parameters need to be determined before measures for their improvement can be implemented. But even before this, a need analyses must be undertaken, a step that has sometimes been neglected in medical education but is a very important step in designing improvement programs.[4]

With this study, we intended to address a clinical problem but also to develop a blueprint for PI procedures in surgeon education.

In 2012, we presented a worldwide webinar on magnetic resonance imaging (MRI) imaging in orthopedic and trauma surgery. An online needs assessment survey that was administered to the participants showed that communication between surgeons and radiologists was reported as one of the major barriers in the use and access to this imaging technology.[5]

Based on this finding, we developed a 3-step workplace-based educational program. In the first step, we measured the current performance. Based on the assessment data, we developed and delivered a local educational intervention and finally remeasured the performance following the education.

METHODS

This study was performed at a University Hospital in Germany (Ulm University). A 10-item communication and information checklist was developed. Anytime a surgeon requested an MRI owing to an acute spinal condition, he or she had to call the responsible radiologist. The checklist was completed by the radiologist to document the content of the request and the consequences drawn by the radiologist (Fig. 2). The surgeons were not informed that the call was documented.

Based on the experience of the first 26 cases, an educational intervention was developed and delivered as a 45-minute session, bringing the groups of surgeons and radiologists together (Fig. 3). The intervention was followed by another 45-minute discussion session. The educational intervention consisted of current studies on MRI in spinal trauma and general information on limitations of this imaging technology and bordering technologies such as computed tomography.[6-9] In addition, the radiologists explained which information is essential for optimal imaging and the consequences that missing details can have on the outcome.

Following this meeting and the educational presentation, a postintervention set of 22 cases was recorded and compared with the pre-educational procedures.

RESULTS

In all, 26 cases collected before the educational intervention showed several areas for potential improvement. Important information was frequently not provided by the surgeons in their communication with the radiologist. A specific trauma mechanism or a possible inflammatory or malignant illness were mentioned by the surgeon in only 5 of 26 cases, and such information may lead to a change of MRI sequence planning. Consequently, in most cases (25 of 26), the communication between radiologists and surgeons did not lead to a change in the MRI sequences that were carried out (Fig. 4A). The educational intervention outlined the data and suggested actions to improve what was identified as a gap to better imaging. Comparing the information transfer of the preintervention and postintervention data, there was a significant improvement following the intervention. Significantly more information was transferred ($p = 0.0013$). Following the intervention, the communication between surgeons and radiologists did significantly influence the