# Anesthesiology and IQ Scientific Institute for Quality of Healthcare

# IMPROVE-implementation study

## Improving perioperative safety: complexity and involvement as implementation challenges

Yvette Emond,[1] André Wolff,[2] Gert Westert,[1] Hub Wollersheim,[1] Hiske Calsbeek[1]

[1] Scientific Center for Quality of Healthcare (IQ healthcare), Radboud Institute for Health Sciences (RIHS), Radboud university medical center, Nijmegen, The Netherlands, [2] Department of Anesthesiology, Pain Center, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands

## Objective

The study objective was to analyse the implementation challenges experienced in carrying out a multifaceted implementation programme (IMPROVE). IMPROVE was designed to help implement the three national perioperative safety guidelines using a stepped-wedge trial including 1934 elective surgical patients in nine hospitals in the Netherlands.

IMPROVE was developed based on an extensive analysis of barriers and facilitators for implementation and consisted of education, audit and feedback, reminders, organizational, team-directed and patient-mediated interventions.

Results showed some improvements over time, such as increased guideline adherence, decreased postoperative wound infections and decreased length of hospital stay. However, most effects were not significant or related to IMPROVE, probably due to heterogeneous implementation success.

Therefore, a process analysis was carried out to investigate the involvement in the IMPROVE-implementation activities.

## Methods

During the study period, we prospectively kept a logbook with field notes to keep track of our “implementation” experiences in the hospitals in order to explain the involvement of the hospitals and to identify challenges for carrying out IMPROVE. The standard process evaluation survey that we developed yielded too little information because of a low response. Therefore, we used our field notes to compare executed and planned activities (i.e., what hospitals actually did based on the field notes compared with what hospitals should have done based on the IMPROVE manual). The logbook contained the notes of all meetings and contacts with the hospitals (including all mail exchange), descriptions of the key features of performed implementation activities (e.g., target group, implementer, intensity) based on the framework of Hulscher et al. as well as attendance logs and, per hospital, a schedule with the planning and distribution of tasks and responsibilities (including to do’s, deadlines and the current state of affairs).

## Results

Four major implementation challenges were derived from our field notes:

1. the study design: fixed design, too short time planning of intervention and measurement period, long study duration, four repeated measurements, and poor data availability;
2. the selection process of hospitals, departments and key contact person(s): inadequately covering the entire perioperative team and stand-alone surgeons who resisted participating in the implementation programme;
3. the implementation programme: large programme size and scope, tailoring, multicentre, lack of mandate, co-interventions by the Dutch Health Care Inspectorate, local intervention initiatives, intervention fatigue;
4. competitive events: hospital mergers or the introduction of new IT-systems.

## Conclusions

This process analysis approach helped to explain the limited and delayed execution of IMPROVE.

The identified implementation challenges reflect a high complexity related to the implementation programme, study design and setting. The involvement of the target professionals was put under pressure by many factors as can be seen in Figure 1.

We mostly encountered challenges, but at the same time we provide solutions for addressing them: a less complex implementation programme, a less fixed study design, a better thought-out selection of contact persons, and more commitment of the hospital management and surgeons would likely have contributed to better implementation results.

Data needed to measure effects appeared to be a highly underestimated challenge. For this reason, we recommend investing resources in accurate data registration.

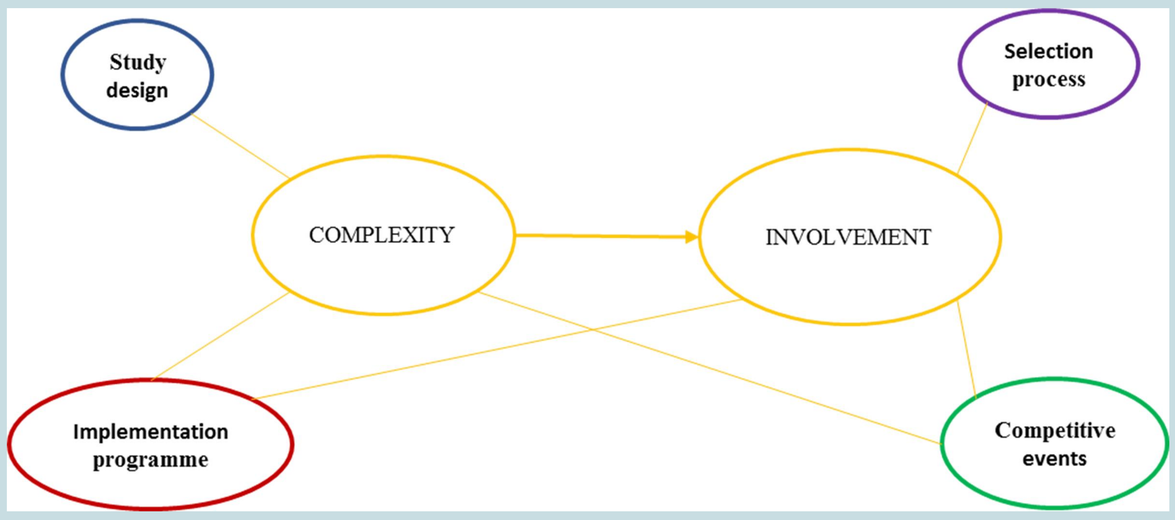


Figure 1: Overview of the implementation challenges reflecting a high complex intervention and factors that seriously affected the involvement of professionals. These implementation challenges also induced and reinforced each other. For example, the data-collection problems in the participating hospitals became particularly challenging due to the many times that data had to be collected according to the stepped-wedge structure.

**Contact:** Yvette Emond, E-mail: yvette.emond@radboudumc.nl

ZonMw

Institute for Health Sciences Radboudumc