How to detect and exploit non-adherence to guidelines?

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Abstract and Objective

Healthcare organizations enforce guidelines or standards in order to improve the quality of care and to reduce costs. Yet, deviations from guidelines always occur, but concepts pertaining to these deviations are not yet well understood. The panel, which includes renowned speakers, aims to increase the awareness and further our understanding of these underlying concepts. In particular, the panel will address the following issues from a multidisciplinary perspective: 1. How to detect non-adherence to guidelines? 2. How to detect structural changes in guideline adherence (with or without decision support) over time? 3. Why do patients and providers deviate from guidelines? 4. How can deviations inform us about opportunities for guideline improvement and customization? and 5. How should organizational and social barriers to guideline improvement be managed?

The panel members are international, representing four different countries. These discussions are likely not only to generate common or general issues related to barriers to guideline development and use, but also bring to the table issues specific to each organization or the country.

Keywords

Standards, deviation, clinical guidelines, process mining, process learning.

Panel description

Healthcare systems are complex systems with many interacting agents and dynamically emergent situations. The presence of dense inter-related network structure of interactions between many entities, including technology makes operations in complex networks exceedingly difficult. This is evidenced in the challenges of patients seeking care as well as the workflow of healthcare professionals. A class of interventions that has proven to be very useful in these environments is use of standard protocols or guidelines.

An advance in clinical investigation, sophisticated data analysis, rapid dissemination, and rigorous evaluation of the findings has led to the accumulation of medical “evidence”. This evidence now forms the basis of thousands of evidenced-based guidelines developed and promoted by professional societies, safety and outcomes organizations, provider institutions, and regulators. Protocol standardizations and guidelines are important for consistent and safe practices. However, complex environments are highly dynamic in nature and often require people confronted with non-standard situations to adjust and deviate from standard protocol. Under what circumstances are deviations permissible? What are mechanisms involved in deviation from guidelines? It is well known that guidelines or standards are inconsistently implemented or used. The questions we ask are why are the guidelines not used consistently, and how can we assess the use of the guidelines and monitor guideline adherence over time? How can we develop schemes for guidelines that support adherence, but also offer substantial flexibility that accommodates situational variance.

Many times guideline adopters do not follow recommended procedures. The guidelines may lack transparency resulting in confusion. The recommended practice may run counter to established norms or perceived norms of the user group or the guidelines may be not available in the form that match the way users think about the problem and their resolutions. It means that guidelines that do not meet user requirements with regard to assumptions of their existing expertise, knowledge content, and integration with workflow may not be readily adopted. Yet there is an abundance of existing guidelines, evidence-based and endorsed by professional societies, those are frequently violated. Examining the barriers to their adoption may provide insight into strategies for effective future guideline development. This raises a number of questions about the nature of guidelines development, implementation and how they are (or are not) used by the users.

Practitioners sometimes modify the use of standard procedures during their practice. These modified practices are needed to manage conflicting goals that arise in an operational environment (e.g., pressures for quick resolution vs. pressures for collecting more data). Sometimes the modified practices make the overall system safer—under some circumstances, where adherence to prescribed procedures can indeed result in unsafe outcomes. At other times the modified practices themselves result in unsafe outcomes (resulting from breakdowns in the adaptations necessary to cope with real world complexity). This is a critical safety paradox.

Practitioners following the prescribed procedures all the time will be unable to complete all of their work. But, if disaster happens because they did not follow the prescribed procedures in a given instance, they will be blamed for not following the procedures. A way out of this dilemma is to understand the nature of the socio-technical system that has to be considered in developing flexible or resilient protocol or guidelines. We must keep in mind that errors in clinical practice guidelines can translate into errors in real-world clinical practice. The best way to reduce these errors is to understand how they are generated, thus enabling the future development of methods to

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Panel Objectives and topics

The goal of the panel is to raise awareness of the value and necessity of deviation from standards. The panel will address issues related to deviation from standards or guidelines, including detection approaches to non-adherence to guidelines; monitoring guideline adherence over time; reasons for deviating from guidelines; and exploiting deviations for guideline improvement. This way we can understand the conditions under which guidelines are followed and when they are not, and this will enable the development of methods to capture errors made in creating the guideline, and ways to improve them before they are used in clinical practice.

The panelists will provide empirical evidence about deviations to the guidelines, address the issue of non-adherence to guidelines, and discuss artificial intelligence methods for improving guideline-based care processes.

Strategies to engage the audience in discussion

To ensure participation by the audience each panelist will contribute three one-sentence provoking statements related to the panelist’s point of view on deviation from standards (e.g., “There is no innovation without deviation,” or “Automated process learning would never outweigh evidence-based studies”). We will ask the audience to vote on the extent to which they agree with the statements, before the panel presentation to encourage discussion. We will develop real world scenarios related to guideline challenges and hope to use these for general discussions with the audience.

Panel organizer and participants

Panel organizer: Vimla L. Patel, PhD, DSc,FRSC

Vimla L. Patel, PhD, DSc is a Senior Research Scientist and the director of Center for Cognitive Studies in Medicine and Public Health at the New York Academy of Medicine. She is also a Professor in the Department of Biomedical Informatics at Columbia University, and a Clinical Professor at Arizona State University. An elected fellow of the Royal Society of Canada (Academy of Social Sciences), the American College of Medical Informatics, and the New York Academy of Medicine, she is an associate editor of the Journal of Biomedical Informatics as well as a senior advisory editor of Journal of Topics in Cognitive Science. Dr. Patel is a cognitive scientist known for adapting methods/theories from cognitive science to develop innovative approaches for providing scientific foundation for health education. Her research includes role of human cognition in designing a safer clinical environment by understanding the complexities of a distributed cognitive system underlying critical decisions.

In her presentation, Vimla will provide research evidence that well-developed knowledge of an expert allows for flexibility and adaptiveness in dealing with guidelines and standards, resulting in deviations, which are most often innovations, while minimizing generation of errors. This is not true for the novice trainees, whose deviations lead to errors. Implications of these results and learning from errors to improve guidelines will be discussed [3,6].

Panel participant: Ameen Abu-Hanna, PhD

Ameen Abu-Hanna, PhD is Professor and Chair of the Department of Medical Informatics at the Academic Medical Center at the University of Amsterdam. He is Principal Investigator in the research area Methodology in Medical Informatics with interest in artificial intelligence, machine learning and decision support systems. He is associate editor of Journal of Biomedical Informatics and a former president of the European Society of AI in Medicine.

Ameen will start by discussing issues related to the seemingly simple task of defining non-adherence to a guideline. Next he will focus on methods that can detect patterns in (non-) compliance to guidelines over time [2]. Ameen will then touch on statistical machine learning techniques [1] that would allow the identification of types of users (physicians and patients) that exhibit distinct non-compliance patterns. Finally, he will report on factors that seem to motivate health care providers to use guideline-based decision support.

The presentation will be illustrated in domains such as medication prescription, blood glucose regulation, respiratory control, and caring for the elderly (in the outpatient and inpatient settings).

Panel participant: Mor Peleg, PhD

Mor Peleg, PhD is an Associate Professor at the Department of Information Systems at the University of Haifa, Israel, which she headed during 2009-2012. Mor has been one of the key developers of the GLIF3 guideline modeling language while she was as a postdoctoral fellow at Stanford University. Her research targets guideline modeling languages, semantic knowledge and data integration, and process learning. In 2005 she received the AMIA New Investigator Award. She was the PC chair of AI in Medicine conference and has repeatedly co-organized the ProHealth and Knowledge Representation in Healthcare workshops. She is the coordinator of the FP7 European large-scale integrated project MobiGuide.

Mor will discuss artificial intelligence methods that she and her team have been developing for improving guideline-based care processes [5]. These methods learn clinical contexts in which deviations from standard practice improve patient outcomes. She will discuss the ways in which guideline personalization and patient empowerment could affect process evolution in the MobiGuide project.

Panel participant: Silvana Quaglini, PhD

Silvana Quaglini, PhD is Professor at the University of Pavia, School of Engineering Laboratory of Biomedical Informatics. Her main research topic is decision support systems in medicine, including computerized guideline implementation, telemedicine, homecare, careflow systems and economic evaluation of health care programs. Particularly interested in technological transfer, some of her research results, among which a stroke registry and a reminder system for outpatients, have been implemented at the Lombardia Region Healthcare System. She has been, and is involved in several European-funded projects (currently MobiGuide), and she is author of about 200 scientific papers.

Silvana will discuss issues related to guideline compliance [4], in particular how to discover non-compliance, provider motivations and how to exploit these motivations to improve the care process. She will provide examples from a guideline implementation in two Italian Stroke Units. Issues related to link computerized guidelines with medical health records will also be addressed.

The panelists represent different areas of research drawing on various disciplines including psychology, computer science, computer science with interest in artificial intelligence, machine learning and decision support systems. He is associate editor of Journal of Biomedical Informatics and a former president of the European Society of AI in Medicine.
(formalization; statistical machine learning; development of decision support systems), and management theory. In addition, they have worked with a wide range of medical domains.

All participants have agreed to take part on the panel.

References


