

Standardization of Care of Common Pediatric Fractures



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KEYWORDS

- Quality improvement methodology • Supracondylar humerus fracture • Buckle fracture
- Standardization • Common pediatric fractures

KEY POINTS

- Quality improvement methodology is different than traditional research; done correctly, it is a regimented process, but is meant to be shared and implemented quickly.
- Using quality improvement methodology to implement an evidence-based protocol for surgical treatment of supracondylar humerus fractures, compliance among the 13 surgeons at the authors' institution increased from 0% to 85% over 2 months and was maintained for over 14 months.
- As a result of supracondylar fracture standardization, the authors also decreased the number of surgeon preference cards for this procedure from 13 to 1 and reduced variability in supply and surgical charges and charge per patient.
- Quality improvement methodology was used to implement Level-I evidence into clinical practice for treating distal radius buckle fractures.
- At 2 tertiary care institutions, the percentage of patients with distal radius buckle fractures treated with braces was increased from 34.8% to 84% over a 6-month intervention period.

INTRODUCTION

Distal radius fractures are the most common site of fracture in the pediatric population.¹⁻⁴ Supracondylar humerus (SCH) fractures are the most common surgically treated fracture of the pediatric elbow.^{1-3,5} Although there is abundant literature discussing treatment and outcomes of these 2 common fractures, there is only emerging literature specifically discussing the variation in care among surgeons.⁶ There is now a known need for standardization of these types of injuries to optimize the quality, safety, and value for patients. Quality Improvement (QI) methodology differs from traditional research in many important ways and is meant to be shared and used to implement changes

quickly.⁷ This article will discuss the basic QI methodology and share 2 examples of specific programs that standardized the surgical care of SCH fractures at 1 institution and wrist buckle fracture care at 2 tertiary care orthopedic clinics.

QUALITY IMPROVEMENT METHODOLOGY

Over the last several years, a major focus of the health care industry has been to track the quality, safety, and value of medical care given by the health care system.⁸ QI methodology is a formalized approach to analyze the performance of a health care delivery system, and to assess the impact and results of changes made to the system. A QI program involves systematic activities that are organized and implemented by a

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health care provider or team to monitor, assess, and improve the quality of health care being delivered. The QI methodology commonly used in health care is a framework called the Model for Improvement, and it is based on the 3 questions:

1. What are we trying to accomplish?
2. How will we know that a change is an improvement?
3. What changes can we make that will result in improvement?

There are many models of QI utilized in health care delivery, and the authors' institution adopted the System of Profound Knowledge, popularized by W. Edwards Deming.⁹ This model involves the interrelationship of 4 main domains of quality improvement: the theory of knowledge, psychology, understanding variation, and the appreciation for a system (Fig. 1). The main concept of this model of QI

is understanding that the system being studied has natural variability over time. By recognizing the natural, expected variability of the system over time (common cause variability), one can appreciate when unexpected variability (special cause variability) occurs, as well as track changes over time. The QI model then uses plan, do, study, act (PDSA) cycles to trial incremental changes and evaluate their effectiveness before implementing large-scale changes to the health care delivery system.¹⁰ By utilizing this model, the system of health care delivery can be incrementally improved to maximize patient outcomes.

Although the QI methodology is a science and is performed systematically, it does differ from traditional hypothesis-driven research.^{7,11} One of the important differences is that QI improves or reduces variability of a process by implementing a standardized approach to health care delivery, whereas the purpose of

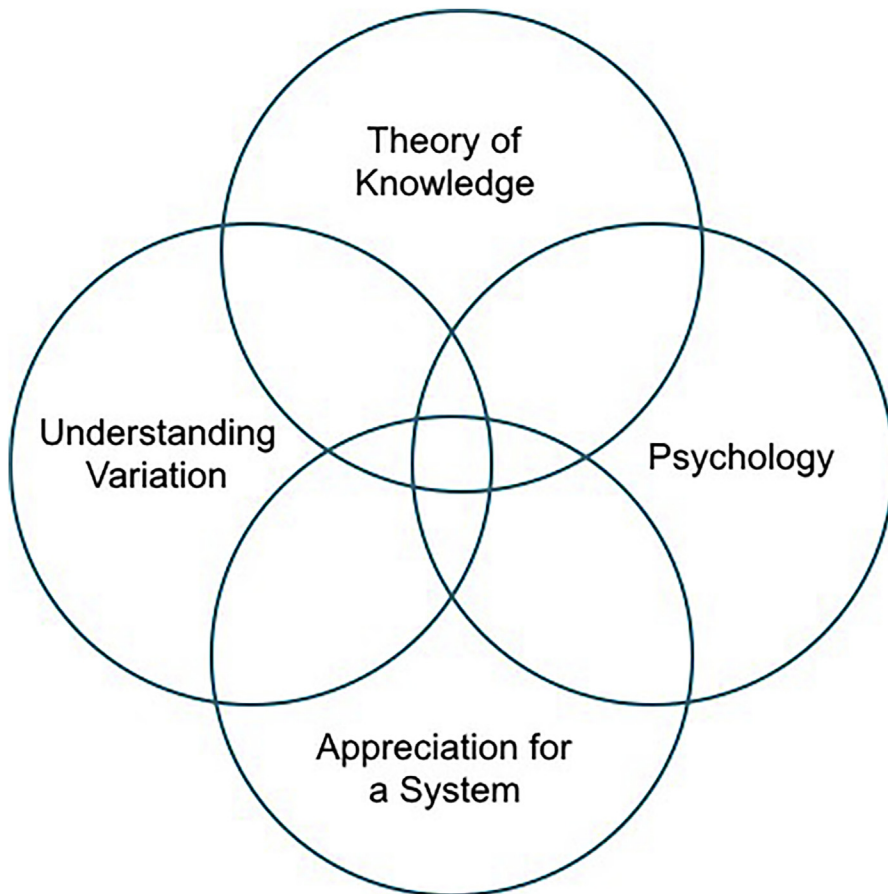


Fig. 1. The W. Edwards Deming model of quality improvement known as the system of profound knowledge. (Data from Lynn ML, Osborn DP. Deming's quality principles: a health care application. *Hosp Health Serv Adm* 1991;36(1):111–20; and Langley GJ, Moen RD, Nolan KM, et al. *The improvement guide: a practical approach to enhancing organizational performance*. 2nd edition. San Francisco (CA): Jossey-Bass; 2009.)

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