Uncertainty in Clinical Knowledge:
A Critical Dimension of Quality Evaluation

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ABSTRACT
This article explores the ways in which uncertainty can be incorporated into the understanding of better performance approaches, and is thus proposed as an enabling dimension of performance. The enabling characteristic of uncertainty is of special interest to designing educational programs for providers in assistance to the amelioration of care through the application of available knowledge, be that from data relating processes to outcomes, or based on feedback providers get from patients and families about their expectations from the care. Tracing the keystone definitions of uncertainty from Hippocrates to Osler, the discussion addresses the dimensions of decision-making appropriateness, its timeliness, the expected and actual value of the care services, and the role of systematic communication between providers of care as well as with patients. The crucial role of Health Information Technology is emphasized, and a unifying model is proposed where the inclusion of uncertainty as a dimension of performance promotes an encompassing evaluation of the quality of health care services. Evaluation, influenced by tradition and precedent, is discussed as requiring the inclusion of health care and caring services.

KEYWORDS
Clinical Knowledge, Communication, Health Care Services, Health Information Technology, Quality Evaluation

BACKGROUND
Historically, decision-making during the management of disease was the domain and responsibility of the physician. Observation placed within a body of knowledge, derived from experience or didactically taught, was the framework for clinical decision-making. The artful application of knowledge, scientifically sustainable or not, constituted the identity of a profession where its members were given the social license to be the keepers of the knowledge they applied, as well as the evaluators of their own performance.

In the process of applying knowledge, the physician came to realize about the uncertainty of how various segments of knowledge interact. The management of this uncertainty has been associated with the “art” of applying incomplete and often untested knowledge toward the well-being of a patient. Hippocrates’s teaching, stated in Latin, summarizes the above reality of medicine as “Ars longa, vita brevis” (the task is huge, life is too short). Centuries later, Osler formulated the profession as “Medicine is a science of uncertainty and an art of probability…” (Brainy Quotes, 2012). It seems that medicine kept its identity almost intact over 20 centuries when dealing with the challenge of uncertainty. Yet, experimentation, also stated by Socrates, has acquired increasing importance as it can lead to a better understanding of how the segments of knowledge interact. In its most successful form,

DOI: 10.4018/IJUDH.2017070102
such experimentation can lead to evidence, or Evidence-based Medicine (EBM) (Bates, 2003; Guyatt, 2004; Strauss, 2005). Evidence in turn determines expectations both from providers and recipients of care, since the very nature of evidence is its replicability and hence predictability. The evolution of artfulness to application of predictable evidence did not however take the “art” of medicine away. Rather, it provided different and complementary dimensions to the evaluation of care provision: the “art” is readily appreciated by the recipient of care; and the evidence-based decision-making by those who evaluate the care scientifically.

As background, let us review the relevant Aphorism of Hippocrates (Wikipedia, 2012):

Ο βίος βραχύς,  
η δ ἐ τέχνη μακρὴ,  
ὁ δ ἐ καρπ ὁ ἐ ἡ κρίσις,  
ἡ δ ἐ πεῖρα σφαλερή,  
ἡ δ ἐ κρίσις χαλεψ.

The translation of this text into English is:

Life is short,  
The art is long,  
Opportunity fleeting,  
Experiment fallible,  
Judgment difficult.

The last statement uses the ancient Greek word Kairos (κρίσις), which means “opportune moment,” addressing the context and timing for the appropriate application of the knowledge. Kairos is different from Chronos, which deals with chronological timing (quantitative) – it defines a moment when an important decision is made (qualitative). Thus, judgment should best be seen as the culmination of the decision making within the context of the opportune moment.

The purpose of this chapter is to revisit the roots of clinical decision making with a special emphasis on the management of uncertainty using information technology as the enabler for both responding in time to the “fleeting opportunity” and maximizing the appropriateness of the judgment within the “opportune moment.”

INTRODUCTION

Techne, Episteme, and Technology

A system of knowledge is required to define science, as Osler defined medicine. Therefore, the term “techne,” when applied to medicine, may better be translated as “craft” rather than art, and be equated more with “episteme” to delineate the scientific boundaries and limitations of medicine. However, and for the purposes of this chapter, “techne” has a special importance as it is the root of the term “technology” and brings us to consider how technology enables practitioners of a craft to apply a system of knowledge, artfully.

Technology in Health Care

The past decade has seen the realization by healthcare payors that the increased volume, complexity, and efficiency in the production of health care services requires the use of automation for better management of utilization, and information gathering and sharing technologies for evaluating the goodness of the services. Indeed, for payors (insurance companies, communities, and governments)
Researching an Activity-Driven Approach to Information Systems Development
www.igi-global.com/chapter/researching-activity-driven-approach-information/78036?camid=4v1a

The RCQ Model: Conceptualizing Inter-Clinician Relationships, Communities of Practice and Quality Improvement in Healthcare
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