

Understanding Medical Uncertainty : A Primer for Physicians

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Abstract

Many decisions in General Medicine have to be made in the paucity of well-researched information. Despite the existence of evidence-based guidelines, physicians may perceive obstacles in implementing these in clinical practice. Intolerance to uncertainty may result in a tendency to perceive ambiguous situations as sources of threat. Variability in treatment, choice of medical specialty, increased personal anxiety, increased test ordering tendencies, decrease comfort with geriatric and psychological problems have been correlated with intolerance to uncertainty. Various Instruments and scales are currently available to measure physician's uncertainty. Quantitative and qualitative techniques of managing uncertainty include shared decision-making, meticulous history-taking and evaluation, exclusion of worrisome diagnosis, ability to critically appraise current literature and establishing trust with patient. ©

HISTORICAL PERSPECTIVE OF MEDICAL UNCERTAINTY

Traditional medical education revolves around the art of a meticulous history taking, critically analyzing the signs and symptoms and arranging the patient's concerns in a known category of disease. Medical students and physicians strive for perfection and are often frustrated when their probabilistic approach to a medical problem fails to resolve the issue. Physicians soon come to realize that uncertainty surrounds every aspect of medicine, from making a diagnosis, selecting a test procedure, sorting out rank order of disease probabilities and assessing the outcome of a disorder. Hippocrates¹ commented, "Life is short, The Art long... experience fallacious and judgment difficult". Osler² recognized the role of uncertainty when he warned graduating physicians, "A distressing feature in the life of which you are about to enter...is the uncertainty which pertains not alone to our science and art, but the very hopes and fears which make us men. In seeking out the absolute truth we aim the unattainable, and must be content with finding broken portions."

However, it often comes as a surprise to most patients and many physicians that despite of thorough evaluation the diagnosis or further course of treatment would be uncertain. The inability to come at a conclusion despite a thorough and reasonable evaluation generates anxiety amongst patients and physicians alike, sometimes leading to

unsatisfactory patient-physician outcome. There are different terms which have been used in literature to describe uncertainty in medical professionals. These include terms like, intolerance to ambiguity, risk averse, uncertainty, unstructured, presented as a probability, vagueness and fragmented and unclear.³

In the present article we will explore the factors that lead to medical uncertainty, identify the different techniques that have been used to identify uncertainty in medical students and physicians and recognize some practical techniques of dealing with medical uncertainty.

MEDICAL UNCERTAINTY IN CLINICAL PRACTICE : SUMMARY OF CURRENT EVIDENCE

Human illnesses usually involve abnormality of a complex biological system. The clinical expression of an illness involves the multi-dimension interactions of the abnormalities of various self-regulated physiological mechanisms with the patient's environment. This is further influenced by the patients and physicians variability in expression and understanding of the problem .Uncertainty remains prevalent throughout the practice of medicine, and causes anxiety in patients⁴ and physicians.⁵ Variation in physicians' practice styles and organization characteristics(sites of medical care) has been linked to uncertainty.⁶ Numerous patient and physician factors could affect the clinical decisions and result in medical uncertainty (Table 1). Physicians frequently use terms which reflect their uncertainty. These include statements like "I don't know," "It's not clear."

In an audiotape review of physicians and patients interviews⁷ it was found that physicians used expressions of

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Table 1 : Patient and physician factors causing medical uncertainty

Patient factors	Physician Factors
Uncertainty in history	Poor communication skills
Inappropriate prioritization of history	Inappropriate assessment of probability
Patient's risk aversion	Physician's tolerance to uncertainty
Test variability	Test interpretation
Variable response to treatment	Inability to apply evidence-based treatment
Access to variable sources of information on same topic	Inability to appraise best evidence
Influence of society	Influence of medical organization and local - practice environment

uncertainty in 71% of the time. However, physicians may be oblivious of their uncertainty.

Adequate informed decision-making process includes fulfillment of six criteria, namely, description of the nature of the decision, alternative options, discussion of risks and benefits, discussion of uncertainties and assessment of patients understanding and personal preferences.⁸ However, in only 5% of the medical encounters where uncertainty of medical diagnosis clearly stated during the process of informed consent. Failure to acknowledge the uncertainties of an intervention could potentially mislead the patient in the process of informed consent with implications towards malpractice.⁸ Most physicians however respond to resolving uncertainty by action, and studies have revealed that this behavior could lead to increased hospital admission and ordering of tests.^{9,10}

Rennee Fox¹¹ reported that uncertainty in medical students stems from personal ignorance, limits of available medical knowledge and an inability in distinguishing between the two. Uncertainty surrounding a problem leads to inquiry, which might result in finding information which generate more uncertainty and result in indignation. Eddy¹² has described the patient and physician encounter as 'the chain of uncertainty' that involves several links. The several links in the chain include factors like, biological variability of the case, uncertainty of the physician, the motives of the consultation, the bias of the patient and the physician, medical errors, variability in medical opinions, and the differing values of the patients and physicians (Fig. 1).

Beresford¹³ identified that there are three kinds of uncertainty: 1) technical uncertainty which occur from inadequate scientific data, 2) personal uncertainty which arises from being unaware of patient's wishes and 3) conceptual uncertainty which arises from an inability of applying abstract criteria to concrete situations. While it is reasonable to assume that one could with more experience and effort address the issue of technical and personal uncertainty, the problem of conceptual uncertainty could continue to linger on.

Personal tolerance to ambiguity and uncertainty seem to play a considerable role in medical students when it comes to career choice. Budner¹⁴ introduced the term, 'intolerance of

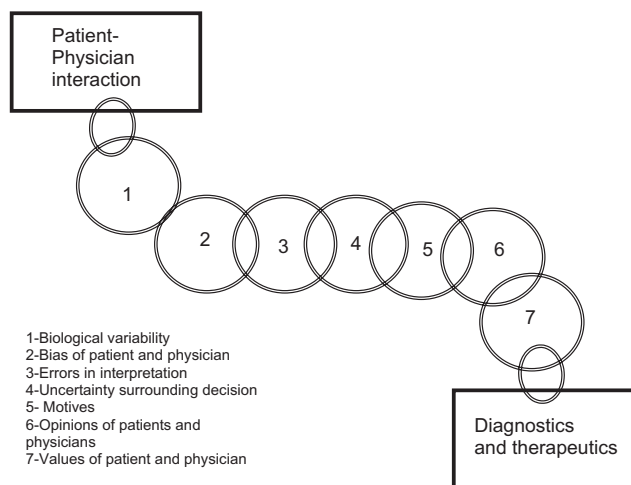


Fig. 1 : The chain and links of medical uncertainty in a patient - physician encounter (* modified from reference 12).*

ambiguity,' as the tendency to perceive ambiguous situation as sources of threat. Amongst medical students there is a higher intolerance of uncertainty in students who ultimately choose Anesthesia, Surgery, and Radiology as future residency options as compared to medical students who choose to go to Internal Medicine and Psychiatry.¹⁵

Patient's response to physician's uncertainty has been found to be highly dependent on the technique that is employed by the physician in expressing uncertainty. Ogden *et. al*,¹⁶ reported that patients found verbal expressions of uncertainty, i.e., using expression like, ' I don't know,' ' let's see what happens', ' I haven't come across this before', etc., more bothersome than behavioral expressions of uncertainty (i.e., using a computer to find a answer, asking another physician for advise , referring to a hospital). Patients were most disturbed when the physician asked a nurse for advice (behavioral expression of uncertainty), or said that they don't know or, 'let us see what happens.' Hence, 'what' and 'how' we say might prove to be more unsettling to patients than what they might be perceiving by observing us handle their case (behavioral uncertainty).

Recent evidence indicate that patients express higher satisfaction with physicians who acknowledge and use more terms of uncertainty than physicians who are more laconic in their conversation.⁷

CAN UNCERTAINTY BE MEASURED IN A MEDICAL STUDENTS AND PHYSICIANS?

Numerous scales have been used to measure uncertainty in medical students and physicians.¹⁴⁻¹⁸ The reliability of these instruments has been variable. The most commonly used scale is Physicians' Reaction to Uncertainty Scale (PRU).¹⁵ This 23 item scale which deals with two subscales, "stress from uncertainty" and 'reluctance to disclose uncertainty.' When physicians were asked about their perception of uncertainty in their daily work; Urologists and Orthopedists stated that they encountered the least amount of uncertainty as compared to Psychiatry, Family Practice,

and General Medicine where the degree of uncertainty was quite profound.¹⁹

Using the patient response to uncertainty (PRU) scale, it was estimated that 17% of excessive cost in medical management arose in physicians with high anxiety due to uncertainty.²⁰ Also, high scores were found in younger physicians, women physicians, and general internists as compared to family practice.²¹

However, other studies in medical students has revealed that women students and students who were older at entry had a higher tolerance to uncertainty.²²

Most medical schools do not include a curriculum in risk assessment, risk communication or teach students how to deal with medical uncertainty. Medical students who were intolerant to uncertainty had a negative response to patients with hypochondriasis, geriatrics, and patients with psychological problems.²³

TECHNIQUES OF MANAGING MEDICAL UNCERTAINTY

The different techniques of dealing with uncertainty, include quantitative methods and qualitative methods. The often quoted quantitative methods²⁴ (using decision trees, Markov chain analysis, and Monte Carlo simulation) are limited in use because of the general perception of being more complex and dependent on the probability estimates. Evidence-based medicine (EBM) has been described as a technique to combine physician's clinical expertise with the use of the best available evidence and incorporating the patient's personal value in coming to a diagnosis.²⁵ Recent evidence indicates that several additional approaches are required to implement evidence in clinical practice. Successful implementation of EBM procedures usually require a five-stage process: 1) development of a concrete proposal for change, 2) analysis of target group for any obstacle for a change, 3) linking of the interventions to the need of physicians and facilitators, 4) development of an implementation plan and 5) monitoring of the progress of implementation.²⁶

Inadequate communication skills could often result in an inability to appreciate to understand the patient's concerns. The common communication deficiencies have been listed in Table 2. Hewson and colleagues²⁷ identified nine strategies that they felt were effective in managing uncertainty in primary care (Table 3). Using this framework and incorporating the strategies when discussing with a patient with an uncertain diagnosis could improve the quality of patient-physician communication. Faculty physicians were noted to use a greater portion of these nine strategies as compared to second year residents (61% versus 44% respectively).²⁷

'Tacit knowledge' is defined as the knowledge and skills that are often used by experts in practice but are rarely articulated.²⁷ The techniques that I have used includes a combination of qualitative and quantitative approach and the use of tacit reasoning.²⁸ These include steps that

Table 2 : Common patient-physician communication deficiencies

- 1) Interrupting patient early in the course of interview
- 2) Failing to elicit full range of patients concerns
- 3) Missing opportunities to understand patients concerns and feelings
- 4) Failing to revalidate the patient's concerns
- 5) Minimizing the patient's role in the decisions-making process
- 6) Failing to assess patients understanding of the decision process.

Table 3 : Strategies for handling medical uncertainty *

- 1) Define the diagnosis and explain the signs and symptoms and its relation with the disease
- 2) Emphasize and eliminate alternate diagnosis which the patient might be concerned of
- 3) Describe the possible course of the illness and scope of the treatment
- 4) Identify and negotiate key issues which concern the patient and the physician
- 5) Prioritize the plan, assess patient's understanding and willingness to comply
- 6) Emphasize that alternative diagnosis will promptly be evaluated if symptoms change or new ones arise
- 7) Take action to eliminate worrisome diagnosis
- 8) Set up reasonable follow-up appointment to assess change of signs and symptoms
- 9) Negotiate a plan with the patient to deal with any situation that require immediate action

*modified from reference 27

incorporate the principles of medical decision-making, risk assessment and communication of uncertainty.

- 1) In the process of dealing with uncertainty, physicians should make it clear to the patient that they are willing to answer any questions about their health.
- 2) Physicians should acknowledge that there is a tremendous information explosion and should suggest valid sources of information including valid web-sites like American Cancer Society, American Heart Association, and Arthritis Foundation.
- 3) It is imperative that the physician be open-minded and acknowledge ignorance if they are unable to answer a question but volunteer to find the answer.
- 4) They should listen sympathetically and explore the concerns of the patients.
- 5) They should acknowledge their own bias and explain that to the patient.
- 6) They should foster a sense of collaboration and involve the patient equally in the decision-making process.
- 7) While expressing the risks and the results of test material, physicians should use a language which is easily understood by the patient and also explain the results using a method which is most meaningful to the patient.
- 8) If there are more than one option on the medical treatment, that should be explicitly informed to the patient.

Summary

There are several factors which result in medical

uncertainty during a clinical encounter, and this could arise from 1) physician as well as patient factors, 2) could arise from test and treatment characteristics as well as 3) organizational characteristics (Heath Maintenance Organization versus other hospital characteristics).

By understanding the tenants of medical uncertainty and practicing the well-established techniques which have been outlined, physicians could probably decrease their work stress and anxiety while dealing with patients with undifferentiated illness, and this could also probably reduce the variation in physicians' use of resources.

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Announcement

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