Three Steps in Making a Diagnosis, Clinically: A Prospective and Universal Strategy

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Abstract

The clinical diagnosis is made based on matching the history and physical examination with known disease-pattern, prior to specific laboratory testing. Notably, there is no single universal tool has been proposed in making the diagnosis, clinically.

We describe a "Three steps strategy" to clinical diagnosis and discuss its advantage and limitation.

Proposed "Three steps strategy" in making diagnosis clinically is for beginners and for those who yet to acquire the clinical ability to transform knowledge directly from book to the practice without prior clinical exposure. The concept is thoughtful and has built-in-flexibility. This is inherently universal, efficient, and allows making the diagnosis, prospectively. Lack of its adaption and individualized internalization are the main limitation. Additionally, this promotes judicious use of laboratory studies and retrospectively, this strategy obviates the need for practice of defensive medicine.

Keywords: Three steps strategy; Making diagnosis; Universal; Prospective; Retrospective

Introduction

The traditional differential diagnosis is made based on matching the clinical history and physical examination with recognizable disease. The information required is typically collected by taking a history under well "structured format". These processes, as such, never discloses the diagnosis. The cognitive processes needed to make a diagnosis has focused on problem-solving [1-3] and decision-making strategies [4,5]. Three steps "approach" has been recommended previously for different clinical situations, including, but not limited to, in-office assessment of the geriatric foot [6], treating a specific condition such as analgesic rebound headache [7], improving pneumococcal vaccination rates [8], and clinical decision making for end-of-life care decisions [9].

"Diagnostic errors are common and can often be traced to physicians' cognitive biases and failed heuristics (mental shortcuts)" [10]. This is likely to occur in initial step of a clinical evaluation.

Notably, no single universal clinical strategy has been proposed for making a diagnosis, clinically. Proposed "Three steps strategy" is shown in the Table 1, which is more relevant in today's practice of clinical medicine.

Discussion

Analytical and comparative

Table shows a comparative list of methods which are used in making a clinical diagnosis.

1. Structured formats for gathering clinical information: This is the first clinical tool introduced during medical training and is applied universally, which heavily emphasizes a detail history taking. This is a sound strategy for gathering clinical information. Other used clinical format, of Subjective, Objective, Assessment, and Plan (SOAP) is a widely used method of documentation [11].

In contrast, the first step is the one which emphasizes on the first sign or symptom from the outset. Because this focuses on patient's specific problem, this directs to the specific line of questioning which leads to the second step. Thus, this strategy has a built-in capability. Simultaneously, this avoids collection of un-needed clinical information (distractor). Both are important in avoiding pitfalls of making a diagnosis, clinically.

2. Pattern-matching or recognition: A widely used method in clinical medicine [12]. The process starts after collection of the clinical information (retrospectively) and then, physician makes

Table 1: Proposed "Three steps strategy".

Three Steps in making a diagnosis, clinically:
A universal and prospective clinical strategy
1.   The first step is to understand the patient's presenting problem.
2.   The second step is an anatomical or pathophysiologic localization of the presented problem.
3.   The third step is exploring the cause of the anatomic or pathophysiologic dysfunction,
The first step in association with the second step generates a short list of appropriate differential diagnosis. The cause, the third step, may be obvious long before the localization. The sequential use of the three-steps is recommended for a systematic complete assessment.

Table 2: Shows a comparative list of methods used in making a clinical diagnosis.

Method	Characteristic	Comment
Medical history taking and examination and subjective, objective, plan, and assessment (SOAP)	Universally used which provides a sound format for collecting the clinical data.	Does not guide for relevancy of the question to be asked, and data is analyzed at the end.
Pattern-recognition	Physicians use the memory of previous exposure of the disease to diagnose the disease in question.	A passive process, which falls short, when physician is unaware to a new clinical situation
Problem–based learning	Learner earns both thinking strategies and domain knowledge	Like Three steps strategy, both are an active learning process.
Proposed "Three steps strategy"	Utilizes all the above cognitive tools and enhances a higher level of clinical problem-solving skill.	Unlike pattern-recognition, this is an active process, the diagnosis is made prospectively.
"Three steps strategy" in making the diagnosis, clinically does not replace the traditional approaches. Rather, it complements them by leading to a specific line of clinical questioning to be asked for the diagnosis.		

the diagnosis by matching her or his previously exposed knowledge to the pattern of the disease.

Unlike pattern-matching, the proposed strategy seeks the presenting problem prospectively. The clinical diagnosis is an inherent result of the first and second steps. In second step; presence, absence, and associated sign or symptom, all improve the accuracy of the localization. The second step increases the diagnostic accuracy particularly in absence of diagnostic physical finding.

The examination affirms what was learned from three steps. Adherence to such a strategy likely to reduce number of tests is being performed.

Of note: The laboratory test should be performed to prove or disprove, which was already inferred from the clinical assessment.

3. Problem-based learning: Three steps strategy should be differentiated from the currently used learning tools (Table 2).

In problem-based learning, students learn both thinking strategies and domain knowledge. The students develop effective problem-solving skills, self-directed learning, and intrinsic motivation [13].

Unlike, three steps strategy enhances the individual ability to apply in a specific clinical context, rather than asking questions based on their own experience such as hypothesis testing, pattern-matching, or categorization [14].

This is the contention of Elstein et al., "The controversy about the methods used in diagnostic reasoning can be resolved by recognizing that clinicians approach problems flexibly" [15].

In addition, error in the making of a clinical diagnosis such as failure to generate the correct hypothesis, misperception of the evidence, and visual cues can be avoided by adhering to the Three steps strategy. The third step, exploring the cause, facilitates the management and prognosis.

Retrospectively, the Three steps strategy provides a short checklist to make sure that an optimal consideration has been given in the planning of the presented problems in their context. This is much more important in avoiding medicolegal claim when clinical diagnosis was unclear after an initial assessment. Documentation of all Three steps affirms that the physician has considered necessary steps in the management.

"Three steps strategy" differs from the traditional approach as follows:

1. Proposed strategy stimulates relevant questioning, guides for relevancy of the clinical question to be asked, 2. What part of the system one should focus for the specific questioning and thus allows for a focus physical examination to be carried out.

A routine application of the proposed strategy will allow the development of a higher level of problem-solving skill and cultivate a much-needed life-long self-motived-learning. Obviously with increasing knowledge and familiarity with clinical encounters, its application may decrease, but its usefulness or importance does not fade-out. The clinical skill, which has developed with this strategy can be tested in a novel clinical encounter of an uncommon presentation of a common disease or a common presentation of a rare disease.

Three Steps: A universal strategy

The previously used Three steps approach has a variable concept and has been used in specific clinical situations. Proposed "Three steps strategy" although has a fixed concept but this can be used in a wide range of clinical medicines and clinical settings. For example, the answer of the same Three steps can be applied in the Emergency Department, Intensive Care Unit, out-patient settings and in the practice of Telemedicine. The increasing use of internet-based practice demands a quick and accurate clinical management. Its use in Telemedicine is particularly valuable because the provider may not have a full access for physical examination.

Who should adapt the proposed strategy?

Proposed strategy is for those who desire making the "diagnosis clinically", with an accuracy in <3 min. They may have learned about the disease but have not yet encountered them physically.

One may question its usefulness for beginners who have not yet acquired or been exposed to the clinical settings. It should be noted that the proposed strategy emphasizes the application of knowledge, anatomy, and physiology, that has already been acquired in early years of medical training.

This is useful for both beginners and for experienced physicians for different reasons. For both, it provides a sound platform for self-reasoning, monitoring, planning, and feed-back to the critical clinical thoughts. Medical students need to persevere in its use because their exposure to clinical medicine is variably limited. Practicing physicians need to adapt this approach to recognize common and uncommon presentations of a rare disease. Because it is unexpected for anyone to encounter all disorders during the entire lifetime. That is why there is a need to develop an ability to transform knowledge directly from textbook to the practice of medicine. The strategy is relevant in today's practice of medicine that often begins with wide-ranging laboratory studies.

Limitations

Lack of its adaption, utilization and internalization are the main limitation. Other limitations are as follows:

1. Individual ability to interpret the "very first step". How to understand the first step? This is a self-learned multifactorial cognitive process.

2. Lack of application of basic science knowledge.

3. Lack of textbook knowledge of the disease. All these limitations will improve with adherence to the Three steps strategy.

Summary

"Most diagnostic errors have been associated with flaws in clinical reasoning" [16]. The proposed strategy provides the most appropriate base for clinical reasoning in each clinical encounter. This strategy is simple, sense-making, and provides "certainty" under conditions of great uncertainty.

This does not replace the traditional approaches including problem-based learning. Rather, it complements by leading to a specific line of clinical questioning. Additionally, "Three steps strategy" can be used in making diagnosis clinically as follows:

1. Universally: This strategy can be used in different clinical settings. Its application in Telehealth Medicine is particularly important, as physicians primarily depend on clinical history.

2. Prospectively: This strategy provides very much needed information in real time for critical clinical decisions.

3. Retrospectively: This provides a short quick checklist, which ensures that the relevant clinical information has been documented in making the diagnosis, which will minimize a medicolegal consequence.

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