

Diagnostic Errors: Are We Being Neglectful?

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In the area of patient safety, recent attention has been focused on diagnostic errors. Medical diagnoses that are wrong, missed or delayed cause substantial suffering and injury. Modern clinicians still struggle to recognize and accept the possibility of diagnostic error. The reduction in diagnostic error is an important goal because of an associated increases in morbidity and mortality which, potentially is preventable.

Opportunities to improve the visibility of diagnostic errors are evident. Education and training of health care professionals to manage and minimize potential risks and harm that can occur in patient care are central to improve safety at all levels of health care. Strategies, mainly systems based should be implemented to reduce diagnostic errors.

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Dr. Richard Cabot from Harvard was probably a pioneer in the field of Diagnostic errors. More than 90 years ago he emphasized the role of autopsies to reveal diagnostic errors. He compared the clinical diagnoses with final autopsy pathological diagnoses. This format of “Clinico-pathological correlation” (CPC) lasted long and despite advances in diagnostic imaging and other test is still useful, both in learning and teaching situations.¹ Cabot estimated that clinical diagnosis was wrong in more than 50% of common cases such as death due to

cirrhosis, pericarditis, nephritis, thoracic aneurysms and others.²

It is now recognized that diagnostic errors are associated with a proportionately higher morbidity than is the case with other types of medical errors.^{3,4} In reviewing 25 years of malpractice payouts, John Hopkins researchers found that diagnostic errors, not surgical or medicational errors were responsible for largest fraction of claims and payouts.⁵ Errors in hospitals are significant but are relatively common and important in primary care, too. There is paucity of studies in high low-income countries. A

study conducted in a high-income country found that approximately 5% of adults experienced diagnostic error in outpatient setting each year and more than half of them had potential for severe harm.⁶ A survey of children's doctors in high-income country found that more than half of responders admitted to making at least one or two diagnostic errors in a month.⁷ In low and middle income countries the challenge is expected to be much more due to limited access to diagnostic testing resources, paucity of physicians and specialists, limited documentations, unsatisfactory record keeping and limited time for consultations due to large number of patients to be seen by one doctor.⁸ Most people will likely experience a diagnostic error in their lifetime.⁸

What is a diagnostic error?

Diagnostic error can be defined as a diagnosis that is missed, wrong, or delayed, as detected by subsequent definitive test or finding.⁹ However not all misdiagnoses result in harm. Misdiagnosis related harm can be defined as preventable harm that results from delay or failure to treat a condition actually present (when the working diagnosis is wrong or unknown) or from treatment provided for a condition actually not present.⁹ Diagnoses often occur over time, rather than at one point in time. Steps in diagnosis are initial assessment; performing and interpreting diagnostic results, referral work-up and follow up. Patient behavior and adherence to the process is equally important part of the diagnosis. Diagnostic error can occur at each of these points.

How have medical errors been identified?

The science of measuring diagnostic errors (and their effects) is underdeveloped. Three factors explain why diagnostic errors tend to be ignored. First, these errors are by nature obscure and may be detected considerably later; second health care organizations have not viewed these as system problems; and third, physicians responsible rarely perceive their own diagnostic error rates as problematic and they are uncomfortable discussing these errors.

Incidence of diagnostic errors has been estimated by:¹⁰

- Autopsies
- Patient and provider surveys
- Standardized patients
- Second reviews
- Diagnostic testing audits
- Malpractice claims
- Case reviews
- Voluntary reports

It is now known that diagnostic errors are largely related to cognitive performance of the physicians.

Causes of diagnostic errors

A study in a developed country that diagnostic errors were made at patient practitioner clinical encounter (79%), referral problems (20%), patient related factors (16%), follow up and tracking of diagnostic information (15%) and interpretation of diagnostic information (15%). Almost half of diagnostic errors involved more than one of these processes. Patient –practitioner encounter problems were in fields of history taking (56%),

examination (47%) ordering tests and further work up (57%).¹¹

Following factors can contribute to causation of diagnostic errors.¹²

1. Access to high quality care
2. Availability of healthcare professionals and specialists
3. Teamwork
4. Availability of diagnostic tests
5. Communication
6. Care co-ordination
7. Follow up
8. Affordability of care
9. Training of health care providers
10. Availability of evidence based health informatics resources
11. Punitive culture
12. Human factors and cognitive issues

What can be done? Potential solutions

A lot of attention must be paid to diagnostic errors. Following may be a reasonable start. It is likely that a combination of intervention will be more effective.¹³

1. Improving education and skills

Improving the reliability of diagnosis requires better education of primary care providers. Trainees would benefit from explicit training in clinical reasoning, patient safety, human factors, critical thinking, probability concept and reliable science. Many practicing clinicians were never taught the basics of diagnostic decisions on a daily basis and the potential pitfalls. Society to Improve Diagnosis in Medicine (SIDM) and leaders in medical education has developed Assessment of Reasoning Tools (ART).¹² These are straightforward evaluation tools to support

educators in assessing a learner's clinical reasoning skills during patient presentations. Accompanying ART are five faculty development videos of 4-5 minutes each. A practicing practitioner can use the videos as a self-learning tool.

The videos are helpful in:

- Collecting and reporting history and examination data in a hypothesis directed manner
- Articulating a complete problem representation
- Articulating a prioritized differential diagnosis
- Directing evaluation/treatment toward high-priority diagnoses
- Demonstrate the ability to think about own thinking (metacognition)

2. Improving health systems

System related factors are peculiar to the treating unit/hospital. No one size fits all. Systems have to continually look at these factors and make continuous improvements.

In all health systems diagnosis could be improved by enhancing access to care, ensuring the competency of providers, making available high quality diagnostic testing services (laboratory and radiology) and providing a suitable work environment. Health systems should see that good quality, evidence based resources are available readily for consultation. Easy availability of sound evidence based system relevant to clinical case in question is essential as human mind, semantic memory; knowledge retrieval systems are all fallible and frail.

3. Health information technology

Technology can improve the diagnostic process by enhancing communication and providing decision support to busy front line physicians. Reform initiatives offered by IT have been employed. For example diagnostic errors test result follow up is fairly common. Electronic communication and tracing of abnormal test reports is one method employed. Remote consultation and diagnosis can be useful. Remote reading of radiology imaging, cardiology, pathology, and dermatology have been useful.¹³

Smart papers have been made for different conditions, which when followed act as check lists.¹⁴

4. Improved diagnostic testing

Diagnostic testing has received a lot of attention. Access to diagnostic tests could significantly reduce diagnostic errors, particularly in low income countries, given the high rates of delayed cancer diagnosis and the difficulties to make diagnoses based on clinical features alone. The process of ordering, performing, interpreting, communicating and acting upon diagnostic test results remain vulnerable to errors. A lot of institutional improvement is usually due in these fields. Recent launch of Choosing Wisely Campaign is based on perspective of efficiency and resource utilization.¹⁵ The best diagnosticians are the ones who get the diagnoses with spending the least amount of resources.

5. Providing leadership

Leadership and mentoring are central. Formation of Society to Improve diagnosis (SIDM) is one of the greatest successes.

(12) This is a new independent organization dedicated to research, education and awareness about diagnostic errors.

In February 2012, the Patient Safety Program convened a consultation of some of the world's top experts in primary care, research, and patient safety to form the inaugural **Safer Primary Care Expert Working Group**. The experts, from 18 Member States and the six world regions, together with senior members of WHO gathered in Geneva for two days. Together they discussed and debated the available evidence on the burden of harm resulting from errors and the global limited understanding of how to intervene to improve the safety of care in primary care settings. A technical series on patient safety has been published. The Technical Series on Safer Primary Care is a series of nine monographs, which explore the magnitude and nature of harm in the primary care setting from a number of different angles and provide some possible solutions and practical next steps for improving safety.

The role of local level leadership cannot be overemphasized.

6. Learning from errors

Health care organizations need ways to routinely assess the quality of diagnostic care. Finding and analyzing individual cases provide an opportunity to understand the problems and explore solutions. Non-punitive and non-defensive discussions are valuable. The organizations should encourage and facilitate error reporting from physicians. Methods such as reporting of errors in an intensive phase of 10 weeks or so can help in sensitization.¹⁶

Ongoing research will play a key role in identifying what works best to improve safety and how to implement best practices and success stories across diverse care setting.

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