

Applying the Capability Approach to Improve the Quality of Medical Laboratory Test Results

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ABSTRACT

Good medical laboratory test result relies on the appropriate quality assurance techniques, quality control mechanism, and quality management practices used in the laboratory. To ensure good quality results, a wide range of quality control tools and methods are applied. Along with them, equally important are the capabilities of humans, machines, and the chemicals used. Given the collective significance of these mechanisms, the joint promotion of those capabilities is the necessary condition for producing quality medical laboratory test results.

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INTRODUCTION

Quality in medical laboratory test results is an essential component of the health care system. Quality assurance methods, processes, quality control techniques, and management all are multidimensional in nature. The capability approach, based on the normative framework, is equally applicable for producing high-quality medical laboratory test results.

FUNCTIONING AND CAPABILITY

The concept of functioning and capability can be traced back to Aristotle, Adam Smith, Karl Marx, and many other philosophers.¹ In 1979, in his Tanner lecture, "Equality of What?" Amartya Sen questioned the existing literature that is grounded on the utilitarianism and Rawlsianism approaches.² For this, Sen focused on alternative interpretations of egalitarianism.¹ Using the concept of Lancaster³ and Gorman⁴, Sen postulated that commodities can be converted into their characteristics as the properties are inherent to the commodities. In his book, *Commodities and Capabilities*, Sen explained the various concept related to the capability approach that

has in-depth philosophical and pragmatic applications.⁵ Importance and application of these concepts on development economics and human development are frequently explained and justified in his books, *Inequality Re-examined*,⁶ *Development as Freedom*,⁷ and in various other studies.⁸⁻¹¹

According to Sen, "the conversion of commodity characteristic into personal achievements of functioning depends on a variety of factors – both personal and social," wherein functioning is "an achievement of a person: what he or she manages to do or to be".⁵ In the book, *Development as Capability Expansion*, Sen writes, "The capability of a person is a derived notion. It reflects the various combinations of functionings (doings and beings) he or she can achieve".⁸ The capability approach has been further developed by the political philosopher Martha Nussbaum; she proposed and advocated the concept of central human capabilities.¹² Both, Sen's and Nussbaum's capability approach are widely applied in various areas of social sciences, health sciences,

medical sciences, educational sciences, law, and technology.

MEDICAL LABORATORY SCIENCE

Medical Laboratory Science, a branch of medical science, is a complex field and a number of different disciplines such as Microbiology, Hematology, Clinical Chemistry, Urinalysis, Immunology, Serology, Histopathology, Immunohematology, Molecular Biology, and many other disciplines belong to this domain.¹³ The laboratory used in these Sciences is equipped with various biomedical instruments, equipment, materials, and reagents (chemicals) for performing different laboratory investigative activities using biological specimens (whole blood, serum, plasma, urine, stool, among others) as well as different mechanical, electrical, electronic instruments, and equipment for performing experimental works, research activities and investigative procedures for the diagnostic of the disease.¹³

Clinical and public health settings demand a very high quality of laboratory produce test results, and health outcome depends on the quality of a laboratory. The laboratory is itself a complex system. The accuracy, reliability, and timeliness of reported test results are the key factors while defining the quality of a laboratory. Many processes and procedures must be properly performed to produce quality laboratory test results. Many factors such as the laboratory environment, quality control procedures, communications, record-keeping, competent and knowledgeable staff, and good quality reagents, and equipment contribute to the quality of the laboratory.¹⁴ Unnecessary treatments, treatment complications, failure to provide the proper treatment, additional and unnecessary diagnostic testing, and delay or incorrect diagnoses are some of the consequences of low quality or inaccurate test results. To achieve the best level of accurate and reliable test results, it is necessary to operate the laboratory in the best possible way.¹⁴

Some of the major roles of a medical laboratory technologist include "Carrying out routine and advanced laboratory tests using standard laboratory methods; Apply(ing) problem-solving strategies to administrative, technical and research problems; Conduct(ing) community-based research in collaboration with other categories of health

professionals; Provide(ing) professional consultancy on matters related to the establishment, renovation, upgrading and reorganization of medical laboratories of intermediate levels."¹³ To produce precise, accurate, and high-quality medical laboratory test results, a laboratory technologist must be equipped with all the necessary and sufficient knowledge related to the theory of laboratory technology and the skill related to practicing it.

HUMAN CAPABILITY & MACHINE CAPABILITY

A particular technology, supported by a set of machines, performs a specific task and solves a particular problem. A machine does not function itself to produce test results until and unless a well-trained technologist properly handles and operates it manually or with a computerized system. What a medical laboratory technologist can do and be is referred to as the capability of the technologist. A technologist can operate the laboratory in the best possible ways because of the capability of the technologist to make the equipment and the entire laboratory system functional. The capabilities of a technologist are based on her academic as well as skill-based practical training and experiences, which in turn plays a vital role in producing good laboratory test results. What the machine can do and produce can be considered the capability of the machine. The nature of the relationship between technology and human capabilities is discussed in detail in a doctoral dissertation by Oosterlaken et al.¹⁵

The performance of the machine and the quality of the laboratory results produced by the machine both depend on the inbuilt function of the machine and the achieved capability of the laboratory technologists. The quality of the produced results also depends on the quality of the chemicals that are used. Neither a machine nor a technologist alone can produce high-quality laboratory test results. Under certain circumstances, for some users, the same technology can expand their capabilities; while for others, it can diminish their capabilities.¹⁶ Thus, we can argue that the quality of the laboratory test results is an outcome of the composite capability of human capabilities, technological capabilities, and the quality of the chemicals. So, whenever operating the medical laboratory, the focus must be given to the joint

promotion of the capabilities of the technologists and the capability of the technology. The capabilities of the technologists can be enhanced by providing an opportunity for need-based proper education and skill-based hands-on training while the capabilities of the technology can be improved either by repairing and maintaining it regularly or by replacing the older version of the technology with the newer one.

To refer back to Martha Nussbaum's idea, central human capabilities are very important for human beings; so, it must be seriously considered by and inquired to the medical lab technologists whether they are enjoying them. If technologists are properly enjoying Nussbaum's central human capabilities, it will be a good set of strong self-support systems for them to produce high-quality medical laboratory test results. Contrarily, if they are deprived of enjoying those central capabilities, it might create a serious problem for them, causing a negative impact on delivering quality laboratory test results. Along with Nussbaum's central human capability, other capabilities of technologists must also be seriously taken into consideration and a good working environment must be created in the organization where all those capabilities are fully respected to deliver high-quality test results.

Way Forward

A high-quality test result has an important role in curing the disease of the patients and improving their health status. Laboratory test results depend both on the capabilities of the laboratory technologist as well as that of the technology. So, it is high time to think about applying the capability approach to improving the quality of the medical laboratory test results and thereby delivering quality health services to the people.

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