

Chemical Pathologists' Role as Part of Multidisciplinary Teams' Approach to Health-care Delivery

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Abstract

Background: The care of the sick has gone beyond a 'one-man show' since the medical profession is dynamic. The dynamism of the profession is to entrench the patients' survival. This is being done by introducing the concept of Multidisciplinary Team (MDT) approach to patients' management. **Objective:** This review is to have a look at the various roles or ways the Chemical Pathologists can fix into MDT as laboratory physicians. **Method:** This article discusses the definitions and some terminologies in Chemical Pathology and concept of MDT. Its approach in medicare, went through the historical line and evolution of the subspecialty of Chemical Pathology. It discusses the role of Chemical Pathologists in MDT as well as pros and cons of the concept of MDT. Finally, it also discusses how to improve MDTs in Nigerian Tertiary Hospitals. It was essentially based on literatures written in English. **Conclusion:** This review article has tried to discuss roles of Chemical Pathologists in MDTs approach to patients' management in our hospitals not leaving out the historical aspects, its advantages, disadvantages, barriers and possible way forward for the suggested challenges.

Keywords: Chemical pathologist, health care, multidisciplinary approach, tertiary hospitals

INTRODUCTION

The practice of medical profession is very dynamic. The dynamism of this profession is entrenched on the survival of the patients. One of the various means of achieving this is the introduction of the concept of multidisciplinary approach to health-care/multidisciplinary teams (MDTs). These steps are being put in place to ensure that patients have the opportunity or rather advantage of enjoying maximum possible care in any health facility for their survival.

In this approach, inputs are usually obtained and integrated from multiple sources depending on, among other factors, stage of disease progression, pain and other symptoms, patient's and family's psychological state, social and practical requirements, and available resources. Doctors from various areas of specialties including chemical pathologists, nursing staff, social worker, and many others involved in the multifaceted care of the patient form the MDT, which provides this care in a coordinated manner so as to provide continuity of care.

There are many advantages of the multidisciplinary approach, and its efficacy has been demonstrated convincingly in increasing satisfaction of the patient and family, improving

quality of life, and even a modest increase in survival for some patients. However, the multidisciplinary approach has its own barriers and challenges. Some of these can be at least partly overcome with an effective coordination of care between different locations, personnel, and time points of care.

The literature suggests that a well-represented MDT include specialists such as gastroenterologists, surgeons, oncologists, endocrinologists, interventional radiologists, pathologists, nuclear medicine experts, nurses, and social workers/case managers.^[1,2]

For example, for more than 20 years, journal articles published by leaders in the field have advocated a multidisciplinary approach when assessing management options for patients with neuroendocrine tumors (NETs).^[3-9] Dr. Larry Kvols in his own

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words in support of MDTs says “Because there are so many therapeutic options available for patients with NETs. and each specialist brings a different perspective. It’s important that we optimize care for these patients. It’s important to integrate that care and use it in a timely fashion.”

While trying to support the concept of MDTs, Dr. Lowell Anthony also says “I think the appreciation of all the many tests that need to be done, all the many treatments that are out there... and then the order of those treatments is challenging. It really involves more than one decision by one specialty. It really involves an integration.”

DEFINITION OF TERMS

- The term chemical pathology can be defined in various ways some of which are:
 - (a) Chemical pathology is the branch of pathology that deals with the biochemical basis of disease and the use of biochemical tests for screening, diagnosis, prognosis, and management^[10]
 - (b) Chemical Pathology is broadly defined as “the chemistry of human health and disease” or “chemistry in connection with the management of patients, as it applies in a hospital laboratory”^[10]
 - (c) When we call it clinical biochemistry or clinical chemistry, it means the study of the biochemical basis of diseases, and the application of biochemical and molecular techniques in diagnosis as well as in the management of diseases^[11]
 - (d) An allied subspecialty of chemical pathology is metabolic medicine which deals with metabolic diseases in all its ramifications
- A discipline (or specialism) is knowledge or wisdom associated with one academic field of the study or profession. A discipline incorporates types of knowledge, expertise, skills, people, projects, communities, problems, challenges, studies, inquiry, approaches, and research areas that are strongly associated with academic areas of study or areas of professional practice. For example, the branches of science are commonly referred to as the scientific disciplines while that of art are called the humanities^[12,13]
- Interdisciplinary knowledge is the knowledge extensions that exist between or beyond existing academic disciplines or professions. The new knowledge may be claimed by members of none, one, both, or an emerging new academic discipline or profession^[12,13]
- Multidisciplinary knowledge is associated with more than one existing academic discipline or profession. For the purpose of this discussion treatise, multidisciplinary approach in patients management means the coming together of all relevant specializations and subspecializations of medicine in the management of patients.^[12,13]
In this approach, inputs are usually obtained and integrated from multiple sources depending on, among other factors,

stage of disease progression, pain and other symptoms, patient’s and family’s psychological state, social and practical requirements, and available resources. Doctors from various areas of specialties including chemical pathologists, nursing staff, social worker, and many others involved in the multifaceted care of the patient form the MDT, which provides this care in a coordinated manner so as to provide continuity of care.

The services of the department of chemical pathology of any tertiary hospital are not only for that hospital but also to the neighboring health institutions, towns, and states if need be. It also provides teaching at undergraduate and postgraduate levels.

WHO IS A CHEMICAL PATHOLOGIST?

This is a specialist who after completing the first degree in medicine (MBBS), followed it with internship and community service (NYSC in Nigeria parlance), then enter a residency program (accredited training program) as a prospective trainee.

Qualification as a specialist chemical pathologist requires the candidate to obtain the Membership/Fellowship of a training College of Pathologists.

In other words, a chemical pathologist is a doctor who specializes in clinical chemistry by obtaining the membership/fellowship of a training college of pathologists.

EVOLUTION OF CHEMICAL PATHOLOGY

- Charles J. B. Williams, the first President of the Pathological Society of London, told of a house call early in his career and the favorable impression he had made by his “habit of bringing ... not only a stethoscope, but also test-tubes and a few reagents for the examination of the state of the secretions of the patient” Figures 1 and 2^[14] Bull. Hist. Chem. 24 (1999). Published by American Academy of Sciences.
- Alfred B. Garrod described the application of chemistry to pathology and therapeutics as being of the greatest importance to the medical practitioner. “How very imperfect our knowledge ... of the healthy and diseased condition of the body, if we do not call in the aid of chemistry to elucidate its phenomena”^[15]
- With the start of the 20th century, clinical chemistry emerged into its own space on the mosaic of medical practice
- The United States led the way with the decisive breakthrough; two names dominated this period: Otto Knut Folin (1867–1934) and Donald Dexter van Slyke (1883–1971)^[16]
- Their systematic explorations on blood and urine set the style and shaped the parameters for clinical chemistry for the remainder of the century as they developed practical and clinically applicable methods of analysis^[17,18]
- On the basis of a new approach to methodology, analysis of small volumes of biological fluids, they determined

reference intervals, correlated variations with pathologic conditions, and elucidated metabolic pathways in health and disease

- Through their research and teaching of biochemistry and clinical chemistry, they demonstrated that chemists could make great contributions to advances in medical diagnosis and the treatment of disease
- While trying to emphasize the import of chemical pathologist in MDTs, Dr Jarikre of blessed memory who happens to be a Nigerian Consultant Chemical Pathologist in his words used to say that “hardly could anybody die without biochemical derangement!!!” This is just to show the import of Chemical Pathology in medical practice because it is very rare that any death will occur without biochemical derangement.

THE EARLIEST GREAT MEN OF CHEMICAL PATHOLOGY

- In 1958, Van Slyke in his words characterized “the complete clinical chemist. For clinical chemistry includes, not only the development of methods, but study of all the phenomena of the body’s normal chemical processes, and of the alterations that they undergo in disease”^[19]
- John Brown of Edinburgh wrote, “Let us by all means avail ourselves of the unmatched advantages of modern science, and of the discoveries which every day is multiplying with a rapidity which confounds; let us convey into, and carry in our heads as much as we safely can, of new knowledge from Chemistry, Statistics, the Microscope, the Stethoscope, and all new helps and methods”; thus the cradle of MDT.

WHAT ARE THE ROLES OF A CHEMICAL PATHOLOGIST?

The roles and daily responsibilities of the clinical chemist extend far beyond the simple definitions listed above, the following are, however, some of them:

- As laboratory directors, competency characteristics would include effective administration of laboratory services, strategic planning, and defining standards of performance, research, and development
- Additional characteristics include communication of laboratory data, functioning effectively with regulatory and administrative groups, and providing educational direction.
- The management, assurance of quality, and provision of advice on the choice of tests and assessment of the significance of the results (especially with some of the more uncommon tests) are the province of the chemical pathologist
- Chemical pathologists have many responsibilities some of which are further summarized as follows:
 - First, with medical laboratory scientists, laboratory technicians, and laboratory assistants, there is provision of a reliable analytical service (for example, measuring blood/plasma/serum/urinary analytes, indices of liver function, hormones, drugs, and tumor

markers in hundreds of patients’ samples every day)

- Second, chemical pathologists have an important clinical role in advising and contributing to the management of patients with metabolic disturbances/disorders
- Another way to state this is that chemical pathologists are managers of a reliable analytical service, overseeing laboratory staff, test selection and development, ensuring quality of results, and providing interpretative advise to the clinicians
- Clinical roles such as participating in investigating and management of disorders of lipid, glucose metabolism, metabolic bone and thyroid; nutrition and obesity services. In addition, management of inherited (genetic) metabolic disorders to mention but few.
- Indeed, chemical pathologists are increasingly having direct responsibility for patients in outpatient clinics and on the wards
- Chemical pathologist, do not only brings together science and medicine, it relates to all the medical specialties
- Naturally, the role of the Chemical Pathologist is not restricted to those aforementioned; rather the few are mentioned just to illustrate the concept as a whole.

MULTIDISCIPLINARY TEAMS’ INVOLVEMENT IN HEALTH-CARE SYSTEM

In an effort to provide effective and efficient care to patients with various health conditions, the US health-care system has done much to redesign its delivery system. Developing an approach to meet the high demands of patients and to best utilize resources became necessary. The result is the common use now of a MDTs approach.

When properly implemented, this MDT approach provides positive measurable outcomes in managing our patients. MDTs, as the name implies, are teams of people from different disciplines that come together for a common purpose. With a diverse group of health-care professionals, such as physicians, pathologists, nurses, pharmacists, dieticians, and health educators, social service and mental health providers, there is more certainty that all of the needs of the patient will be met.

The MDTs approach is used in a variety of different setting including health care, education, mental health, and criminal justice. The concept is that it is best to address an issue or problem from all angles to maximize our gains.

The MDTs professionals can change from case to case depending on the diagnosis and social or personal situation of the patient. In general, the team will include medical professionals from various disciplines, homecare professionals if needed, social service and mental health professionals, nutrition as well as health educators.

The benefits to the professionals are the opportunity to enhance the professional skills and knowledge of individual



Figure 1: Otto Folin

team members by providing a forum for learning more about the strategies, resources, and approaches used by various disciplines.

As a member of an MDT, the chemical pathologist and other specialists work together to develop a plan of action or a treatment plan and then combine their efforts toward initiating treatment.

The patient is involved in every aspect and is encouraged to involve family as well, as this support can improve outcomes in the long term.

We should all know that the most important member of the MDT is the patient!!!

ADVANTAGES OF MULTIDISCIPLINARY TEAMS

The benefits of a MDT for the patient are enormous some of which are:

- Everyone knows what everyone else is doing
- The ill patients are not responsible for sharing information not fully understood
- The patient will have family and social supports as part of the team.

For the patients:

- MDT improves care by increasing coordination of services, especially for complex problems
- It integrates health care for a wide range of problems and needs
- It empowers patients as active partners in care
- It can serve patients of diverse cultural backgrounds
- It uses time and money more efficiently.

For health-care professionals:

- MDT increases professional satisfaction
- It facilitates shift in emphasis from acute, episodic care to long-term preventive care
- It enables the practitioner to learn new skills and approaches



Figure 2: Donald D. van Slyke

- It encourages innovation
- It allows providers to focus on individual areas of expertise.

For the health-care delivery system:

- MDT holds potential for more efficient delivery of care
- It optimizes resources and facilities
- It decreases burden on acute care facilities as a result of increased preventive care
- It facilitates continuous quality improvement efforts.

For educators and students:

- MDT offers multiple health-care approaches to study
- It fosters appreciation and understanding of other disciplines
- It models strategies for future practice
- It promotes student participation
- And also challenges norms and values of each discipline.

DISADVANTAGES OF MULTIDISCIPLINARY TEAMS

- MDT might be complicated by:
- The utilization of many professionals on a single case might lead to their underutilization as well
- It can be expensive recruiting highly paid (and busy) health professionals.

BARRIERS TO MULTIDISCIPLINARY TEAMS

Despite the fact that team approach has many benefits, it could be hampered by some barriers and the chemical pathologist need to be able to work to overcome some of these common barriers to multidisciplinary care such as:

- MDTs being seen as revolutionary by skill-centered specialists; it is fundamentally an expression of being guided by wholism rather than reductionism
- A major barrier such as the long-established tradition of highly focused professional practitioners cultivating a protective (and thus restrictive) boundary around their area of expertise.

Other barriers include the following:

- Difficulty in coordinating schedules and response of busy health professionals (whom are members of numerous MDTs)
- Inadequate support (infrastructure and resources)
- Lack of understanding about how teams function
- Individual accountability
- Paucity of chemical pathologists.

MULTIDISCIPLINARY TEAMS' PARTICIPATION IN COLLABORATION AND CONFLICT MANAGEMENT

- Joint deliberation by team members who have different perspectives and areas of expertise often results in insights and solutions to problems that seldom can be achieved by one health professional working in isolation
- Conflict may encourage innovation and creative problem-solving, and successful resolution of differences may foster increased trust and understanding among team members
- Failure to deal effectively with conflict may, however, lead to low morale, withdrawal, condescension, anger and burn-out!!!
- Strategies that chemical pathologist and other members of a team may use to maintain group collaboration and resolving health-care issues include the following:
 - They set standards for accomplishing tasks and identify norms for team behavior
 - Keep the door open for less talkative members and encourage each to contribute
 - Seek consensus in arriving at the best decision
 - Seek harmony when conflict occurs by listening carefully and respectfully to all opinions, brainstorming possible solutions, and focusing on common interests
 - Give and receive feedback about positive and/or negative behavior
 - Review and evaluate progress at conclusion of interaction.

CHEMICAL PATHOLOGY AND MULTIDISCIPLINARY TEAMS: UNIVERSITY OF ILORIN TEACHING HOSPITAL EXPERIENCE ILORIN, KWARA STATE, NIGERIA

The Department of Chemical Pathology, University of Ilorin Teaching Hospital has to some extent been involved in MDTs management of patients in the hospital, though there is still room improvement.

The following are some of the examples of previous participation of Chemical Pathology Department in MDTs approach to health care at UITH, Ilorin are:

- i. Running of Metabolic, obesity, and oral glucose tolerance test clinics
- ii. Co-management of cases of hypocalcemia complicating total thyroidectomy
- iii. Participation in the management of recalcitrant hypokalemia complicating perforated typhoid

- iv. Co-management of persistent hypocalcemia complicating parathyroidectomy in a patient who had parathyroid gland tumor
- v. Participating in the diagnosis and management of diabetes insipidus, etc.
- vi. Participating in multidisciplinary researches at the teaching hospital, sister teaching hospitals in Nigeria, College of Health Sciences, University of Ilorin, Ilorin, etc.
- vii. Co-supervision of fellowship thesis with other departments
- viii. Participating in diagnostic and therapeutic activities at ART Centre at UITH. Just to mention but few.

IMPROVING MULTIDISCIPLINARY TEAMS IN NIGERIAN TERTIARY HOSPITALS

The five strategic directions that guide the improved multidisciplinary care in Nigerian Tertiary Hospitals are:

- Creating and supporting effective MDTs
- Establishing and strengthening multidisciplinary meetings
- Building effective team linkage
- Fortification of the telemedicine facility in the hospital
- Judicious use of mobile telephone facility in communication.

CONCLUSION

This review article has tried to discuss roles of chemical pathologists in MDTs approach to management of patients in health-care facilities not forgetting the historical aspects. Its advantages, disadvantages, barriers, and possible way forward for the challenges were also suggested. It is hoped that if all health facilities imbibe the concept of MDTs in patients' management, it will avail them the opportunity or rather advantage of enjoying maximum possible care, thus ensuring the chance of their survival. The era of sole ownership or management of patient should be discouraged or completely discarded!

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Conflicts of interest

There are no conflicts of interest.

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