

The art and the science of history-taking and physical examination: Its relevance in modern day medicine

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ABSTRACT

History taking and physical examination which started as the bedrock of practice of clinical medicine many centuries ago has been challenged by advancement of practice of medicine through research and development, sociocultural changes, changes in patient and public expectations, amongst many other changes that have occurred over the centuries. These changes have accelerated during the last 100 years and transformed way doctors manage their patients with a tendency to distance from their patients and depend more than ever on machines in planning and executing their management. This article threads through these developments and discusses how such changes affected conventional approaches to history taking and physical examination.

“Medicine is a science of uncertainty and an art of probability” - Sir William Osler

It is important to realise that practice of medicine developed as an art when the process of history taking and physical examination formed the only pathway leading to a diagnosis of the illness, rather than the disease.

Important milestones

For few millennia, people have practised medicine as a profession in diverse parts of the world such as China, Egypt, India and Mesopotamia. Most of the ancient practice of medicine was not rational and the prospect of recovery rested in the faith of mythical gods of different cultures. Hippocrates (~460 - 370 BC) who lived in the island of Kos near Greece is considered to be the ‘*Father of Medicine*’ as he was the first person to believe that diseases were caused by natural causes rather than been determined by the god. However, his concepts were based on a theory of ‘*Humorism*’, but detailed inaccurate information about anatomy and physiology. Hippocratic medicine was notable for its strict

professionalism, discipline, and rigorous practice. The Hippocratic School gave importance to clinical observation and documentation (1). Hippocrates and his followers were first to describe many diseases and medical conditions.

Hippocratic medicine was practiced over many centuries without a sound understanding of its scientific basis with good doctor-patient interaction which involved history taking and physical examination evolving into an elaborate art over many centuries. This interaction formed a major part of doctor-patient relationship. In the civilized world, as there were no specific curative therapies up until the twentieth century though this relationship in itself played a major therapeutic role and doctors played multiple roles as the healer, witness to suffering, interpreter of symptoms and a provider of comfort and compassion.

Two important milestones in techniques of physical examination - percussion and auscultation - started as an art and embraced scientific thinking and interpretation with refinement of techniques and understanding of physiological, anatomical and pathophysiological basis of different acoustics. Leopold von Auenbrugger, was an Austrian

physician who introduced percussion as a diagnostic technique. This technique of percussive diagnosis had its origins in testing the level of wine casks in the cellar of his father's hotel by listening to dullness to percussion. Rene Laennec, a French Physician, the inventor of the stethoscope while walking down a street in Paris, he saw some children holding their ear to one end of a stick while the opposite end was scratched with a pin; the stick transmitted and amplified the scratch. Laennec presented his findings and research on the stethoscope to the Academy of Sciences in Paris, and in 1819 he published his masterpiece on the use of stethoscope in medicine (2).

Many changes leading to modernisation of clinical medicine can be attributed to Sir William Osler (1849 - 1919), a Canadian who is arguably the "Father of Modern Medicine". One of his outstanding contributions includes revolutionising the medical curriculum of the United States and Canada, synthesizing the best of the English and German systems (3). Osler adapted this system to the English system by teaching all medical students at the bedside. He was instrumental in establishing Johns Hopkins School of Medicine in 1893. He held the position of Professor of Medicine in four reputed universities - McGill, Pennsylvania, Johns Hopkins and Oxford. He described many diseases and signs of which some bear his name. One of his outstanding works is the textbook of clinical medicine published in 1892 titled '*The Principals and Practice of Medicine*' going into many editions as the standard textbook in clinical medicine for medical students and doctors in Britain, Canada and United States for over a century (4).

Although doctor-patient relationship was built on such good faith, the downside was the lack of standards of care, quality control and accountability making patients vulnerable to quackery. Over many centuries medicine was practiced as a trade rather than a profession and the services were available only to affluent members of the society. As a matter of fact, there was no mechanism that would ensure that best care for the patient would be made available anywhere in the world until American Medical Association which was established in 1847 undertook the development of "*Code of Medical Ethics*" as its first task.

The influence of science

Rise of the scientific paradigm and dominance of the biomedical model

During the last few centuries, medical care has been revolutionised by the discoveries of the circulation of the heart and vascular system, the germ theory of disease, cell theory with its application to the effects of disease on tissues and organs as well as the discovery of drugs and pharmaceuticals, devices and equipment (5).

In eighteenth and early nineteenth centuries with clinical reasoning switching to the biomedical model arising out of many scientific discoveries, it attributed diseases purely to physical changes in the body, with absence of symptoms being equated to absence of illness and a state of health. Beyond the 19th century the roles of the doctor as perceived by the patient expanded to domains such as an evidence based practitioner, service provider and professional. This has led to changes of healthcare practices and societal expectations. Doctors' status and capabilities rose with their scientific knowledge, newer anaesthetics and surgical techniques, effective drugs, new devices and pharmaceuticals. Classifications based on the signs and symptoms of disease became the primary focus rather than the patient's suffering. The body was increasingly seen as a machine, and the disease, not the patient's experience of illness became the object of study and treatment. These made doctors to lose their modesty and become proud and paternalistic with the patient becoming a passive recipient of care (6). The Flexner Report of 1910 also transformed the nature and process of medical education in the United States with a resulting elimination of proprietary schools and the establishment of the biomedical model as the gold standard of medical training (7).

Challenges to the biomedical model and rise of the biopsychosocial model

The biomedical model was challenged in the latter part of the twentieth century by psychoanalysts (Carl Rogers and others) who believed that many symptoms and somatic presentations of illness can arise due to unhappiness (8). There were many other shortcomings of the biomedical medical model as well. Those were: i) it's 'paternalistic' nature with loss of patient autonomy and increase of doctor's

power, ii) failure to build any ‘therapeutic relationship’ which would otherwise have fostered better compliance and expedited recovery, iii) inability to capture or understand non-verbal language, iv) difficulties doctors would encounter with regards to explaining the illness when they could not arrive at a diagnosis, v) doctor-centeredness, leading a doctor-centred agenda with closed-ended questions in a structured format leaving little room for the patient to express his or her suffering as desired, especially on matters such as ideas, concerns and expectations, vi) tendency for patients to be perceived more as clients or customers and the practice of medicine becoming more a business than a profession, vii) lack of room for patient feedback on matters such as safety, efficiency, effectiveness, timeliness and equity, viii) failure to address physicians civic obligations, and ix) tendency for doctors to acquire high credibility within their profession leading to loss of self-regulation and loss of accountability (by not coming under supervision of any professional or regulatory body for supervision) (9). Biomedical model also encouraged development of dichotomy between science and art of medicine: researchers were more interested in science, while clinicians were more devoted to art. Such dichotomy is bound to fail to deliver best care for the patient as practicing medicine without attention to science would have been foolish, and caring human beings without attention to professionalism, compassion and empathy would have been unkind. Taking such deficiencies in the biomedical model into consideration, one of the advocacies came from Engel who suggested the need for a new medical model that linked science and humanism and used the term ‘bio-psycho-social-cultural model’ (10). This approach integrated information concerning ‘what was the matter with the patient’ and ‘what mattered to the patient’. The biopsychosocial concept of health, or ‘Whole Person Health’, or holistic care, was affirmed in the World Health Organisation’s Alma-Ata Declaration in 1978, a major milestone of the 20th century, defining health as a state of complete physical, mental, and social wellbeing, and not merely the absence of disease or infirmity’ (11).

However, bio-psycho-social model cannot be applied to all clinical encounters when contextuality

is taken to consideration. As physicians, it is important to consider contextuality during history taking and physical examination. Taking contextuality to account, Thomas Szasz and Marc Hollender described three basic models of doctor-patient relationship: i) ‘*activity-passivity*’, whereby the physician does something to an inert or unresponsive patient as when the patient is in delirium or in coma or has acute trauma or is under anaesthesia or if the patient is an infant; ii) ‘*guidance-cooperation*’, in which the physician tells the patient what to do and the patient complies as in patients with pneumonia or myocardial infarction or acute asthma; and iii) ‘*mutual participation*’, whereby the physician helps the patient to help him or herself and the patient participates as a partner as in long term management of diabetes or hypertension (12).

Drivers that changed its practice in modern times

There have been many changes in the way we approach patients due to scientific developments that have occurred in the past, especially during the last 100 years. Some such developments are highlighted below. These scientific developments seem to challenge the artful manner we handle patients during clinical encounters.

Teamwork and specialisation

Towards the end of last century, another challenge to the way how doctors treat patients occurred with the development of ‘team-based’ approach in which the tasks previously carried out by the doctor himself / herself alone, came to be shared by allied health personnel working as members of the caring team. This multi-disciplinary approach though effective and efficient has disjointed the breadth of care that is traditionally provided by family practitioners. It also changed the way doctors perceive their role by shifting to an approach of confining services in detail only to certain aspects of the management, thereby compartmentalisation of care. As expectations of such services by the patient, family, hospital and the public became high, it added stress to doctors making their behaviour defensive at times. Thus, increased specialisation in the organisation of care resulted in great benefits of expertise but also weakened continuity

of longitudinal relationships for patients due to segmentation of delivery of care with failure to deliver holistic care (13). These changes have escalated the cost of care and increased the complexity of management, especially in patients with multiple comorbidities.

Dawn of an era of evidence-based medicine and development clinical practice guidelines

Another factor that influenced the art and science of practice of modern day clinical medicine is the emergence of the concept of Evidence-Based-Medicine (EBM) that was pioneered by American-Canadian physician David Sackett, in early 1990s. With this the approach, practice of clinical medicine became more objective, contrary to the process of management that was based on clinical judgement which depended more on clinical wisdom. Sackett argued that evidence-based practice was the integration of individual clinical expertise with the best available external clinical research evidence and its judicious application to the care of individual patients (14). Based on EBM various healthcare institutions and medical association have drawn 'best practice advice' known as clinical practice guidelines. However, whether practice of EBM alone is the ideal recipe to address individual issues in a given patient is debatable (15).

Need for accountability to the society

During the latter part of the twentieth and twenty-first century with increasing public awareness of doctors' responsibilities and increase in transparency of healthcare delivery, public agitation in instances of malpractice increased and doctors became more vulnerable to litigation. In the United Kingdom, the King's Fund (an independent charity in the UK) in 2010 included views of lay people, amongst the various stakeholders, to define the basis for a moral contract between the medical profession and society in achieving the goals of best care for both the population as a whole and for the individual (16).

The Internet and democratisation of knowledge

In the twenty-first century with the explosion of information available, patients, carers and the public became more aware of clinical knowledge regarding

diseases, treatments that are available including latest developments, and the process of delivery of healthcare. In short, the Internet became the biggest medical library in the world. As result of such awareness many changes occurred in the way clinical medicine is practiced in developed countries. These include; i) increase in prior knowledge of the patient with respect to the illness for which the he / she is seeking treatment, making room for shared decision making and paving the way for 'client-provider' type of consultations compared to previously practised 'doctor-patient' relationship, ii) breakdown in the trust patients have in doctors and the healthcare delivery due to horror stories in the internet about unsafe drugs and medical errors, and iii) increased access to advice and algorithms regarding self-care available in the Internet leading to patient-empowerment to handle their own illnesses.

In addition to changes described above on part of patients, the way doctors manage their patients too have changed radically with the advent of the Internet. These include electronic medical records, maintenance of electronic medical databases, gathering of medical knowledge and information sharing with colleagues, patients and careers. These developments seem to distance patient further away from the traditional 'doctor-patient' relationship. For example, during consultations doctors seem to focus more on the computer screen than looking at the patient, thereby losing opportunities to develop rapport as well to recognise non-verbal cues - which are important aspects of history taking. Another disadvantage of electronic data storage is the tendency to data leakage leading to loss of confidentiality.

Medical errors, litigation and medical defence

WHO defines patient safety as the prevention of errors and adverse effects in patients associated with health care (17). Medical negligence encompasses medical errors as well as acts of omission. In December 1999, the Institute of Medicine of United States reported that medical errors cause up to 98,000 deaths and more than 1 million injuries each year in the United States alone (18). With medical errors not being infrequent, there is heightened vigilance on part of patients, carers and the public of

such occurrences. Therefore, patient-safety has now become the centre stage of good medical practice leading to litigation of doctors who are caught of malpractice. This has led to doctors being more defensive by paying substantial amounts of money for medical insurance cover, which in turn inflates consultation fees and hospital charges. In order to reduce the risk of litigation, doctors also over investigate patients to ensure that nothing gets left out and as a result patient charges get escalated. These events often set in a vicious circle leading to lack of equity and affordability to so many who deserve more attention to their ill health.

Emphasis on communication skills, medical ethics and professionalism

Research on consultations of doctors in 1980s have shown that high control styles of communication to be common, with interruption of patients only 18 seconds into the consultation with important information being missed (19). Doctors often turn out to be poor listeners and patients are not informed of the diagnosis and the plan of management in simple lay language before they wrap up the consultation. 'Tomorrow's Doctors' published by the UK GMC in 2009, spells out competency level of communication skills required by a doctor (20). With the public becoming more aware of medical matters, patients prefer to be involved in shared decision making (exercising autonomy), whilst factoring other basic principles of ethics such as beneficence, non-maleficence and justice. Patients and carers expect them to be handled with empathy and compassion. In addition, the public expects the doctors to practice with respect and be responsible and accountable in whatever duties they perform, with recognition of their limitations and the need to improve with further training. All these together can be called medical professionalism and the modern society has high expectations of professionalism from doctors.

Globalisation, information technology and consumerism

Information technology is now widely available in most countries along with more modern approaches to disease including new drugs, new devices and new techniques that are being designed in developed

countries. These innovations are often made available for healthcare globally, including developing countries within a short time. Information technology enables patients and their carers to be more aware of options available to them, giving a choice in selecting their doctor for consultation. This kind of consumerism to a great extent depends on factors such as availability of choice of doctors, financial status of the patient and healthcare facilities that are at hand. In short, as mentioned by Sigerist, "the physician's position in society is never determined by the physician himself, but by the society he is serving" (21).

Concluding remarks

In the sphere of medical research and development many advances are taking place every day giving a different dimension to the manner in which we manage our patients. These developments include use of gene sequencing and genetic diagnosis; multi-slice MRI scanning, functional PET scanning and other cutting edge imaging techniques; robotic surgery; nanotechnology; artificial intelligence; precision medicine with genetic and molecular profiling; organ transplantation; stem cell therapy; 3-D printing of organs; bio-artificial hearts, lungs, trachea and kidneys; to mention a few. Use of this ever increasing armamentarium in no doubt will benefit survival of our patients and improve morbidity and mortality statistics but we need to ponder whether it could replace the kindness and compassion that we as physicians could bestow upon our patients. With the dawn of an era where computers and other forms of artificial intelligence are on the verge of taking over the task of diagnosing and making decisions on management of our patients, we physicians seem to distance ourselves from our patients more and more. Can we rebuild or create a new progressive era for medicine, and practice the art and science of medicine the way it was done, whilst retaining our commitment to science, building back and reinforcing our obligations of service to the society, artful practice, humility, and professional autonomy in the way it prevailed for centuries?

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