

Scientific Ethics applied to Medicine

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Introduction

General medicine is the study of the science that allows physicians to deal with the prevention, diagnosis and treatment of adult diseases in human beings. Since medicine is the science or practice of the diagnosis, treatment, and prevention of disease [1], those who are physicians are normally called general practitioners (GPs). The American College of Physicians confirms that internal medicine (IM) is a discipline focused on adult care underscoring the use of the best medical science available in caring for patients with a thoughtful, meaningful doctor-patient relationship (<https://www.acponline.org/about-acp/about-internal-medicine>).

According to the Wonca European Definitions [2], the discipline of general practice (or general medicine) of which GPs are masters, is an academic and scientific discipline with its own research and clinical activity oriented to primary care. General medicine develops a person-centred approach and GPs provide comprehensive and continuing care to every individual seeking it. Indeed, the defining features of primary care (that is, continuity, coordination, and comprehensiveness) [3].

The World Health Organization regional Office for Europe confirms that both the terms primary care and general practice are often used interchangeably and defines them thus (<http://www.euro.who.int/en/health-topics/Health-systems/primary-health-care/main-terminology>):

- primary care is more like a process in the health system where the clinician provides first-contact care with a patient and focuses on his/her long-term health
- general practice is referred to the clinician (GP) operating on the nine levels of care, being prevention, pre-symptomatic detection of disease, early diagnosis, diagnosis of established disease, management of disease, management of disease complications, rehabilitation, palliative care and counselling.

This preamble is foundational in our attempt to define the characteristics of medicine, as a whole, and in particular with reference to clinical practice and its relationship with ethics. It seems obvious that whatever applies to medicine in general would also apply to the specialties that altogether constitute medicine. Therefore, we shall not distinguish the particular processes and procedures that are proper to each specialty, but consider them in their entirety as applicable to the art/science of medicine [4].

Medical Ethics

Medical ethics is the discipline that in practice deals with fundamental ethical questions arising from all aspects of treating, managing and conducting research into illness and disease ([5], pg 4). Medical ethics has become an integral part of medical education and training and although placing increasing emphasis on professional formation of physicians and clinicians, has not been able to deliver clear indications as to what is the essential knowledge and skills expected of learners [6].

Scientific Ethics is based on standard scientific principles and is founded on science and the scientific method [7]. The universal principles that are proper to SE can be successfully utilized in any applied scientific discipline [8]. As medicine uses science to understand health and disease, so it is prone to be a field of application of SE.

Although medicine, as an applied science, already has a practical ethics linked to itself, namely bioethics (seen as applied ethics [9]), a larger, more general and standardized view can come directly from, and be set by SE. SE would analyse the status quo of medicine and then provide appropriate indications as to which actions should be taken in various situations [7]. This analysis will follow.

The three main aspects of general medicine are diagnosis, management or treatment of the disease and prevention (of future episodes of the same disease). In this view, prognosis (the outcome of disease or of an intervention), while part of the traditional model of clinical practice, is not considered [10].

The GP is responsible for the diagnosis (identification of the disease that afflicts the patient) by reviewing the medical history of the patient [11]. In his/her review, the clinician should be attentive to the signs and symptoms and try to identify the cause. The cause or aetiology is the obscure part of the diagnosis. Indeed, if we consider pericarditis the aetiology can be either infectious or non-infectious (being essentially driven by autoimmune, inflammatory or post-traumatic causes) [12]. We shall come back to the diagnosis very shortly. Nevertheless, once the disease is recognized, the treatment follows. Nowadays, the GP is aided by computer-based systems that support clinical decisions and help in finding the most tailored treatment recommendations for many diseases, based on individual patient data [13]. Essentially, these systems allow clinicians to assess clinical guidelines and evidence-based practices, in a similar way as the GP have done in the past but at a much greater speed. The result is the same: clinicians will adapt their recommendations on available international clinical guidelines and provide evidence-based treatments.

Evidence-based medicine (EBM) could be defined as the process or exercise of systematically finding, evaluating, and integrating/applying the contemporary research data in their clinical decisions [14]. As soon as the clinical decision coalesces into a defined treatment, the GP will ensure that the treatment is successful. Here, a reiterative process could ensue as the success of the treatment is sought, but, if elusive, the GP will continue to search for the adequate management plan and once resolved, will try to ensure the patient remains healthy (prevention).

Scientific Ethics enlightens Medicine's Path

In contemporary medicine, clinical diagnosis is a process similar to that of a detective or scientist [11]. The GP gathers all patient's information on the disease, assesses it to generate a hypothesis, and then the hypothesis is tested and finally discussed to see if it holds water. In this sense, the procedure is similar to that of the scientific method. Hence, SE can apply to this crucial human activity.



It is at these three points in the primary care setting that ethical challenges arise. There have been concerns around the feasibility of EBM in primary care [15]. The main reason for this is that EBM is not always relevant to primary care clinicians as it conflicts with the respect of the patient's autonomy. The physicians have a duty to individual patients which involves the application of specific ethical principles such as altruism, accountability, excellence, duty, service, honour, integrity and respect for others [16]. These ethical standards are similar to those of SE but lacking one essential virtue or principle: truth [7]. Clinicians should or must be truthful to first and foremost to the patient and then also to themselves by seeking the truth in any medical context.

Truth about the causes of diseases. Truth about the best management of an episode of illness. Truth about the prevention of such acute or chronic illnesses. And especially truth about prognosis, particularly prognosis of different interventions and their outcomes [10].

Therefore, the internist is compelled ethically to present all options to the client/patient. Not just those therapeutic options that have been studied during university years (in a possibly biased setting), nor just those from national or association-prepared guidelines, but also and perhaps most importantly those that have been clinically evaluated personally or inter-personally during their practice. All options should encompass those that come from modern medicine as well as those from natural or traditional medicine or from what the ancients called *diatetiken* (Διατητικήν), that is nutrition. Indeed, Celsus in his treatise on medicine (*De Medicina*), confirmed that in ancient times the art of medicine was divided into three parts: one being that which cures through diet, another through medicaments (Φαρμακευτικήν), and the third by hand (surgery or Χειρουργίαν) [17].

The choice of the therapeutic option has to be taken together with the patient, if not being first of all the patient's own primary decision. The GP should present all options with their honest opinion concerning each and it is together with the patient that the final choice is made. By showing compassion and respect for the patient and his/her autonomy in putting patient's need above their own, the GP will demonstrate the ability to utilize the minimum ethical principles proper to the clinician [6].

SE is not requiring the clinician to make unbearable feats of accomplishments and study the whole body of knowledge in the field (a factually impossible task given the rate of article publishing [18]), but to strive to be as informed as possible on the vast array of therapies available. In a patient-centred clinical setting, for a patient to be fully autonomous, he/she must be told the truth about both the disease and the possible interventions and treatments to highlight the uniqueness of each patient, as an individual [19]. Although full truth is not possible, the GP should be at the best of his/her ability, striving to know, present and deliver the vastest array of clinically meaningful interventions to their patients.

It seems clear that EBM can and should be done from the front lines of clinical care where individual clinical expertise decides how and when the best available external evidence can apply [18]. This external evidence has of course to be researched and integrated into the clinical judgement. But, it is acknowledged that there is generally a lack of time to do this kind of task (the research, the appraisal and then finally the discussion with the patient) [20].

Unfortunately, to salt on the wound, the challenges that a physician in general IM faces are enormous. Nowadays, a GP in IM has an exhausting worklife with long workdays, and electronic medical record-related distress [21]. But this should not be an excuse not to follow SE and its universal principles.

EBM cannot be reduced to just reading and assessing standard resources of EBM such as clinical practice guidelines or journals where systematic reviews are presented [20]. The attentive clinician will soon realize that the current level of disease management is insufficient to properly care for the patients. There is also almost no prevention care provided.

Furthermore, as every person is different, the GP should strive to move towards a more personalized or individualized medicine (possibly precision medicine) [22]. For example, it is well known that there exists individual variation in drug response (the study of such phenotypes being the realm of study of pharmacogenomics) and this data is increasingly being integrated into patients' electronic health records [23].

While misjudgements concerning the efficacy of therapies is a common problem that any clinician faces [24], the simple action of doing one's best in any clinical practice circumstance and searching for truth will suffice for SE.

One cannot find ethical standards for the internist in just the codes of conduct of various associations of physicians. It is 'mandatory' to go beyond this deontological definition of the tasks a GP of medicine should perform. SE can fruitfully be applied to General Medicine and Clinical Practice to shed light on the path that a physician should follow to improve their practice.

Conclusions

Ethical standards are essential in medicine and in clinical practice. As a scientific discipline, SE can deliver insights into how medicine should deal with truth in all aspects of diagnosis, especially concerning the research of the causes. As a practical endeavour, ethical principles are allow the GP to deal with the patient's needs in effective treatment and true prevention, by teaching the clinician to research for the best option even outside of the 'box', thus satisfying the patient and delivering lasting results.

Even in extreme contexts, like end of life situations, SE provides a straight path towards truth and respect of human dignity [7]. While autonomy is often equated as self-determination in the choice of the medical intervention, it is also equated as the desire for control over the dying process [25]. Applied SE in this context puts dignity of human life at the highest level and respect of life at the same superior level to truth [8]. With this in mind, the clinician can approach the patient and start discussions on prognosis and interventions, putting the patient's life in a position such that it can never be nullified by any of their agreed decisions.

Without prejudice with any guidelines on clinical practice, the integration of interventions focused on physical activity and nutrition (not just for weight management) in primary care settings would be very beneficial [26, 27]. Therefore, clinicians should step up and start to take charge in developing their knowledge beyond the limits conceived by modern medicine (standard University studies and clinical guidelines) to truly deliver comprehensive primary care to their patients.

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