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'Gold Standard' in Clinical Practice

Standard

Standard in any science is a dynamic process. As science increases its hold in medicine and as spiritual and other aspects are getting increasingly less importance in mainstream medical practice, it is imperative to set standard. The crux of the matter is to define what constitutes a standard. To consider earth as a flat planet was once standard for many centuries when Plato and Aristotle challenged the idea and gave evidence that the earth was spherical. Now this has become the standard. Once pneumatic encephalography was the standard test done to detect the mass lesion in the brain until the advent of computed tomography (CT) scan. Similarly, direct carotid puncture used to be the standard in doing cerebral angiography for many decades.

In evidence based medicine and in the hierarchy of evidence, standard is something proven by repeated randomized control trial.² For example, taking out an epidural hematoma causing significant mass effect in a neurologically deteriorating patient is standard.

The requirements of the standard are closely dependent on circumstances. Whether the standard of care has been breached is determined by the trier of fact, and is usually phrased in terms of the reasonable person as proposed by *Vaughn v. Menlove* in 1837 (leading English Tort law).

Gold Standard

Closely associated, subtly different but with much 'glorification' is the expression, 'gold standard.' A **gold standard** is a monetary system in which the standard economic unit of account is based on a fixed quantity of gold.

The use of gold as money began thousands of years ago in Asia Minor. It used to be a system by which the value of a currency was defined in terms of gold, for which the currency could be exchanged. This stemmed from the fact that there was widespread acceptance of gold as currency in the period when this was practiced. The reason why gold was chosen for this purpose is still open to speculation but possible reasons could be the wider acceptance of gold as a pure metal, least likely to wear over time, expensive and rare (but not that rarer!). Most nations have already abandoned the gold standard as the basis of their monetary systems at some point in the 20th century. However, it found its use in medical and allied sciences and has been increasingly popular to date. For example, Pubmed search using the search words 'gold standard' in January 2016 produced 45591 results. So, it is imperative for the clinicians to know what gold standard means along with its strengths and limitations. In general, the accepted definition of Gold Standard is: A thing of superior quality which serves as a point of reference against which other things of its type may be compared.⁴ Gold standard test usually refers to a diagnostic test that is the best available test under reasonable conditions.

Gold standard is a dynamic process. As new diagnostic methods become available, the "gold standard" test may change over time. For instance, for the diagnosis of herniated lumbar disc, the "gold standard" test used to be the myelogram before 1980s. Nowadays, Magnetic Resonance Imaging (MRI) has become the new "gold standard" test.

However, in many areas in surgery, standard is a relative phenomenon. There are many factors, cultural, economic, and psychosocial which tremendously influence the standard of something. Most important of all is the economic factor. For the neurosurgeons in the low and middle income countries routine MRI in every case of suspected brain tumor is not standard.

Some believe that because the subject is in a state of perpetual evolution gold standards are, by definition, almost never reached.¹ Gold standards are constantly challenged and superseded when appropriate.

'Alloyed' Gold Standard

On many occasions, "gold standard test" refers to the best performing test available which may not be possible to do or are not justifiable to perform on ethical grounds. Other times, "gold standard" does not refer to the best performing test available, but the best available under reasonable conditions. For example, an MRI is the gold standard for brain stem tumor

diagnosis, though it is not as good as a biopsy. Hence, as gold standard are most of the time only wishful thinking of the enthusiasts, another term "'alloyed' gold standard' has come into existence.^{3,5}

References

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