

**TITLE:** Are Patient Classification Systems ready for Medicine's Second Great Hippocratic age?

## **Introduction**

Clinical coding is the task of transforming medical information in a patient's health records into structured codes that can then be useful. In Ancient Greece, Hippocrates promoted a dialogue between patient and physician.<sup>i</sup> Categories within the medical history have been largely stable since then: presenting complaint, history of presenting complaint, past medical and surgical history, medications, family history, social history (to include smoking and alcohol). A more detailed 'systems review' has developed over time, in which each medical and surgical sub-speciality requires another list, akin to the expansion cards in a multi-player board game. The advent of laboratory tests, radiography, scans, and exploratory interventions adds further robust and verifiable evidence. Genetic testing allows us to interrogate the genome. Machine learning and artificial intelligence offer the possibility to interrogate and draw together large and disparate sources of information, to predict outcomes, and even to create patient avatars. We live in the age of the expert patient. We also live in the age of misinformation and too much information.

The PCSI conference is one of the few venues where those interested in patient classification systems can discuss fundamental questions. Is the age of reductive and precise coding now over and are we about to take a massive leap back to Athenian principles? Also, where will truth and trust lie in a hybrid machine/human world where data is increasingly open and available?

## **Methods**

I will briefly outline the major shifts in patient history taking, examination and testing and map them against clinical coding system principles. I will refer to the role of key players in the classification systems and how ownership and curation of information has changed. I will consider what changes will come next with the application of machine learning and the dawn of artificial intelligence and how this might affect clinical coding systems.

## **Results**

A resurgence in the interest of developing a shared patient 'story' through narrative medicine<sup>ii</sup> brings us full circle back to the holistic approach advocated in ancient Greece. The six principles are 1) action toward social justice, (2) disciplinary rigor, (3)

inclusivity, (4) tolerance of ambiguity, (5) participatory and nonhierarchical methods, and (6) relational and intersubjective processes. The role of technology, both in record - keeping, data analysis and predictive medicine is proving to be both a tool and a game-changer. The next wave of development involves three major changes. The internet of things allows continuous tracking of biometric data. A shift to predictive medicine based on algorithms that incorporate medical data and genetic analysis can establish the risk profile of an individual for future disease. Finally, the use of diagnostic assistant tools powered by AI will sift through all available evidence to produce what was formerly the sole province of the clinician. I add to this the voice of the patient, both to supplement the information available and also to challenge it.

## **Discussion.**

Patient classification systems translate available evidence from the official patient record into standardised alphanumeric codes, with an emphasis on accuracy and standardisation. Major underlying shifts in approach impact now on the coding systems we work so hard to maintain. Technology opens the door to a much wider consideration of health related data.<sup>iii</sup> Classification systems need to adapt as we embrace a holistic approach and enter medicine's second great Hippocratic age.

## **References.**

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<sup>i</sup> Hulkower, R. (2010). The History of the Hippocratic Oath: Outdated, Inauthentic, and Yet Still Relevant. *The Einstein Journal of Biology and Medicine*. 25/26: 41–44. [https://www.einsteinmed.edu/uploadedFiles/EJBM/page41\\_page44.pdf](https://www.einsteinmed.edu/uploadedFiles/EJBM/page41_page44.pdf) (accessed 20 Jan 2024).

<sup>ii</sup> Greenhalgh, T. Hurwitz B. (1999). Why Study Narrative? *British Medical Journal*. **318** (7175): 48–50. [doi:10.1136/bmj.318.7175.48](https://doi.org/10.1136/bmj.318.7175.48) (accessed 20 Jan 2024)

<sup>iii</sup> Moulds M., Horton T. (2023). What do Technology and AI mean for the future of work in health care? Health Foundation. <https://www.health.org.uk/publications/long-reads/what-do-technology-and-ai-mean-for-the-future-of-work-in-health-care> (accessed 20 Jan 2024)