

Why Is a Terminology Important?

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"When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean—neither more nor less." "The question is," said Alice, "whether you *can* make words mean different things." "The question is," said Humpty Dumpty, "which is to be master—that's all."¹

To "choose what words or concepts mean, neither more nor less" is the function of a terminology. Each term has a precise meaning or description. The problem is that clinicians may use different terms to describe the same concept. For example, *aqueous misdirection*, *malignant glaucoma*, *ciliary block glaucoma*, and *posterior aqueous diversion syndrome* all describe a single concept. Without a common reference point, like a dictionary, a typical computer system would consider all these terms as having different meanings, instead of the same. A concept-based terminology would function to recognize that these terms are synonyms referring to a common concept, as compared with a terminology that does not distinguish synonyms and has redundancies. It allows and maintains these terms in the database but, when queried, collects them together to refer to the same disease entity (or concept).

A common language allows the sharing of information, with a mutual understanding of its terms. A coded terminology should make the job of searching, retrieving, and comparing data easy and automatic by a computer.² One could easily then specify a search, say, of all patients with geographic atrophy of the macula without argon laser treatment, or of all patients with diabetes and corneal epithelium findings, and who also were on corticosteroids.

Ideally, a clinical terminology should include all the concepts and terms a clinician needs to describe in a patient record, and provide the input for billing and administrative systems to extract data needed for reimbursement purposes and utilization/process measures. Images should not stand alone either; an accompanying terminology is needed to relate how a test or imaging was performed and the patient's age, diagnosis, etc. A systematic review found that providing clinical information along with the diagnostic tests (x-rays, digital images) improved test-reading accuracy.³

Chiang et al⁴ have set forth to determine which of a small number of existing terminologies fits the clinical practice of ophthalmology best—"which is to be master?" They report that the answer to that question depends on the context—how is the terminology going to be used? And how is the terminology going to keep up with advances in knowledge and technology? As noted in their article, terminologies evolved for different purposes, some for administrative or financial reasons (e.g., International Classification of Diseases 9 [ICD9] and Current Procedural Terminology), and others for the collection of detailed information about patients needed for recordkeeping, comparison, and analysis (e.g., the Systematized Nomenclature of Medicine

[SNOMED]).⁵ A terminology developed for billing and statistical purposes falls short of being able precisely to describe patient evaluation and management. For example, an ICD9 term, *other visual distortions and entoptic phenomenon*, captures photopsia as well as diplopia, polyopia, and visual halos. A Current Procedural Terminology term, *closure of the lacrimal punctum; by thermocauterization, ligation, or laser surgery*, captures 3 different techniques, not just one.

Based on this study's results, SNOMED (a comprehensive clinical terminology) emerged as having the broadest coverage for ophthalmology. This is in line with the growing consensus that SNOMED should be *the* terminology of choice, not only in the United States but also internationally. In 1999, the United Kingdom's National Health Service agreed to merge its terminology with SNOMED to create a single international health terminology, known as SNOMED, Clinical Terms (SNOMED-CT). Spanish and German language versions are available. In November 2003, the National Committee on Vital and Health Statistics (an advisory panel to the Department of Health and Human Services) recommended SNOMED-CT⁶:

The breadth of content, sound terminology model, and widely recognized value of SNOMED CT qualify it as a general-purpose terminology for the exchange, aggregation, and analysis of patient medical information. The broad scope of SNOMED CT itself and the inclusion within it of concepts from other important healthcare terminologies allow SNOMED CT to encompass much of the patient medical record information domain.

Beginning in January 2004, the National Library of Medicine has made SNOMED-CT core content freely available in the U.S. through a 5-year \$32 million license agreement. In May 2004, Cerner, a leading supplier of health care information technology, licensed the use of SNOMED-CT in its patient records used worldwide.⁷ As one of the designated data standards across federal agencies, the Consolidated Health Initiatives endorsed SNOMED for 5 different areas.⁸

The power of SNOMED-CT is unleashed in the richness of the descriptions, or relationships, that accompany each term or concept. The July 2004 release (SNOMED is updated every 6 months) contains over 361 800 concepts with unique meanings, 975 000 synonyms, and 1 470 000 relationships. For example, a clinician might type in the concept "traumatic optic nerve injury." This concept is associated with a unique code, which has already been described within SNOMED-CT by its relationships to other concepts. This allows the entered information to be used in different ways, to answer clinical questions, to ask about disease incidence, to look at outcomes, etc., without any additional work. In this example, traumatic optic nerve injury is al-

ready defined in various ways: a disorder of the optic nerve, a traumatic injury of the visual pathways, and an injury of a cranial nerve. Thus, if one were interested in all disorders of the optic nerve, this would automatically be included. Another example of how a terminology can yield relevant search results is seen when an ophthalmologist enters the term *radiation damage to the optic nerve*. If one were to do a search for all traumatic optic nerve injuries, radiation damage to the optic nerve would automatically be included, as well as in a search for all radiation-induced disorders.

Chiang et al's evaluation of the adequacy of terminologies for ophthalmology is timely, given the confluence of recent events pressing for the implementation of computer patient records. In an Executive Order issued on April 27, 2004,⁹ President George W. Bush called for widespread deployment of health information technology within 10 years. The Veterans Administration and Department of Defense are developing health information systems that can communicate to each other for a seamless transfer of information across facilities. On July 21, 2004, the Administration outlined a 10-year plan to build a national electronic health information infrastructure.¹⁰ The goals include bringing electronic health records directly into clinical practice by providing incentives for adoption and lowering risks of investments, interconnecting clinicians so information can be portable and move from one point of care to another, laying out standards for electronic prescribing, and connecting federal health information systems.

The American Academy of Ophthalmology (AAO) has been working these past several years to promote common standards to help build a foundation for terminology and imaging. In 1994, the AAO initiated a Task Force on Computer Patient Records. It was readily apparent after canvassing the available technology that it was too soon to implement computer patient records broadly without the availability of a common language to describe patient evaluation and a standardized way to exchange images. Thus, the AAO focused its efforts on international standard-setting activities (SNOMED and Digital Imaging and Communication in Medicine) to leverage existing medicinewide efforts and to make sure that these would meet ophthalmology's unique needs.¹¹

Chiang et al's work in this issue⁴ not only illustrates the breadth of ophthalmic scope of the SNOMED-CT terminology, but also identifies some of its deficiencies. To address the need for completion of the SNOMED ophthalmic terminology, in 2001 the AAO entered into an agreement with SNOMED to continue development of the ophthalmology content, and enrich and maintain its relevancy. This is being accomplished with the help of ophthalmologists who are not only practicing clinicians but also trained and knowledgeable in the discipline and intricacies of terminology development.

We believe that, for the foreseeable future, the answer to "which is to be the master?" is SNOMED-CT, at least for the purposes of an electronic health record. It has the broadest coverage of ophthalmic terms³; is linked to other terminologies such as ICD9, Clinical Modification; provides unambiguous meanings for terms; is freely accessible

through the federal government; and is maintained on an ongoing basis. The building blocks for terminology and imaging have thus been laid; the President has asked to make electronic health records available for most Americans in the next 10 years. The AAO has committed to complete the work, and now the vendor industry should take up the gauntlet to build systems that are cost-effective, usable, and clinically beneficial, delivering on the promise of electronic health records to provide clinical information wherever and whenever it is needed to make good decisions.

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