



For more information or to order a free PRAXIS demo, call **703-819-5910** or visit **www.ctimedsys.com**.

## How Structured Language Works Against You

### ■ Structured Language will not lead to good medicine

Structured and discrete language is a property of an electronic medical record template that uses pre-set phrases, which theoretically encapsulate every medical description you wish to convey. Within the preset text selected by you at the point of care, there are hidden codes to allow a computer to “make sense” of your medical descriptions. It is claimed that this will allow for effective retrospective analysis of clinical data. It is hoped by some that the use of this kind of structured language in EMR templates will make possible the transfer of medical records from provider to provider, help evaluate quality of care, and improve cost effectiveness.

Backers of the structured language approach to retrospective queries quote a 2004 report by the Institute of Medicine<sup>1</sup>. This very report, written by renowned national expert physicians and computer specialists, nevertheless provides no scientific basis for any of its claims. The report reads as though medical experts and computer experts were living worlds apart, having little concept of what the other is up to, and without any insight into what these recommendations will lead to.

In fact, a thorough review of the literature fails to show any controlled scientific studies to support any of the assertions backing the use of structured language in electronic medical records. The few studies performed thus far that serve to support the structured language approach based on templates have been termed by Harris et al “Quasi-Experimental”<sup>2</sup>. We submit that the approach of structured language based on templates does not meet the requirements of rigorous scientific reasoning. It cannot logically result in the a priori improvement in quality of care, nor in the successful application of appropriate queries retrospectively.

Indeed, this approach has a “big brother” undertone that should be of concern to all physicians.

### ■ The Premises Behind Structured Language & Templates

The use of templates to structure retrospective queries and Clinical Practice Guidelines is based on two false premises:

Assumption 1: If doctors are forced to manage data within the confines of structured templates – therefore being told exactly what questions to ask, what findings to check for, and what diagnostic and therapeutic approaches to take under various clinical conditions - then the quality of the medical practice will automatically improve.

Assumption 2: If doctors are forced to enter information in a predictable and controlled manner using structured language built into their EMR software, the result will be the ability to perform effective retrospective queries that disclose the quality and cost effectiveness of a physician’s performance.

We maintain that both of these unproven assumptions are incorrect.

### ■ Invalid Assumption 1: “There is One Correct Way to Practice Medicine”

This first assumption says: “There is only ONE correct way to practice medicine, and everyone should practice medicine exactly the same way.”

Following this line of reasoning, the use of perfect templates and structured language would result in the perfect practice of medicine. As any practicing physician will realize, this is far from clinical reality. The enormous complexity of a human being makes the healing act not only a science, but also very much an art form not amenable to this kind of structured approach. If it were, computers would be able to practice medicine all by themselves!

It is while interacting with the patient that the physician’s full sensitivity and experience comes into play. To attempt to computerize the healing act within a set of fixed rules embedded into templates, which turn a patient into a series of factoids to be manipulated by third parties, will not result in effective medical care. It only serves to debase the art of healing, doing irreparable harm to the quality of care being delivered.

The structured template approach is an affront to the training, capacity and integrity of the doctor, who is a highly skilled and motivated individual called upon to heal the sick.

### ■ Invalid Assumption 2: “Template-based Electronic Documentation Represents an Accurate and Complete Description of the Act of Healing”

This second assumption argues that: “Documentation that results from filling structured pick-lists of options within templates represents an accurate and complete description of what actually takes place in the examining room, in the interaction with the patient, and within the mind of the provider at the time of the rendering of care.”

There is absolutely no evidence to support this assumption either.

There is no such thing as a pure retrospective query when dealing with Electronic Medical Records. The reality is that behind every retrospective query, there is a software engineer that has prospectively created all the fields to later be applied retrospectively. The fact is that whatever the engineer failed to incorporate prospectively cannot be performed retrospectively, period. To create a truly useful retrospective query, the developer would be required to know medicine better than the practicing physician-user, and be omniscient to every possible case and every variation presenting to the healer at the point of care. As often said in medicine: “The retrospectroscope is always 20/20”.

## ■ Retrospective Data

A few pieces of retrospective data are not problematic: demographic information such as the patient’s age, insurance, gender, or city are all discrete fields often queried accurately and easily because they are standard. Fields like the ICD/CPT Codes, laboratory findings, vital signs and some clinical parameters such as visual acuity, fetal heart rate, and demographics in any combination can be also easily set up prospectively, to be queried retrospectively. Any good EMR, Praxis included, is able to do that. This is not what is understood by structured language, however.

The actual descriptions of illness, what structured language is attempting to substitute for, are far more subtle and clinician-dependent. These kinds of studies demand prospective, and not retrospective, studies. And this is not just true for Electronic Medical Records. The issue is not to be found in the digitalization of the information, but the very nature of medical practice itself. Medicine is not and cannot be omniscient, or computers could practice all by themselves. That is why by far the most effective studies in medicine have been prospective, randomized, cross-over, and blind. Indeed, it is in the performance of prospective studies that the computer excels, and not in the rehashing of the paper record paradigm.

For example, if the field for the “race” of the patient is not present, or if the completion of this field is not required for every incoming patient, then it becomes impossible to query for it later, as the sensitivity for this query would not be meaningful. This has nothing to do with terminology, as it would be the same whether you call it race, ethnic background, or any other term. Of course, this situation applies to the vast majority of symptoms, historical descriptions, and even signs whose complexity leads to making the correct diagnosis and providing optimal treatment.

## ■ Structured Language vs. Freedom of Expression

Of equal importance is the fact that even if clinical fields could be set up omnisciently, any query of the required clinical finding forces the practitioner to select among a myriad of choices at the point of care. As the clinician deals with more complex cases, the requirement to comply with the selection of pick-lists becomes greater, and the time and effort of using such templates become insurmountable. If the option is not there, or cannot be found under the pressure of the office visit, or if, for whatever reason, selecting a given option does not occur to the provider, then of course, the application of a retrospective query would also be meaningless.

Inverse relationship between the ability to query retrospectively and freedom of expression by users of the EMR. For high “queriability,” the freedom of the user approaches zero.

The burden to providers so as to ensure precise and efficient data entry becomes overwhelming, and may easily detract the physician from looking at the whole patient, while frantically attempting to answer all the minutiae of pick-lists.

In short, there is NO guarantee that the physician will think like the template and will therefore take into account the same issues faced at the point of care, nor that the issues presented by the template are appropriate for the actual case at hand. Thus, when later querying for results, there is no evidence to support that the results/templates represent an accurate or even complete description of what actually took place. Indeed, given the enormous pressure of today’s medical practice, it is more than likely that the overburdened physician will tend to skip corners in his desire to spend more time with the patient and have a personal life!

## ■ Structured Language Conclusions

We maintain that the approach behind the use of templates and structured language to generate Electronic Medical Records is flawed in its two basic assumptions. And if just one of the assumptions is false, then the whole edifice behind the use of templates to impart Clinical Practice Guidelines and obtain effective retrospective queries crumbles like a house of cards.

We believe that the narrow industry focus on using templates to resolve this critical aspect of Electronic Medical Records is the attempt to transport a two-dimensional paper paradigm into the three-dimensional electronic medical record, where the patient record is not just a static document, but a dynamic entity that can help the provider practice better with greater ease.

Paper is by nature static and non-dynamic. However, now it no longer makes sense to use an absolute retrospective approach to evaluate quality of care, when a prospective approach is far more effective in the dynamic computer age.

Even the most ambitious retrospective studies ever performed on paper, such as the ongoing Framingham Heart study, point to the gross difficulties with this approach. Billions of dollars have been spent on this huge study to read paper charts retrospectively. Although the very few results obtained have been useful (high cholesterol, diabetes, smoking, high blood pressure are all bad, and exercise, of a debatable amount and type, is good), far richer data could have been obtained much less expensively with simple prospective studies using Electronic Medical Records, based on the same population.

## ■ The Non-Template Solution

Today, Electronic Medical Records can be set up to work prospectively far better than retrospectively, and they will provide the additional bonus of total physician freedom at the point of care. As a result, we submit that the use of structured language to perform retrospective studies is not needed. The ONLY requirement is that the practitioner understand the requests being made at the point of care. Moreover, prospective queries don't just measure the quality of care, but also modify it for the better at this very point of care. (See papers on Practice Guidelines & Queries and The Three R's of Health Care Quality)

In short, a prospective query is nothing but a Clinical Practice Guideline in reverse! The desire to advise physicians at the point of care is tremendously important to society and actually welcomed by almost all physicians. Whether the message received imparts a suggestion or requests feedback (prospective query) is irrelevant. Both benefit the practitioner. Both keep the practitioner free from being micromanaged, and yet they still deliver far more accurate information to the researcher.

Everyone is reaching for the same goals, starting with physicians: to be able to improve the quality of medical care and reduce costs without in the process hurting physician income or joy in the practice of medicine. The computer presents the unique opportunity to make that extraordinary possibly a reality via practice guidelines and prospective queries that interact directly with the expert at the point of care. Doing so retrospectively may indeed be possible for some kinds of data, but the cost of doing so for all data, and the forcing of providers to use structured language for this purpose will be far higher than its questionable benefits.

1 Philip Aspden, Janet M. Corrigan, Julie Wolcott, Shari M. Erickson, Ed, PATIENT SAFETY: ACHIEVING A NEW STANDARD FOR CARE, 2004 Institute of Medicine, National Academies Press, Washington DC

2 ANTHONY D. HARRIS, MD, MPH, JESSINA C. MCGREGOR, PHD, ELI N. PERENCEVICH, MD, MS, JON P. FURUNO, PHD, JINGKUN ZHU, MS, DAN E. PETERSON, MD, MPH, JOSEPH FINKELSTEIN, MD . The Use and Interpretation of Quasi-Experimental Studies in Medical Informatics J Am Med Inform Assoc. 2006;13:16-23. DOI 10.1197/jamia.M1749.

**Request** a Free PRAXIS CD demo  
go to [www.ctimedsys.com](http://www.ctimedsys.com) or call 703-819-5910

**Fastest Way to Document Medicine ■ No More Templates**

The advertisement features a central image of a computer monitor displaying the PRAXIS software interface. Below the monitor, the PRAXIS logo is prominently displayed, consisting of three interlocking rings in red, green, and blue, followed by the word "PRAXIS" in a large, bold, sans-serif font, and "Electronic Medical Records" in a smaller font underneath. The background of the advertisement is a blue grid pattern with a glowing effect around the monitor.

At the bottom of the advertisement, there are several award and certification logos:

- A circular badge with "#1" in the center, with the text "in the 2008 AAFP EHR Survey" below it.
- A rectangular badge for "FROST & SULLIVAN 2008 BEST PRACTICES AWARD NORTH AMERICAN HEALTHCARE TECHNOLOGY INNOVATION AWARDS".
- A rectangular badge for "HIMSS Davies Award 2006".
- A rectangular badge for "CCHIT CERTIFIED" with "Anniversary Since 2006" written vertically on the right side.