



## **Concept Processing Vs. Template-Based Electronic Medical Records**

**TECHNICAL PAPER**



## ***Executive Summary***

The critical part of the Electronic Medical Record is the interface between the EMR and the provider. This paper deals with a new technology for rapid and accurate data entry called “Concept Processing,” (used extensively in Praxis 3.0), and compares it with the use of templates, expert systems, voice recognition, and dictation transcription based EMR’s. We conclude with a discussion of the many powerful features that an application based on Concept Processing can do, that other systems—in particular “templates”—cannot.

A physician is not merely a medical technician. A provider is a true detective of illness and a creator of creative medical solutions individualized for each patient.

We are going to use the “you” form here for clarity, assuming that we are addressing such a provider. It is simply easier and more direct way to describe this unique technology. Please forgive us if you are someone else in the medical industry, but you will also be able to understand this technology far better when seeing things from the point of view of a busy practitioner.

Concept Processing is a computer program that combines words, phrases, sentences, even entire paragraphs from your own previous cases, and then processes them for fast and effective re-use. Like an intelligent shorthand of expression, you give the Concept Processor your own concepts at any level of abstraction, and the computer generates all the writing faster than dictation and with far fewer errors. As PRAXIS learns from you it becomes smarter and faster, empowering you to effectively chart patients at the speed of your mind.

The basis of the Concept Processor is simple: Medicine is an art as well as a science and, as such, it is subject to individual user variability. No two doctors practice medicine the same way, and no doctor wants to be told exactly how or how not to practice medicine. Concept Processing allows you to quickly and accurately say and write exactly what you wanted to say in your own words, not in the words someone else thinks you should use. Concept Processing uses the full power of your computer to help you express yourself in your own words and chart at amazing speed by constantly learning from your own past.

You save you hours a day in paperwork alone, and progressively increase the quality of both, your output and of the medicine that you practice.

Keep in mind that this is not just a clever theory: Praxis 3.0 is a number one selling EMR today in the small and mid-size practices with hundreds of satisfied practitioners. You are about to make a very important choice on how to run your practice. You owe it

## Concept Processing for Electronic Medical Records

to yourself to read this document carefully and find out why doctors who actually use Electronic Medical Records, prefer Praxis to the templates hands down.

# TABLE OF CONTENTS

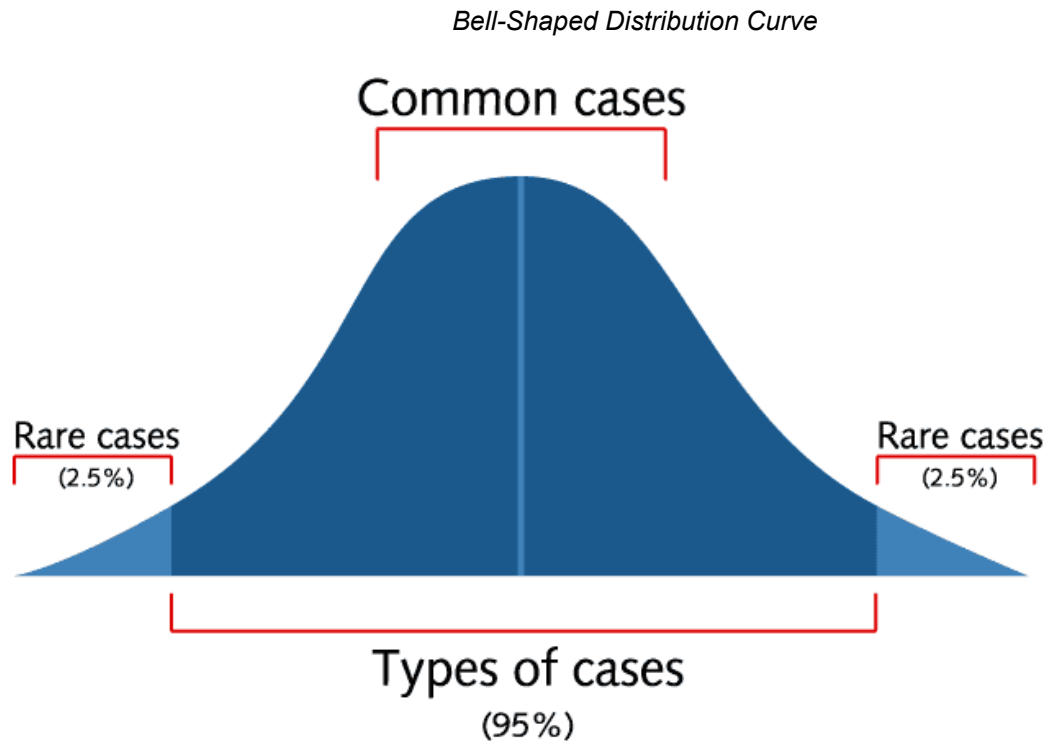
Executive Summary .....	3
HOW DOES CONCEPT PROCESSING WORK? .....	7
Concept Processing Decreases Clinical Errors:.....	9
Learning From Your Own Clinical Records:.....	9
How Long Does A Concept Processor Take To Learn Your Cases?.....	10
WHY ARE TEMPLATE-BASED EMR's INEFFECTIVE? .....	13
PRAXIS 3 - NEW FEATURES .....	17
SOAP Agents.....	17
Intelligent Scheduler .....	19
Intelligent Printing .....	20
Using a Concept Processor To Process Incoming Data: .....	21
Intelligent Flow Charting .....	23
Flow Charts For Pediatrics And Obstetrics: .....	24
Pre-Visit Patient Preparation:.....	25
Health Maintenance via Agents: .....	25
The "Chronic" Patient:.....	27
What about the Plan in a Chronic Patient? .....	29
Dictation/Transcription With Concept Processing? .....	30
PRAXIS 3.0 - OTHER NEW FEATURES .....	33
Drug Contraindications: .....	33
Superbilling: .....	33
Nursing Tasks:.....	34
HIPAA: .....	34
Interfacing: .....	34
Retrospective Query: .....	36
THE FUTURE OF CONCEPT PROCESSING.....	37
Intelligent Graphic Interfaces: .....	37
Field-Macros: .....	37
Knowledge Exchanger:.....	38

**Concept Processing for Electronic Medical Records**

Practice Guidelines: ..... 39  
Prospective Query: ..... 40  
Revolutionary “Feedback Loop:” ..... 41  
CONCLUSION: LEARNING FROM OUR GREAT CLIENTS!.....43

## HOW DOES CONCEPT PROCESSING WORK?

Although you practice your art unlike anyone else in the world, medical cases do repeat themselves in your practice following a statistical bell-shaped frequency distribution curve.



Looking at the distribution curve, you can see that the extremes represent the rare cases. You will probably never see some of these cases (although you studied them in medical school), even if you lived **three** lifetimes!

Those in the center might present three times a day! As for the ones in between—you will probably see them all—with differing frequency of presentation. This relationship holds true **irrespective** of your specialty or practice conditions (Praxis is being used in just about every specialty in medicine, which confirms this hypothesis). It is a mathematical imperative.

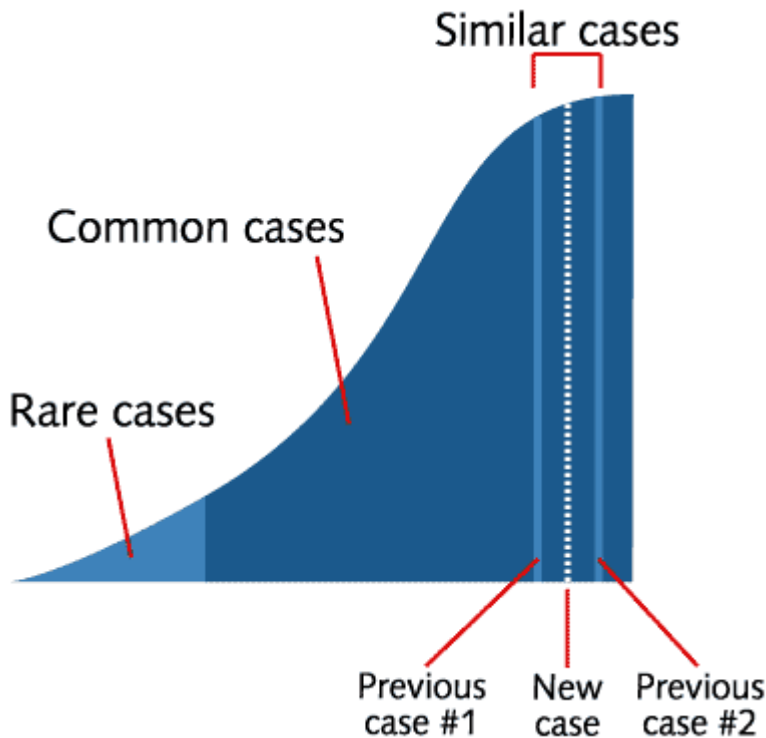
The Concept Processor constantly “learns” from every piece of information that you enter. Exactly *how* this technology works is outside of the scope of this presentation. Suffice it to say that the system searches within its memory and instantly brings to the computer screen the closest case to the one you are currently evaluating.

This closest previous case must necessarily fall into one of three categories: **identical**, **similar**, or **very different** from the case you are currently seeing.

If the closest case is **identical** to the present case, ***you are actually finished writing almost before you begin***, no matter how complex the case itself may be. The computer automatically charts the full progress note (or the H & P), and writes the prescriptions, instructions to the patient, notes to the staff, admitting orders for the hospital, pre-approval authorization requests from third party payers, letters to colleagues, laboratory orders, procedure notes, operative reports, even the superbill— instantaneously.

If the closest case is **similar** to the present case, you need only **edit** the few differences that may appear between the prior case and your current one. Once again, the computer will generate the entire case as before. **In addition, the system will remember the changes you make now and, when a future case falls in between this case and its previous similar case, the editing time for your new case must drop by half, then by half again for the next such case, and so on until you are literally writing complex cases in seconds. This is the essence of Concept Processing.**

*The Three Case Possibilities*



Even if your closest case were very different from the case you are seeing now, **rare** cases are no problem for the Concept Processor. In written form, most rare cases are simple combinations of SOAP elements, which are not rare at all. Elements like fever instructions, cardiac murmurs, X- Ray findings, even the standard or semi-standard



procedures performed for other kinds of cases are **immediately and automatically** re-linked by the Concept Processor for these rare cases.

In a relatively short period of time, the Concept Processor begins to mirror your thought process, giving you, the health care provider, support of a nature never before experienced. **The process is much faster, better, and safer than human speech (i.e. dictation).**

It is important to understand that a Concept Processor does not memorize each case as a block or template; rather, it learns to tell the subtle differences between *close* cases, much the same as the human mind works—as a form of Gestalt. The Concept Processor **does** memorize concepts and relates them to other existent concepts, again, the way your mind would, only faster and better. As a result, the amount of computer memory space used is surprisingly small.

### ***Concept Processing Decreases Clinical Errors:***

Most mistakes in medical practice do not happen at the extremes of the bell-shaped curve (with rare cases), but at its very center - with the most common cases. We are talking “Murphy” type errors: not errors caused by ignorance but the much more frequent “stress” errors brought on by the overwhelming time pressures ever-present in medicine.

The Concept Processor cannot include a mistake in a current case if the closest previous case was free of errors. On the other hand, if you discover an error in the previous case you are working with **now**, and you **catch and correct** it now, you cannot make that same mistake in the future. As a result, the random errors in your medical practice continually decrease. The stress involved in day-to-day medicine decreases as improvement in productivity increases, because you are now assured that every “t” is crossed and every “i” is dotted. With each new case, the quality of your documentation gets progressively better.

### ***Learning From Your Own Clinical Records:***

As an added bonus, a Concept Processing-based EMR provides a powerful clinical use for your own medical records. Instead of keeping a SOAP note purely for medico-legal and financial reasons, you can now use your patient record the way a pilot uses a checklist, to ensure that *nothing* is forgotten or overlooked. The chart prompts you to ask the right questions, check for the right signs, order the right tests, and give your patient, in writing, the full instructions every time—all learned from your previous best performance.

And this feature, unlike anything else in medicine, helps you change your habits for the better! Each time you add a history, a new idea, and new evaluations to the medical

record, the wealth of the patient history, the description of the physical exam performed and, in fact, the entire work up becomes progressively richer for every similar case in the future. Each entry in the medical record provides you with an ever more detailed blueprint for future cases in your own practice of medicine. So you can use the record on your time off, while reading journals and studying Medicine, and incorporate new treatment modalities to your system. Months later, they will reappear just in time, ready to help the patient that fits the appropriate Assessment. Some doctors even add the journal references in their SOAP Note. Talk about quality!

### ***How Long Does A Concept Processor Take To Learn Your Cases?***

A major question posed by the developers of the Concept Processor—and by many perceptive prospective clients— is "How long would the system take to be useful?" (that is, to learn the "critical mass" of knowledge so it could be of help to you).

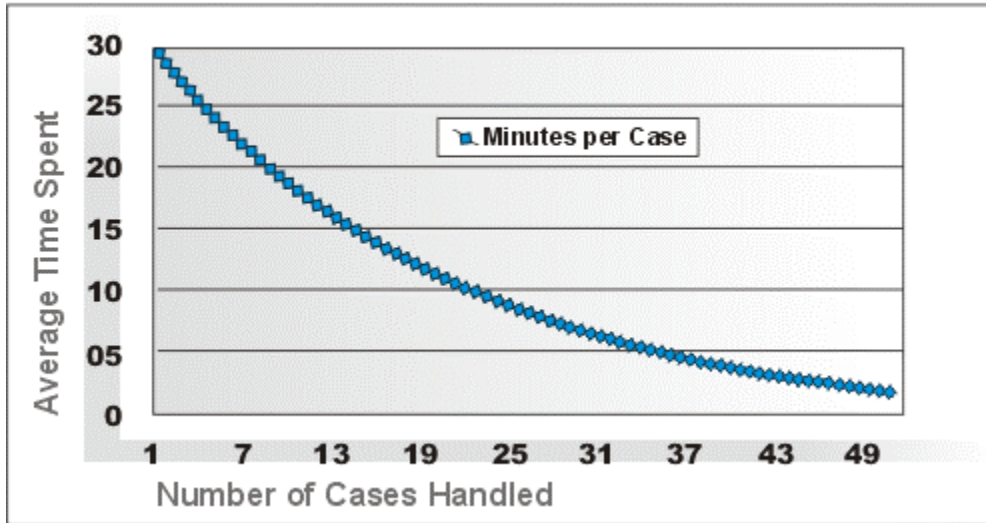
This project was initially undertaken with the assumption that even if the system took significant time and effort to get up to speed, it would still be a worthwhile endeavor if, in the end, it could save you hours per day in your practice of medicine and improve its quality and if, as a result, a practical working EMR with all its implications could be realized.

The results were pleasantly surprising. It turns out that that the Concept Processor takes virtually no time to learn the cases of even the most exacting physician (a humbling experience for those of us who think our knowledge is infinite!).

When you first receive the program, you will probably take it home for the weekend and play with it by entering a few typical cases. Physicians tell us that they find it a sheer delight to watch their own thoughts reflected on the computer screen at the speed of their mind—each case returning even faster than the one before.

Assuming it takes you about 30 minutes to enter the very first case, and factoring a mere 5% speed improvement per case as previous writing is automatically recalled (the usual is around 15%), the compounded writing speed, shown in the following graph, is quite impressive.

*Speed Versus Time In Use*  
**Praxis Learning Curve Assuming 5% Improvement Per Case**



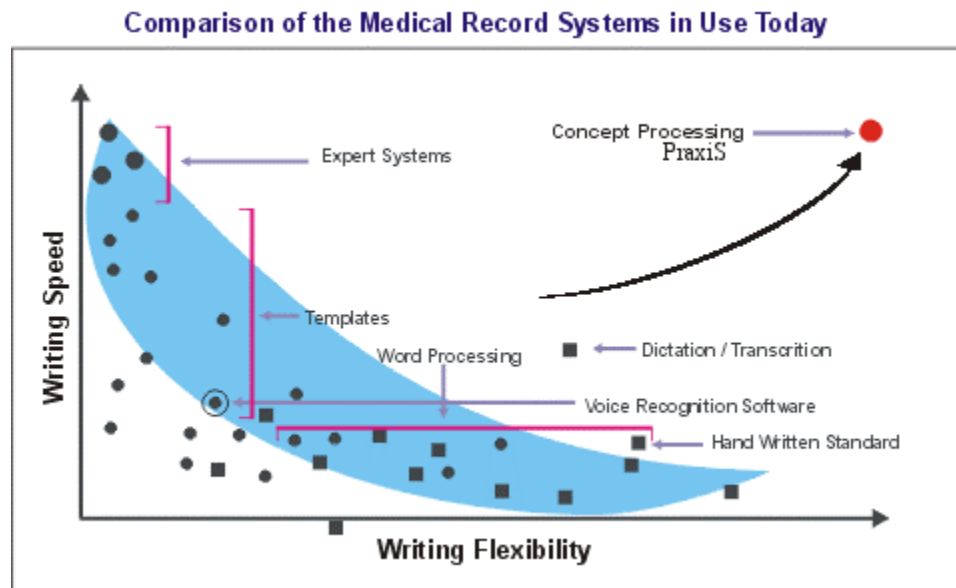
After less than 10 hours of use, you are writing a case in less than three minutes; four more hours and that time is cut in half. Furthermore, you are able to clearly measure the improvement in time and quality per case from the very beginning. Once the two-minute mark is reached, you can return to the clinic with the computer, and, starting with the easiest cases, work more and more cases with progressively greater ease.

The more you use the Concept Processor, the faster and smarter the writing becomes until you are generating precise documents in seconds with a minimum of effort, spending far more time reading than writing. One can read approximately five times faster than one can speak, and that is with unfamiliar documents. However, the bell-shaped curve assures familiarity of your own writings, so the speed of document generation becomes extraordinary, and so is its quality.



# WHY ARE TEMPLATE-BASED EMR's INEFFECTIVE?

It is vital to understand the difference between the Concept Processor and the many kinds of template-based EMR software programs on the market.



The Comparison of Medical Record Systems, shown above, represents the relationship between patient record systems' writing speed and their writing flexibility. We have included writing longhand and old dictation/transcription in this graph for comparison.

You can see clearly that all other patient record systems, not based on Concept Processing, fall into a speed of writing versus writing flexibility trap:

- ◆ **Word Processors** are flexible but twice as time consuming as writing longhand. If you use macros, you can write faster but will lose flexibility proportionally to the gain in speed.
- ◆ **“Experts Systems”** are certainly fast, but their flexibility factor lies somewhere between slim and none. With an expert system, you are asked to choose from someone else's "menu options" and practice *their* medicine, not your own, exposing you to significant legal risk, along with other undesirable effects. Simply put, medical practice just does not fit into nice, neat little niches, or computers could practice all by themselves.
- ◆ **Templates, which comprise the vast majority of EMR's on the market today, are basically word-processing macros in disguise.** As a poor compromise between the expert system's inflexibility and the word processor's slowness, the canned response inherent in this type of software is so artificial as to be embarrassingly obvious and surprisingly risky.

Another major disability of templates is that the more they are used, the *less* flexible and *slower* they become. Moreover, trying to find these templates later becomes a nightmare all its own.

◆ **Templates are legally dangerous.** "There is another related problem that is latent in every template-driven program that is not present in PRAXIS. The templates in other systems are subject to discovery and to use against the defending physician. Imagine how pleased a plaintiff's attorney would be to find that a physician's entire practice could be reduced to a series of simple statements:

*"Suddenly, the art of medicine is diminished, and the defending physician appears to be a mere technician in the way he practices, forcing all his patients into a single mold. However, since PRAXIS is based on the examination of previous patients, these records are not subject to discovery since they are protected by physician-patient confidentiality.*

*"While the process by which a physician using PRAXIS to enter data is discoverable, that process is little different than what is now done without PRAXIS. While several other systems provide for such things as accurate and legible recording of notes and prescriptions, it is the flexibility and theory behind PRAXIS that will, in the long run, provide the best legal protection for the practicing physician."*

*Curtis E. Harris, M.S., M.D., J.D., Practicing Endocrinologist, Professor of Medical Law  
University of Oklahoma, Oklahoma City, Oklahoma*

◆ **Voice activated (speech recognition) software systems do not take the place of the spoken word.** The issue is not whether the system understands your speech (which it does not completely do yet), but whether your speech as it comes out of your mouth is clean and without error. At least a medical transcriptionist can say "he could not possibly have meant to say that!" Voice Recognition will enter what it hears, and what it hears may be extremely different than what you meant to say. Since Concept Processing is instantly generating your concept the way you have done many times in the past (and hopefully free of random errors), it just has to be more accurate than human speech, it follows that it is faster and more accurate than any speech recognition software. Even if voice recognition were perfected and worked in a steady, unbroken manner, Concept Processing is still far superior to voice recognition where medical documentation is concerned.

However, coupled with the Concept Processor, voice recognition is much more than a spoken template; it becomes an integral part of the Concept Processing engine, allowing for even farther freedom by working *totally hands free*. It is a synergistic product (Praxis uses Dragon Naturally Speaking® voice recognition software) that multiplies the power of both the Concept Processor, and the voice recognition application. Voice recognition simply takes the place of the keyboard, while the Concept Processor takes the place of your subconscious mind, where

all the random errors comes from (indeed, it could be argued that you use a biologic Concept Processor today. When you think “normal” and you say “*Well developed, well nourished male in no acute distress*” (or whatever you say in such circumstances), you are not thinking of every one of the words you have just uttered, to say nothing of every one of the letters. You think of the general concept and your subconscious finds the words and puts it together for you and brings it out of your mouth almost instantaneously— based on your previous experience with many other cases. This system does the same thing: only faster and better than your subconscious could. The Concept Processor gives you full control over your conscious mind (actually better control!), while it takes over the unconscious part far better than you could yourself, and with far fewer errors. In essence it is an extension of your mind, multiplying its power and reducing your stress.

◆ The Human Transcription/Dictation systems were, up to now, the most rational alternative to templates. However, not only are they associated with prohibitive cost factor, human transcription cannot deal with the multiplicity of documents you must generate immediately: prescriptions, admitting orders, instructions, etc. These still have to be written longhand.

More importantly, the write up comes back to you hours if not days after the event took place, and by that time it is not as easy to evaluate the case from memory. On the other hand, Praxis 3.0 enables your transcriptionist to team with you and help you develop your Knowledge Base at much faster speed, thus creating a synergy that decreases transcription time and cost, and contributes to a robust and ready-to-use Knowledge Base in a very short time (see page **Error! Bookmark not defined.**).

None of these systems—word processors, templates, even human transcription—can learn. An amazing fact is that many transcription companies (sometimes without the provider's knowledge) are relying on *templates* in an attempt to speed up output and lower their costs. As mentioned above, the Concept Processor can include an interface with dictation transcription for initial priming of the system, with the advantage that it is a progressively diminishing expense.

In conclusion, template-based software reached its peak performance several years ago, and it not been able to improve its basic functionality since. In fact, even after all these years, template software has never really taken hold of the medical profession because of all the issues just mentioned.

Concept Processing is getting better and smarter with every passing version, clearly distancing itself from all other current EMR technology. Yet, this technology—as amazing as it is today—will continue to improve for a long time before any conceivable limits are found.





# PRAXIS 3 - NEW FEATURES

A whole new field has opened up in Electronic Medical Records, and it goes far beyond documentation alone!

Concept Processing works! Over the last ten years, this has been demonstrated time and time again by hundreds of clinics currently using Praxis everyday. However, the feedback from our customer base had a theme: "Not only do we think about the current case, but we also think of the long-term patient at the same time. Give us a full Electronic Patient Record based on Concept Processing!"

With that thought in mind, we realized that Concept Processing had opened up a new temporal dimension, using the same theory as before to manage the dimension of time. Not only can the software learn how to write a current note, but it can also prompt you for future events, reminders, notes, procedures, health-maintenance systems and MANY more activities designed by you. Moreover, these activities can be learned and re-used for your other cases as well.

For clarity, we will divide the remainder of this discussion in two areas:

A) Revolutionary new Features that are currently available with Praxis 3.0 (this section) and can only be available with the use of a Concept Processor, and

B) Features currently in development and soon to be released.

You will quickly see why Concept Processing is becoming the most powerful Electronic Medical Record tool available.

## ***SOAP Agents***

Think of an "agent" as a memo (such as an e-mail) that you can send to yourself and/or others in your clinic. The difference is that this memo includes several unique features ideally compatible with a medical practice:

Timer: These messages can be regulated by time. Some messages you wish to be sent instantly and even urgently, while other wait for trigger events or dates to be sent to your office staff for action. These timing delays, once memorized for use with a given patient, are then automatically triggered for other patients who have the same medical conditions by the concept Processor previously described, in essence giving you a customized health maintenance engine effortlessly.

So at one extreme, you can send **urgent** memos and alarm the receiver to review immediately (Example: "The CCU is on the line for you!"). At the other extreme, an agent can "wake up" a year from now (example: "Call patient. She is due for annual mammography").

**Because this agent is attached inside your SOAP Note, the next time you see a different patient with the same problem, you see the instant option of sending the**

**same agent to repeat the same study with the same time delay.** This is the power of the Concept Processor, which effortlessly creates a health maintenance system for your habits and assessment patterns, customized to your way of doing things. You program the agent once, and use it many times by simply editing it to fit that occasion. Routine orders such as endoscopies, mammograms, laboratories, and pelvic exams, are recalled by whomever you indicate exactly when they need to be done.

Audit Trail Documentation – the “ANY” Option: As is the case with e-mail, with agents you can also create a **Group List** or **Alias** so you can send the same message to a number of people in your clinic at the same time (all Receptionists, all Assistants, all Dietitians, all Cardiologists, etc). However, the “**Any**” option works in such a way that the first member of that group who opens this agent, deletes it from the in-box of all the other list members, so that the others are not bothered with this message, and the initial reader’s name appears as the responsible party to act on your order or request. His or her name will appear in lieu of the group’s name as the “accountable” person who read your note and who is therefore responsible for its content.

In this way, you need not specify who will carry out your instructions—something you may not be aware of at the time you send the message (“Mary Cartwright opened this agent on 3/3/03 at 4:49 pm”). Note that agents can be programmed to activate only under certain conditions, such as when the patient returns to the clinic. So, for example, the first Dietitian or Orthopedic Surgeon who has your patient standing in front of them will read your request...and not anyone else.

Phone Calls and Inserted Notes: An agent is composed of a Title, a Subtitle, and Text. All of these can be memorized for future use under a keyword of your design. This means that you can create special “form questions” for your front office staff to ask patients while on the phone, for example. When the message is generated, your staff can quickly fill in the blanks or select from pre-made choices, instead of having to type complex messages to you. This, in turn, dramatically speeds up the message creation, and reduces errors. You get the information you want - the way you want it, and it is clearly entered in the patient record in a way that will protect you in the future.

Rapid Document Scanning: Your practice is constantly receiving documents by mail and by fax. These documents can be entered into the patient records ONLY via these agents. The reason is three-fold:

- a. The agent makes sure that your staff gets the correct information (“This agent is for final laboratory studies! Use the temporary agent for temporary labs”);
- b. It is programmed to route the documents to the right provider for evaluation so that no note makes it to the record un-reviewed;
- c. It uses its pre-programmed Label to CLASSIFY the inserted note in your patient’s record, so you can, in turn, classify the chart exactly the way you wish to see it...

...and of course, this method also allows you to find and query scanned documents rapidly and effectively (“List the patients who had CT of the brain with contrast this year!”)

Dynamic Chart Classification: As mentioned before, the Agents can be used to classify clinical information by automatically generating the chart labels that you have pre-programmed. These labels then become part of the chart. For example, you scan a chest X-Ray by using the agent and selecting “X-Ray” as its label. Once the agent sends the X-ray to be reviewed by the correct Provider, it then classifies it in the corresponding patient record, under the label “X-Rays.” The chart classification can be anything you like: Laboratories, Insurance Information, Biopsies, Referral Reports, etc. Once classified, you can search/sort the information very rapidly.

Conditional Agents: The agents can be programmed to launch under certain events. For example: If a patient is a “no show,” an agent can be fired off to a pre-assigned office person, who will then contact the patient, recording the results of the phone exchange in the patient record under (say) “No-Show.” Agents can even be fired off days before a visit to make sure that the laboratories are back, or to remind an office person to call the patient, confirm the appointment and prepare them (“Do not eat prior to the visit”). Other examples: Agents can be designed to warn you if the patient does not make the visit within a certain amount of time. They can advise you what refills are due, etc. These agents can be “working reminders” as well; as mentioned, they can even be fired off during the patient encounter (“Ask him how his mother is doing.”)

Directed Activities: In addition to sending a message, agents can be used for office activities to improve office flow. For example an agent can be used to schedule a patient by opening the Praxis scheduler on the right date of the visit. An agent can be used to refill medications by prompting the provider for approval, then making sure that prescription gets printed or faxed to the patient’s pharmacy.

This is only the beginning of what these agents will be able to do in the near future (see upcoming features section below).

**Keep in mind, however, that the unique and amazing power of the new Praxis 3 Agent is a direct result of its link to the Concept Processor.** The agent can be embedded in the actual SOAP Note. This means it will appear when a different patient presents with a similar case that requires it. In addition, once it exists, the agent can be easily modified to perform additional or similar tasks. The agent can be programmed to alert you if any of your orders could not be carried out for any reason, all effortlessly and automatically. Just as with the Encounter Note, the more one uses an agent, the easier it is to modify and create more of them. The agents become ambassadors of your mind to ensure that what you want to get done is—in fact—done.

### ***Intelligent Scheduler***

“I’d like to see you again in a week” is simple enough to say, but it is entirely possible that you don’t know that you have already been booked solid for 2 weeks! The question is: Why does the scheduling need be done twice—once by you, and again by your front office? With the built-in scheduler (based on the Concept Processor and the Intelligent

SOAP Note), the scheduling becomes almost automatic; it's so easy you can schedule your patient yourself before you close the chart!

The first time you see a patient with a particular problem, the you must decide when your patient should return to see you, and how much time you will need for the follow-up visit. You may also want to select the equipment that should be available during that follow-up, what staff might be involved, and what other actions should be taken prior to the visit ("Make sure labs are back," "Call patient," "Remind patient the day before to come without breakfast," etc.).

Once you do this and close the chart, Praxis can open the scheduler right on the correct date depending on what you wrote in your note. It is so easy that you could schedule the patient all by yourself simply by asking the patient "Are you free on Monday the 7<sup>th</sup> at 3 pm?" and then, with a mouse-click, - Praxis will print out a return slip you can hand to the patient!

As with so many other areas of Praxis, the next time you see the **same type** of case presenting in **another** patient, , Praxis automatically remembers: when to schedule the follow-up, the length of time needed for the visit, the desired equipment, the necessary staffing and any other wants or needs regarding preparation of the visit. It then opens the scheduler on that new date —instantly, of course!

Again, this is only available in a Concept Processing engine.

## ***Intelligent Printing***

Although Praxis creates a "paperless office," the reality is that, for the next few years anyway, the medical world will still demand paper documentation of all sorts from you.

These documents are varied and complex. In addition to the chart itself, there are also prescriptions, admitting orders, pre-hospital authorizations, letters to colleagues, and medical documents for all types of excuses and permits that you produce. Any "external" documents may be required as well, some on special forms **not** developed by you or your clinic (Hospital Admissions, ER forms, Health Department forms, etc). As with all the other elements of Medicine, these forms are repetitive. The answer to this time wasting chore is a clever feature called Praxforms™, based on (what else?) Concept Processing.

In essence, the Praxforms module lets you scan any FORM you wish (yours or a third party's) into the computer. You need do this only once per new form. Then you map the fields to be filled out to your Praxis database (kind of like mail-merge), and Praxis stores the now intelligent form in its memory. You then add the Praxform to your SOAP note, and, when you save your note, the form will be filled out and printed out as though you had nothing better to do with your life than take up an old-fashioned typewriter and "fill in the blanks!" The next time, all this will happen automatically!

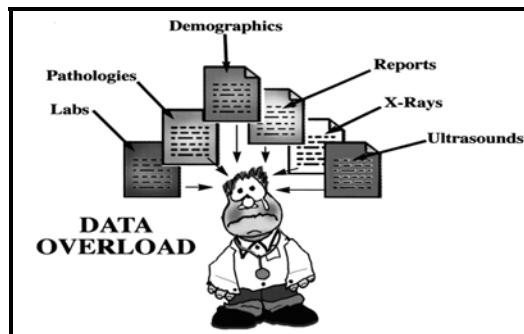
By use of the Concept Processor, your SOAP Note indicates which forms you need to fill out for which type of case and patient. Praxis then finds the previously created forms, populates them correctly from the data in your Praxis, then prints all the desired forms—all in one step. The recipients will get their forms completely filled out exactly the way they want them, but won't know that you didn't waste a minute producing them! Another blow to bureaucracy!

This feature also allows you to create letters to colleagues (with appropriate personalized headings), prescriptions faxed to a patient's pharmacy, and admitting orders to the appropriate hospital. Based on your patient information, as well as a database of resources, providers, labs and hospitals—all linked to your Concept Processor representing your own experience with these documents in the past—Praxis will automatically know which referring physicians, patients, pharmacies or hospitals should receive which document, and will generate and personalize them all instantly.

Until the time that the world eliminates the requirement for paper, Praxforms is your bridge to the paper nightmare.

### ***Using a Concept Processor To Process Incoming Data:***

The major problem in receiving clinical/laboratory information electronically is not in the transmission per se. Indeed, there have been major attempts at communicating clinical information and creating standards, most of which have met with little success. The major problem solved with Concept Processing is the virtual elimination of the data overload and data incompatibility nightmare.



This drawing illustrates your dilemma of having to wade through the deluge of laboratory numbers, reports, pictures, etc. you continuously receive, in order to get to the pearls of information you need to make clinical decisions. Many bits of data are received in "computerese." Data often comes to you accompanied by bizarre facts (like irrelevant code numbers) and extemporaneous references having little or no relevance to the case at hand (the name of the laboratory technician who performed the readings), and which often cannot be visually separated from the important results. Frequently, the

eyes of the physician must carefully trace the symbols to extract what is being searched for among the myriad of numbers and explicatives, and risk losing critical data. Usually, this stressful experience feels like looking for a needle in a haystack. No other profession has so much noise (read "garbage") associated with clinical information; and you are expected to sort it all out at lightning speed, without error, and *at three o'clock in the morning*. In this sense, the computer has made things worse, further alienating any reasonable physician from getting more deeply involved.

The following formula says it best:

INFORMATION = DATA – NOISE

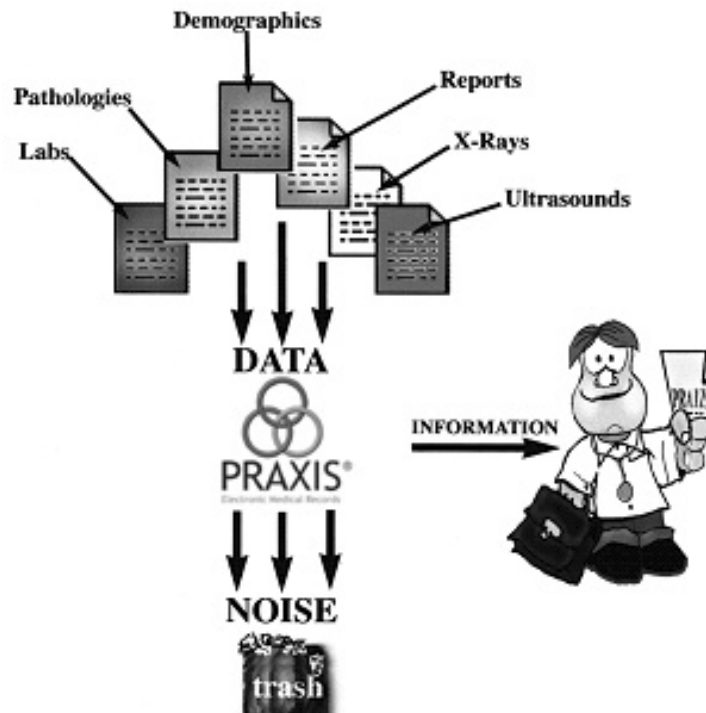
**Information:** The useful facts you require to make a clinical decision, at the precise you need them (not sooner or later), in the exact format you wish to see them display, **and absolutely nothing more.**

Everything else is massive **Noise, and you should not be exposed to it...period!**

Before Concept Processing, the problem was that no one could make this filtering decision for you other than you yourself. No other kind of program could accomplish this because what is noise for one provider is information for another, and no other system has been able to figure out this difference in advance. One physician may prefer to read the temperature in Centigrade, someone else in Fahrenheit, but nobody wants to see both!

It turns out that the same Concept Processor used to generate fast and smart outgoing documentation can be turned around to field all incoming electronic data and deliver to the end user pure information exactly the way he or she wants it, and exactly in the place and the time desired. This filtering system significantly speeds up the diagnostic process, decreases clinical error, and lowers the level of human stress.

*Concept Processing Separates Information From Noise*



The Concept Processor can also personalize the flowchart for the case at hand, and can input the relevant data in the right place automatically - as though it were being handled by a smart assistant.

### ***Intelligent Flow Charting***

Think of a flowchart as an intelligent spreadsheet where you can enter—once in your life—any kind of medical information to be tracked on the vertical axis, and Praxis will instantly post the results, as they are available for the appropriate dates along the horizontal axis. Moreover, if these results are numbers, then Praxis creates appropriate graphic/bar charts to show the trends as well. Note that you can pre-select any number of individual labs (“blood potassium level”), vital signs (“pulse”), and/or clinical parameters (“fetal pulse rate”) and include them in the same flow chart under a label you create.

What makes this kind of intelligent flowchart different is that the setup you create is memorized and linked to the Assessment of the case at hand for automatic future re-use with other patients that present with the same Assessment! So in the future, you need not do all this. In fact, you can work from this page to add or take away other parameters for more relevant use to that future case. So you can take a similar flow chart (one you have created in the past), change it a little bit, and you now have a new kind of flowchart without having to create it from scratch. The type of data you select, and the sets of graphs you may design, can be as varied as you wish. For example, for a case of Anemia you may wish to plot the patient's pulse, the hemoglobin level, the MCV, total iron binding capacity, and the Iron sulfate medication all on one page. You then call this flow sheet "anemia" and link it with a case of "Iron Deficiency Anemia". Then, every time a case of Iron Deficiency Anemia presents in **this or any other** patient, Praxis knows that you need this flow chart, and it will be automatically created and updated for that patient as well. That is the power of Concept Processing.

Moreover, if you then see a case of Hemolytic Anemia, you may wish to add the reticulocyte count, and remove the iron medication. This will be remembered for all like cases in the future. Now you have created two kinds of flow charts (regular anemia, and hemolytic anemia). In essence, an unlimited number of flowcharts can be created and used on the fly.

Again, the Concept Processor makes sure that in the future, when the right patient presents, the correct flow chart will be instantly generated for that patient without human interaction!

### ***Flow Charts For Pediatrics And Obstetrics:***

In Pediatrics, the age of the patient is also a relative date (from the date of birth). In Praxis, the flowchart for any patient less than two years old defaults to "months," and less than two months old to "days." In OB, the flow chart defaults to the gestational age as calculated from the LNMP (Last Normal Menstrual Period) and defaults to weeks, but can also be set for days or months. You are not stuck with a standard OB flow chart, but can create several kinds depending on the different presenting diagnoses of your pregnant patients.

There are no limits to what you are able to flow chart with Praxis 3.0 and, thanks to the Concept Processor, all these flow charts appear when they are needed, for certain patients under particular conditions.



### ***Pre-Visit Patient Preparation:***

Although templates have no place in the practice of Medicine, they may be useful in helping your Assistants prepare your patient per your instructions. Your Concept Processor can be used to generate templates for their use. Many initial tasks during a visit are handled by the nursing staff following protocols conceived by you for any sort of patient profile.

You can create a general profile that includes instructions (such as, "What brings you in to see the doctor today?" "How long have you had this problem?" "Has anyone else in your family reported the same symptoms?" "Have you seen another doctor for this?" and so on. ). You can also include more specific "Questionnaires," such as the Zung Depression scale, or the Oswestrey Disability Score, along with the Review of Symptoms, the Histories (Past Medical, Surgical, Family)...what have you. Your assistant can fill out this part of the record for you before you even see the patient.

You can instruct your nurse about desired vital signs and what clinical parameters to obtain (like the Fetal Heart Rate in a pregnant female, the ophthalmic input data read by the staff of an Ophthalmologist, a fasting blood sugar in your Diabetic patients, and any other sort of objective data which can then be flowcharted and queried). You would save all this under a general or a specific profile (pregnant patient, Diabetic patient, depressed patient, well child, etc.) for future use.

When the patient arrives, the nurse simply opens the closest "profile" (e.g. Sore Throat) to the patient she is seeing, and presto...the Pre-SOAP note opens for your assistant to complete per your directions. In short, everything that is usually done by the nursing staff, prior to and in preparation for the visit, can be in the profile. Then, when you open today's encounter note, all that information will be there, waiting to be activated in the note with a simple click of the mouse.

The nurse then opens the closest profile to the patient she is seeing, and...Presto! The Pre-SOAP Note opens and the different areas you delineated appear for your assistant to complete per your instructions, In short, everything that is usually done by the nursing staff (prior to and in preparation for the visit) can be incorporated in the profile. Then, when you open today's Encounter Note, all that information will be there, waiting to be activated in the note with a simple click of the mouse. That pre-generated information then mixes with your Concept Processor to generate the final note in a second.

### ***Health Maintenance via Agents:***

The traditional paper Encounter Note is simply a static document recording what has been done for the patient. In itself, it "does" nothing except remind you of what **had** been done and what **had** been ordered. In point of fact, its electronic counterpart can take action, not only in the present by generating all the prescriptions, instructions, admitting orders, etc, but in the future as well!

You can place any procedure or plan element in the Health Maintenance Section of the SOAP Note, and you are immediately prompted on how often you wish that plan or procedure repeated. That's it! When the patient arrives to his/her appointment, after the designated time has elapsed (not before) you will see the indicated plan or procedure in your own Encounter Note under the Plan section, ready to be activated and documented by a simple mouse click - without a thing to write!

And...you can attach an Agent to look for Health Maintenance issues that were missed at some point, or to be warned should your designated date lapse. An example: For patients on Lamisil, you might wish to take a Liver Function Test every two months; if a patient goes three months without the test, you would be advised not to refill the prescription. The Agent is your electronic assistant, designed to help you with the Health Maintenance aspect of each and every one of your patients.

Of course, the "real power" of this feature lies in its linkage to the SOAP Note via the Concept Processor so that this future Plan/Procedure order is not a simple isolated event, but is assessment-related and instantly available for other patients with the same condition. Let's assume you now see a **different** patient with the same Assessment. As you look at your otherwise empty encounter note for today, you will again see your procedure or plan order ready to be activated. Moreover, if you have instructed that this procedure be repeated only once each year, it will be another year before you automatically see it again in your Note on this new patient!

As a result, you develop a customized health maintenance program for your patients simply by practicing medicine the way you have been doing all along. And if you ever learn about an addition or modification to your current approach, you can change it in the Concept Processor and the system changes your habit quickly and painlessly...on the fly!

Rigid templates cannot handle such complex, individualized and growing health maintenance orders, unique to your way of practicing medicine, to the patient, and to the kinds of illnesses you are likely to see. The Concept Processor can do this with ease; this is truly effective Artificial Intelligence at work!

There can be no error: Specific patients will always be called for their routine paps, endoscopies, prostate exams or flu shots...at the time they are due!

As medicine changes, the quality of the practice will continue to improve as well, because **you** are always in control! **You** "teach" the system what to do so, it follows that you are always improving on your past performance with each new case.

(Note: Take care not to confuse **this** Health Maintenance area with the one built into the SOAP Note. That area is described next under Chronic Assessments.)

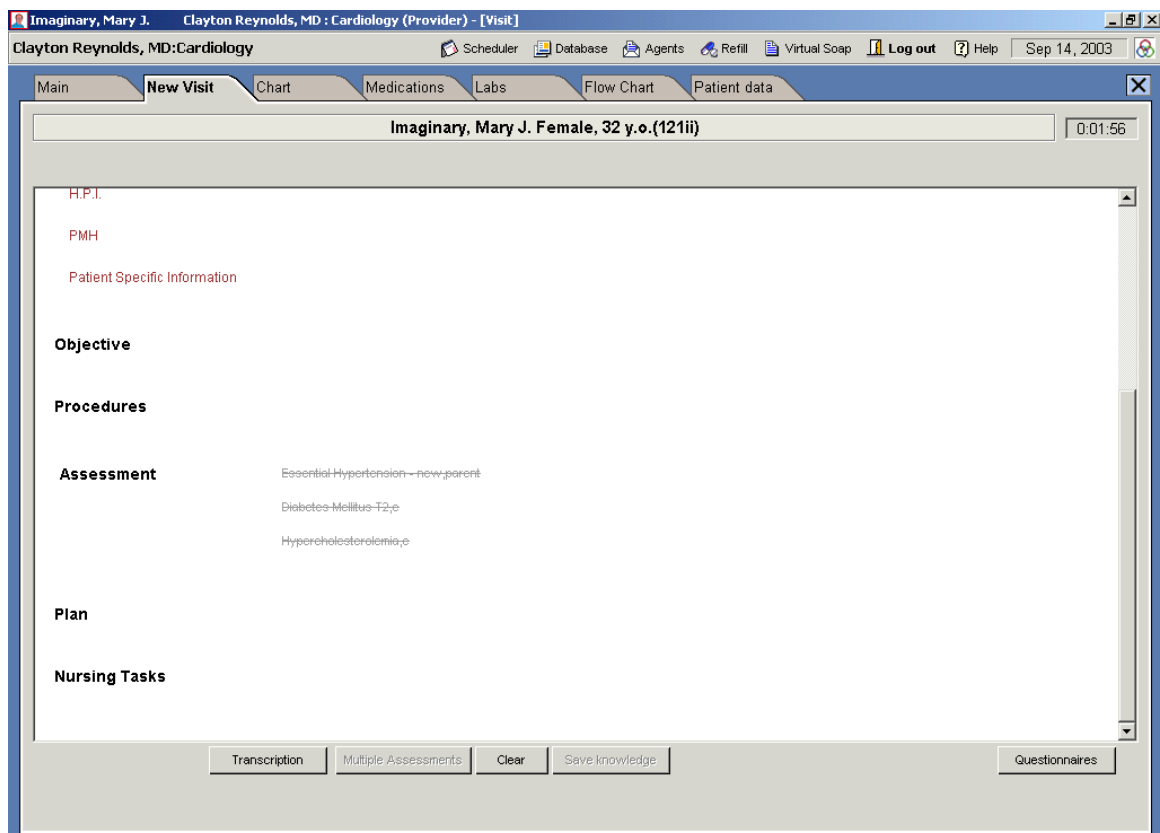
## The "Chronic" Patient:

The patient who comes back with a number of chronic multiple complaints is the most common type of presentation for many practices, particularly in Primary Care. The tedium comes with documenting these follow-up cases for each problem on the list. You do not want to forget to ask or to check for everything under the weight of the routine. As you know so well, most of the time you are not really dealing with a diagnostic issue, but with a management one.

This monotony is where computers excel. Often it is simply a matter of good follow up: remembering what has been done for this patient and what needs to be done today based on your own approach to each presentation. No longer a problem!

Upon opening today's encounter, you see any number of follow-up Chronic Assessments for this particular patient, all presenting in "inactive" status (crossed-out).

*Empty Encounter Note Showing this Patient's Chronic Problems Crossed Out*



These diagnoses initially present in "dormant" form as your patient may be visiting you for a very specific and unrelated problem. If you ignore these problems, they will not be

## Concept Processing for Electronic Medical Records

charted today with the visit nor printed out. They will simply disappear from your SOAP Note after the visit has been saved only to reappear next time.

However, if you happen to select on any or all of these chronic assessments by simply clicking on the name(s), your Concept Processor comes alive and literally builds today's note for you without any effort on your part. The logic Praxis follows is quite interesting to understand.

### Same Chart After One Click of the Mouse

Imaginary, Mary J. Clayton Reynolds, MD: Cardiology (Provider) - [Visit]

Clayton Reynolds, MD:Cardiology Scheduler Database Agents Refill Virtual Soap Log out Help Sep 15, 2003

Main **New Visit** Chart Medications Labs Flow Chart Patient data

Imaginary, Mary J. Female, 32 y.o.(121ii) 0:01:01

CHEST Lung fields are clear to percussion and auscultation.

HEART Regular rhythm. Point of maximal impulse at the 5th ICS and MCL, S2 physiologically split, no murmurs, S3, or S4 noted.

ABDOMEN Soft, non tender, liver and spleen not enlarged, bowel sounds normoactive. no masses.

NEUROLOGIC Alert, oriented x3. Cranial nerves 2 to 12 intact. Sensorium symmetrical intact, coordination intact, motor function symmetrical intact, DTR 2+ throughout. Babinsky's negative.

EXTREMITIES No lesions, no clubbing, cyanosis, or edema. Full range of motion, intact distal neurovascular function.

**Procedures**

**Assessment**

1. Essential Hypertension - new, parent
2. Diabetes Mellitus T2, c
3. **Hypercholesterolemia, c**

**Plan**

Rx. Celestipol-Habs-[20-mg-Sig-4 tab-Q-hs-#90]

Labs - Send Out Cholesterol-HLLDL - fasting

Transcription Multiple Assessments Clear Save knowledge Check Brackets **Contraindications** Questionnaires

New element linking

The Chronic Objective findings are straight forward. They are simply copied from this patient's previous visits where you discussed these chronic findings. Note that this patient previous acute findings are NOT copied. Let's say you recorded your patient as having a "3/6 holosystolic murmur at the apex" last time; your patient will still present with a "3/6 holosystolic murmur at the apex" today, and if you change it (today) to "4/6," then that is what it will read the next time the patient record is accessed. Nothing simpler and nothing to remember either. (Ask yourself how many times you have recorded a chronic finding on a previous visit, only to describe that same physical finding as normal in the next visit; a clear "temporary miracle", since in subsequent visits you chart it correctly again!)

The history, however, is not "clone-able" from previous visits, or you would end up with identical entries and clearly bad medicine. Instead, you will see an *area* called "Evolution" where all the related text you have used in the past to document each specific chronic Assessment (for this **and any other patient with any condition listed**) shows up for you to select. And if you add any relevant text, this will also be memorized for use with this and other follow up patients in the future. In time, your Evolution-type history will progressively enrich itself as in the case of acute cases, and you will never forget to consider all the options while you are evaluating the follow up with your patient sitting in front of you.

This is a much faster, easier, and more effective approach than remembering to write or dictate text every single time. It is far easier to do what you wrote than to write what you did!

Past Medical History, Social History, and Review of Systems—once recorded—do not vary too much for that patient from visit to visit. So, in the second and subsequent visits, the evolution information is derived from this particular patient's own history **already in the chart**. In essence, you are editing the past history for use in the present. With the click of a mouse, you can include any part of that text into the current Encounter Note to be used for this patient now and in the future.

Better yet, you don't even have to remember to do it in the first place...the computer will do it for you!

### WHAT ABOUT THE PLAN IN A CHRONIC PATIENT?

Of even greater interest, a unique Health Maintenance engine handles the Plan and Procedure elements of a chronic recurrent patient. These elements are not brought back automatically for this patient for the next visit - *only* when their time is due.

So, if you order a cholesterol level for a patient with chronic hypercholesterolemia today, the Health Maintenance engine kicks in and asks you, "How often you wish to repeat this lab order?" If you select "every 6 months," then the order will be automatically be placed in the SOAP Note every 6 months—and not before. In effect, you are creating customized Health Maintenance on the fly, one that can be improved at will whenever a new medical fact prompts you do so! That is the amazing power of Artificial Intelligence found in the Concept Processor.

## Concept Processing for Electronic Medical Records

Orders Selected by your Health Maintenance Engine ~~For You~~ to Activate **T**oday..

### Plan

Rx.	Colestipol tabs. [20 mg. Sig 1 tab Q hs #30]
Labs - Send Out	CholesterolHDL LDL--fasting
Health Maintenance	<b>Rx: Colestipol tabs. [20 mg. Sig 1 tab Q hs #30] [Every Appointment; A-: None A+: None; 09/14/2003]</b> <b>Lab.: CholesterolHDL LDL - fasting [Every Appointment; A-: None A+: None; 09/14/2003]</b>

## **Dictation/Transcription With Concept Processing?**

Good question: Why do you need a dictation/transcription module when you use a system that charts at the speed of your mind?

The fact is, there may be some colleagues in your clinic, who just will not get close to a computer—preferring to dictate than learn this new technology. Other times, even you may wish to generate a very unique and personalized report, or, more likely, mix parts of a personalized report, with standard clinical information that you have used many times before. This is particularly true in the Medico-legal and in the Psychiatry fields, as well as in some unique consultations. Yet, even here the Concept Processor shows its amazing advantage. Your transcriptionist can actually share, not only the patient record you are generating, but also your Knowledge Base, and both of you work to populate your Knowledge Base, and dramatically reduce her and your own time in dictation/transcription, and dramatically lower the costs involved.

Praxis 3 has the ability to capture your voice as actual dictation encapsulated within each SOAP element. This audio information, together with the incomplete SOAP Note you have generated, is instantly available to your transcriptionist - be that person in your office, or thousands of miles away via a virtual Private Network. The fascinating thing is that your transcriptionist also has immediate grasp of: 1. what this case is about by looking at the note and the patient demographic. 2. Who you are and 3. What your knowledge base is about. Indeed, your transcriptionist has full access to your Knowledge Base as described earlier, which she or he can help enrich by simply using it the way you would. Then, as soon as your report is ready, you have it instantly to review!

Not only is the transcription turn-around dramatically faster than before, but more importantly, as the Concept Processor learns your approach, you are able to intervene

## Concept Processing for Electronic Medical Records

directly in many transcriptions by using the Concept Processor in many areas (such as the prescription and instruction generation, and even part or all of the note). This also means that your transcriptionist has every time less work, and this generates less cost to you. The Concept Processor doesn't only work for you, but for your transcriptionist as well, and you can both feed it and teach it so that it becomes ever faster and better. Any grammar or syntax correction made by either of you is now available for the other!

This arrangement is helpful even to those providers who cannot type. However, it is our strong belief that—if you work in a multispecialty clinic—some of your more recalcitrant colleagues will start by using the dictation module but will gradually be moving toward the Concept Processor rather than dictate their notes every time.





# PRAXIS 3.0 - OTHER NEW FEATURES

In addition to the unique options discussed , Praxis 3.0 also comes with several other important features.

## ***Drug Contraindications:***

Praxis comes integrated with the powerful First Databank® Drug Contraindication Software, which automatically gives drug/drug, drug/allergy, and drug/diagnosis contraindications. In addition, it can instantly offer all available strengths for all the medications you are likely to use, as well as their correct labels. .

Praxis automatically alerts you if you try to prescribe a medication that can potentially cause an adverse drug reaction in your patient.

FDB instantly provides your program a National Drug Identification Number. An additional benefit of linking all the medications to FDB is that you can use this number to query for the medications used by all the members of your clinic, even though they may be written slightly differently. Eventually this linkage will make possible the use of sophisticated external practice guidelines to advise you as to what medications should or should not be used for which type of patient (see "future features" - below).

## ***Superbilling:***

Since 1991, Praxis has had a strategic partnership with ACME Software Development for the release of CPT and ICD-9 codes which are now linked into the SOAP Note. In this way, as soon as the visit is completed, the Superbill can be sent directly to your favorite billing software and billing service.

This linkage also includes the Levels of Service linked to one of the Assessments in such a way as to closely approximate HCFA requirements. In addition, ACME Billing Software is soon releasing a new linkage to Praxis called the PraxCoder. This innovative program will,

- 1) Advise as to the optimal possible reimbursement after reviewing the SOAP Note, and
- 2) Advise as to what History or Physical Examination items may be missing which would meet that higher Level of Service. Of course, once you have linked the elements to their ICD or CPT code(s), the next time the superbill is generated automatically.

### ***Nursing Tasks:***

Your assistants perform a variety of tasks following direct or standing orders from you. These orders need to be documented and, often, billed.

This feature which connects directly to both the record and to the agents coming from the Encounter Note, allows the assistant to document these actions. Then, if there are any deviations from your instructions to your nurse, this can be documented. You as the provider review everything, and include it in the patient's chart.

### ***HIPAA:***

Protection of patient confidentiality—in addition to being the law—is really a good idea if it was not so complicated. With the use of the Concept Processor, however, there is now an easy way for you to maintain compliance.

Under the new HIPAA law in the U.S., a clinic must select a “Privacy Officer” who is empowered by the clinic to make decisions regarding privacy. The Privacy Officer has access to a Privacy Office Module where he or she can assign different entry levels to all the Praxis users of the clinic. The Privacy Officer can assign each entry profile manually, or it can be done by instantly copying the access privileges assigned to another similar user.

In this way, privileges can be set which can block certain users from accessing certain information.

For improved security, the Privacy Officer can also determine how often users must change their passwords, who entered into any patient record and when, and who is receiving printed documentation from your clinic.

### ***Interfacing:***

As exciting as Praxis EMR is, a full Practice Management system will generally involve many other applications besides Praxis. Simply put, Praxis 3.0 has a flexible approach both to development and to interfacing with the myriad of other solutions currently on the market. Praxis makes full use of both Active X technology and XML to ensure that these interfaces can easily be developed. Of course, Praxis supports the HL7 and ASTM standards used currently in the market.

Active X is a technology championed by Microsoft. It uses components of one software application inside another software application (such as embedding a Microsoft Excel Spreadsheet into a Microsoft Word Document). This has contributed greatly to the rapid development of diverse components, avoiding “reinventing the wheel.”

XML (Extended Markup Language) is a way to include data as textual information. In Praxis 3.0, this is fully used to query - and/or act on - the Encounter Note. This is the technology that allows "on the fly" creation of flowcharts, agents, and Health Maintenance items.

XML is also an easy way to interact with the multitude of databases created by other parties. Praxis 3.0 fully supports the idea of "Pervasive Computing" currently being explored at the national level in the United States. Pervasive Computing will allow the physician to access any information anywhere instantly yet safely—taking into account patient confidentiality and HIPAA constraints.

A full team of interface developers is on hand to create interfaces with Praxis, as they may be needed in the future. Examples of important interfaces currently available include:

Billing Applications: (Such as) Medisoft, Medical Manager®, GE/Millbrook®, MicroMD®, PCN®, Lytec®, and many others. PRAXIS shares demographic and coding information to produce documentation, billed at the highest possible level. This shared information saves hours for you and your staff.

Laboratory Interfaces: (Such as) LABCORP®, QUEST DIAGNOSTICS® and several others are available to help reduce the incoming paper load.

Two other interfaces of note:

Instant Medical History® ([www.instantmedicalhistory.com](http://www.instantmedicalhistory.com)): A program that allows for patients to enter their own history into their own chart. This could be done from home, prior to the visit.

Brentwood (by MidMark) Data Interface®: Employed so that the data from tests such as ECGs and spirometries can quickly be entered into Praxis (about to be released!)

Bottom line? Praxis 3.0 is interface-friendly.

We have made a major commitment to interfacing with any and all other applications, with their cooperation. We do not charge any extra fee for doing our part, if the other vendor cooperates using national standards such as HL7 or ASTM. Our clients have been extremely useful in letting other vendors know of the importance to interface with Praxis, and more and more applications are following suit and becoming interface-friendly.

### ***Retrospective Query:***

Retrospective query is based on data already found inside various fields in Praxis. Examples: patient name, patient insurance, current medications, allergies, patient age, diagnoses, etc.

In Praxis 3.0, a Query "reporting library" has been created, so one can ask questions that can easily be reported back by the system. This is a dynamic library which contains feedback from requests coming in from hundreds of clinics. In fact, the library has been created in such a way that - if you do not find the retrospective query you need - you can notify us, and we will be create it within hours, not only for your use, but for everyone else that uses Praxis. In addition, the most powerful PROSPECTIVE query engine is in development, taking advantage of the Concept Processing Engine (discussed in the next section).

# THE FUTURE OF CONCEPT PROCESSING

Praxis 3.0 has been in development for 15 years and is used by several hundred clinics representing thousands of doctors. The Concept Processor is no longer an interesting theory, but an amazing reality that saves doctors hundreds of hours a month and greatly improves the quality of medicine practiced.

The astounding feedback received from Praxis 2.19 gave rise to many the features already available in Praxis 3 and yet there are still even more amazing things to come.

## ***Intelligent Graphic Interfaces:***

Praxis has been able to capture, store and print graphic images for years. What is exciting about the new development is that you will be able to work up a drawing on an overlay, so that the drawing is memorized for use with other patients. This drawing can be added to illustrate such things as the procedure or the instruction to your patient.

The sketch is then memorized separately from the original graphic, and brought back together automatically in the future with another similar case. At that point it can be left the same, erased, or edited (as was done with the first case). These mixed graphics can then be printed with the record, sent to referring providers, or given to the patient as part of the instructions. The final look is super-professional with minimal memory use.

## ***Field-Macros:***

A hyperlink field is defined as a word-symbol which, when viewed or printed, is replaced by its actual current value. The Concept Processor is able to incorporate these fields into macros inside Encounter Notes and then, in a future case, the new patient's age and gender automatically appear where they should ("Mary is a 22 year old woman who ...").

Of course, the macros are not limited to patient name, gender or age, but may be used for any defined field of the EMR: ("The latest sodium value taken on 5/5/02 was 5.1 meq/l".) In fact, the macros are not limited to fields developed by Praxis; the provider can design any kind of value to a field in a macro.

If this is a user-defined macro, then the system simply creates a new field and begins to follow that value. For example, one can enter "Patient sustained a laceration on the *right* hand". Then, under the objective findings, the description will automatically refer to the right hand everywhere in that day's encounter. (The next similar case could easily substitute left knee or lower lip throughout its Encounter Note.)

In addition, one can then query for that parameter and even follow it in a flowchart (for example "diameter of a palpable mass", "heart sound," etc.). Once created, the Concept Processor ensures that this field-macro need never be created all over again for a future case. It is easily reused in a myriad of other cases as it is disseminated to similar cases in the future.

In contrast, menu template-based EMRs do not have agents and could not use them successfully because someone would first have to program them all in advance. This would further require that the "entry person" know all the infinite possibilities for individual doctors. Such agents would have no flexibility and no way to be customized; further, they could not remember how the doctor used them the last time.

Macros as Field Editors: The Encounter Note can also be used to create new fields automatically for any part of the record. Different clinics have different requirements, such as adding the race as a demographic field, or the name of the referring attorney, etc. Patients on clinical trials may also have different field data which may need to be tracked. This would allow the clinic to track any item desired for any group of patients.

Again, the beauty of the Concept Processor is that it automatically knows what a patient needs by selecting a case from the past that is similar to the present case. Not only is the case fully documented, but these fields also appear automatically in the future case as well – all instantly and without effort from the provider or the staff.

With Praxis, the doctor is only making small editorial changes on the past, which is far quicker and easier than doing each new case from scratch and trying to remember all the minute details each time.

### ***Knowledge Exchanger:***

As you have seen by now, Praxis is not an expert system, or at least not when you first receive it. It **becomes** an expert system with you as the expert. Yes, the practice guidelines (when they become available) will surely help in this area by allowing doctors to think of new things.

But...what, however, would it take to develop a real, true, "classic" expert system?

Surprisingly, not very much. The Concept Processor is basically formed by two databases that are interacting in real time to produce the final document. One database belongs to the patient record, and one to your medical knowledge. In a multiprovider setting, there are  $n+1$  databases, where "n" is the number of providers in the practice. However, what if we took one of those Knowledge Bases and made it available to other practitioners? Hey - We have hundreds of "expert" physicians using Praxis all around the country - in every specialty.

Now, the fact that we are about to release a Knowledge Exchanger may surprise you, since you already know our position on templates.

However, our Knowledge Exchanger and the Template-Run kind couldn't be any different!

The template works directly on your patients; while the Knowledge Exchanger would work on your medical knowledge only!

Here is how it works: You will be able to download one or more different Knowledge Bases available from all kinds of colleague specialists currently using the Praxis software. You will be able to see how your colleague has handled his or her cases and how they manage the clinic. You can then "take up" any case you like in the usual way. The case arrives to you in red, which means you cannot use it directly on your patient until you fully review it, and, if necessary, edit it to fit your practice. Once you save this case, you can use it on your patient, and from then on it becomes your own and you can keep teaching it from then on as usual.

This Knowledge Exchanger has two benefits:

1. It will show you the way other doctors in your specialty handle any given case, and
2. It will allow you to cut the time needed to "prime the pump" (so to speak) so your knowledge base can become more useful to you.

We have seen many knowledge bases that are most impressive, and we have convinced those doctors to license them through us. These real-life knowledge bases beat any template system that could possibly be developed. They are not built a-priori, but during the actual practice of medicine by the authoring physician. Our clients are not computer doctors who also happen to practice medicine, but first rate physicians who use the PRAXIS EMR, and that makes a big, big difference!

This is coming soon.

### ***Practice Guidelines:***

As you recall, an agent is basically a message that can be programmed to activate under a certain time or certain pre-set conditions.

Instead of a chart being opened at a given time to allow the provider access to information, what if it were the ICD-9 code, reimbursing insurance, the patient's age, name of the medication, or any other mixture of existing fields you pre-programmed to trigger the agent when the right conditions are met? Presto! The information is at the your fingertips, just in time to change your habits.

As a result, the agent becomes an ipso-facto (and very powerful) "Practice Guideline," ready to remind you and your colleagues about any diagnostic or treatment modalities at the point of adjudication. In other words, the agent would appear with the patient still in the room, and with the SOAP Note ready to be generated by you ("I recommend you use xxx medication instead of yyy one you are about to use in this case because..."). Often, all you need do is to click on the alternative option for it to become your own. And from then on, the Concept Processor has changed your habit for good! And if you do

*not* agree? Then explain your reason (once), and Praxis will retain your explanation from then on for use with other patients. The practice guideline agent will not trouble you again!

The possibilities here are endless, and the list continues to grow as you continue to use this system. Progressively and naturally, the practice becomes safer and easier, the quality higher, and the entire process much less stressful. We believe that this is the answer to the use of Praxis in academic institutions.

Of course, the agents are now operating strictly within your clinic, but there is no reason that they cannot be turned into e-mails that can be shared from one clinic to another, or even from an expert to thousands of clinics. A whole new industry is just waiting to be born!

### ***Prospective Query:***

The retrospective query previously discussed is a standard type query based on previously saved information.

However, there are questions an investigator may wish to query, that no provider has yet addressed when seeing patients, or has not addressed in a consistent manner. Therefore query is impossible.

There are other areas which limit the usability of query to the language used. For example, if you wish to know how many patients presented to your multi-specialty clinic last month with symptoms of "Right Lower Quadrant Pain." You can search for those words, but you will miss the records of any doctor entering "RLQ pain," "McBurney's point pain, etc." You get the picture: The sensitivity of such queries is very poor.

The solution is the use of the Concept Processor to store and retrieve clinical information in a prospective manner.

**In fact, one could argue that a prospective query is really a practice guideline in reverse!**

With the help of Agents, Praxis can prospectively prompt you and your colleagues for information regarding your patient - at the time of service.

Let's use an example:

In an academic or research environment, someone might have designed an agent to research "banana consumption" among patients with hypertension. He has set up this agent to examine ALL the patients, no matter who the provider is; the agent is triggered



when any patient who has an ICD-9 of Hypertension or a Bp diastolic greater than 110, and is older than 50.

The agent can be further customized to launch only when the provider or nurse sees a patient with these criteria. Once triggered, the agents could prompt the provider—while the patient is still in the room— to ask a question from the patient or obtain the clinical finding. (“How many bananas does the patient eat per day? 0, 1-3,4-7 more than 8”). Indeed, the agent may come with optional responses that require a simple click of the mouse. Again, as in the case of the practice guideline agents, once this agent is accepted, it keeps coming back to this provider with other patients who may meet the conditions.

At this point, there are a number of options that the agent's recipient can do:

- 1) Nothing. The user can choose to ignore the agent. It may not be interest him or he may not have time to read this agent right now. The query or practice guideline engine is never intrusive, and can be easily ignored by the user.
- 2) Follow the instructions. “Patient reports eating [x] bananas per week.” The doctor may simply choose to change or accept the bracketed variable.
- 3) Add his own comment to the query—**in free text!**

All these responses are then retrieved by the agent and instantly sent back to the originating investigator, **with the provider's consent**. Then the responses can be automatically tabulated with comments and hyperlinks to the actual charts.

This type of prospective query is not limited to “one” Networked System. In fact, it could be set up for **all** Praxis EMR users...**in the world!** Within a few seconds, the investigator could have this query reach hundreds of thousands of providers, with rapid feedback including clarifications/exemptions to the original question. Obviously, this feedback then can improve the investigator's line of questioning. With permission from the providers, the original chart could even be retrieved for deeper analysis following HIPAA guidelines.

Then, the next time another patient is seen with the same parameters, the updated query is triggered automatically via the Concept Processor. Very quickly the researcher begins to see real answers to ANY kind of question based on responses from as many polled providers as desired with an unparallel degree of sensitivity and specificity, and with extreme ease for all involved in the loop.

### ***Revolutionary “Feedback Loop:”***

It is no secret that practice guidelines are often found lacking and unclear. They are developed by well-intentioned physicians and are placed in manuals that - more often

than not - are not available when needed (at the point of adjudication). Add to that possible exceptions (to the guideline) which might have been overlooked.

The makers of Praxis believe that this unique combination—the ability to generate powerful "just in time" practice guidelines linked to the ability to query this information—will generate a new feedback loop among investigators/medical decision-makers and the physicians who are practicing "in the trenches" that is likely to permanently revolutionize medicine.

It is hoped that this feedback loop will dramatically improve medicine and lower its costs by allowing physicians to share information while validating new fields such as Health Maintenance, Nutrition and Alternative Medicine, as true modern sciences.

This new technology would make the great studies of the past—such as the Framingham Study—appear primitive by comparison and—using Concept Processing - the costs to implement such a study would be negligible.

Entire fields of Health (such as Cost-Containment and Nutrition) are waiting for just this kind of tool to be able to expand and grow!

# CONCLUSION: LEARNING FROM OUR GREAT CLIENTS!

It should be no surprising that a new great software should be appealing to physicians with vision who are always working at the State of the Art. Great clients do purchase great software. What is perhaps less evident is the opposite idea: that the only way to develop a great product such as Praxis, is to have had great clients as teachers providing constant feedback.

No great software can be built in a vacuum, no matter how smart the developers are (or *think* they are)! After all, “we know what we know, but we don’t know what we don’t know.”

This is why Version 3.0 has been built in a modular fashion, so that it can be instantly modified and improved following a technique called “extreme programming.” The approach has always been to involve our current clients as teachers from an early stage, and to make the software as flexible as possible. We expect to make many more improvements in the software as current and future Praxis users teach us what those changes must be. A very active discussion site for current beta testers exists for this very purpose. In addition, each improvement involves new vistas and new ideas for even *further* improvement. Indeed, as outstanding as Praxis is currently today, the fact that it is working in many hundreds of physicians practices means that there are many more ideas coming our way. This very paper, which may be new to you, is the result of years of feedback by colleagues all over the country that eventually turned into a fantastic product. The ideas are not ours, they are our past and current clients’!

The fact is, the only way that Praxis 3.0 could have been possible at all is because there was Praxis 2 and, before that, Praxis 1. Add to that the blessing of our wonderful, loyal clients, and the end result is the most exciting Electronic Medical Records System ever developed!

In short, Praxis 3.0, using the unique Concept Processing technology that learns on the fly from its user, stands to help physicians gain back their time, their freedom and their money, while practicing easier, more enjoyable medicine. The result? The improvement of the practice of XXI Century Medicine!

The move from paper to computer has begun in earnest with Praxis 3.0, **the doctor’s Second Medical Brain.**

For more information, please visit our website:

[www.praxisemr.com](http://www.praxisemr.com)

or call us toll free at:

800-985-6016

*"The Electronic Medical Record, used within the framework of Concept Processing, will liberate the provider to practice the best and most creative medicine possible; it will lower the stress level associated with daily practice, assure better reimbursement, and actually improve the quality of medical care given.*

*For the first time, the medical record will be an ally instead of an adversary of those who practice the wonderful art of medicine."*

*Praxis Makes Perfect!*