

How Physician-Friendly Are Your Information Systems?

By Dr. Margot Quinn, Becki Weber & Vince Ciotti

The Managed Care revolution in Health Care has forever modified the relationship between physicians and hospitals. From the totally independent mind-set of the sixties and seventies (viz. Medicare Part A versus Part B and Blue Cross vs. Blue Shield), physicians today have become intimate partners with hospitals. Whether serving as co-providers in PHOs and PPOs, members of an Integrated Delivery System or as "gatekeepers" in HMOs, physicians are a critical member of the hospital team, and hospitals are becoming more attentive to their admitting and referral practices. Hospital Information Systems (HIS) can have a crucial impact on physician relations, as more and more physicians are becoming computer-literate and asking if they can use your HIS to:

- Order tests and view results from home/office PCs?
- Schedule outpatient procedures with a single phone call
- Access the Internet from the Medical Library?
- Research the PDR & other CD-ROMs from nurse stations?
- Print admitting & consulting patient lists in the physician's lounge?
- Define personalized order sets in your Order Entry system?
- Receive electronic copies of face sheets for their billing?
- Benefit from alerts & reminders on order screens?

This article reviews how each of these capabilities can improve patient care and lower costs, so crucial to survival in today's Managed Care environment. Surprisingly, the key to MD acceptance of an HIS lies not so much in its raw technical capabilities, but equally in the mind-set of administration and HIS management.

"A DAY IN THE LIFE"

Following a day in the life of a typical physician at a hospital reveals a number of ways an HIS can save time and money for both hospitals and MDs. In rough chronological order, the first thing a physician needs upon entering a hospital to make rounds is a simple list of his or her patients, showing their present location in the hospital, a capability most HIS systems have had for decades. However, some variations on this theme can make this capability either a rewarding or frustrating experience:· **Hardware** - are enough PCs or terminals available in the MD lounge? All it takes is a short line to cause a busy physician to request patient lists from a hospital employee instead. There should be one device per hundred physicians on staff to avoid contention, and the printers should be quiet, small lasers, not noisy, bulky, dot matrix clunkers.· **Monitors** - are CRT screens large, legible and in color? Monochrome screens may save a few hundred dollars per, but how many readers opted to save that money on their own PCs? Give your physicians equal consideration.· **Census Reports** - can lists be printed that include or exclude (at an MD's option) admitting vs. attending patients, private patients vs. group affiliations, and be printed in alphabetic vs. room and bed sequence (for making rounds vs. finding one patient)?

NURSE STATIONS

The second step in most physicians hospital day is visiting their patients' nurse station to check on patient's conditions before seeing each individual. Again, an HIS can be a crucial tool or an annoying frustration:· **User-Friendly** - Is the system easy enough to use that an MD can inquire directly into the system, without requiring a nurse or unit secretary to intervene? In this age of Graphical User Interfaces,

such as Macintosh (which many physicians use in their offices) or Windows 95, or a character-string screen presentation is as obsolete as a Medicare 1453 claim form. Try to inquire into a patient's results yourself, and if it seems difficult to you, imagine how (un)likely a busy physician will be to use it. **Pointing Devices** - Few Medical Schools teach touch-typing, and most care givers (and CFOs!) haven't the time to learn "QWERTY" keyboards. An HIS should use a pointing device (light pen, touch screen, mouse or track pad) to aid MDs in navigating screens. Also, are enough devices available on floors? Are they color, not monochrome? There should be one or more PCs/CRTs specifically set aside for physicians, or they will ask your nurses or unit secretaries to find information for them. **Response Times** - are a devilish issue: most HIS vendors' contracts stipulate that their systems will "average" under 2 or 3 seconds over any 24 hour period, but what good does that do for the poor practitioner who only makes rounds at "peak" hours every morning and afternoon? CIOs get as blue in the face explaining system contention and report writers running in the background as physicians do drumming their fingers waiting for test results on which to make critical decisions. Their is only one acceptable response time to MDs: instantaneous. With advances in chips and telecommunications, there is no reason why an HIS can't respond as quickly as its salesman does to a hot prospect.

Screen Design - can be crucial in results reporting, as certain features either attract or repel physicians and most HIS systems today allow the hospital to "paint" screens in any way desired: - "LIFO" displays (last in, first out), showing the most recent results first, saving scrolling through pages of history. - highlight abnormal, through color, blinking or reverse shading; even audio alerts are not beyond today's PCs. - graphical display;

(Figure)

the system user-friendly enough that an MD can order directly through the HIS, without requiring a nurse or unit secretary to intervene? This capability is the ne plus ultra of an HIS, separating the physician-friendly from the physician-unfriendly. Figure B illustrates the difference in process engineering terms, showing the steps required for a physician to order through nursing, versus directly through the HIS. It also points out how without direct physician entry, the prime users of most HIS systems are Unit Secretaries, among the lowest-paid and least technical members of the clinical team!

Figure B: Typical Steps in Ordering a Patient Procedure	
MD Orders Through Nursing	MD Orders Directly via HIS
<ol style="list-style-type: none"> 1. MD searches for patient's chart 2. MD "scribbles" on order sheet 3. MD alerts nurse if STAT test 4. RN "interprets" scribbles 5. RN copies onto Kardex "To-Do" 6. Unit Secretary (US) keys into HIS 7. US reads any alerts/errors 8. US calls RN/MD to resolve 9. US corrects/confirms order 	<ol style="list-style-type: none"> 1. MD enters order in HIS 2. Reads any alerts/errors 3. Modifies/confirms order

Alerts - Hard costs savings are available if the HIS can trigger physician alerts when certain medications or procedures are ordered. Figure C documents a study done recently on H2 Blockers, which might be given either orally (PO) or intravenously (IV). For one hospital's volumes, the potential annual savings are in six-figures for this one item alone. Multiply this capability across the hundreds of items in the typical charge master, and the potential savings from such alerts are enormous.

Figure C: Potential Cost Savings Through System Alerts

To determine the effectiveness of physician alerts in its HIS, our hospital conducted a study of the use of H2 blockers. It has been determined that these medications are as effective when given orally as

intravenously, enabling a significant potential cost savings. Of 140 patients admitted to the ICU during July, 1996, 136 charts were reviewed, and 34 patients had been prescribed with IV administration of H2 blockers. Based on the patients NPO status, it was determined that 314 doses of the drug could have been administered orally. Switching from IV to PO medication routes would have realized a direct medication cost savings alone of \$1,800 that month, or an annual savings of over \$20,000 for the ICU. With 16 nurse stations in toto, the potential savings throughout the hospital are in six figures for this one drug alone. Below is the alert that we have since designed to appear on order screens whenever a physician inquires into a patient whose drug administration route should be re-considered

Display Costs - If your HIS does not have the sophistication to handle such "artificial intelligence" or rules-based decision making, it surely can simply print the price of each item on the ordering screen to constantly remind MDs of the economic impact of their actions. In this member-per-month capitated world, physicians are extremely cost-conscious, and such a simple modification can reap rewards for both patients and providers.

KNOWLEDGE BASE

Deciding among alternative procedures and medications is a complex decision, especially considering the vast amount of new procedures and medications, and the pressure on a physician's time keep up with the hundreds of medical journals describing the latest research. To assist your hospital's MDs in prescribing the optimum treatment for their patients, an HIS should provide ready access to a number of knowledge-base resources and publications:**CD-ROMs** - exist for over 300 medical texts and data bases usually found only in the medical library (MicroMedix, BiblioMed and the Physician's Desk Reference are among the more popular titles). Modern technology can expand the access to these library resources, as electronic media break down the four walls of the library, enabling physicians to access its resources at any HIS device throughout the hospital. Relatively inexpensive "juke boxes" store the CDs, Local Area Networks transmit them, and the same PCs that act as HIS terminals display them via "hot key" inquiries.**Internet** - access is the ultimate knowledge-based tool, as the World Wide Web has literally thousands of medical web sites with:

- libraries of radiologic images of various media, eg: the Visible Human Project at the National Library of Medicine (www.nlm.nih.gov) or MRI and CT scans at GE's 3D Medical Reconstruction site (www.ge.com).
- "UseNet" groups where MDs can post conditions that patients present, and receive responses from colleagues around the world with potential diagnoses and suggestions.

Although daunting security issues (i.e., viruses, hackers, patient privacy...) preclude Internet access directly through an HIS (firewalls merely reduce such risks, rather than eliminate them), a few dedicated PCs in the Medical Library and Physician lounge can enable Internet searches in a controlled environment at a very low cost (about \$20 per PC per month for unlimited access).**Networks** - Intranets or even simpler E-Mail networks can facilitate communicating among physicians for such mundane matters as staff meetings, published minutes, policy memos, etc. Although only a minor cost saving to the hospital to automate, they can be a tremendous boon to a paper-burdened MDs who receive, file and must retrieve dozens of such documents each day.

MIS DEPARTMENT

Although not a daily occurrence, on many days, a physician may need to interact with the hospital's MIS department, an experience that can be as rewarding or frustrating as interacting with the system itself:

- **RNs** - at a minimum, every MIS department must have one or more RNs assigned as clinical system analysts, to spare MDs the trauma of deciphering the "computereeze" spoken by most computer programmers and operators. At smaller hospitals (<100 beds), there should at least be an "Informatics" specialist in the nursing department acting as an ombudsman for physician

problems or questions concerning the HIS. At medium sized hospitals (100 to 300 beds), one or two RNs should be assigned full time to MIS to address clinicians needs and concerns. For the largest facilities (>300 beds), an exciting new trend is appearing:

- **MDs** - physicians themselves are being hired in many MIS departments, usually recruited from among the more computer-literate on the medical staff. In smaller facilities, they would be, at best, part-time, serving on selection and implementation committees, but at larger facilities, representing the medical staff permanently on MIS steering committees and in ongoing inservice and screen design capacities. Reimbursement for their time is an added but worthwhile cost to the hospital, as Managed Care has adversely impacted MDs' earnings as much as hospitals' precluding such work to be pro bono. The largest and/or most progressive facilities are hiring a physicians full time, either as CIOs or staff members of the MIS department, an admirable trend that costs the most but can pay back enormous dividends in intelligent screen and pathway design.

MD OFFICES

At this point in the typical physician's day, let us follow her from the hospital to their office, and see how additional links to an HIS can benefit both parties. Indeed, this introduces a new player in the story: the physician's Office Manager, as important to a physician as anyone except either depending on several key features of an HIS:

- **Physician Billing** - 1500 claim forms are as near to an MD's heart as UB-92s are to a hospital CFO's, and there are several key ways in which an HIS can facilitate their production:

- face sheets (admission forms) for inpatients contain information vital to professional billing, such as patient demographic, insurance and employer information (that's why they disappear so frequently from the front of patient's paper charts!). The ideal HIS should automatically print or FAX a copy of every one for the admitting physician's office manager, and greatly facilitate their re-printing for consulting MDs.- CPT4 and ICD9 codes are even more crucial to professional fee billing than hospital billing, with a diagnosis code required for every procedure, not just one per stay. Transmitting these codes, often assigned by Medical Records coders after discharge, whether electronically or via paper, can save office managers much time and trouble.

- **Communications** - Surprisingly, some hospitals inadvertently make it difficult for a physicians office manager to send them business:

- Scheduling outpatient procedures can be a nightmare of calls to multiple hospital ancillary departments, each of which operates autonomously, placing the office manager on hold, demands they repeat the same patient demographic data over and over, while they hand-write appointments into paper books. Woe to the office managers who has to re-schedule an appointment because the last department called in a day can't squeeze the patient in; one must then call each department all over again, be placed on hold, ad nauseam... The ideal HIS has a central scheduling module where a single phone call to a central location quickly searches for available slots and easily accommodates cancellations or re-scheduling.- Inpatient admissions are a similar bottleneck, depending on the nature of the MPI in the HIS: a good design enables the quick identification of past visits and re-calling of patient demographic information through such techniques as phonetic searches. A poor HIS causes a frustrating catechism for office manager: "How do you spell "Paderweski?"" and "What was their grandmother's maiden name?"

PHYSICIAN'S HOMES

Finally, long after most people are asleep in front of their TVs, a physician's typical day often ends up late at night in their home/office, with a beeper announcing a patient's condition turning critical or a phone call from a nurse station about an abnormality. Again, an HIS can be a help or a hindrance: **Remote Dial-Up** - almost any HIS can allow MDs to dial-in to a bank of modems from a home/office PC to check the

patient's condition or test results, but the devil is in the details:- Number and speed of modems - as with terminal devices, spending a few hundred dollars (popular brands are now under \$200 per) to avoid busy signals and having new, fast modems available is a must: 28.8 and 33.6 bps are now de rigueur; 9600 or 14.4 bps are slugs on the electronic superhighway. Anyone who ever signed on to AOL or CompuServe at such outmoded speeds can imagine the frustration an MD experiences navigating through the numerous screens of an HIS in slow motion.- Security Codes - the challenge here is to balance undue restriction with excessive laxity. Granted one must be cautious about hackers & break-ins, but the number of ID codes and sign-on complexity must be commensurate with the desire to entice physicians access. Also, allow MDs to pick their own ID codes to match ones they use on their office PCs and other systems, which minimizes the number of codes memorized or scribbled on stick-up notes pasted on monitors (how secure are they?). The most crucial areas to improve security with regards to MD usage: an HIS should automatically sign off a terminal if it is left unattended for over 10 minutes, as busy practitioners are thinking more about their patients than the needs of a computer operating system. Also, security codes should be changed periodically (e.g., every "x" months); try signing on to your HIS using the password of "Nurse," "Doctor" or "Test," and you'll see how often anyone updates your HIS' codes. • **Automatic Facsimiles** - this simple device is common in many ancillary department computer systems (eg: DEC's "VAX to FAX" capability), and it can save a hospital the cost of having clerks carry paper result slips to FAX machines for scanning and then manually dialing an MD's office. It can be a boon or bane to MDs, however, depending on how it is implemented:- FAX all test results for all departments (Laboratory, Radiology, etc.) and sub-departments (Micro, Hematology, etc.), and you will bury the MD and/or their office manager in a blizzard of curly paper.- FAX only abnormalities, that exceed pre-determined values for critical tests in selected departments, and it can be a great service.

HOSPITAL CHECKLIST

All of the above physician linkages are recapitulated in the survey form in Figure D . It was designed as a tool to enable financial managers to rate how friendly their information systems are to their physician community. There are no passing or failing grades on the 200 point scale, but rather it represents a quantifiable measurement that enables a facility to take its temperature at a given point in time, implement a program to improve its HIS' physician relations, and then compare a revised score later to the original benchmark. As technology marches on, more lines will be added to such a report card, and a "good" score today might seem mediocre in a few years. However, the risk to a hospital for having a poor score on this checklist might be reflected in the hospital's bottom line far sooner than in a comparative survey or JCAHO report.

(Figure D: Physician-Friendliness Survey)

CONCLUSION

As Managed Care revolutionizes the Health Care industry, physicians have become business partners with hospitals: the source of income, through inpatient referrals and outpatient testing, and also in control of many expenses, through ordering of tests and discharge decisions. Such critical members of the Health Care team deserve extensive consideration in an HIS, not only in selecting and implementing systems, but in their ongoing customization and day-to-day use. Considering a physician's perspective in making mundane decisions, like the quantity and quality of terminals or printers, can have an enormous impact on their (and ergo the hospital's) productivity. There are some who argue that a hospital's true "customers" are its physicians, even more than its patients, since MDs are responsible for making most clinical decisions for patients. If that is true, then physicians should rank high up on the priority list among HIS users. In most of the criteria discussed in this article, it is not just the programs or features programmed into an HIS by the vendor that make a given system physician-friendly, but rather it is how they are implemented and supported by the hospital. The positive attitude and financial support of hospital administration can make a weak HIS appear physician friendly, while an unsupporting or uninvolved hospital management team can negate a multi-million dollar HIS investment.

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