

Overcoming Barriers to Implementing Computerized Physician Order Entry (CPOE) in U.S. Hospitals

Rainu Kaushal, MD, MPH; Eric Poon, MD;
Tonushree Jaggi, BA; Melissa Honour, MPH;
David Bates, MD MSc;
David Blumenthal, MD MPP

Background

- Medication Errors are:
 - Common – 1.4 per patient admission
 - Expensive – \$4600 per preventable ADE
 - Preventable
- Computerized Physician Order Entry has proven efficacy
 - 55% reduction in serious medication errors
 - Favorable cost-benefit
 - Identified by Leapfrog group as one of 3 patient safety ‘leaps’.

So what's the problem?

- Only 10-15% of hospitals across the country have active CPOE systems
- High stakes
 - Enormous institutional investment
 - Well-publicized 'failures'

Study Aims

- To identify barriers to successful CPOE implementation in US hospitals
- To identify ways to overcome these barriers

Methods - 1

- Hospitals at various stages of CPOE implementation identified by local and national experts:
 - Fully Adopted
 - Committed to Adoption
 - Considering Adoption
 - Failed Adoption
- 5 hospitals selected in each category, stratified by:
 - Region
 - Academic vs. community hospital

Methods - 2

- Up to 3 top management officials (or designate) interviewed:
 - CIO
 - 2 of : CEO, CMO, COO, CFO
- 30-minute taped, semi-structured interviews conducted over the phone by 2 MD interviewers
 - Domains:
 - Current state of CPOE adoption
 - Anticipated Benefits of Adoption
 - Barriers to Adoption
 - Facilitators to Adoption
 - National Policy Options
- All interviews transcribed
 - 48 total transcripts

Variables assessed

- Role of the interviewee
- Vendor system
- Status of Hospital:
 - Major teaching/Minor Teaching/Non teaching (Intern-resident-bed ratio)
- Stage of CPOE Implementation (subjective assessment)
- History of Failures
- Barriers
- Facilitators

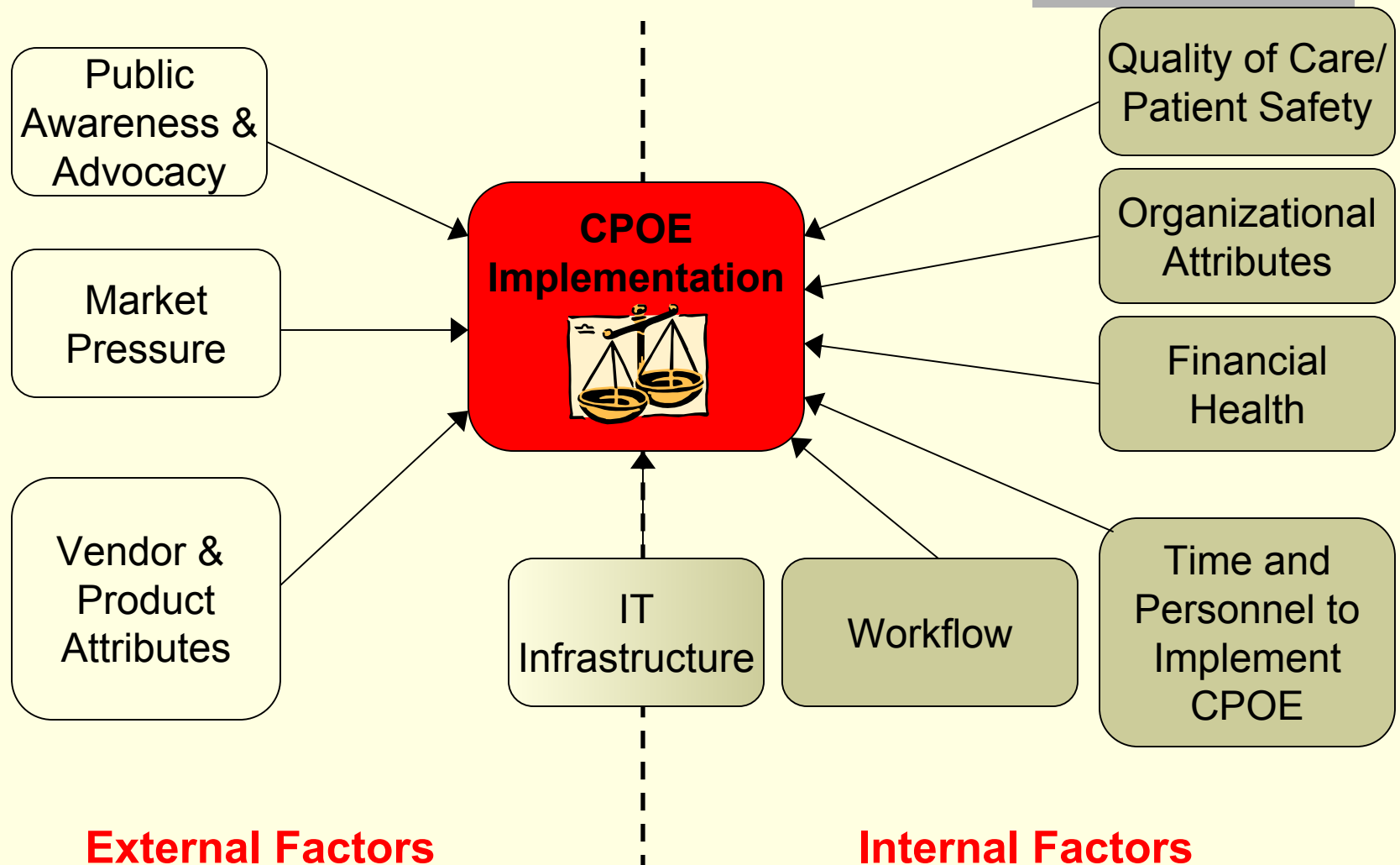
Methods-3

- Identified key policy informants nation-wide
- 30-minute taped, semi-structured interviews conducted over the phone by 2 MD interviewers with 16 informants
- Domains:
 - Goals of a CPOE policy
 - Methods to improve adoption
 - Financial
 - Mandates
 - Quality standards
 - Cultural
 - Other
 - Administrative and financial structure of a policy
 - Political feasibility



Result Highlights

Preliminary Model



Significant Barriers

<u>Top Barriers Cited</u>	<u>N</u>	<u>%</u>
Physician resistance	39	35%
High cost/ lack of capital	33	29%
Organizational culture	22	19%
Product/ vendor immaturity	19	17%

Physician Resistance

- CIO: 'I can't look anybody in the eye and say, "Dr, I'm gonna save you time putting your order in the computer." That's not possible. It's gonna take longer to put the order into the computer than it is to scribble on the chart.'
- "I actually saw a 20% loss of efficiency, and in some cases closer to 30% to 40%"
- "We had physicians who didn't know what a mouse was. They could be *brilliant* surgeons, but if you put them in front of a computer, they're like deer in headlights"
- "Q: If CPOE was mandated in your hospital despite physician's reluctance to use it, what would happen?
A: The CEO will get fired."

Cost

- “The number one [barrier] is cost. I have been doing hospital software for 29 years, and this is the most expensive project I’ve ever done”
- “Hospitals that are going out of business or are ¼ or ½ percent in the black are not going [to undertake] a five six seven eight million dollar project”
- “To implement [CPOE] at our institution was an enormous task, and the cost of it was staggering. And the data out there to make a financial argument for this was relatively weak.”

Uncertain ROI/Cost Benefit Analyses

- “We called a hospital that has CPOE and asked them how to do a cost-benefit study. The finance person at that hospital said, “ Well, if you’re calling because you want to cost justify CPOE, then you might as well hang up now and stop and go do something else”, CIO
- “It’s so full of speculation about how much money you may save from reducing errors, and the track record’s not good enough. It’s all crap to me.”, CFO
- “[CPOE] may save a lot of money [for] the health care system overall, but [the money] is not being collected by the hospital.”

Organizational Culture

- “We had to do a hard sell job on some of the [physicians] because these people were told that there was no money in the pot for their pet project, and then they see money being put into [CPOE].”
- “It’s a continuing battle, because we were forcing change about once a quarter. [The physicians] think that we’re putting up barriers to care.”
- “Were we willing to be pioneers? Did we think we could withstand failures? Were we confident in ourselves?”

Product/ Vendor Immaturity


- CIO: “If you look at the big companies, [Company A] has a product that now getting to be only 2 years [old]—and it still has a lot of work to do. [Company B] has a brand new product out there from [University X], but boy, that’s leading edge brand-new software that now needs to be rewritten [to fit into company B’s core product]. You wouldn’t put 8 or 10 million dollars in one of [Company C’s] old products for fear they’ll disappear, so you put [your money] into their new product, and the paint’s still wet on that. And that’s less solid than [Company B’s] *basic* product. [Company D], well, their forte is pretty much considered to be outpatient systems. Now, I’m starting to run out of names of real solid companies.”

Some are skeptical about direct government intervention...


- “My view is that if the government is in it, then I want *out*. If you shove this process down somebody’s throat, and you don’t do the right training, have the right committees and get everybody fired up positive, it can fall on its fanny.”
- “Overall, I think it's gonna be a marketplace decision. That is, the vendor that comes up with the best product at the best price is probably gonna become the preferred vendor. I'm not sure the government is gonna have much value in that area.”

Some don't like government mandates

- “All we need is another unfunded mandate from the government like HIPAA”
- “If [a hospital] has no money, but CPOE was mandated, then the hospital would choose the cheapest system that may not be cost-effective.”



Potential Methods of Addressing Barriers



Commitment to Patient Safety/ Quality

- CFO: “Patient safety drives all of our decisions. We’re proud of that attitude.”
- CMO: “[CPOE] was part of the strategy of how [our hospital] was going to be the leader in New Jersey.”
- “If you want to know what’s the turn around time in radiology for a certain class of patients, you can just query our [CPOE] system and it will tell you.”

Financial incentives

- “[We] documented \$1.2 million worth of nursing savings.”
- “Right now there’s really no throttle put on drugs. [For example], we pay for eight to ten cab rides a day for drugs delivered to our organization, ’cause they’re not part of the formulary.”
- “It would be great if there were some incentives such as higher reimbursement rates to physicians who use CPOE systems, or huge discounts in medical malpractice for physicians who use CPOE.”
- “If the government believes so strongly that we’re killing 98,000 people a year [and] they’re paying for maybe a third of [the medical costs] of these people, it would be very nice if the government were looking at waysto cover some of the cost that go into making CPOE happen.”

Leadership

- “Commitment of key leadership is as important as the quality of the technology.”
- “Our CEO said that this was going to be a clinician-driven process from the beginning.”
- “[You] had to be a believer [in CPOE], because you cannot give an inch on the vision side.”

Physician Champions

- “We believe a champion really has to be a physician, because physicians are different. I don’t think they would believe anyone that is not in their shoes.”
- “I guess I’ll [have to] give credit to [our] Chief Medical Officer. Jack was extremely pro this system and was out front at all times. When there was an issue, he really sat down and addressed it quickly.”

The Housestaff Advantage

- “[At our hospital], 90 to 95% of orders are written by residents, so the chief medical officer tells us that he doesn’t see acceptance being an issue for our hospital”
- “The house staff is not concerned at all about productivity.”
- “These kids that are coming out of medical school now are *much* more computer-literate—they’ve grown up with the technology.”

The Housestaff Advantage (continued)

- “A lot of the young residents that come in now don’t look at this as something they have to do, they almost look at it as an *entitlement*.”
- “The other lesson that I think that I learned was I wished that we had gotten the residents involved much earlier in the process. They were the core to the successful implementation of [CPOE].”
- “[The housestaff] offer a lot of critique. We have logged their issues and have worked really hard to address them, because they have really good ideas about what makes [the CPOE system] better.”

Improving Efficiency/ Value Added

- “There is a big overhead that we carry in order to remain safe with medications. If we can automate that process full cycle,.. then we have the potential of not only improving safety, but improving efficiency.”
- “All our systems are tied together. When a physician enters request for a radiology study on the floor, before he leaves rounds on that floor, radiology can be there for the patient.”

Commitment to Address Workflow Concerns

- “We have to be overstaffed at the point of service, so that if you have troubles, you get pretty immediate assistance...so you don’t go berserk.”
- “Anticipate the needs of the physicians.... Have IS people make rounds with the physicians.”

Role of IOM Reports and Leap Frog

- “What has been enormously helpful [in the decision to implement CPOE] has been the public recommendations that you need to go to CPOE to reduce errors... When Leapfrog came out, that pushed us over.”
- “The external forces of Leapfrog and [the] IOM report clearly weighed upon people, and I think that was sort of the push—the final push [towards implementing CPOE].”

Finding a Good Vendor/ Product

- “The screen we have are ours, and are totally customizable.”
- “Trust. They were honest with us. [Vendor A] showed us their warts and their strengths.”
- “We have been watching the marketplace for CPOE for the last several years, and we decided to take the plunge this year because we believed that the products were finally getting mature enough that it’s worth the risk.”

Finding a Good Vendor/ Product (continued)

- “[Vendor Y] is different. They’re willing to throw [in] whatever resources they have. They have made a real commitment.”
- “I would make sure before you go ahead with a product that your vendor is committed to clinical systems and to making sure that they work in your environment.”

Building Standards, Infrastructure and Common Knowledge Base

- “You just can’t buy anything that works out of the box from the vendors. Smaller hospitals will not be able to afford to customize the products to suit their needs.”
- “If there is a realistic, non-vendor-based assessment of the [CPOE] technology and where it will be in 2-3 years, then I as a leader could leverage my political capital with some reassurance that there’s gonna be some flesh on the bones.”
- “It would be helpful if hospitals interested in CPOE can share the contract or RFP, so that nobody has to re-invent the wheel when they deal with the vendors.”
- “Think of the VA model.”
- “I really think the vendors could help. They could design their product to comply with more standards.”

Technology—A Role for Government?

- “I think government needs to play a role in building the IT infrastructure [in healthcare], just like it did when Hill Burton was passed in the 50’s. Because if they don’t, we will continue to be inefficient and patient safety will suffer.”



Summarizing

Twin Peaks Theory

CPOE

Housestaff

MD Champion

Leadership

MD Resistance

Commitment to Patient Safety

Better ROI analyses

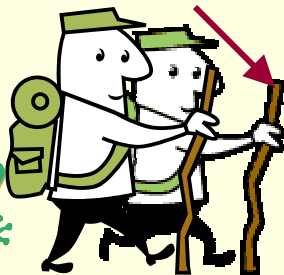
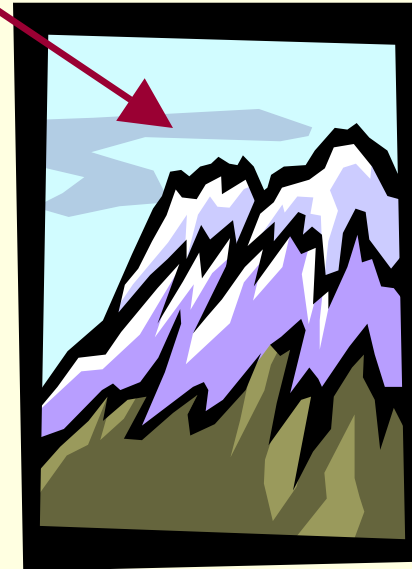
Costs

Leadership

Project Mgt

Vendor commitment to improve product; Value added for MD; Address workflow issues

Maturation of vendors; Lower costs; IT infrastructure



Leapfrog IOM