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Technology Evaluation

Return on Investment for a Computerized Physician Order Entry System

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Abstract Objective: Although computerized physician order entry (CPOE) may decrease errors and improve quality, hospital adoption has been slow. The high costs and limited data on financial benefits of CPOE systems are a major barrier to adoption. The authors assessed the costs and financial benefits of the CPOE system at Brigham and Women's Hospital over ten years.

Design: Cost and benefit estimates of a hospital CPOE system at Brigham and Women's Hospital (BWH), a 720-adult bed, tertiary care, academic hospital in Boston.

Measurements: Institutional experts provided data about the costs of the CPOE system. Benefits were determined from published studies of the BWH CPOE system, interviews with hospital experts, and relevant internal documents. Net overall savings to the institution and operating budget savings were determined. All data are presented as value figures represented in 2002 dollars.

Results: Between 1993 and 2002, the BWH spent \$11.8 million to develop, implement, and operate CPOE. Over ten years, the system saved BWH \$28.5 million for cumulative net savings of \$16.7 million and net operating budget savings of \$9.5 million given the institutional 80% prospective reimbursement rate. The CPOE system elements that resulted in the greatest cumulative savings were renal dosing guidance, nursing time utilization, specific drug guidance, and adverse drug event prevention. The CPOE system at BWH has resulted in substantial savings, including operating budget savings, to the institution over ten years.

Conclusion: Other hospitals may be able to save money and improve patient safety by investing in CPOE systems.

■ J Am Med Inform Assoc. 2006;13:261-266. DOI 10.1197/jamia.M1984



Metode

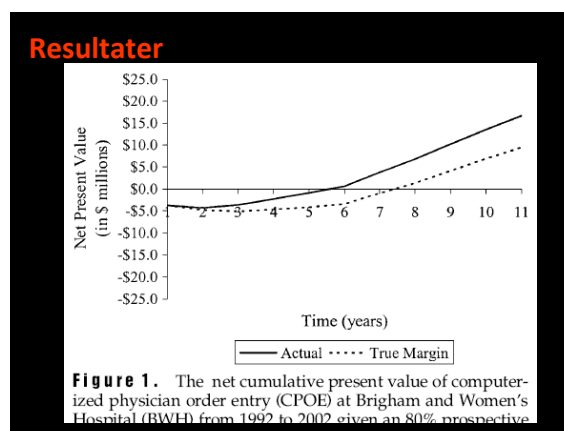
Udgifter:

- Hardware, software, netværk, ledelse og uddannelse.
- Diskonterede udgifter 7% p.a. fra begyndelsen af en periode

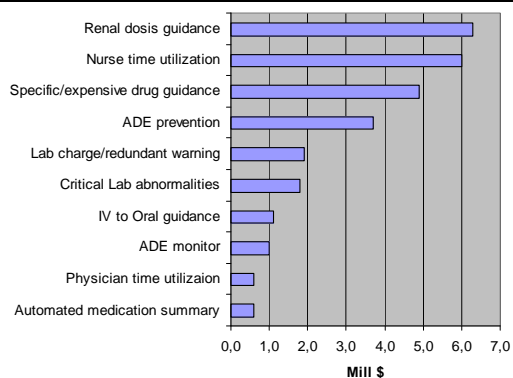
Benefits:

- Identificerede vigtige interventioner gennem:
 - litteraturstudier,
 - interne dokumenter
 - interview med nøglepersoner
- Diskonterede benefits 7% p.a. fra slutningen af en periode

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Resultater



Diskussion

- Det tog over fem år før netto benefits viste sig
- Hovedparten af besparelserne stammer fra få interventioner
- Vejledningen i dyre behandlinger kun for få præparater
- Inkluderer kun de elementer der har et godt estimat af besparelser
- Forudsætter at alle læger anvender systemet
- Godt designede beslutningsstøtteelementer
- Effektiv interface til apotek, laboratorie og medicin administration

Begrænsninger i studiet:

- Kliniker tid medgået i udviklingen ikke medtaget som cost
- Inkluderer ikke forhindrede sagsanlæg som følge af fejlbehandlinger
- Systemet er udviklet i organisationen og ikke en hyldevare

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ORIGINAL ARTICLE

Postoperative Robotic Telerounding

A Multicenter Randomized Assessment of Patient Outcomes and Satisfaction

Lars M. Ellison, MD, Mike Nguyen, MD, Michael D. Fabrizio, MD,
Ann Suk, MD, Sompol Permpongkosol, MD, Louis R. Kavoussi, MD

Hypothesis: Patient safety and satisfaction are adversely affected when robotic videoconferencing (telerounding) is used in the postoperative setting.

Design: Randomized controlled trial.

Settings: Three academic institutions.

Patients: A total of 270 adults undergoing a urologic procedure requiring a hospital stay of 24 to 72 hours were randomized to receive either traditional bedside rounds or robotic telerounds.

Main Outcome Measures: The primary outcome measure was postoperative patient morbidity. Secondary outcomes were patient-reported satisfaction and hospital length of stay. Other variables assessed included demographics, procedure, operative time, estimated blood loss, and mortality. Patients also com-

pleted a validated satisfaction instrument 2 weeks after hospital discharge.

Results: Patients were equally distributed based on the baseline demographic and operative measures. Morbidity rates were similar between the study arms (standard rounds vs telerounds: 16% vs 13%; $P = .64$). Length of stay was similar in both arms (standard rounds vs telerounds: 2.8 vs 2.8 days; $P = .94$). In addition, patient satisfaction was equivalently high in both arms of the study.

Conclusions: Robotic telerounds matched the performance of standard bedside rounds after urologic surgical procedures. Virtual visits did not result in missed or increased postoperative complications. Hospital length of stay and ratings of hospital satisfaction were on par with those for traditional rounding.

Arch Surg. 2007;142(12):1177-1181

Telemedicine

- **Reference**
 - Ellison LM et al. Arch Surg. 2007 Dec;142(12):1177-81 [Penobscot Bay Medical Center, Rockport, ME]
- **Title**
 - Postoperative robotic telerounding: a multicenter randomized assessment of patient outcomes and satisfaction.
- **Mål**
 - At vurdere patient sikkerhed og tilfredshed ved anvendelse af robot tele-stuegang i forbindelse med postoperativ stuegang.
- **Metoder**
 - 270 voksne patienter der gennemgår urologisk kirurgi med hospitalisering på 24 til 72 timer blev tilfældigt udvalgt til at deltage i enten traditionel stuegang eller robot telestuegang.



Telemedicine

- **Reference**
 - Ellison LM et al. Arch Surg. 2007 Dec;142(12):1177-81 [Penobscot Bay Medical Center, Rockport, ME]
- **Metoder, fortsat**
 - Primær resultat mål var postoperativ morbiditet.
 - Sekundær resultat mål var patient rapporteret tilfredshed og indlæggelsestid
 - Andre variabler der indgik var demografi, procedure, operationstid, estimeret blodtab, og mortalitet.
 - Patienterne udfyldte også en valideret tilfredsheds måling 2 uger efter udskrivelse.
- **Resultater**
 - Morbiditet og indlæggelseslængde var ens for begge grupper (standard stuegang vs tele-stuegang: 16% vs 13%; $P = .64$, 2.8 dage indlagt begge grupper, $P = .94$).
 - Patient tilfredshed var lige høj for begge grupper.

Telemedicine

- **Reference**
 - Ellison LM et al. Arch Surg. 2007 Dec;142(12):1177-81 [Penobscot Bay Medical Center, Rockport, ME]
- **Konklusion**
 - Robot-stuegang fungerer lige så godt som traditionel stuegang efter urologisk kirurgi.
- **Betydning**
 - Provokerende telemedicin rapport for interne brug
 - Kvalifikationer for telemedicinere forskellig fra andre læger – nogle er mere naturlige 'TV-doktorer'.
 - Skulle måske lave et studie, hvor man brugte sygeplejersken uden robot ?

Vigtige områder for effektmåling

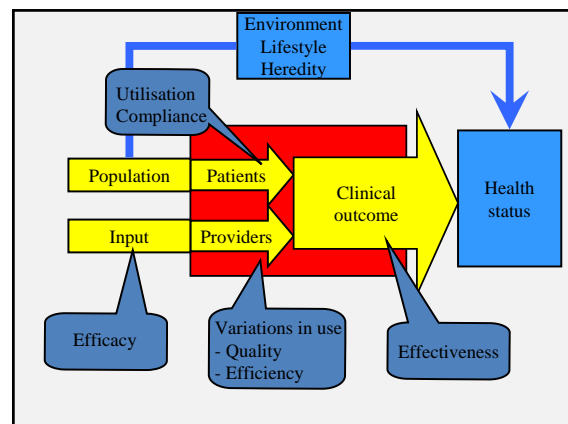
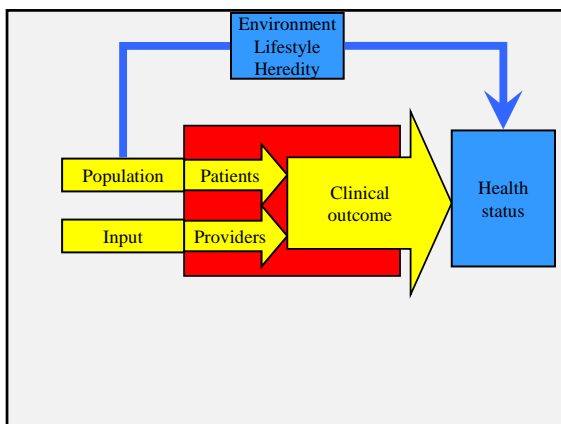
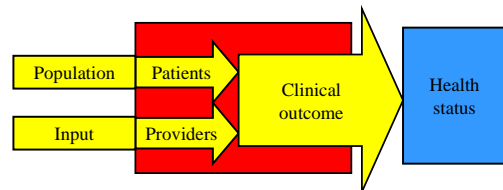
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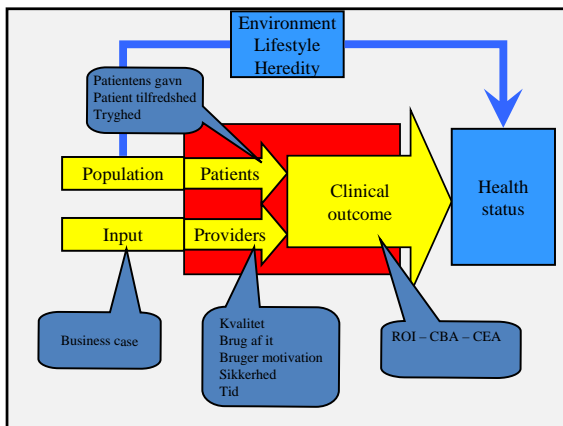
- E-konsultationer
- Sammenhængende patientforløb
- Tværsætorielle aktiviteter
- Effekt af god implementering
- Organisatoriske processer
- Opfyldelse af nationale strategier
- Konsekvenser af at effektmåle
- Nytteværdi af standardisering og datakvalitet
- Finde ud af hvad vi ikke ved.....

Vigtige områder for effektmåling

2. Metrik:

- Kvalitet
- Brug af it
- Patientens gavn
- Bruger motivation
- Fastholdelse af medarbejdere
- Patient tilfredshed
- Medarbejder tilfredshed
- Tryghed
- Sikkerhed
- Tid
- ROI – CBA - CEA





Mangfoldighed og diversitet

Mangfoldighed af effekter:

something that inevitably follows an antecedent (as a cause or agent)

Diversitet i mål.

Culture eat strategies for breakfast and structure for lunch