Informatika v medicíne

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LRC FNsP Košice
MaESC Washington DC

Zdroje

- **Study Tour**
- San Francisco - Palo Alto Silicon Valley California
- Portland - OHSU Oregon
- AMIA Los Angeles California
- Cleveland Ohio

Zdroje

- Oxford , Cambridge 1993,1994 GB
- Providence 1996,1997 Rhode Island
- Boston 1996 Massachusetts
- Atlanta 1997 Georgia
- Washington DC AMIA, MaESC 1999,2000

Prečo?

- To Err is Human
- **48 000 úmrtí v USA ???**
- vyššie ako niektoré nádorové ochorenia
- Ako to je u nás ?
- Počet týchto prípadov klesá alebo stúpa?
- Aká je pravdepodobnosť že budeme alebo sme my súčasťou tohto procesu...ako lekári alebo hoci aj ako pacienti?

esa http://books.nap.edu/books/0309068371/html/26.html#pagetop



2
Errors in Health Care: A Leading Cause of Death and Injury

Health care is not as safe as it should be. A substantial body of evidence points to medical errors as a leading cause of death and injury.

- Sizable numbers of Americans are harmed as a result of medical errors. Two studies of large samples of hospital admissions, one in New York using 1984 data and another in Colorado and Utah using 1992 data, found that the proportion of hospital admissions experiencing an adverse event, defined as injuries caused by medical management, were 3.7 and 2.9 percent,[1] respectively. The proportion of adverse events attributable to errors (i.e., preventable adverse events) was 58 percent in New York, and 53 percent in Colorado and Utah.[2]
- Preventable adverse events are a leading cause of death in the United States. When extrapolated to the over 33.6 million admissions to U.S. hospitals in 1997, the results of these two studies imply that at least 44,000 and perhaps as many as 98,000 Americans die in hospitals each year as a result of medical errors.[3] Even when using the lower estimate, deaths in hospitals due to preventable adverse events exceed the number attributable to the 8th-leading cause of death.[4] Deaths due to preventable adverse events exceed the deaths attributable to motor vehicle accidents (43,458), breast cancer (42,297) or AIDS (16,516).[5]

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Príklad z praxe

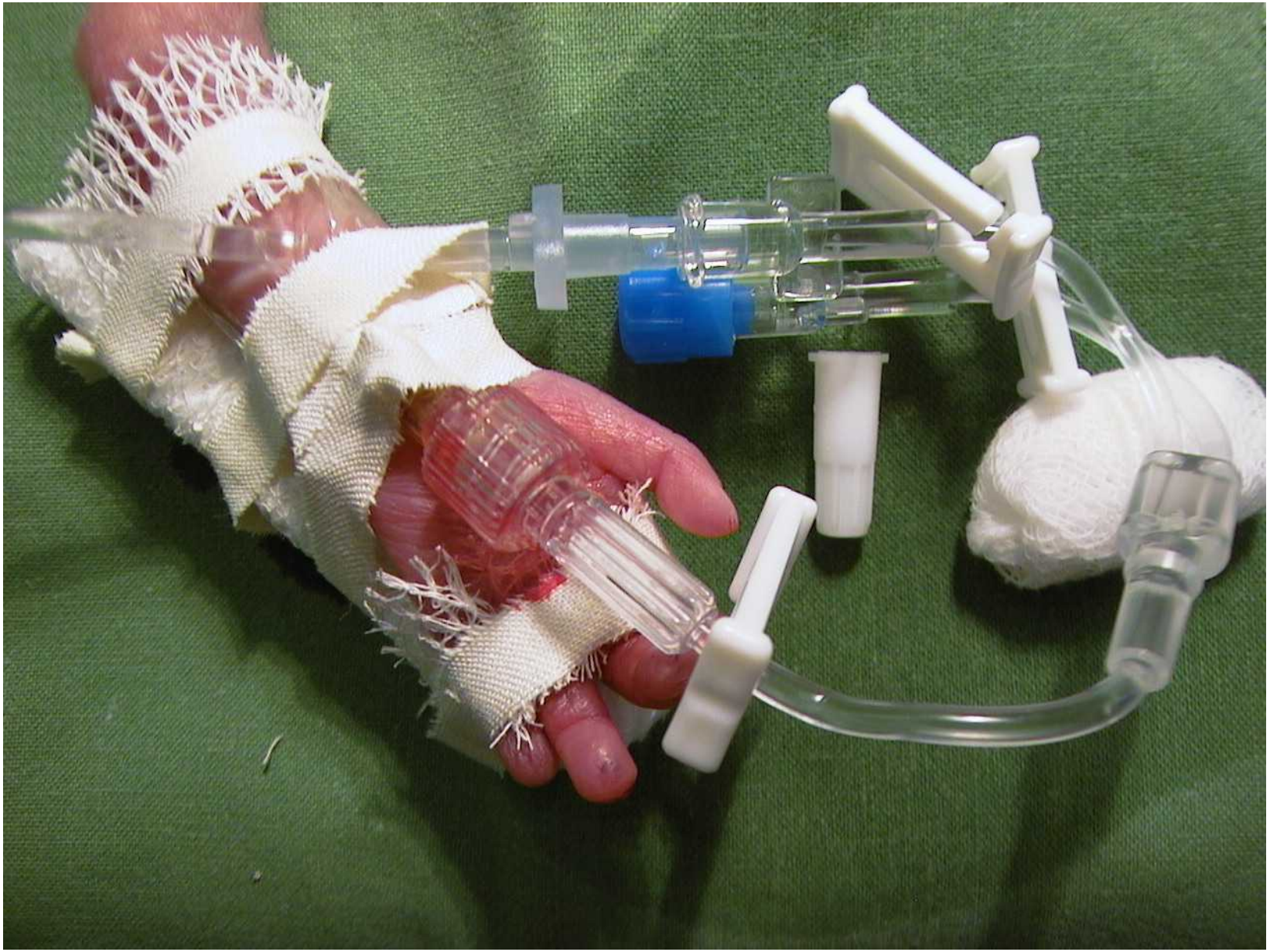
- Napr. závažné onkologické ochorenie
- na Slovensku tri radikálne rozdielne názory na riešenie
- odstrániť celý orgán pričom vznikne trvalá strata životnej funkcie
- daľšia komplikovaná intervencia spojená s tranplantáciou
- nerobiť vôbec nič

Riešenia

- odstrániť celý orgán pričom vznikne trvalá strata životnej funkcie “nemá význam ?”
- daľšia komplikovaná intervencia spojená s tranplantáciou “ťažšie sa realizuje na Slovensku, ale sú experti, naozaj postupujú správne?”
- nerobiť vôbec nič - sme na konci 20 storočia !
- úroveň (dôvera) zdravotníctva sa na Slovensku zlepšuje, stagnuje, zhoršuje ?
- Čo hovoria pracoviská, ktoré majú desať násobne toľko prípadov – odpoveď je vo www.



26 GT, 710 g, IRDS III, prvé hodiny



Nozokomiálna infekcia 730g – Pseudomonas aeruginosa – nutná exsanguinácia ,TRC 21, realizované cez arteriu ulnaris, rýchla úprava stavu bez nutnosti dlhodobej ATB terapie.



Extubovaný 16 hodín po exsanguinácii



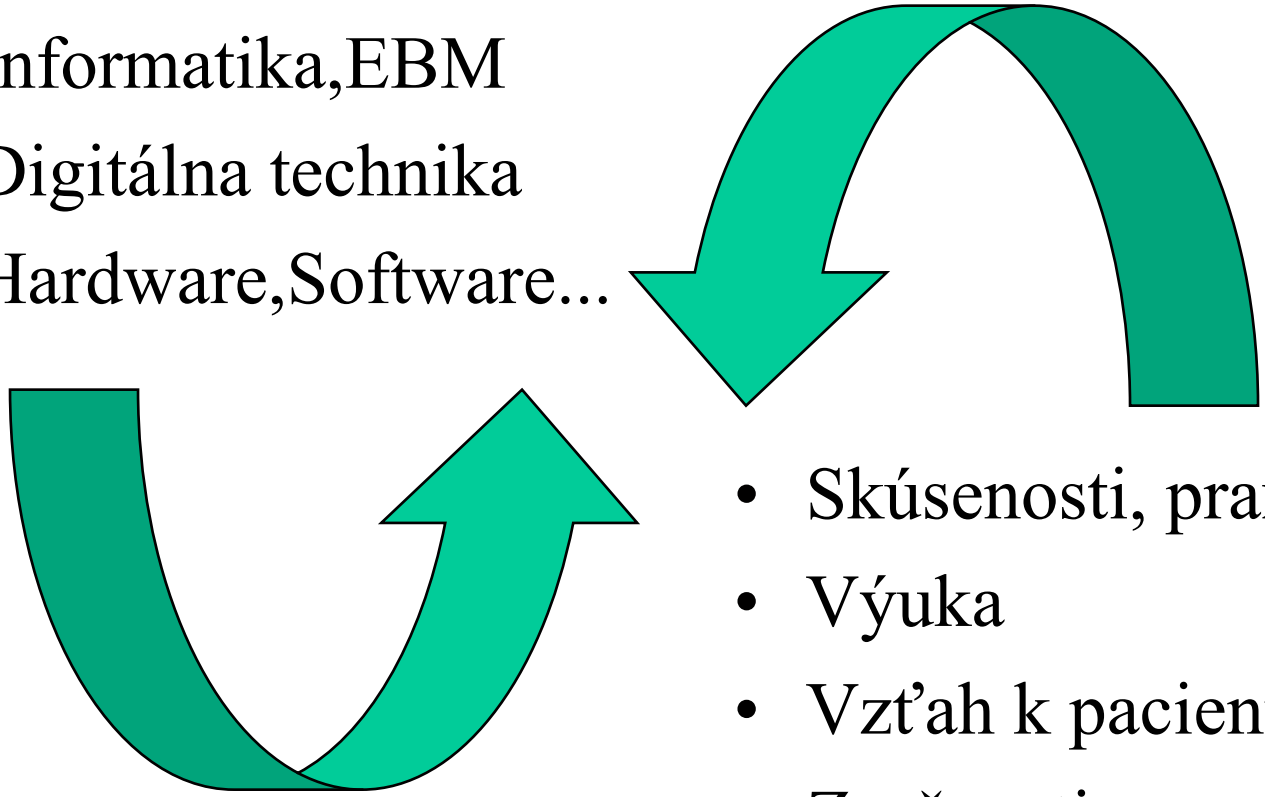
Bez liečby – čakáme na prepustenie 1910g



2360g - pomaly ideme domov

Dopĺňajú sa...

- Informatika,EBM
- Digitálna technika
- Hardware,Software...



- Skúsenosti, prax
- Výuka
- Vzťah k pacientovi...
- Zručnosti

Rýchlejší vývoj

VČERA

- Niektoré praktické zručnosti neboli , niektoré zákroky sa vôbec nerobili
- Len časopisy, knihy, pomalý prístup k inform.
- Prístroje neboli

DNES

- Dostatok praktických zručností, regionálne centrá
- Prístup k „up to date“ informaciám
- Aspoň minimálne prístrojové vybavenie

Oblasti výskumu lekárskej informatiky

- Biomedicínske vedomosti, údaje – zlučujúci systém
  - Vývoj modelov
  - Získavanie informácií
  - Stanovenie diagnóz
  - Plánovanie liečby
  - Ľudské rozhranie
  - Výuka
  - Vytváranie zobrazení

Súčasti informatiky

- Databázy
- Podporné rozhodovacie systémy
- Liekové interakcie
- EMR – elektr.karta
- Imaging
- Komunikácia
- Riadenie, ekonomika
- www – databázy
- www – publikácie
- www – EBM
- www – chats
- www – verejnosť
- www – poradne
- www – telemedicína
- www – www...

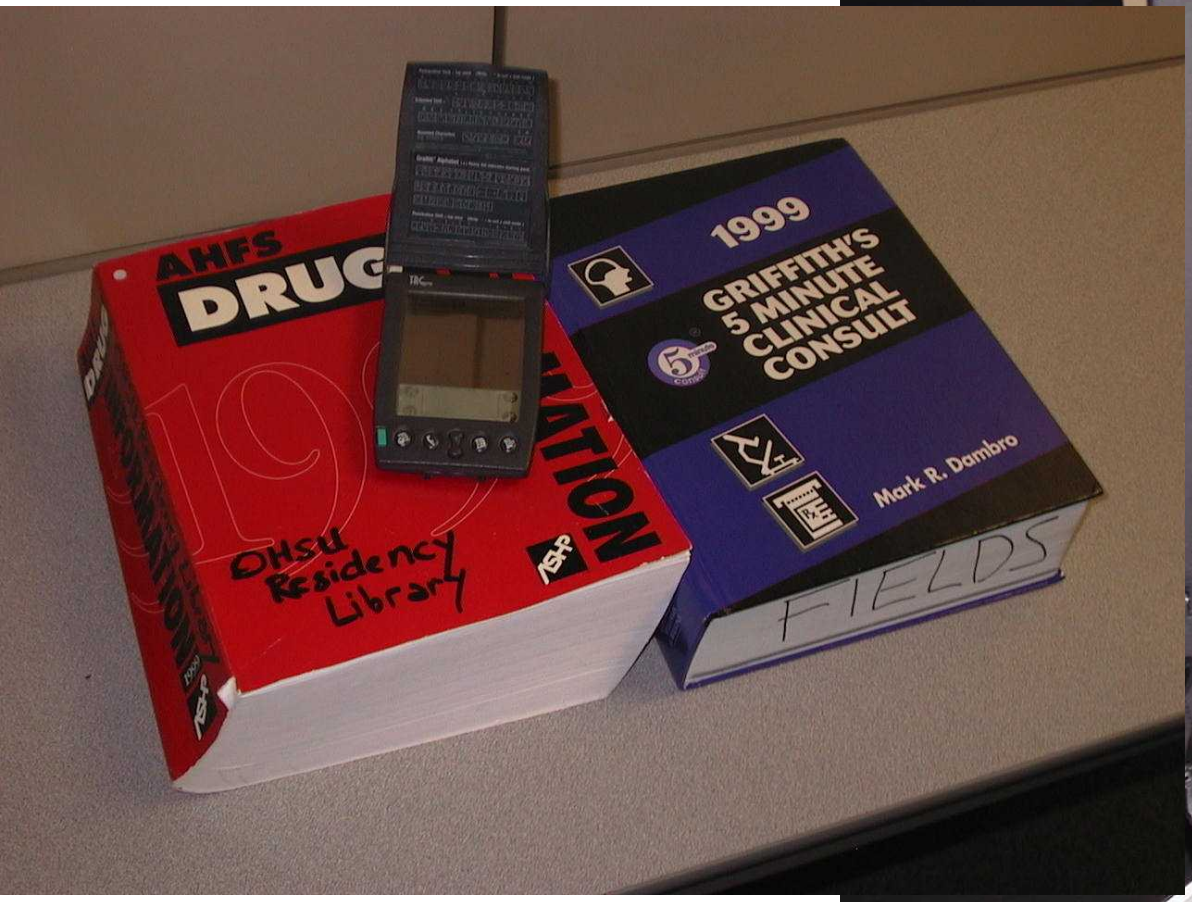
Databázy

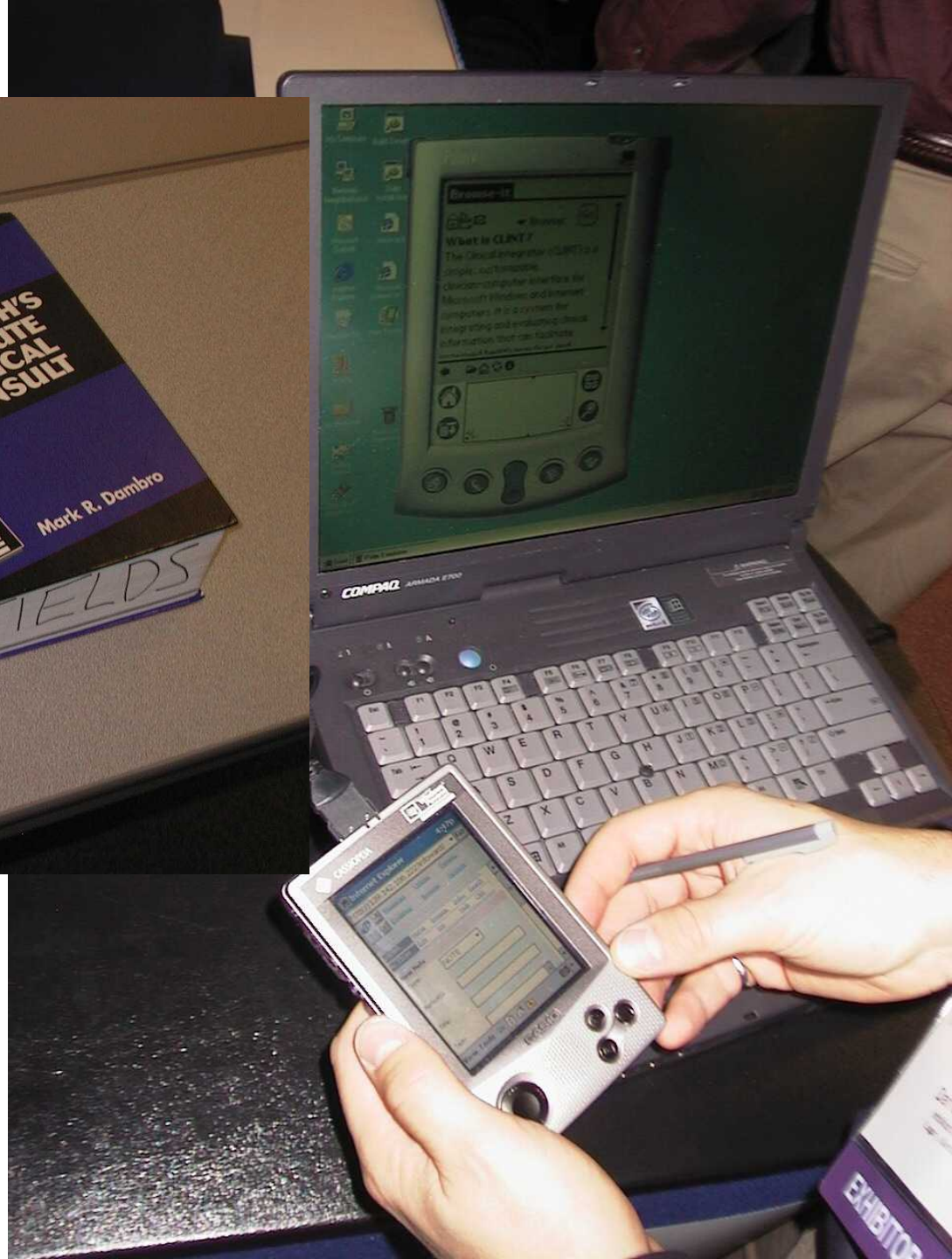
- Neustály vývoj hardwaru mení prostredie
- Software – Oracle, Java – Silicon Valey
- Prechod na EMR vytvára „paper paradox“
- Hardware tvorí len 1/3 z finančných nákladov
- Zmena systému – ostrím rezom
- Palmtop – zadávanie – infra-prenos
- Konečne by bolo potrebné monitorovať procesy, výsledky...chceme to?



DSS – rozhodovacie systémy

- Nie je možné obsiahnuť v danej chvíli najoptimálnejšie a najpodstatnejšie...
- Protokoly, guidelines...sú prvým krokom, ale...
- „Up to date“
- Nezávislé systémy – mobilná komunikácia
- Sú naozaj nerealizovateľné v našich podmienkach?
- Väzba na EBM, www, databázy





Liekové interakcie

- Výpočty E mail
- Databáza ... Free software

Financie

- Si limitujúce, ale vysoký objem ešte negarantuje výsledky...
- Pred vytvorením nemocničnej siete je potrebné budovať funkčné počítačové centrá
- Je potrebné nájsť spôsob komunikácie a cestu ako realizovať obnovu a zlepšovanie procesov-diagnostických, liečebných, rozhodovacích ...(budeme pohltení – neoplatí sa brániť)

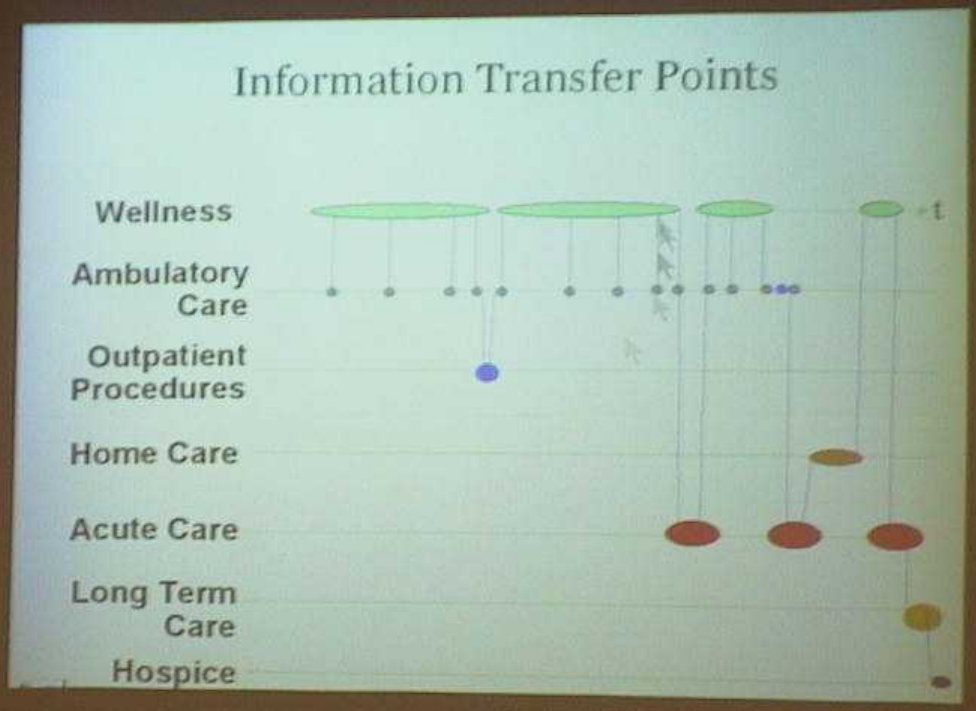
Goal for the Electronic Medical Record

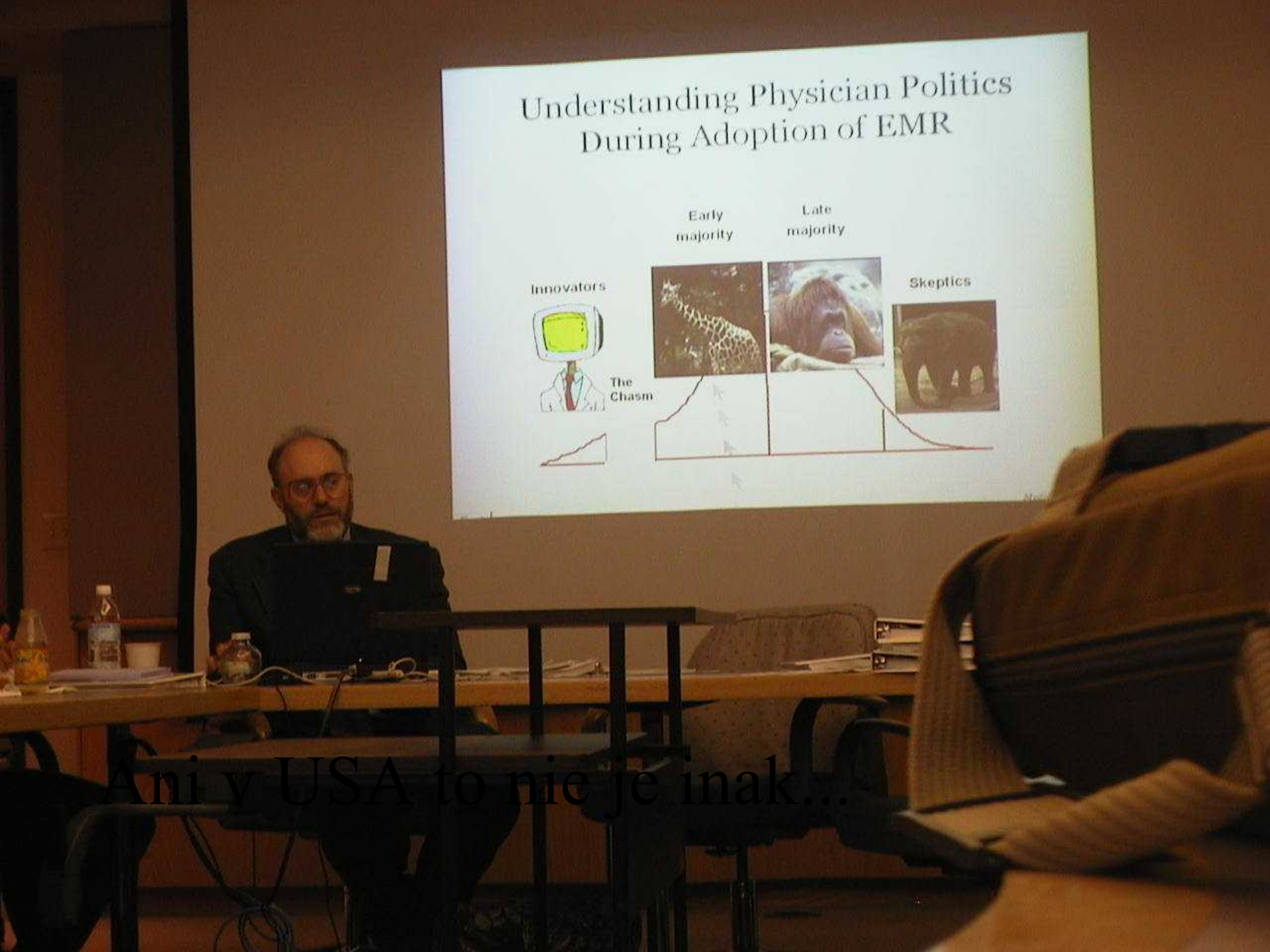
The Right Information
in the Right Place
for the Right Patient
at the Right Time

by the Right Doctor

EMR

- Jednoduchá, interaktívna, www - limitovaný prístup
- Podstata prepojenia cez všetky zložky novorodenec - dôchodca
- DSS tak aby sa znižoval počet chýb
- Liekové interakcie a iné interakcie???
- EBM


Information Transfer Points
Wellness
Ambulatory Care
Outpatient Procedures
Home Care
Acute Care
Long Term Care
Hospice
t



Ani v USA to nie je inak...

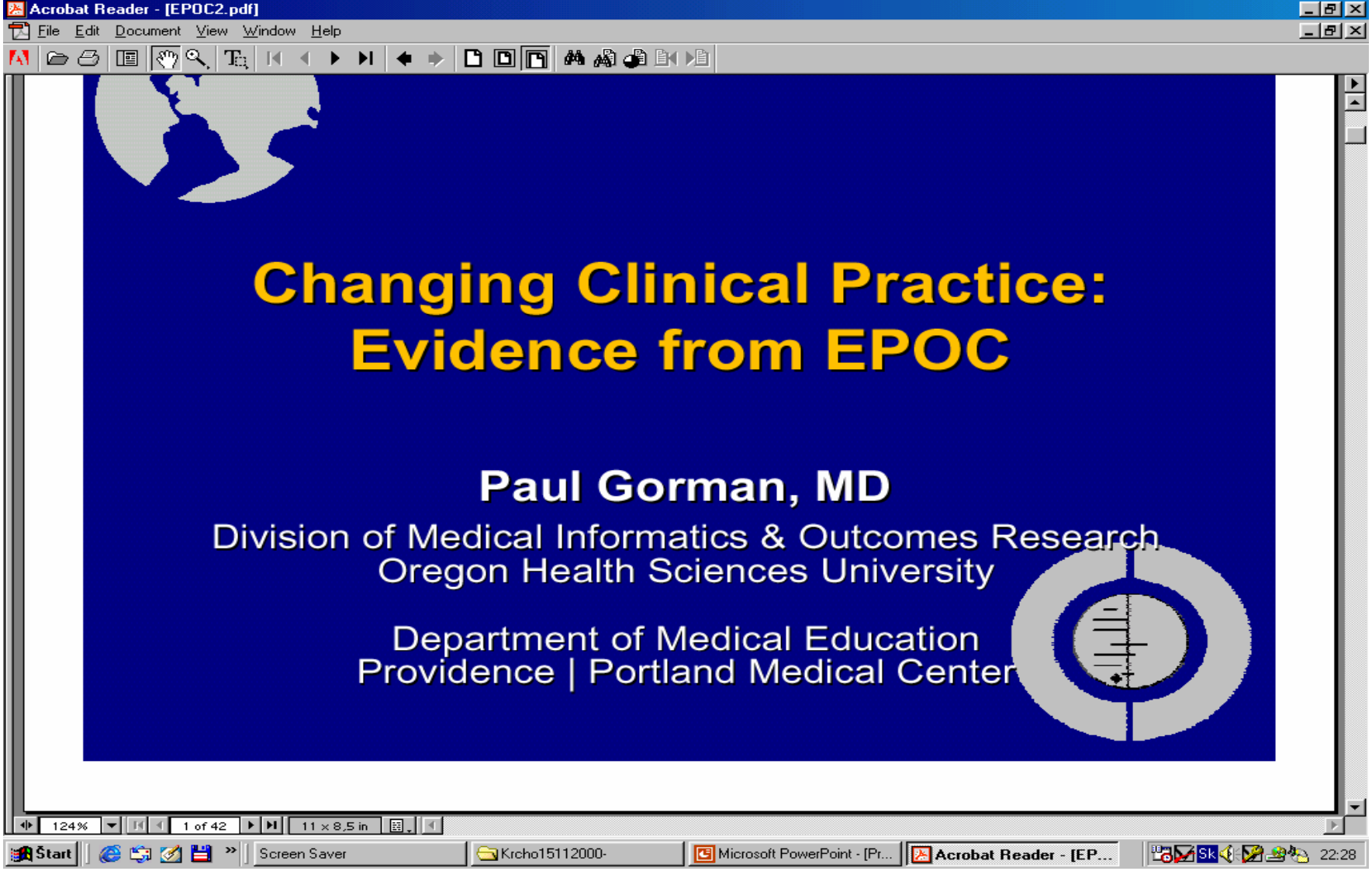
Dojem?



EBM

Realita





Celá prezentácia na webovej stránke Open Medical Club

http://www.aiha.com/english/partners/kosice/openclub.htm

Acrobat Reader - [EPOC2.pdf]
File Edit Document View Window Help

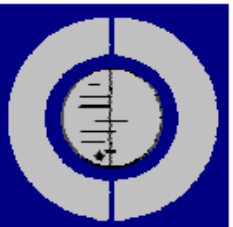
Rationale

- **A gap exists between evidence & practice**
- **We should care about it**
  - patient outcomes
  - system outcomes
  - professional outcomes
- **What can we do about it?**

124% 5 of 42 11 x 8,5 in
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Acrobat Reader - [EPOC2.pdf]
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Cochrane Collaboration



- Cochrane '72 - keep track of evidence
- Systematic reviews, meta analysis
- Oxford database of perinatal trials
- First Cochrane Colloquium 1993

"preparing, maintaining, and disseminating systematic reviews of the effects of health care"

105% 6 of 42 11 x 8,5 in
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Acrobat Reader - [EPOC2.pdf]
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The Gap: Clinical Practices Need Improvement

- **Diabetic Retinopathy** (Stross & Harlan, 1979)
- **Primary Care "Markers"** (Williamson, 1989)
- **Beta blockers after MI** (CAST, others)
- **DVT prophylaxis** (Anderson)
- **Thrombolysis for MI** (Euro 2d Prev Stdy)
- **ACE Inhibitors in CHF, DM**
- **Drug Errors** (Bates, Leape, IOM Report 1999)

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Steroids in Preterm Labor: Traditional vs Systematic Review

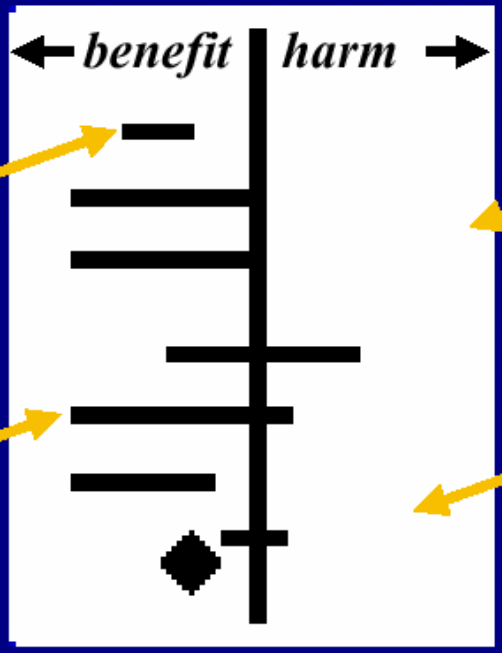
- Traditional review: the voting method
- 2 trials show benefit
- 5 trials: no benefit
- Conclusion:
  - No definite benefit
  - Need more research
  - Answer 10 Y later

- Systematic review and meta analysis
- 2 trials $p < 0.05$
- All trials c/w benefit
- Conclusion:
  - Definite benefit
  - Just do it
  - Answer 10 Y sooner

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Odds Ratio Plots Compare Results of Trials



All trials c/w benefit (none c/w harm)

95% CI excludes 1.0 ($p < 0.05$)

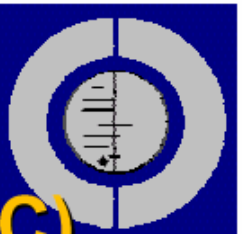
Summary Estimate Confirms Benefit

95% CI includes 1.0 ($p > 0.05$)

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Effective Practice and Organisation of Care (EPOC)



"Systematic reviews of rigorous evaluations of dissemination and implementation strategies provide the best evidence for policy decisions about activities to promote provider behavior change."

Bero, et al, Cochrane Library

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EPOC Systematic Reviews

- **Review trials of interventions to change clinical practices**
  - Controlled studies (RCT, CCT, CBA, TSA)
  - Objective outcomes: patient or practices
  - Variable quality & design prevent quantitative meta analysis
- **Summarize findings**
  - Interventions that work, those that don't

124% 11 of 42 11 x 8,5 in
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Acrobat Reader - [EPOC2.pdf]
File Edit Document View Window Help

Printed Materials: Drinking From a Firehose



- 22 practices UK GPs
- 855 guidelines, 28kg
  - 438 1- 2 pages
  - 257 3-10 pages
  - 160 > 10 pages
- Age
  - 38 % undated
  - 8 1990
  - 73 1995
  - 138 1996

124% 13 of 42 11 x 8,5 in
Google Search: Open Medical Club - Microsoft Internet Explorer
Start Microsoft PowerPoint - [Pr... Google Search: Open Med... Acrobat Reader - [EP... 9:46

obrazovka

Adresa http://www.google.com/search?q=nosocomial+infections+in+newborn+&btnG=Google+Search

Google™ Advanced Search Preferences Search Tips

nosocomial infections in newborn | Google Search | I'm Feeling Lucky

Tip: In most browsers you can just hit the return key instead of clicking on the search button.

"in" is a very common word and was not included in your search. [details]

Searched the web for **nosocomial infections in newborn** . Results **1** - **10** of about **1,100**. Sear

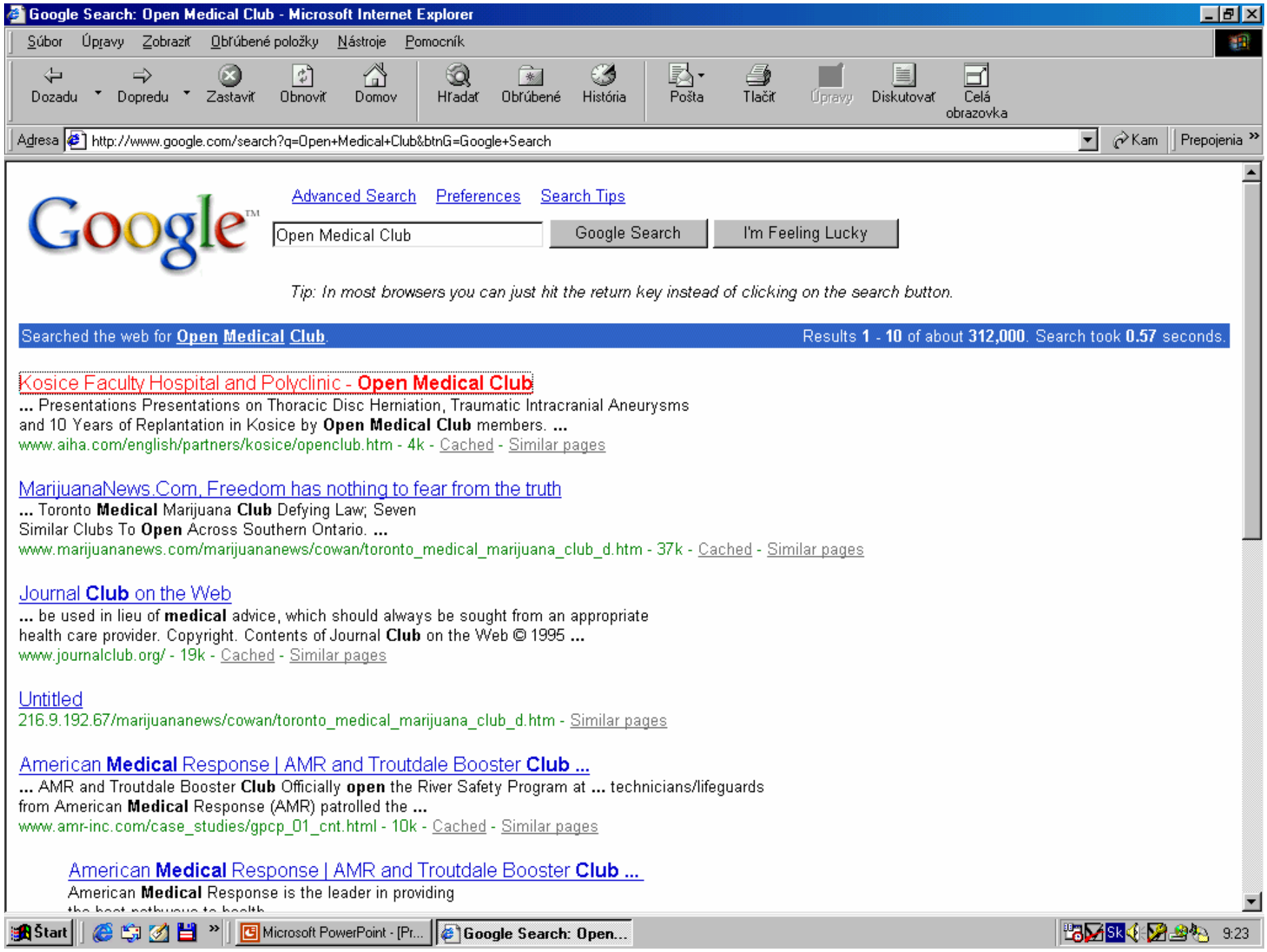
Nosocomial Infection Surveillance, 1984
... negative staphylococci were the second most frequent cause of **nosocomial infections** on the **newborn** and pediatrics services and were an important cause of **...**
www.cdc.gov/epo/mmwr/preview/mmwrhtml/00001772.htm - 28k - Cached - Similar pages

Lippincott Williams & Wilkins
... Mumps, Rubella, and Human parvovirus B19 44. **Nosocomial Infections** in **Newborn** Nurseries and Neonatal Intensive Care Units 45. **Infections** Acquired in Child Care **...**
lww.com/onlinestore/tableofcontents/1,2261,499364586,00.html - 17k - Cached - Similar pages

NICU – **Nosocomial infections** Providence-Kosice
... Information flow. Challenges. 1995-99 Admissions , Mortality. **Nosocomial infections**. Results - 1995-99 Used ATB. ATB per **newborn** in average. How did we achieve these **...**
www.aiha.com/english/partners/kosice/nicures/ - 3k - Cached - Similar pages

Nosocomial Infections - New Treatments, October 15, 2000
... of transmission in **nosocomial infections**, has two modes **...** recommended after inadvertent **nosocomial** exposure to a **...** pregnant women. 3. **Newborn** infants whose mothers **...**
www.ccspublishing.com/journals2/nosocomial_infections.htm - 12k - Cached - Similar pages

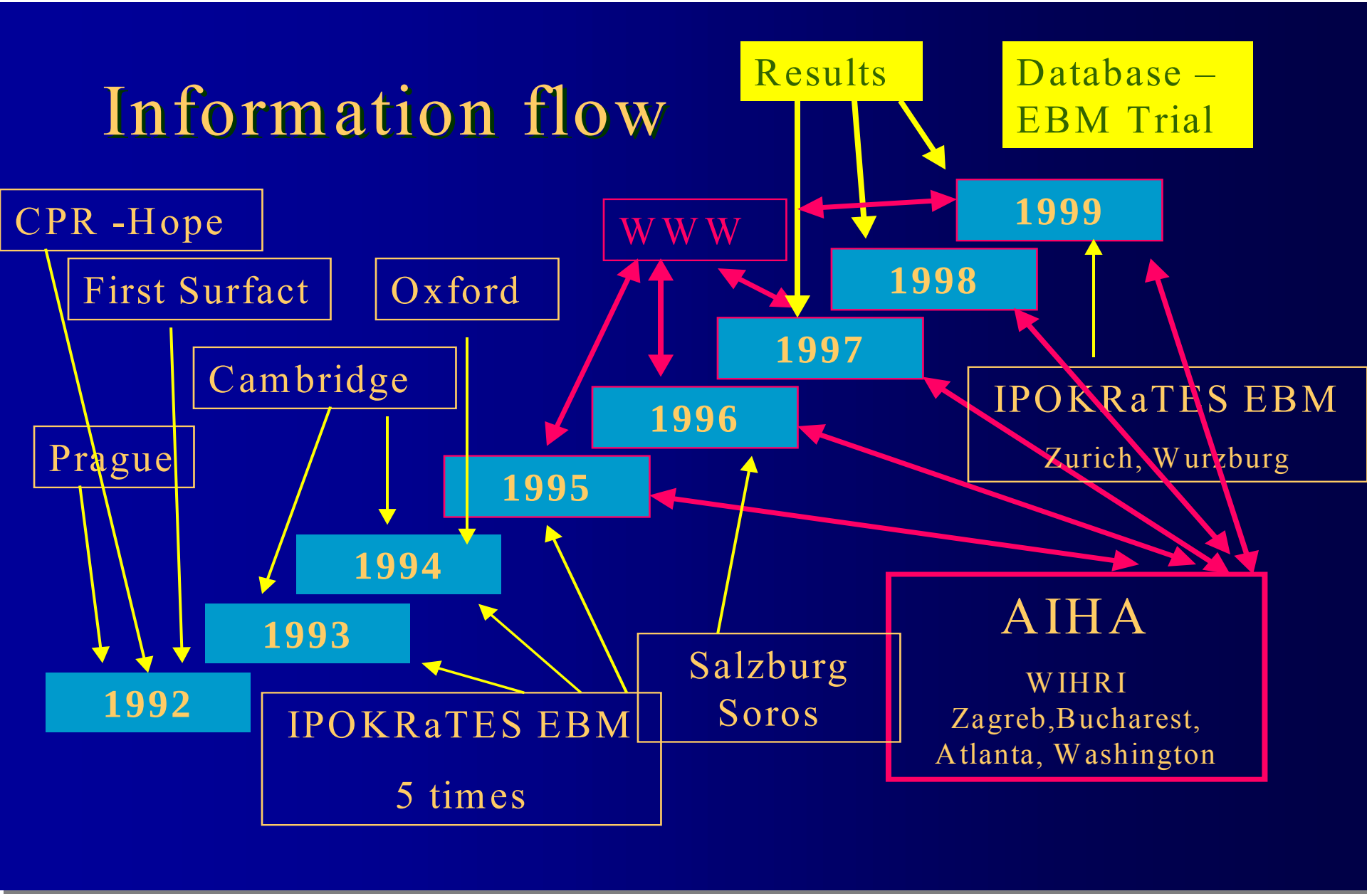
http://www.aiha.com/english/partners/kosice/openclub.htm


Google Search: Open Medical Club - Microsoft Internet Explorer
Súbor Úpravy Zobraziť Obľúbené položky Nástroje Pomocník
Dozadu Dopredu Zastaviť Obnoviť Domov Hľadať Obľúbené História Pošta Tlačiť Úpravy Diskutovať Celá obrazovka
Adresa http://www.google.com/search?q=Open+Medical+Club&btnG=Google+Search
Kam Prepojenia
Google
Advanced Search Preferences Search Tips
Open Medical Club
Google Search
I'm Feeling Lucky
Tip: In most browsers you can just hit the return key instead of clicking on the search button.
Searched the web for Open Medical Club. Results 1 - 10 of about 312,000. Search took 0.57 seconds.
Kosice Faculty Hospital and Polyclinic - Open Medical Club
... Presentations Presentations on Thoracic Disc Herniation, Traumatic Intracranial Aneurysms and 10 Years of Replantation in Kosice by Open Medical Club members. ...
www.aiha.com/english/partners/kosice/openclub.htm - 4k - Cached - Similar pages
MarijuanaNews.Com, Freedom has nothing to fear from the truth
... Toronto Medical Marijuana Club Defying Law; Seven Similar Clubs To Open Across Southern Ontario. ...
www.marijuananews.com/marijuananews/cowan/toronto_medical_marijuana_club_d.htm - 37k - Cached - Similar pages
Journal Club on the Web
... be used in lieu of medical advice, which should always be sought from an appropriate health care provider. Copyright. Contents of Journal Club on the Web © 1995 ...
www.journalclub.org/ - 19k - Cached - Similar pages
Untitled
216.9.192.67/marijuananews/cowan/toronto_medical_marijuana_club_d.htm - Similar pages
American Medical Response | AMR and Troutdale Booster Club ...
... AMR and Troutdale Booster Club Officially open the River Safety Program at ... technicians/lifeguards from American Medical Response (AMR) patrolled the ...
www.amr-inc.com/case_studies/gpcp_01_cnt.html - 10k - Cached - Similar pages
American Medical Response | AMR and Troutdale Booster Club ...
American Medical Response is the leader in providing
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Google Search: Open...
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Imaging



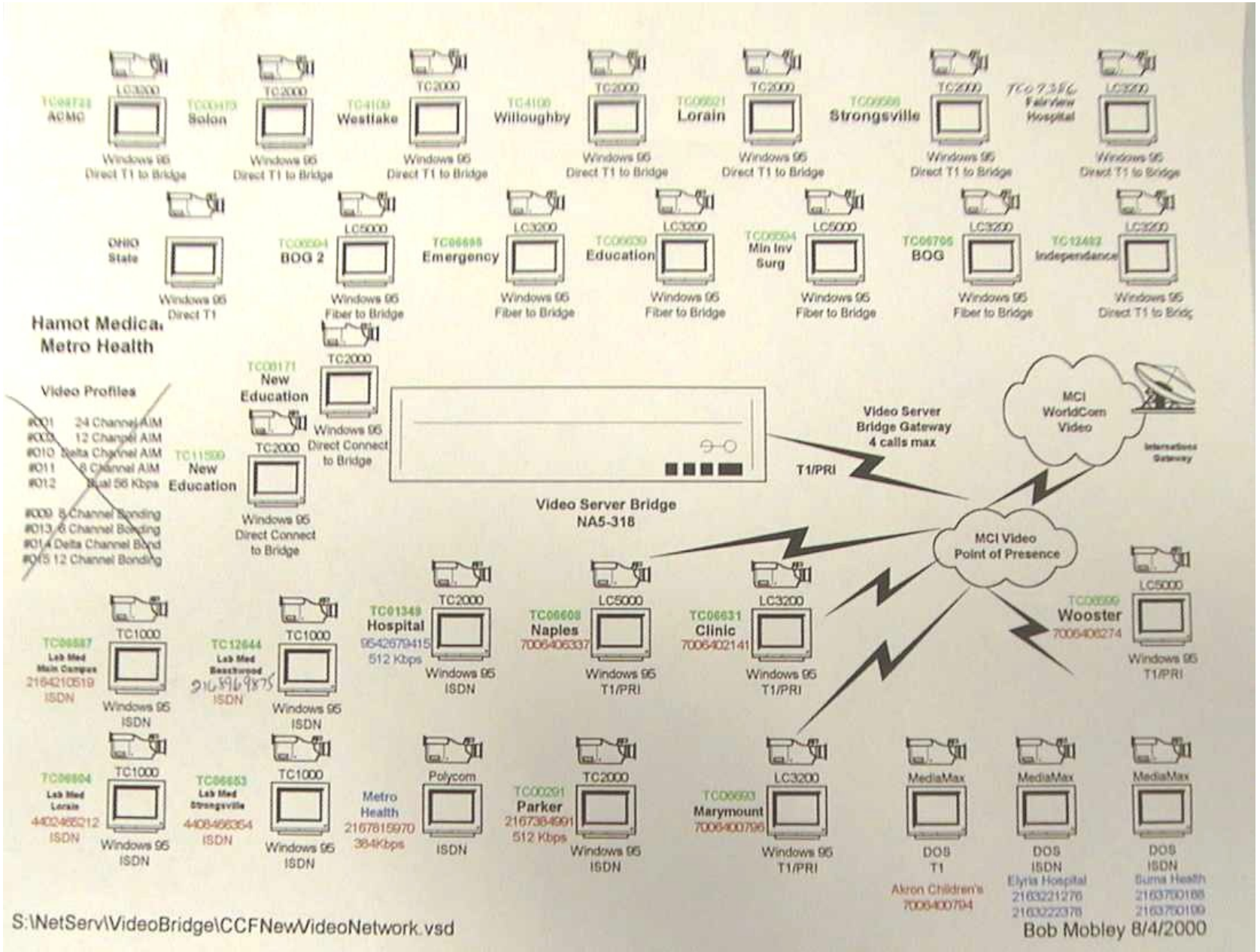
Komunikácia



Riadenie, ekonomika

- Limitujúci faktor, nedostatok niekedy produkuje ešte vyššie náklady?
- Našou snahou musí byť realizácia tých postupov, ktoré vyžadujú minimálne náklady
- Granty...
- Zahraničné kontakty...

Telemedicína




THE CLEVELAND CLINIC



Záver

- Informatika urýchľuje, zjednodušuje prístup

k informáciám, pacient sa nás opýta...

- Ten kto ostane bokom zaostane...
- Pohltí nás či to budeme akceptovať alebo nie
- Umožní nám dobehnúť stratené roky...
- Umožní nám nerobiť tie isté chyby...
- Informatika je pre lekára a sestru nutnou gramotnosťou...