# Update in Medical Informatics

(the randomness continues)

PCC Ojai, California
June 2017

Colin Banas, CMIO, Virginia Commonwealth University
Bill Galanter, Senior Associate CHIO, University of Illinois Hospital and Health Sciences System

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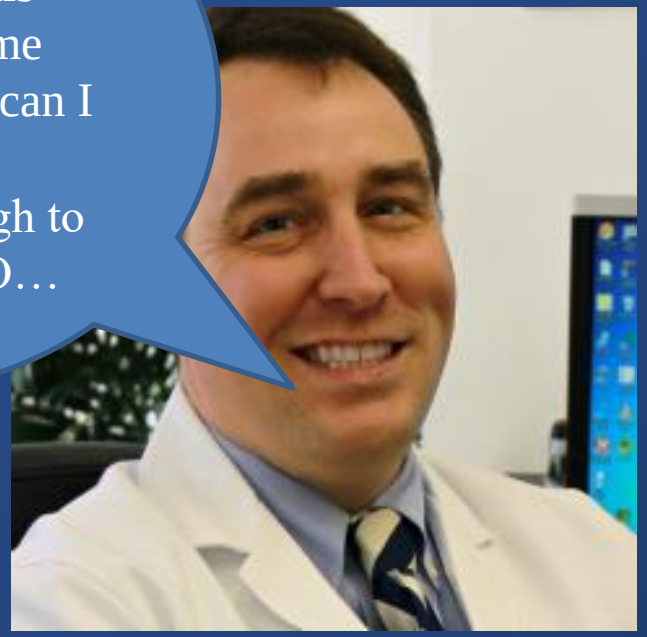
# Review Methodology (unchanged)

Hmmm. What cool things did I read this year? What helps me fall asleep. Where can I find my jokes.
I don't have enough to do being a CMIO…



- PubMed weekly hits on CDS, MU, Longhurst ☺ , etc.
- Table of contents emails from journals
- When you guys start going nuts on the listserv
- Twitter (follow me to follow the people I follow @colinbanas_VCU)
- Other randomness
- My focus tends to settle on systematic reviews and big themes of the year, not always pure research

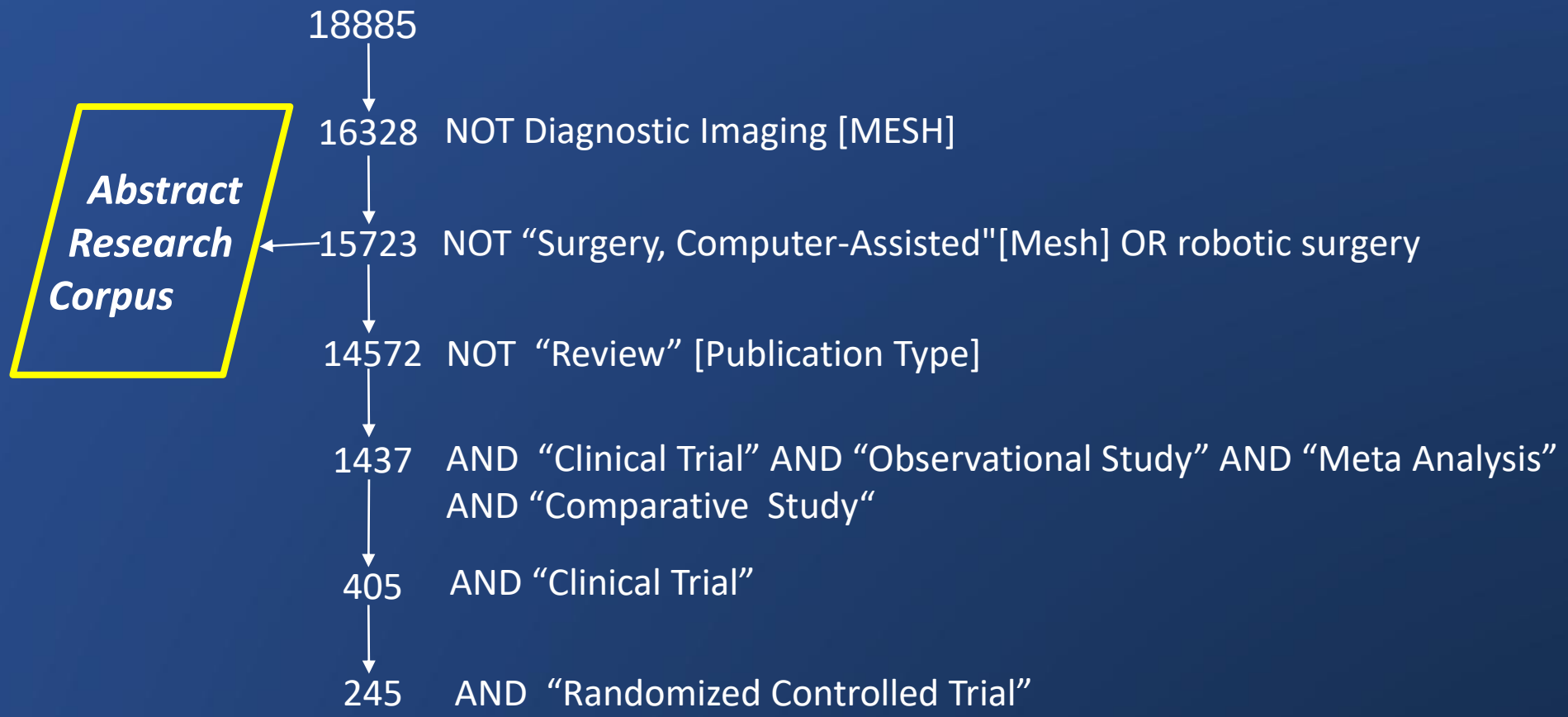
I'm bored, interested in unnecessarily complex methodology

# Review Methodology

clinical informatics OR Appl Clin Inform OR appl med inform OR bmc med inform decis mak OR comput inform nurs OR int j med inform OR j amia OR j clin bioinforma OR j innov health inform OR j med internet res OR j med syst OR med inform OR "Medical Informatics"[Mesh] OR "Medical Informatics Computing"[Mesh] OR "Medical Informatics Applications"[Mesh] OR "Medical Order Entry Systems"[Mesh] OR "Medical Records Systems, Computerized"[Mesh]

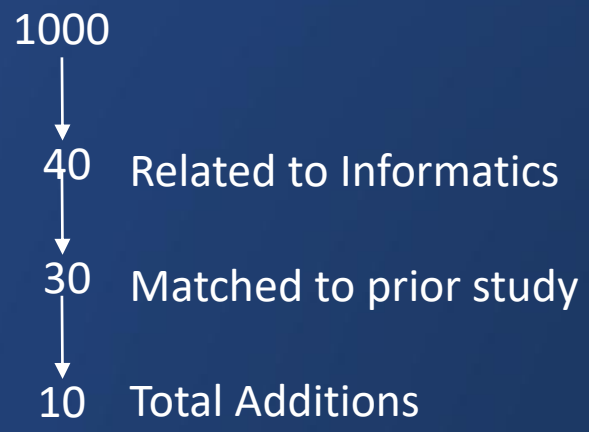
5/1/16-4/30/17 & +English

# Review Methodology

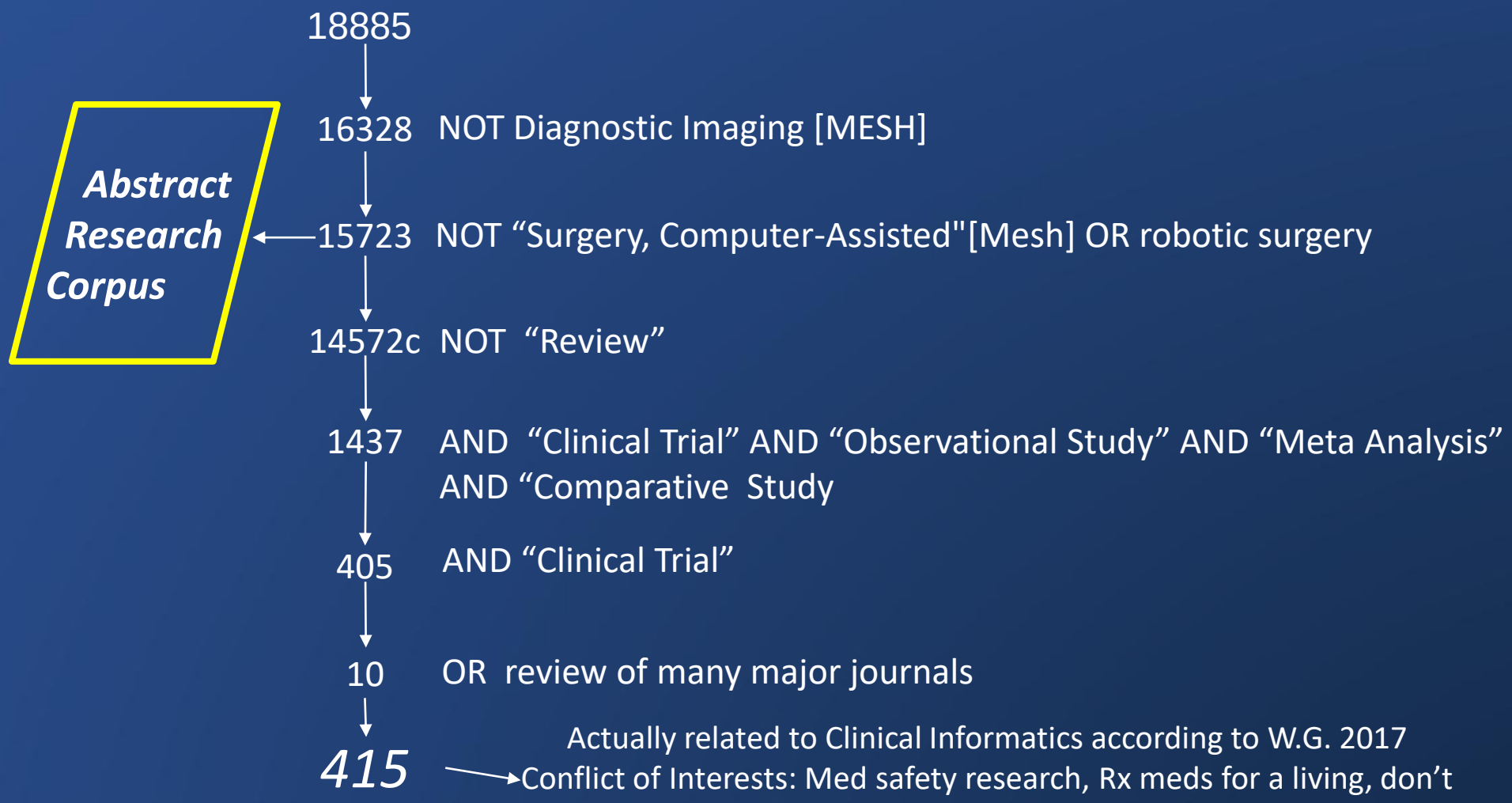


# Review Methodology

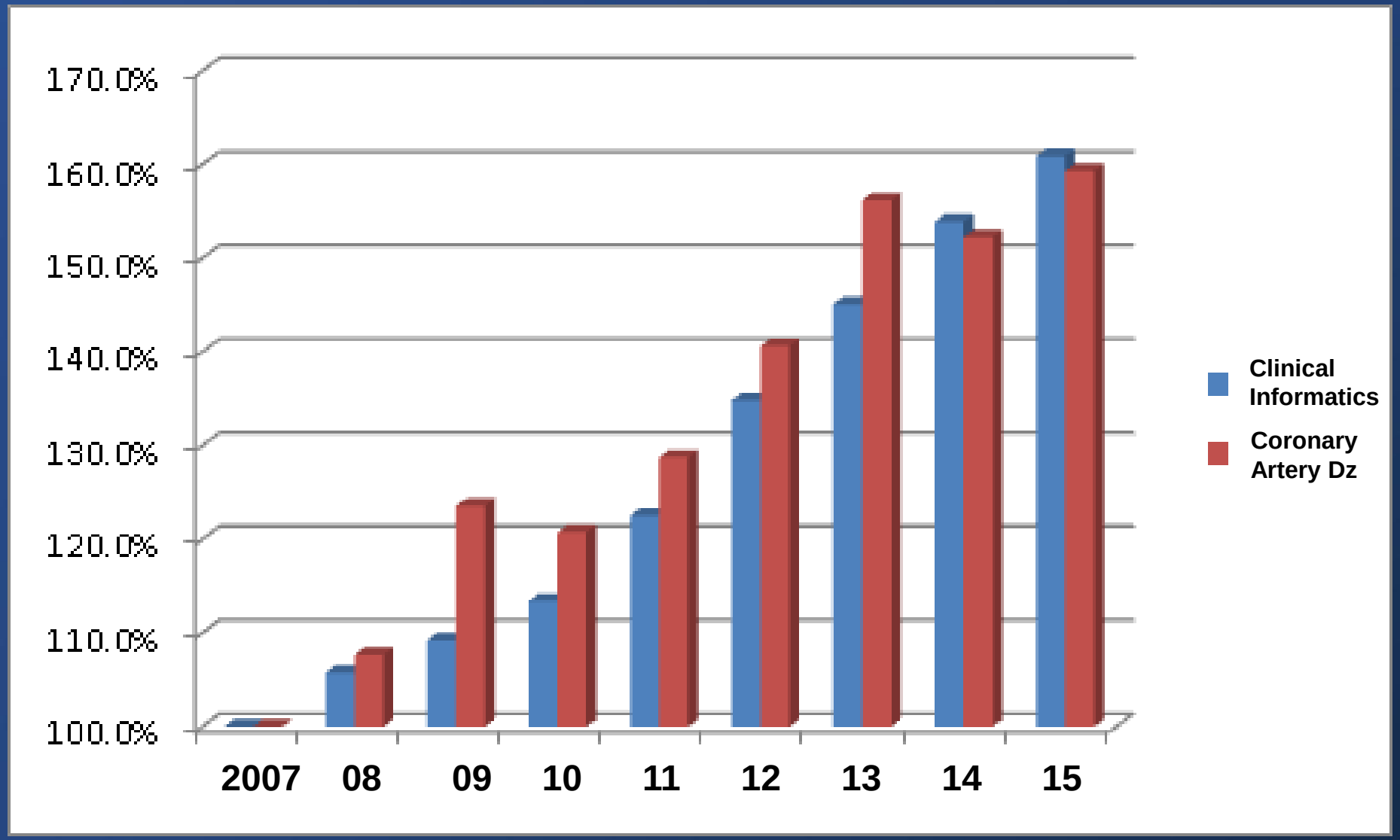
"Am J Health Syst Pharm" OR "Anesthesiology" OR "Ann Emerg Med" OR "Ann Surg" OR "J Gen Intern Med" OR "J Hosp Med" OR "JAMA" OR "Lancet" OR "New Engl J Med" OR "Pediatrics" OR "Pharmacotherapy" OR "Plos One" OR "Plos Med"
5/1/15-4/30/16 & +English +Humans, RCT, Observational



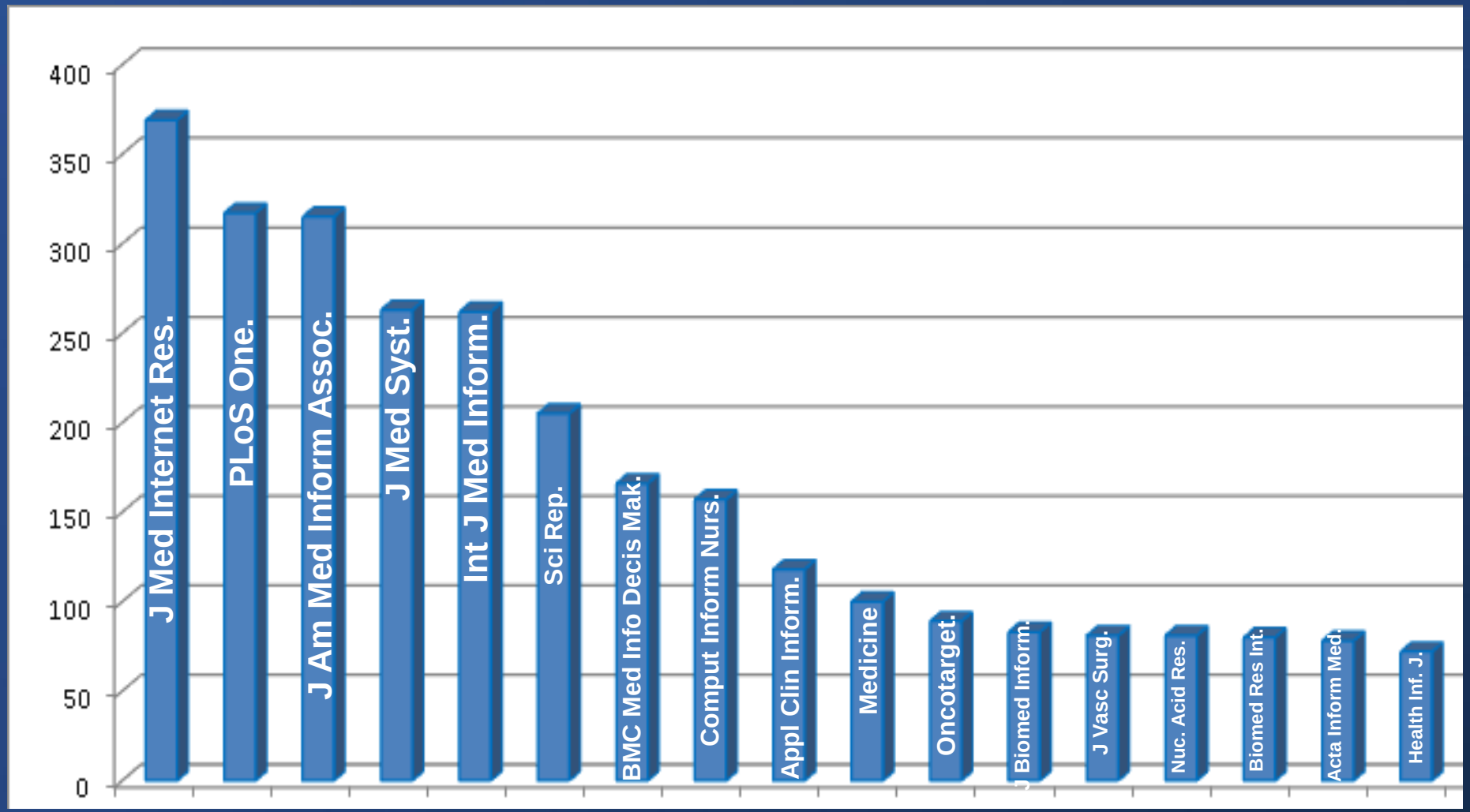
# Final Paper Review Methodology



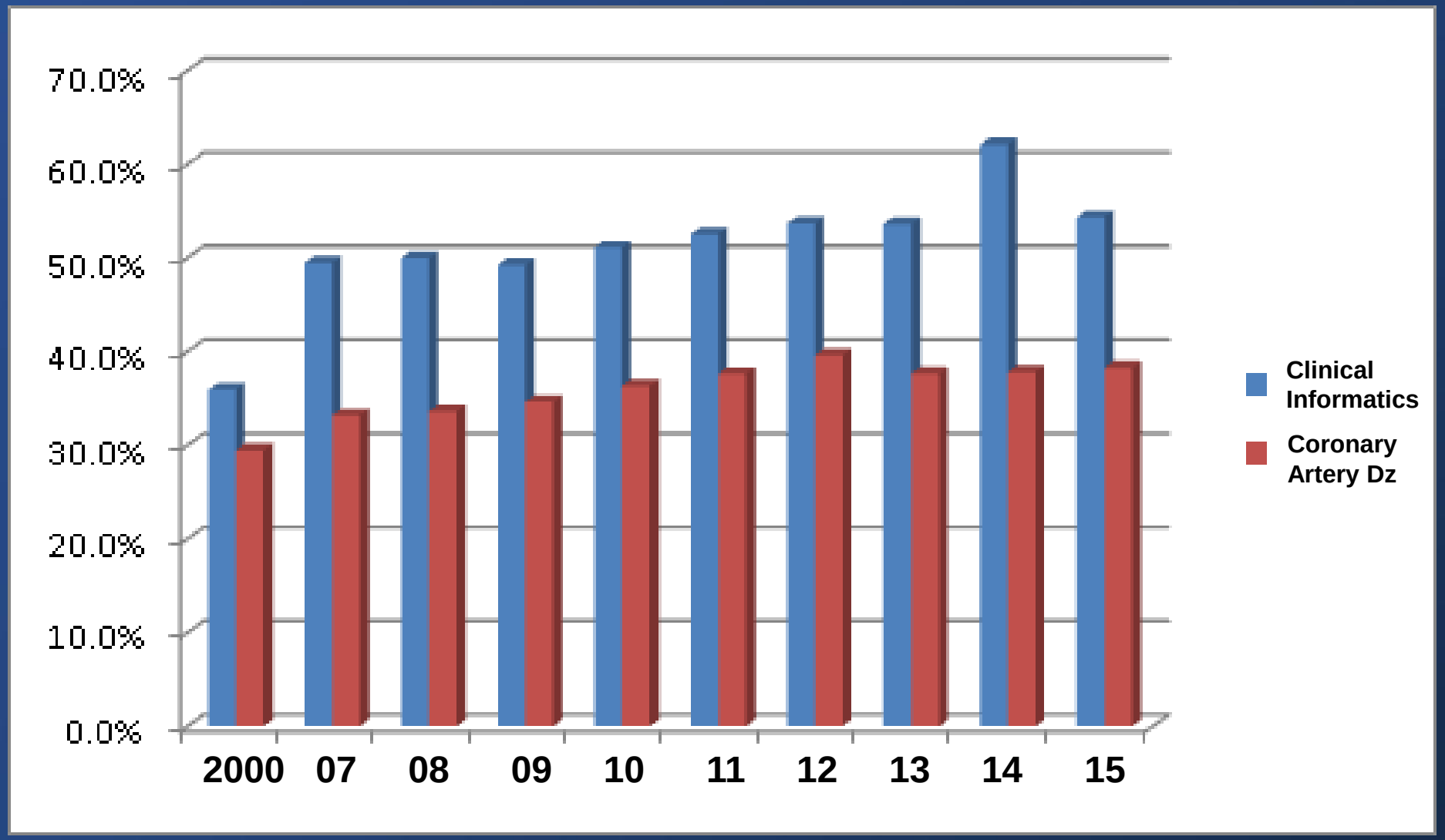
# Growth in Publications



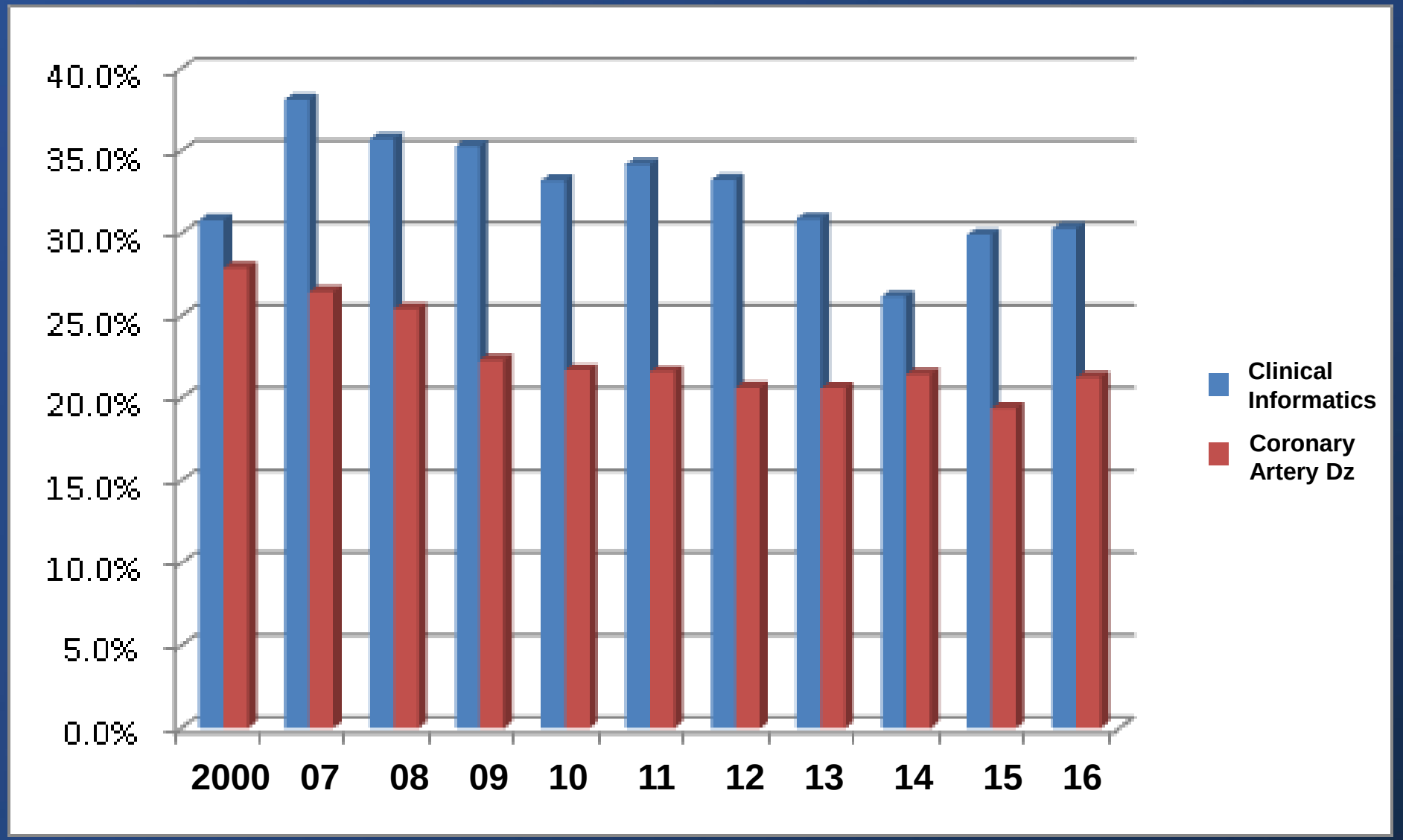
# Who published these Studies?



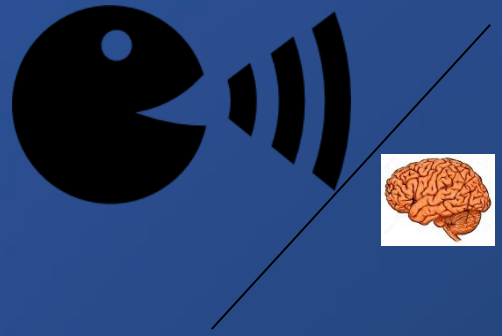
# % of studies funded

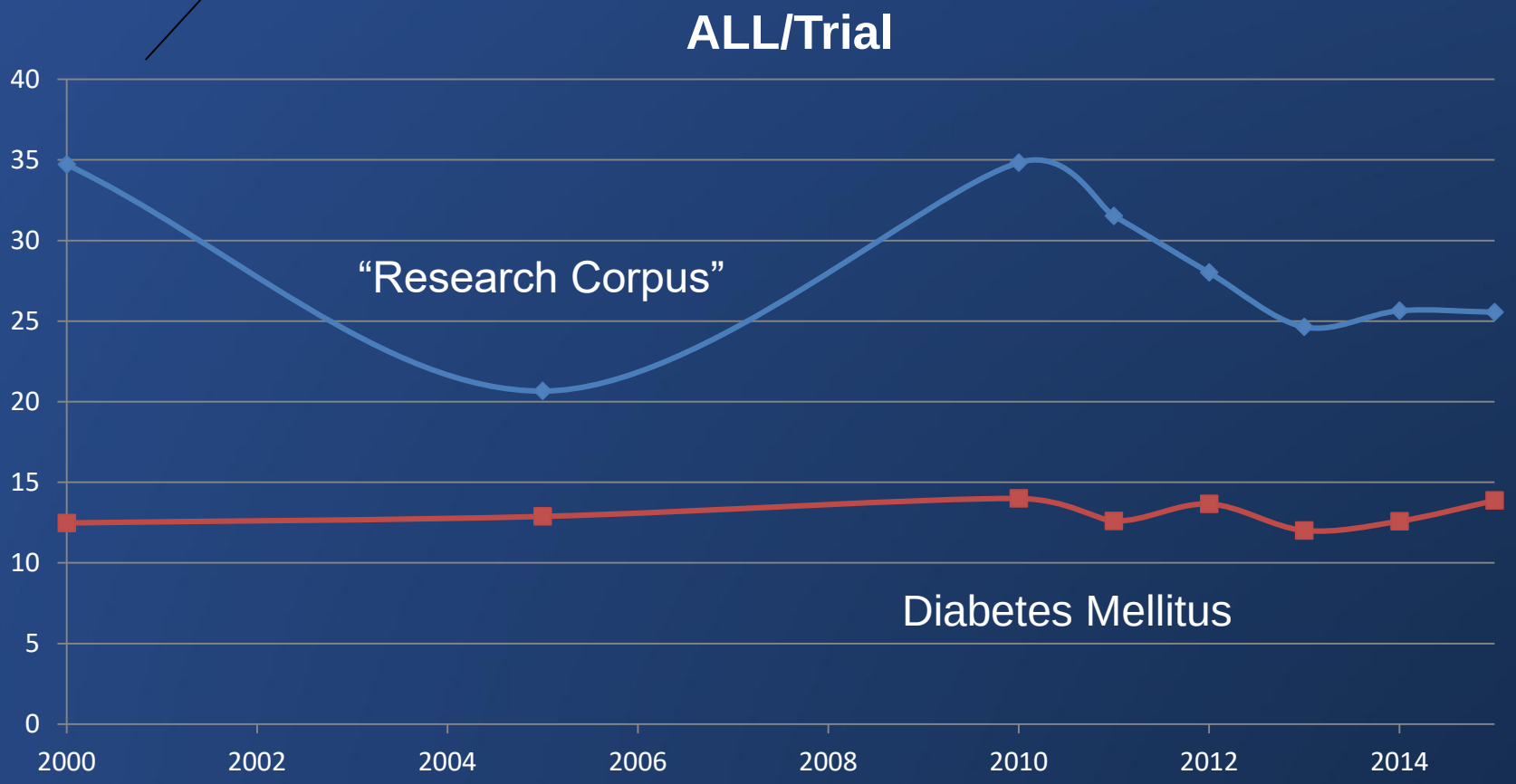


# % of Funding from the Government



# The "Talk/Study or T/S" Ratio®



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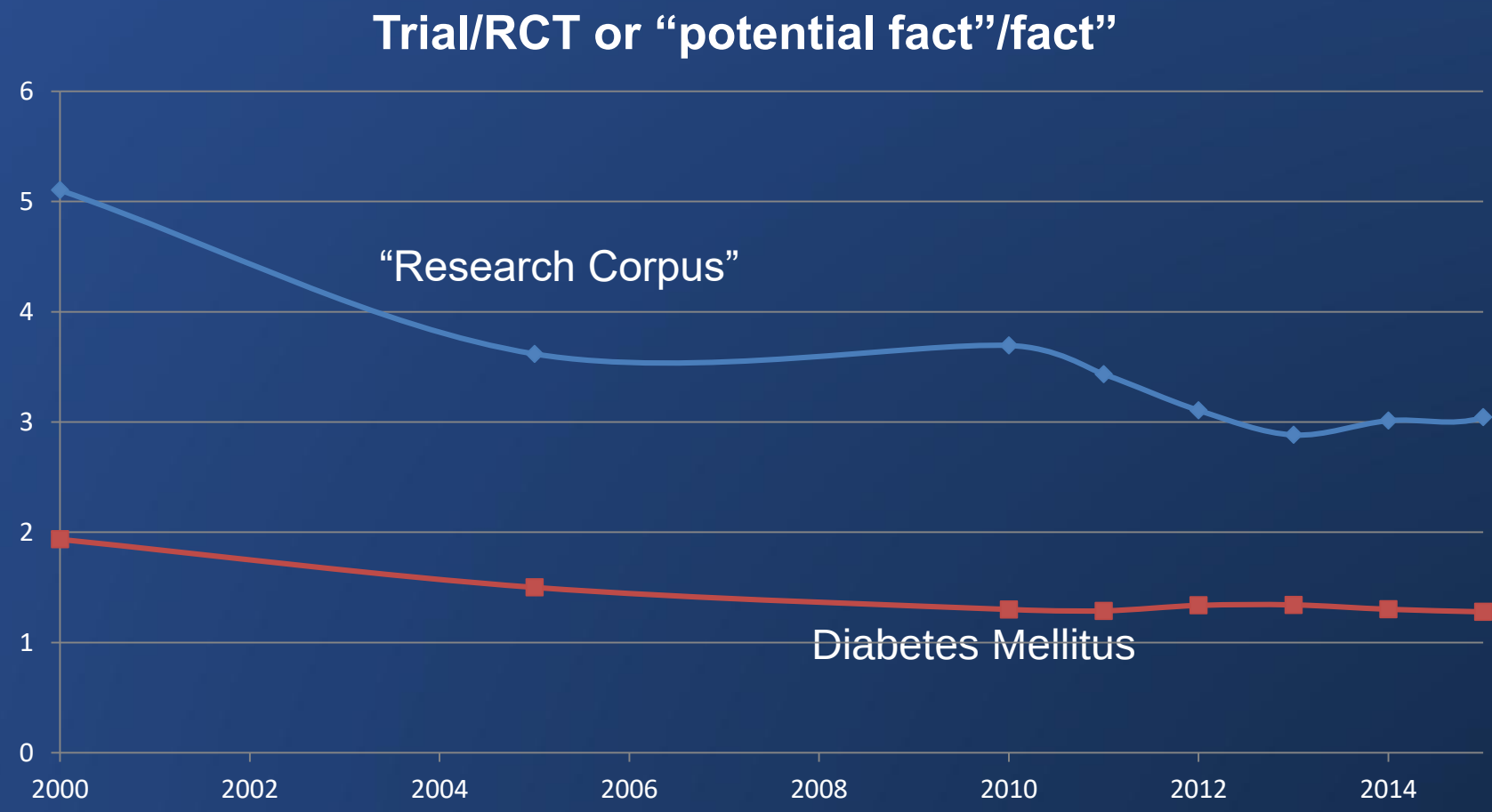
® W. Galanter & C. Banas 2014

# The “Banas Ratio”®

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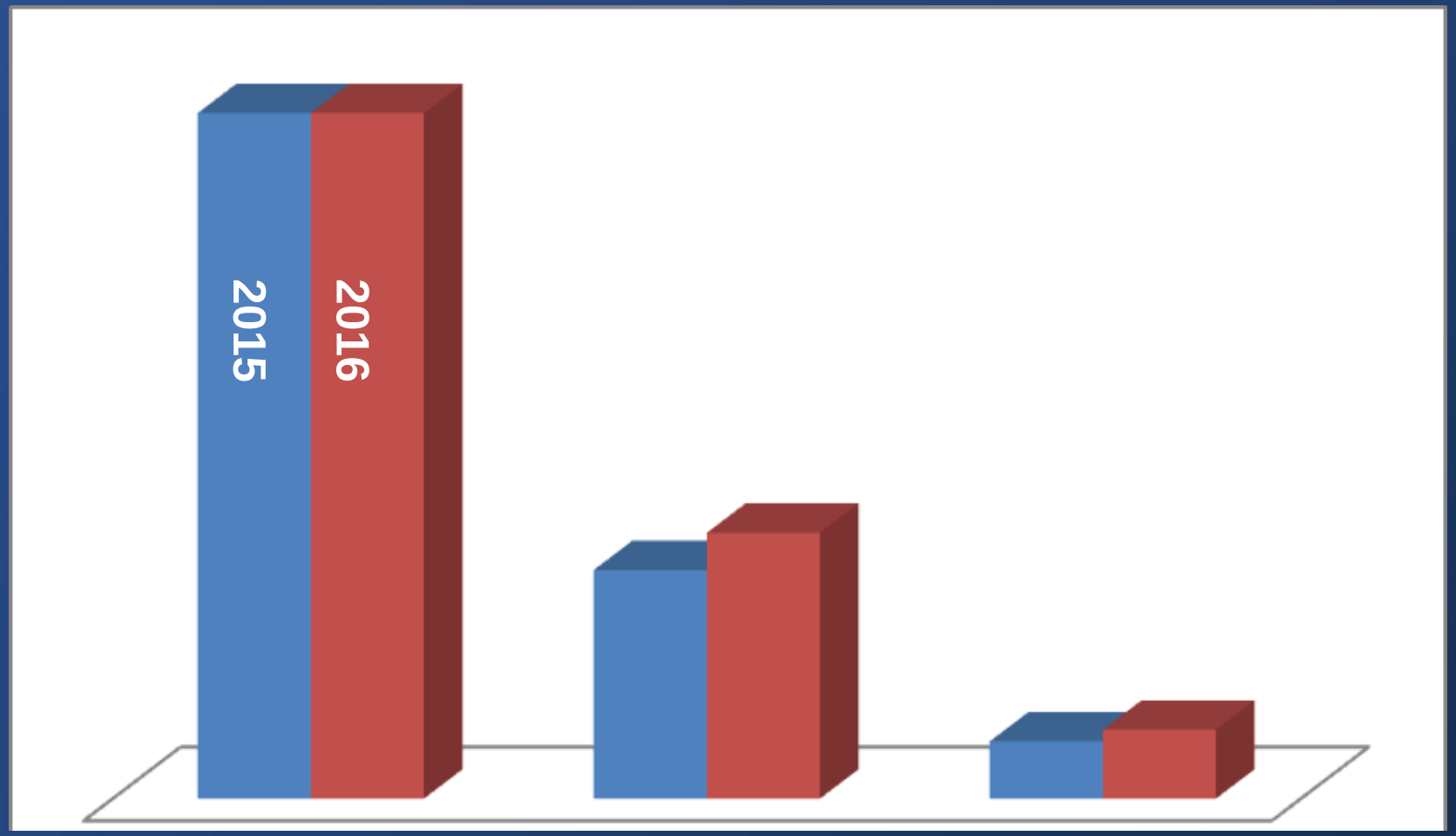
# What's in the Research Corpus

# Who's in the Research Corpus



# Comey Opening Statement Lacks HPI, Family History, Review of Systems

By Dr. 99

TRANSITION COMEDY SLIDE!!!!

# Comey Urologist Confirms: He is a Leaker

By Gomerblog Team

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# What's old is new again…

Review

**Impact of commercial computerized provider order entry (CPOE) and clinical decision support systems (CDSSs) on medication errors, length of stay, and mortality in intensive care units: a systematic review and meta-analysis**

**Mirela Prgomet,[1] Ling Li,[1] Zahra Niazkhani,[2,3] Andrew Georgiou,[1] and Johanna I Westbrook[1]**

[1]Centre for Health Systems and Safety Research, Australian Institute of Health Innovation, Macquarie University, Sydney, Australia, [2]Department of Health Information Technology, Urmia University of Medical Sciences, Urmia, Iran and [3]Nephrology and Kidney Transplant Research Center, Urmia University of Medical Sciences, Urmia, Iran

Correspondence to Dr Mirela Prgomet, Centre for Health Systems and Safety Research, Australian Institute of Health Innovation, Level 6, 75 Talavera Road, Macquarie University, Sydney NSW 2109, Australia; mirela.prgomet@mq.edu.au; Fax: +612 9850 2499.

Received 5 June 2016; Revised 9 August 2016; Accepted 31 August 2016

JAMIA

- Meta-analysis of 24 papers related to CPOE and CDS (vs. being on paper) and key outcomes such as LOS, Mortality, ICU stays


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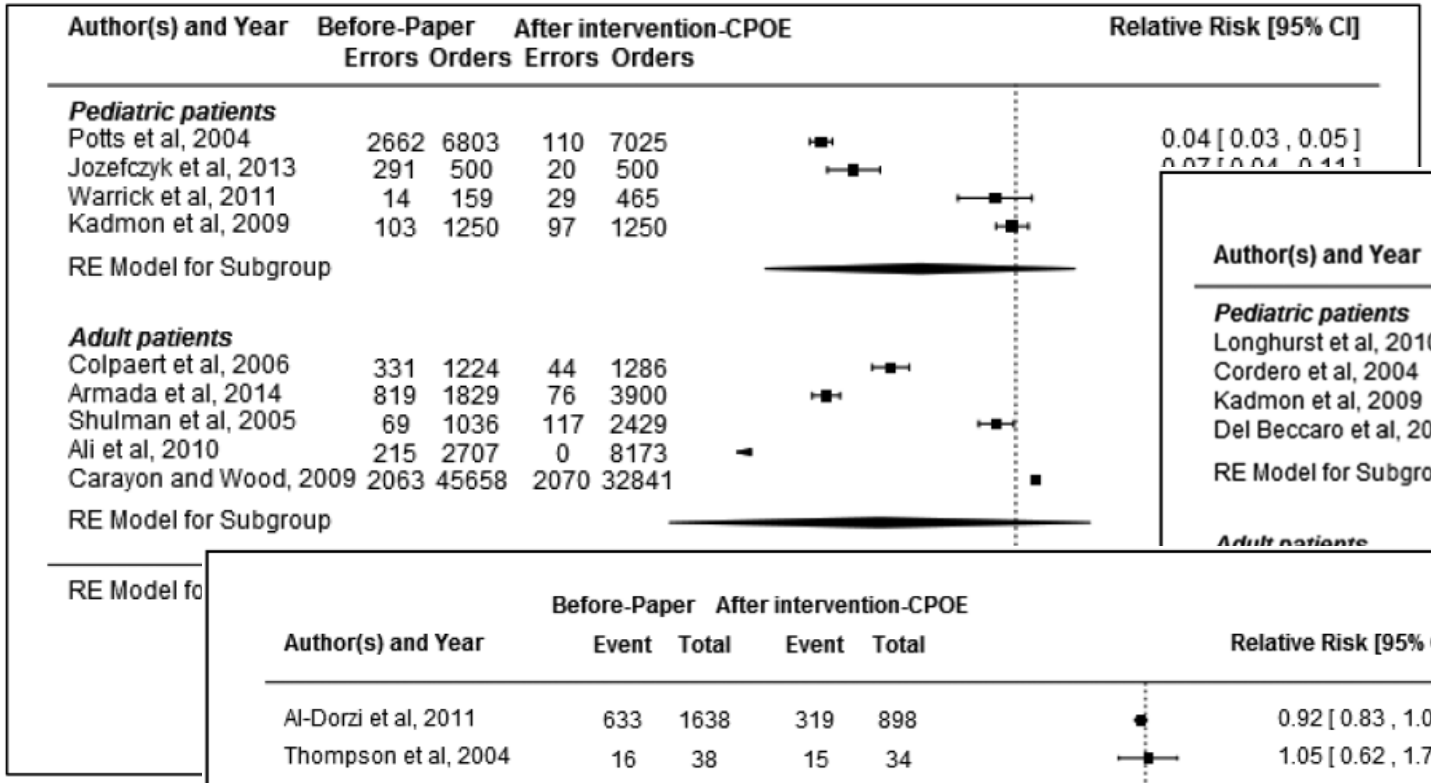
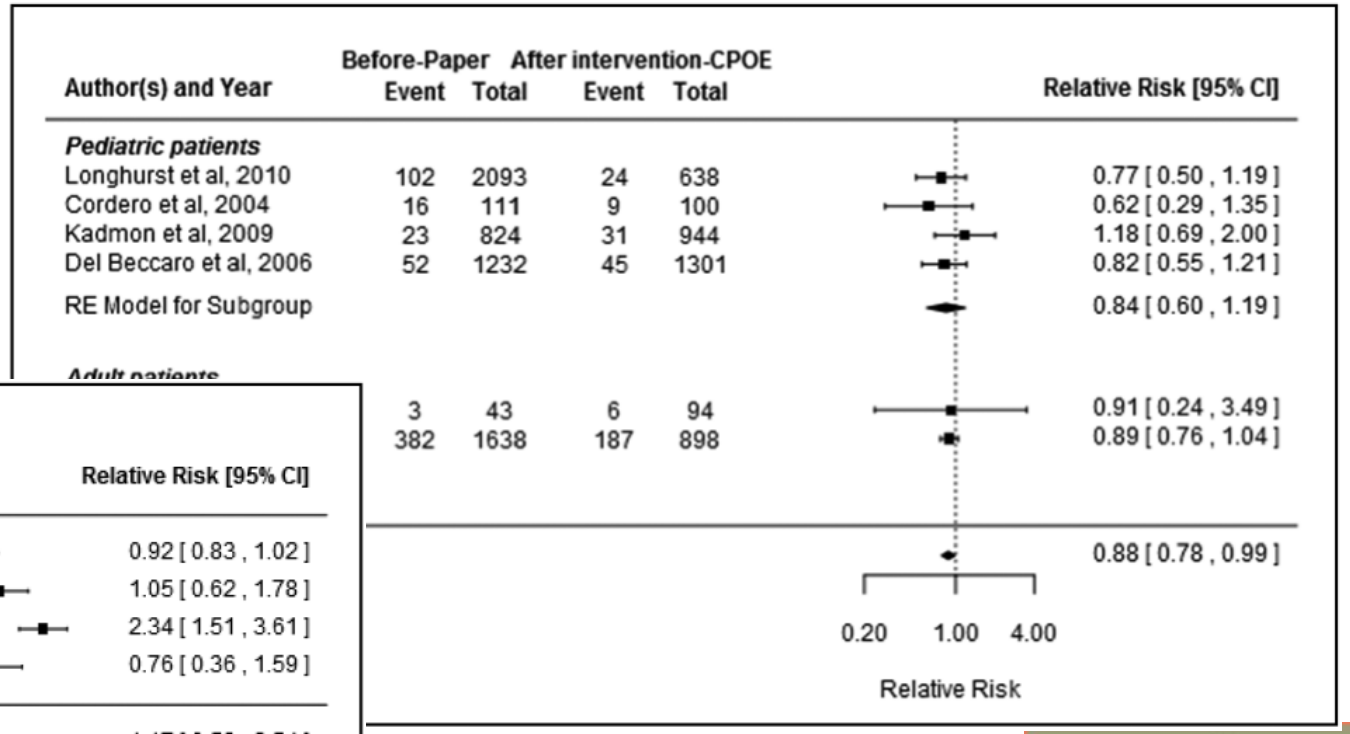
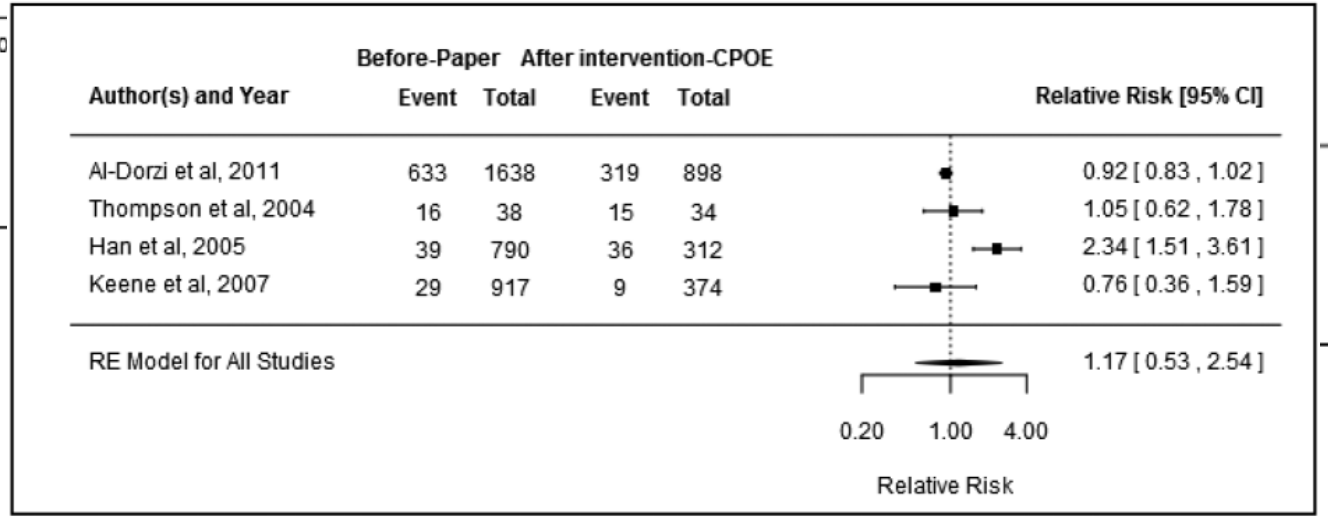
Journal of the American Medical Informatics Association, 24(2), 2017, 413–422
doi: 10.1093/jamia/ocw145

# Does CPOE and CDS make things better? Yup, but not as much as we all had hoped….



# CPOE and CDS does some expected things well – meta-analysis confirms

- **85% reduction in Medication prescribing rates**
- LOS and Hospital Mortality is at least unchanged (statistically)
- ICU Mortality is reduced 12%

Lesson – don't go back to paper just yet ☺


Journal of the American Medical Informatics Association, 24(2), 2017, 413–422
doi: 10.1093/jamia/ocw145

JAMA Internal Medicine | Original Investigation | LESS IS MORE

# Effect of a Price Transparency Intervention in the Electronic Health Record on Clinician Ordering of Inpatient Laboratory Tests

## The PRICE Randomized Clinical Trial

Mina S. Sedrak, MD, MS; Jennifer S. Myers, MD; Dylan S. Small, PhD; Irving Nachamkin, DrPH, MPH; Justin B. Ziemba, MD; Dana Murray, MSN, CRNP; Gregory W. Kurtzman, BA; Jingsan Zhu, MS, MBA; Wenli Wang, MS; Deborah Mincarelli, MBA; Daniel Danoski, BS, MLS; Brian P. Wells, MBA; Jeffrey S. Berns, MD; Patrick J. Brennan, MD; C. William Hanson, MD; C. Jessica Dine, MD, MSHP; Mitesh S. Patel, MD, MBA, MS

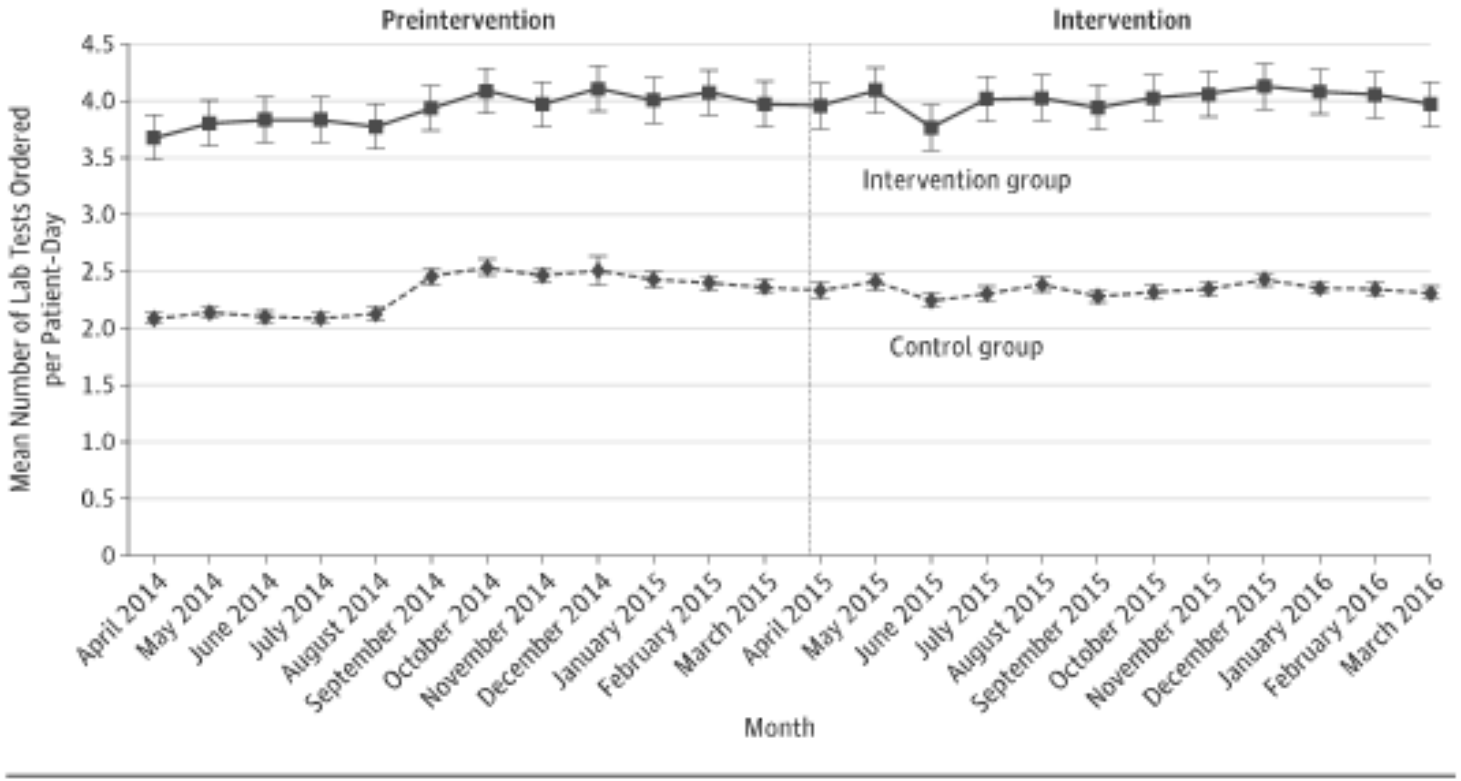
JAMA

Original Investigation Research

EVERYTHING OLD IS NEW AGAIN

- 75 high value target lab tests were displayed to the intervention group….
- No effect….

Figure 2. Unadjusted Number of Inpatient Laboratory Tests Ordered per Patient-Day by Group and Month




Error bars indicate the 95% CIs. Vertical black line delineates the preintervention and intervention periods. Data for April 2016 are not displayed because only 8 days exist within the study period in that month.

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ORIGINAL INVESTIGATION

ONLINE FIRST

# Impact of Providing Fee Data on Laboratory Test Ordering

## *A Controlled Clinical Trial*

*Leonard S. Feldman, MD; Hasan M. Shihab, MBChB, MPH; David Thiemann, MD; Hsin-Chieh Yeh, PhD; Margaret Ardolino, RN, MS; Steven Mandell, MS; Daniel J. Brotman, MD*

- JAMA Internal Medicine, April 15 2013
- Does displaying the charge data next to the lab test impact ordering habits?
  - Total number or orders?
  - Frequency of orders?
  - Charges?

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EVERYTHING OLD IS NEW AGAIN

# It’s not the first time it’s been done…

ORIGINAL INVESTIGATION

## Does the Computerized Display of Charges Affect Inpatient Ancillary Test Utilization?

*David W. Bates, MD, MSc; Gilad J. Kuperman, MD, PhD; Ashish Jha, MD; Jonathan M. Teich, MD, PhD; E. John Orav, PhD; Nell Ma’luf; Andrew Onderdonk, PhD; Robert Pugatch, MD; Donald Wybenga, MD; James Winkelman, MD; Troyen A. Brennan, MD; Anthony L. Komaroff, MD; Milenko J. Tanasijevic, MD*

1997

2004

## Impact of an Evidence-Based Computerized Decision Support System on Primary Care Prescription Costs

*S. Troy McMullin, PharmD[1]*
*Thomas P. Lonergan, PharmD, MBA[1]*
*Charles S. Rynearson, RPh, MS[2]*
*Thomas D. Doerr, MD[1]*
*Paul A. Veregge, MD, MS[2]*
*Edward S. Scanlan, MD[2]*

**ABSTRACT**

**PURPOSE** Although newer, heavily promoted medications are commonly prescribed, published evidence and consensus guidelines often support the use of less expensive alternatives. This study was designed to evaluate the impact on prescription costs of a computerized decision support system (CDSS) that provides evidence-based recommendations to clinicians during the electronic prescribing process.

1990

SPECIAL ARTICLE

## THE EFFECT ON TEST ORDERING OF INFORMING PHYSICIANS OF THE CHARGES FOR OUTPATIENT DIAGNOSTIC TESTS

WILLIAM M. TIERNEY, M.D., MICHAEL E. MILLER, PH.D., AND CLEMENT J. MCDONALD, M.D.

VIRGINIA COMMONWEALTH UNIVERSITY

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# Price Transparency

- It works for awhile (usually) then providers get numb to it’
- Need perhaps some more novel ways of representation this data (charges vs. costs vs. patient portion)
- Works best when providers have some skin in the game
  - *Perhaps a new ACO model would alter this type of research?*

EVERYTHING OLD IS NEW AGAIN

# Clinical Decision Support: a 25 Year Retrospective and a 25 Year Vision

B. Middleton[1,2], D. F. Sittig[3], A. Wright[4]

- Summarize the state of the art of clinical decision support (CDS) circa 1990, review progress in the 25 year interval from that time, and provide a vision of what CDS might look like 25 years hence, or circa 2040

Authors arrive at six axes of CDS:

- Data
- Knowledge
- Inference
- Architecture and technology
- Implementation and integration
- Users

These axes frame the review and discussion of selected barriers and facilitators to the effective use of CDS


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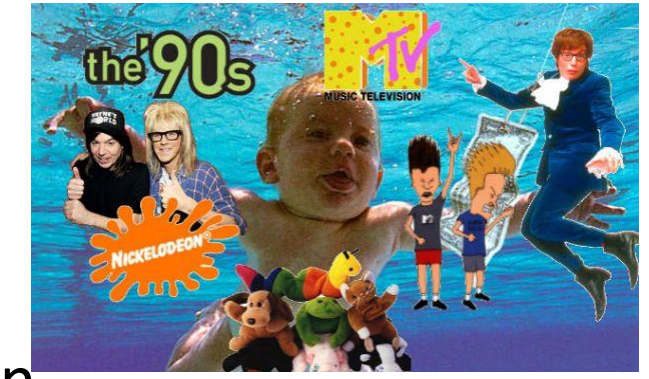
Yearb Med Inform. 2016 Aug 2;Suppl 1:S103-16. doi: 10.15265/IYS-2016-s034.

# The last 25 years CDS




- Thoughtful look back to the “old days” of the 1990s and CDS
- VISTA / The Brigham / LDS / Meditech days

Mediocre systems designed to keep doctors from making silly mistakes

- Barriers to CDS then
  - No one was paying for quality
  - Workforce for these systems; informatics didn’t really exist
  - Transferability of CDS between systems didn’t exist
  - Computer literacy of users
  - Inability to optimally insert into workflow
    - “Users don’t mind being re-routed, but they hate being stopped”
  - Lack of standards
    - Arden syntax
    - CCOW
    - RXNorm

Yearb Med Inform. 2016 Aug 2;Suppl 1:S103-16. doi: 10.15265/IYS-2016-s034.



EVERYTHING OLD IS NEW AGAIN

# The next 25 years

- Explosion of CDS is inevitable
- AI
- Precision Medicine
- Big Data
- Sheer computing power and inevitable “cognitive aides” in real time

We believe that the power of human reasoning will never be fully supplanted by an algorithm of any kind, nor do we believe the intimate and essential relationship between a doctor and her patient can be replaced by a computer.

VCU Health

EVERYTHING OLD IS NEW AGAIN

Yearb Med Inform. 2016 Aug 2;Suppl 1:S103-16. doi: 10.15265/IYS-2016-s034.

# Providers Now Required to Change EMR Password Every 20 Minutes

By Livin La Vida Locum MD


- To further enhance the digital lock-down, each new password must contain at least one symbols, one number, one capital letter, one lowercase letter, one medical emoji, one Chinese symbol, and one zodiac sign. *Same password cannot be used for any of the 5 different systems that the hospital is using for EMR, PACS, billing, coding, and email.*

If anyone was ever to find out how much opioids and antibiotics we're over-prescribing, we'll be finished. Seriously people, if Russian hackers get their hands on this stuff, DNC hacking will look like joke.

Ancker *et al. BMC Medical Informatics and Decision Making* (2017) 17:36
DOI 10.1186/s12911-017-0430-8

BMC Medical Informatics and Decision Making

RESEARCH ARTICLE Open Access

# Effects of workload, work complexity, and repeated alerts on alert fatigue in a clinical decision support system

Jessica S. Ancker[1,2,5*], Alison Edwards[1,2], Sarah Nosal[3,4], Diane Hauser[3], Elizabeth Mauer[1], Rainu Kaushal[1,2] with the HITEC Investigators

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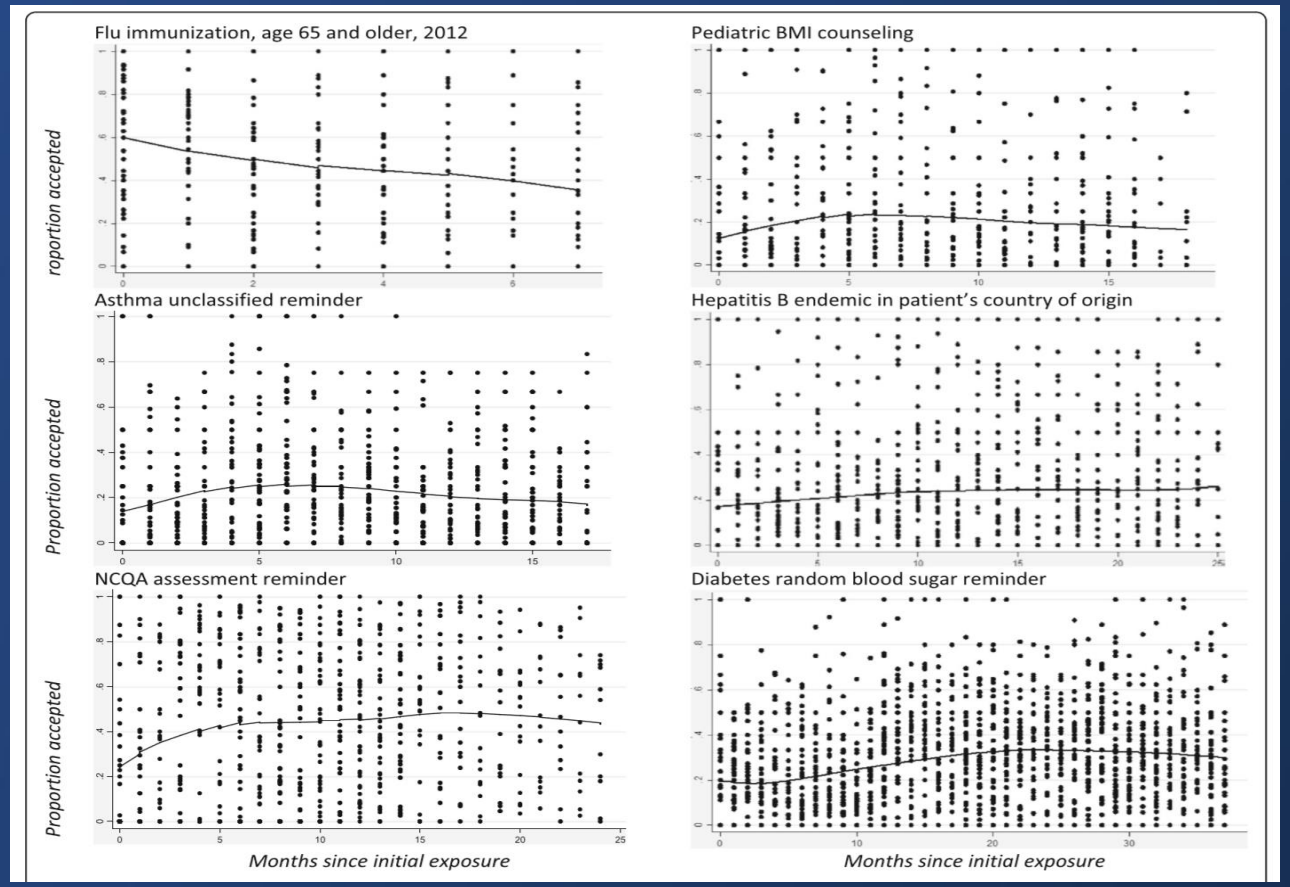


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Jessica S. Ancker[1,2,5*], Alison Edwards[1,2], Sarah Nosal[3,4], Diane Hauser[3], Elizabeth Mauer[1], Rainu Kaushal[1,2] with the HITEC Investigators

**Conclusions**

Primary care clinicians became less likely to accept alerts as they received more of them, particularly as they received more repeated (and therefore probably uninformative) alerts. Complexity of the patients was also a factor in bivariate analyses, although not in the multivariable models. These findings are consistent with a model of alert fatigue caused by a high proportion of uninformative alerts combined with complex work that makes it challenging to distinguish relevant from irrelevant alerts. There was no evidence of desensitization or of a general effect of workload. Approaches to reduce the numbers of within-patient repeats could be a promising target for reducing alert override rates and alert fatigue.

Journal of
Clinical Pharmacy and Therapeutics

*Journal of Clinical Pharmacy and Therapeutics*, 2017, **42**, 69–74 doi: 10.1111/jcpt.12476

# A randomized controlled trial to assess the effect of a medication plan containing drug administration recommendations on patients' drug knowledge after 2 months

A. F. J. Send* PhD, F. Peters-Klimm† MD, T. Bruckner‡ Dr sc hum, W. E. Haefeli* MD and H. M. Seidling* Dr sc hum

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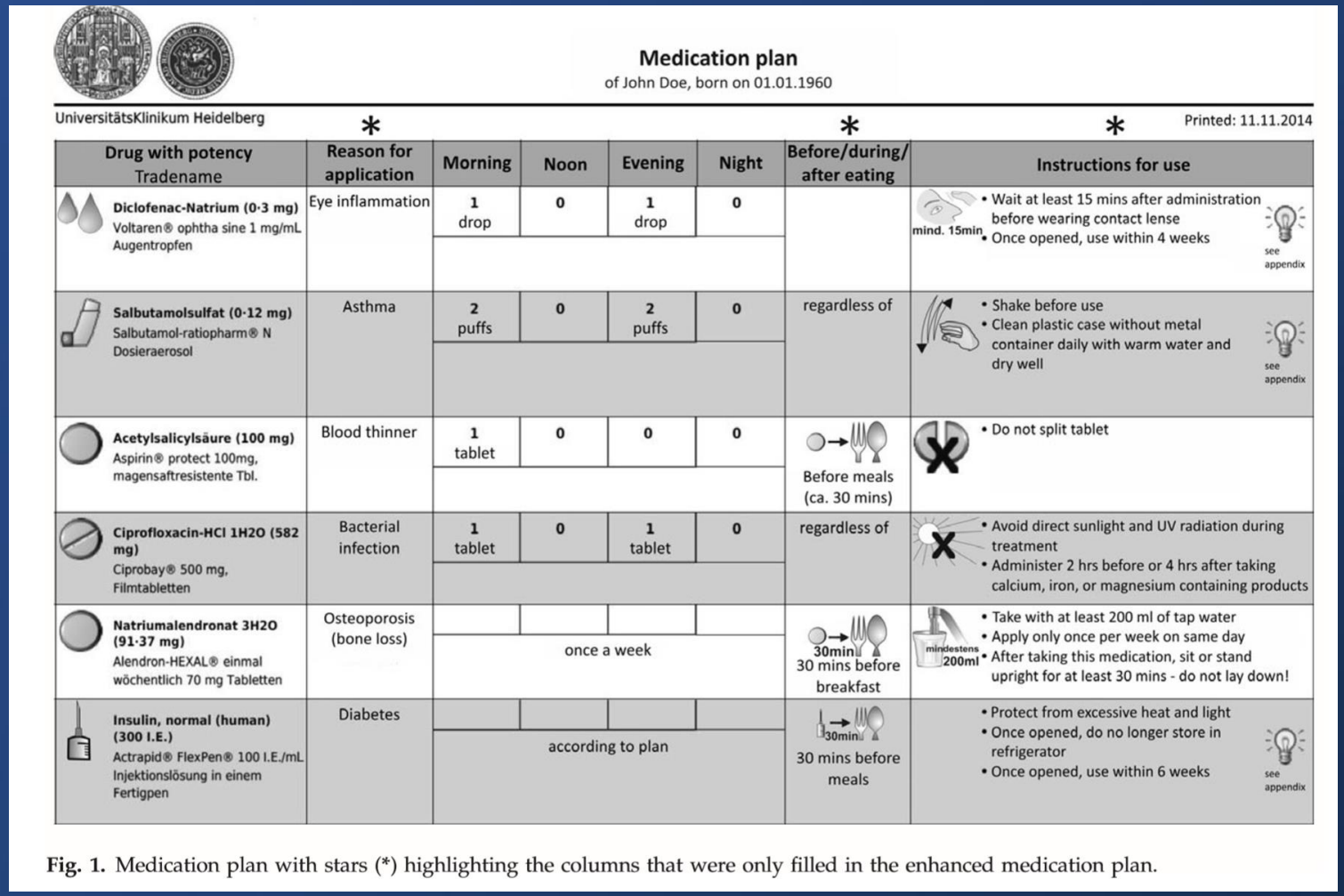

**Medication plan**

of John Doe, born on 01.01.1960

UniversitätsKlinikum Heidelberg * * * Printed: 11.11.2014

| Drug with potency<br>Tradename | Reason for application | Morning | Noon | Evening | Night | Before/during/after eating | Instructions for use |
|---|---|---|---|---|---|---|---|
| **Diclofenac-Natrium (0·3 mg)**<br>Voltaren® ophtha sine 1 mg/mL Augentropfen | Eye inflammation | 1 drop | 0 | 1 drop | 0 | | • Wait at least 15 mins after administration before wearing contact lense<br>• Once opened, use within 4 weeks<br>mind. 15min<br>see appendix |
| **Salbutamolsulfat (0·12 mg)**<br>Salbutamol-ratiopharm® N Dosieraerosol | Asthma | 2 puffs | 0 | 2 puffs | 0 | regardless of | • Shake before use<br>• Clean plastic case without metal container daily with warm water and dry well<br>see appendix |
| **Acetylsalicylsäure (100 mg)**<br>Aspirin® protect 100mg, magensaftresistente Tbl. | Blood thinner | 1 tablet | 0 | 0 | 0 | Before meals (ca. 30 mins) | • Do not split tablet |
| **Ciprofloxacin-HCl 1H2O (582 mg)**<br>Ciprobay® 500 mg, Filmtabletten | Bacterial infection | 1 tablet | 0 | 1 tablet | 0 | regardless of | • Avoid direct sunlight and UV radiation during treatment<br>• Administer 2 hrs before or 4 hrs after taking calcium, iron, or magnesium containing products |
| **Natriumalendronat 3H2O (91·37 mg)**<br>Alendron-HEXAL® einmal wöchentlich 70 mg Tabletten | Osteoporosis (bone loss) | once a week | | | | 30min<br>30 mins before breakfast | • Take with at least 200 ml of tap water<br>• Apply only once per week on same day<br>• After taking this medication, sit or stand upright for at least 30 mins - do not lay down!<br>mindestens 200ml |
| **Insulin, normal (human) (300 I.E.)**<br>Actrapid® FlexPen® 100 I.E./mL Injektionslösung in einem Fertigpen | Diabetes | according to plan | | | | 30min<br>30 mins before meals | • Protect from excessive heat and light<br>• Once opened, do no longer store in refrigerator<br>• Once opened, use within 6 weeks<br>see appendix |

**Fig. 1.** Medication plan with stars (*) highlighting the columns that were only filled in the enhanced medication plan.

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# A randomized controlled trial to assess the effect of a medication plan containing drug administration recommendations on patients' drug knowledge after 2 months

| | Baseline assessment/follow-up assessment | |
|---|---|---|
| | Control group | Intervention group |
| Overall | | |
| *N* (number of questions) | 126/126 | 138/138 |
| Correctly answered | 55 (43·7%)/58 (46·0%) | 56 (40·6%)/88 (63·8%) |
| *P*-value | 0·70 | <0·01* |
| Questions on indication | | |
| *N* | 42/42 | 46/46 |
| Correctly answered | 26 (61·9%)/27 (64·3%) | 31 (67·4%)/38 (82·6%) |
| *P*-value | 0·82 | 0·09 |
| Questions on food intake | | |
| *N* | 69/59 | 82/64 |
| Correctly answered | 25 (36·2%)/26 (44·1%) | 22 (26·8%)/36 (56·3%) |
| *P*-value | 0·37 | <0·01* |
| Questions on other topics | | |
| *N* | 15/25 | 10/28 |
| Correctly answered | 4 (26·7%)/5 (20·0%) | 3 (30·0%)/15 (53·6%) |
| *P*-value | 0·63 | 0·20 |
| All questions correct/wrong | | |
| *N* (patients) | 42 | 46 |
| All questions correct | 4 (9·5%)/4 (9·5%) | 3 (6·5%)/14 (30·4%) |
| *P*-value | 1·00 | <0·01* |
| All questions wrong | 7 (16·7%)/9 (21·4%) | 10 (21·7%)/3 (6·5%) |
| *P*-value | 0·58 | 0·04* |

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Journal of Diabetes Research
Volume 2016, Article ID 2129838, 16 pages
http://dx.doi.org/10.1155/2016/2129838

*Clinical Study*

# Effects of a Patient-Provider, Collaborative, Medication-Planning Tool: A Randomized, Controlled Trial

**James F. Graumlich,[1] Huaping Wang,[2] Anna Madison,[3] Michael S. Wolf,[4] Darren Kaiser,[5] Kumud Dahal,[6] and Daniel G. Morrow[7]**

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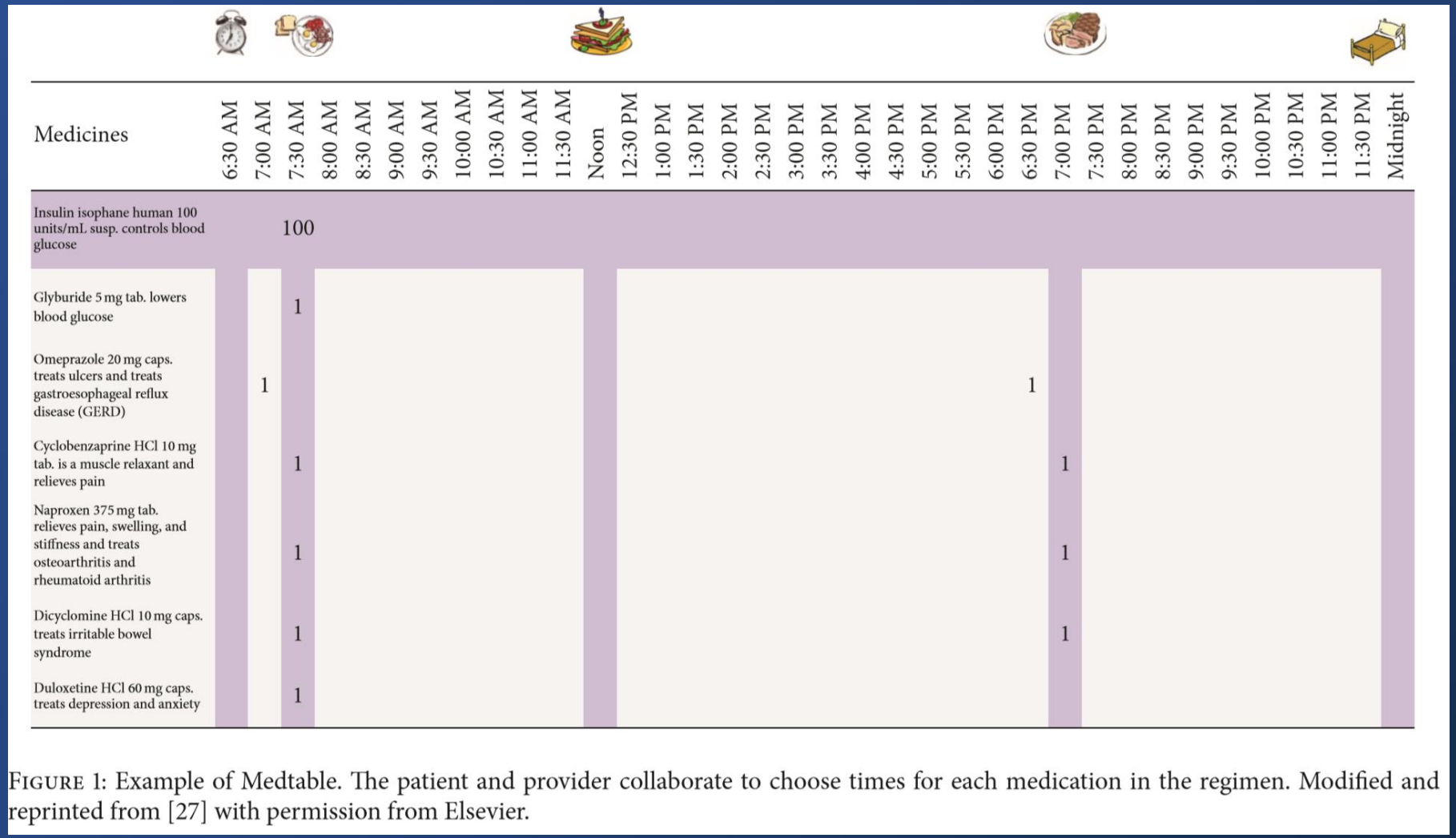
# Effects of a Patient-Provider, Collaborative, Medication-Planning Tool: A Randomized, Controlled Trial



| Medicines | 6:30 AM | 7:00 AM | 7:30 AM | 8:00 AM | 8:30 AM | 9:00 AM | 9:30 AM | 10:00 AM | 10:30 AM | 11:00 AM | 11:30 AM | Noon | 12:30 PM | 1:00 PM | 1:30 PM | 2:00 PM | 2:30 PM | 3:00 PM | 3:30 PM | 4:00 PM | 4:30 PM | 5:00 PM | 5:30 PM | 6:00 PM | 6:30 PM | 7:00 PM | 7:30 PM | 8:00 PM | 8:30 PM | 9:00 PM | 9:30 PM | 10:00 PM | 10:30 PM | 11:00 PM | 11:30 PM | Midnight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Insulin isophane human 100 units/mL susp. controls blood glucose | | | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Glyburide 5 mg tab. lowers blood glucose | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Omeprazole 20 mg caps. treats ulcers and treats gastroesophageal reflux disease (GERD) | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |
| Cyclobenzaprine HCl 10 mg tab. is a muscle relaxant and relieves pain | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Naproxen 375 mg tab. relieves pain, swelling, and stiffness and treats osteoarthritis and rheumatoid arthritis | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Dicyclomine HCl 10 mg caps. treats irritable bowel syndrome | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Duloxetine HCl 60 mg caps. treats depression and anxiety | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

FIGURE 1: Example of Medtable. The patient and provider collaborate to choose times for each medication in the regimen. Modified and reprinted from [27] with permission from Elsevier.

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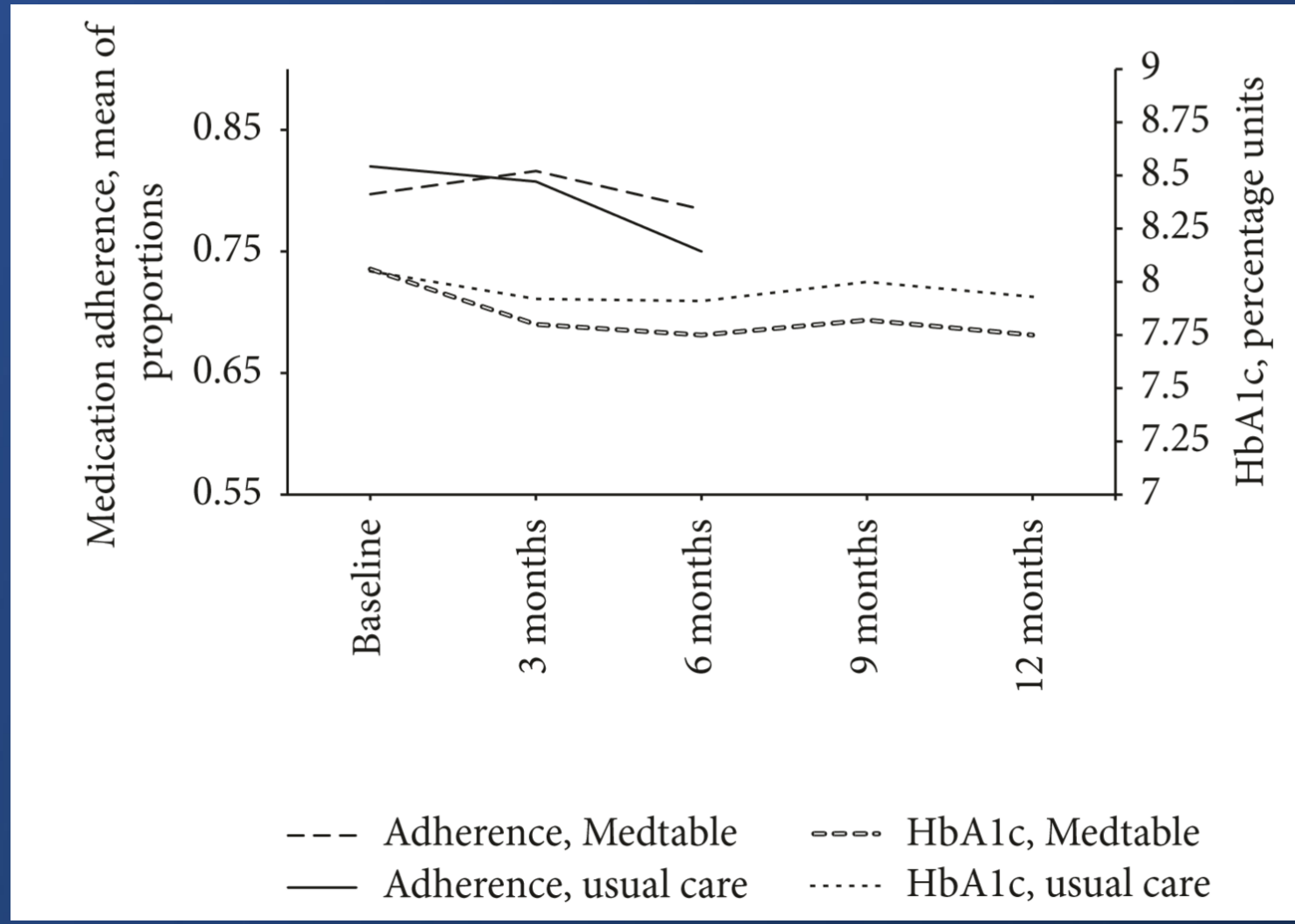
# Effects of a Patient-Provider, Collaborative, Medication-Planning Tool: A Randomized, Controlled Trial

Table 3: Patient-demonstrated knowledge of the medication regimen before and after intervention: Medtable versus usual care.

| | Time | Medtable Mean (SD) | Usual care Mean (SD) | Unadjusted intervention effect (ITT) OR (95% CI) | Unadjusted intervention effect (ITT) $p$ value | Adjusted intervention effect (ITT) OR (95% CI) | Adjusted intervention effect (ITT) $p$ value |
|---|---|---|---|---|---|---|---|
| Combined demonstration knowledge of the regimen for all 4 questions | Baseline, preintervention | 0.86 (0.15) | 0.85 (0.16) | 1.03 (0.88, 1.20) | 0.7320 | 1.03 (0.88, 1.21) | 0.7402 |
| | Immediate, postintervention | 0.86 (0.15) | 0.85 (0.15) | 1.08 (0.92, 1.26) | 0.3560 | 1.09 (0.93, 1.29) | 0.2799 |
| | Month 3 | 0.86 (0.15) | 0.85 (0.15) | 1.07 (0.91, 1.26) | 0.3916 | 1.06 (0.90, 1.25) | 0.4814 |
| | Month 6 | 0.86 (0.14) | 0.86 (0.14) | 1.08 (0.92, 1.27) | 0.3676 | 1.06 (0.90, 1.26) | 0.4763 |
| When compared to the label, the patient demonstrates correct number of pills per dose | Baseline, preintervention | 0.895 (0.131) | 0.90 (0.13) | 0.97 (0.81, 1.17) | 0.7728 | 0.99 (0.82, 1.19) | 0.8971 |
| | Immediate, postintervention | 0.9 (0.131) | 0.90 (0.13) | 1.05 (0.87, 1.26) | 0.6274 | 1.09 (0.90, 1.31) | 0.3880 |
| | Month 3 | 0.90 (0.134) | 0.89 (0.13) | 0.95 (0.79, 1.14) | 0.5549 | 0.95 (0.79, 1.14) | 0.5925 |
| | Month 6 | 0.902 (0.128) | 0.91 (0.119) | 0.99 (0.82, 1.20) | 0.9553 | 1.00 (0.83, 1.22) | 0.9839 |
| When compared to the label, the patient demonstrates correct number of doses per day | Baseline, preintervention | 0.89 (0.13) | 0.88 (0.14) | 1.03 (0.87, 1.23) | 0.7262 | 1.03 (0.86, 1.24) | 0.7093 |
| | Immediate, postintervention | 0.89 (0.126) | 0.88 (0.14) | 1.10 (0.92, 1.32) | 0.2823 | 1.12 (0.93, 1.34) | 0.2448 |
| | Month 3 | 0.90 (0.129) | 0.88 (0.139) | 1.19 (0.99, 1.42) | 0.0622 | 1.18 (0.98, 1.42) | 0.0758 |
| | Month 6 | 0.901 (0.127) | 0.90 (0.126) | 1.12 (0.93, 1.35) | 0.2243 | 1.10 (0.91, 1.33) | 0.3228 |
| The patient demonstrates correct number of pills each day in total | Baseline, preintervention | 0.87 (0.143) | 0.87 (0.147) | 1.04 (0.88, 1.23) | 0.6258 | 1.04 (0.88, 1.23) | 0.6504 |
| | Immediate, postintervention | 0.878 (0.140) | 0.87 (0.14) | 1.06 (0.90, 1.25) | 0.5046 | 1.07 (0.90, 1.27) | 0.4345 |
| | Month 3 | 0.875 (0.136) | 0.87 (0.14) | 1.07 (0.91, 1.27) | 0.4020 | 1.06 (0.90, 1.26) | 0.4883 |
| | Month 6 | 0.880 (0.134) | 0.88 (0.135) | 1.07 (0.90, 1.26) | 0.4623 | 1.05 (0.88, 1.25) | 0.5656 |
| The patient demonstrates correct amount of time (spacing) between doses | Baseline, preintervention | 0.89 (0.130) | 0.88 (0.147) | 1.02 (0.86, 1.21) | 0.8340 | 1.02 (0.85, 1.22) | 0.8082 |
| | Immediate, postintervention | 0.90 (0.126) | 0.88 (0.14) | 1.09 (0.91, 1.30) | 0.3301 | 1.11 (0.93, 1.33) | 0.2611 |
| | Month 3 | 0.90 (0.130) | 0.88 (0.14) | 1.17 (0.98, 1.40) | 0.0855 | 1.17 (0.97, 1.40) | 0.1104 |
| | Month 6 | 0.9 (0.127) | 0.89 (0.126) | 1.12 (0.93, 1.34) | 0.2457 | 1.09 (0.91, 1.32) | 0.3525 |

| | Time | Medtable Mean (SD) | Usual care Mean (SD) | Unadjusted intervention effect (ITT) OR (95% CI) | Unadjusted intervention effect (ITT) $p$ value | Adjusted intervention effect (ITT) OR (95% CI) | Adjusted intervention effect (ITT) $p$ value |
|---|---|---|---|---|---|---|---|
| Combined knowledge of the indication for drugs in the regimen, "what is the medicine for?" | Baseline, preintervention | 0.87 (0.21) | 0.87 (0.20) | 1.04 (0.88, 1.23) | 0.6815 | 1.06 (0.89, 1.27) | 0.4977 |
| | Immediate, postintervention | 0.94 (0.12) | 0.88 (0.19) | 2.22 (1.80, 2.74) | <0.0001 | 2.32 (1.86, 2.88) | <0.0001 |
| | Month 3 | 0.95 (0.12) | 0.88 (0.19) | 2.34 (1.88, 2.91) | <0.0001 | 2.45 (1.95, 3.09) | <0.0001 |
| | Month 6 | 0.96 (0.09) | 0.91 (0.17) | 2.35 (1.86, 2.98) | <0.0001 | 2.53 (1.97, 3.25) | <0.0001 |

# Effects of a Patient-Provider, Collaborative, Medication-Planning Tool: A Randomized, Controlled Trial

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# UIC Med Table

**University of Illinois Hospital & Health Sciences System**

## HOME MEDICINE LIST

****THIS IS NOT A PRESCRIPTION****

[redacted] **DOB:** [redacted] **Age:** 59 Years **Sex:** FEMALE **MRN:** [redacted]

**Address:** [redacted] CHICAGO, IL 60607
**Phone**
**Allergic To:** No Medicines

**PCP:** Falck MD, Suzanne
**Creatinine Clearance:** 77.9 (05/21/2014)

This is a list of your medicines according to the University of Illinois electronic medical record. If changes were made to this list during your visit today, those changes may not show up in this list. Please draw a line through any medicines that you are no longer taking. Please add any medicines that you are taking in the blank spaces at the bottom. This will be your current medication list. Always carry your medicine record with you and show it to all your doctors, pharmacists and other healthcare providers.

| Medicine | | | When do I take it? | | | | As Needed? | Before Food? | Special Instructions/Notes |
|---|---|---|---|---|---|---|---|---|---|
| Name | For What | Dose/Route | Morning | Noon | Evening | Bedtime | | | |
| albuterol CFC free 90 mcg/inh inhalation aerosol | | 1 puff by inhalation every six hours | 1 puff | 1 puff | 1 puff | 1 puff | YES | | |
| albuterol HFA 90 mcg/inh inhalation aerosol | | 2 puff by inhalation every 6 hours | X | X | X | X | YES | | |
| aspirin 81 mg oral enteric coated tablet | | 81 mg by mouth every day | 1 tab | | | | | | |
| atorvastatin 80 mg oral tablet | High cholesterol | 80 mg by mouth every day | 1 tab | | | | | | Take when you run out of Crestor. Do not take at same time as Crestor. |
| blood presure cuff. Diagnosis: Hypertension, Diabetes | | | | | | | | | DAILY |
| clindamycin topical 1% lotion | | Apply 1 appl to the affected area every day | 1 appl | | | | | | affected area on back |
| Crestor 40 mg oral tablet | High cholesterol | 40 mg by mouth every day | 1 tab | | | | | | |
| Diovan 160 mg oral tablet | High Blood Pressure | | | | | | | | TAKE ONE TABLET BY MOUTH TWO TIMES A DAY |
| diphenhydrAMINE 25 mg oral capsule | | 25 mg by mouth three times a day | 1 cap | 1 cap | | 1 cap | YES | | |
| Estrace Vaginal Cream 0.1 mg/g | | | | | | | | | (take for 21 days, withhold for 7 days, then repeat cycle) |

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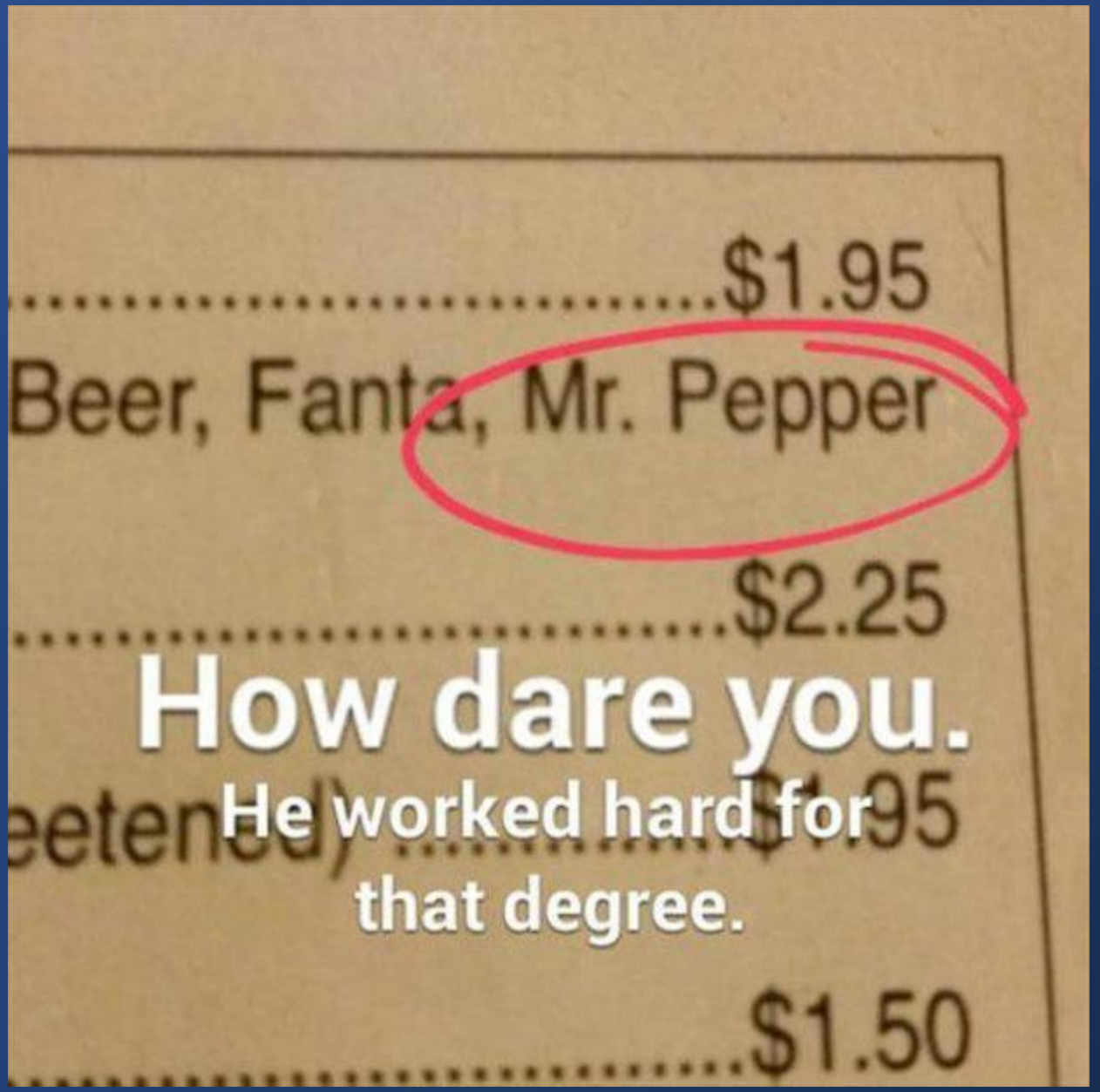
A primary care, electronic health record-based strategy to promote safe drug use: study protocol for a randomized controlled trial

Kamila Przytula[1], Stacy Cooper Bailey[2], William L Galanter[3,4], Bruce L Lambert[5], Neeha Shrestha[4], Carolyn Dickens[6], Suzanne Falck[3] and Michael S Wolf[1*]


$1.95
Beer, Fanta, Mr. Pepper
$2.25
How dare you.
He worked hard for
that degree.
$1.50

# Patient Portals

## Who uses them? What features do they use? And do they reduce hospital readmissions?

Ashley Griffin[1]; Asheley Skinner[1]; Jonathan Thornhill[2]; Morris Weinberger[1,3]


## Objectives

- Identify patient characteristics associated with portal use
- Determine which common patient portal features are commonly used
- Examine whether the level of use (non-use, light use, active) is associated with 30-day readmission

## Methods

- Looked at discharged AMI, CHF, or PNA patients and corresponding portal usage classification
- Logistic regression to predict whether portal use was associated with 30-day readmission

Appl Clin Inform. 2016 Jun 6;7(2):489-501. doi: 10.4338/ACI-2016-01-RA-0003. eCollection 2016.
PMID: 27437056


# Portals and Readmission…

Results

- ~3k patients
- 83% non-use, 9% light use, 8% active use
- **For patients who were active users the odds of being readmitted within 30 days was 66% greater than non-users**

Discussion

- Vast majority of patients invited (given a code) did not use it (sound familiar?)
- **Patients using the portal were older, sicker**, and more likely Caucasian than non-users
- Consistent with prior studies showing that healthy patients, patients less than 35 years, and ethnic minorities are least likely to use portals

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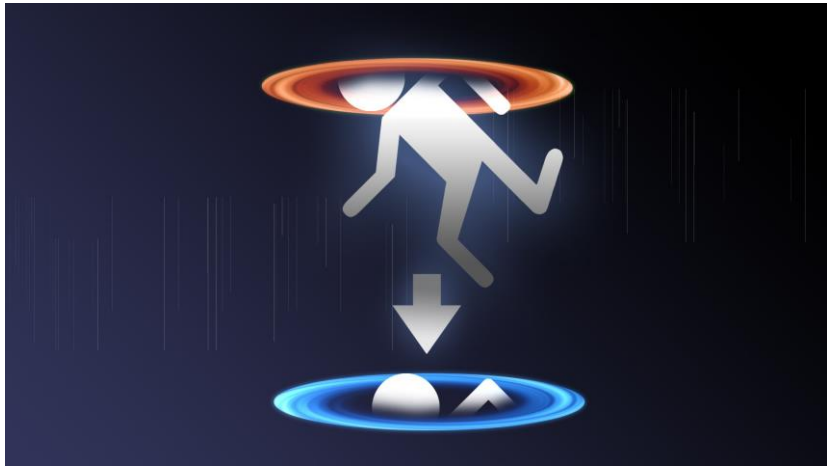
Appl Clin Inform. 2016 Jun 6;7(2):489-501. doi: 10.4338/ACI-2016-01-RA-0003. eCollection 2016.
PMID: 27437056

myUNC Chart™
YOUR HEALTH CARE. ONLINE. ALL THE TIME.


# Portals and Readmissions…

- Do sicker patients have more interactions to be sold on the utility of the portal and hence use it more?
- Were these readmissions going to happen regardless of portal use?
- *What would happen if we sprinkled in Open Notes? (my idea….)*

- "More study is needed"



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Appl Clin Inform. 2016 Jun 6;7(2):489-501. doi: 10.4338/ACI-2016-01-RA-0003. eCollection 2016.
PMID: 27437056

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shm Journal of HOSPITAL MEDICINE www.journalofhospitalmedicine.com

ORIGINAL RESEARCH

# Safety Analysis of Proposed Data-Driven Physiologic Alarm Parameters for Hospitalized Children

Veena V. Goel, MD[1,2*], Sarah F. Poole, BS[3], Christopher A. Longhurst, MD, MS[4,5], Terry S. Platchek, MD[1,6], Natalie M. Pageler, MD, MEd[2,7], Paul J. Sharek, MD, MPH[1,8], Jonathan P. Palma, MD, MS[2,9]


- Cross-sectional study of children at LPCH
- Cerner / Philips Monitors
- Extracted vitals for 15 months of data (HR and RR) that had fed Cerner via BMDI
- Excluded ICU and physiological implausible vital signs
- 5th to 95th percentile limits locally selected as alarm parameters

- Retrospective manual chart review and analysis of RRT events for the past 15 months

**TABLE 2.** Indications for RRT and CRA Events in Patients Not Detected by Data-Driven HR and RR Parameters

| Indication for event | Patient Age |
|---|---|
| 1. Desaturation and apnea | 10 months |
| 2. Hyperammonemia (abnormal lab result) | 5 years |
| 3. Acute hematemesis | 16 years |
| 4. Lightheadedness, feeling faint | 17 years |
| 5. Desaturation with significant oxygen requirement | 17 years |
| 6. Desaturation with significant oxygen requirement | 17 years |
| 7. Patient stated difficulty breathing | 18 years |
| 8. Difficulty breathing (anaphylactic shock)* | 18 years |

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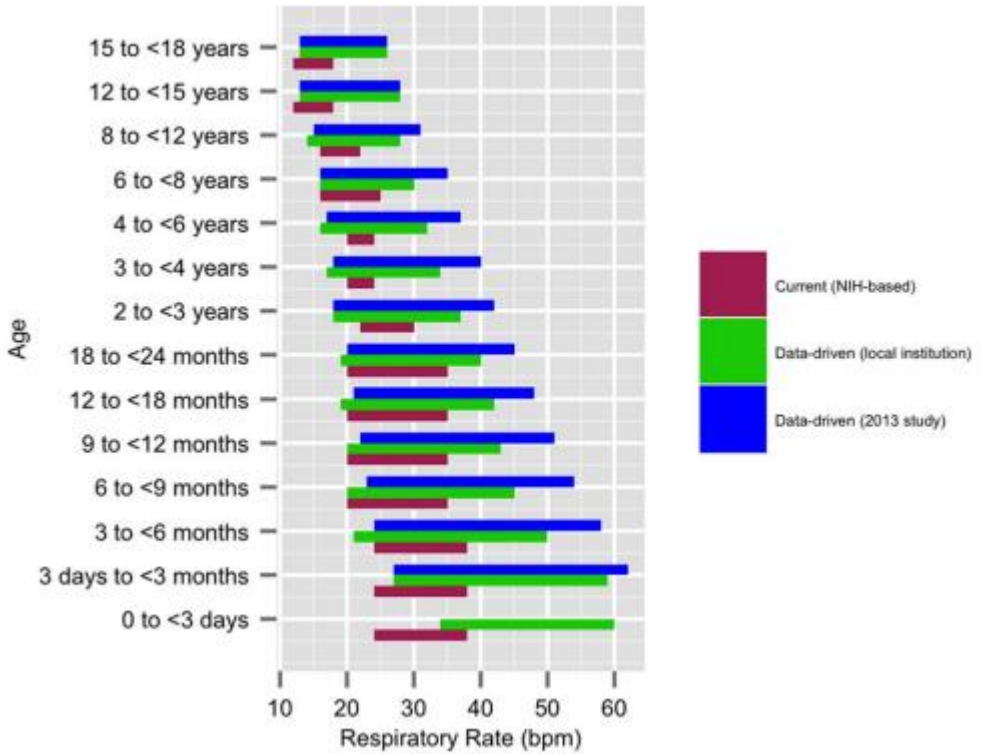
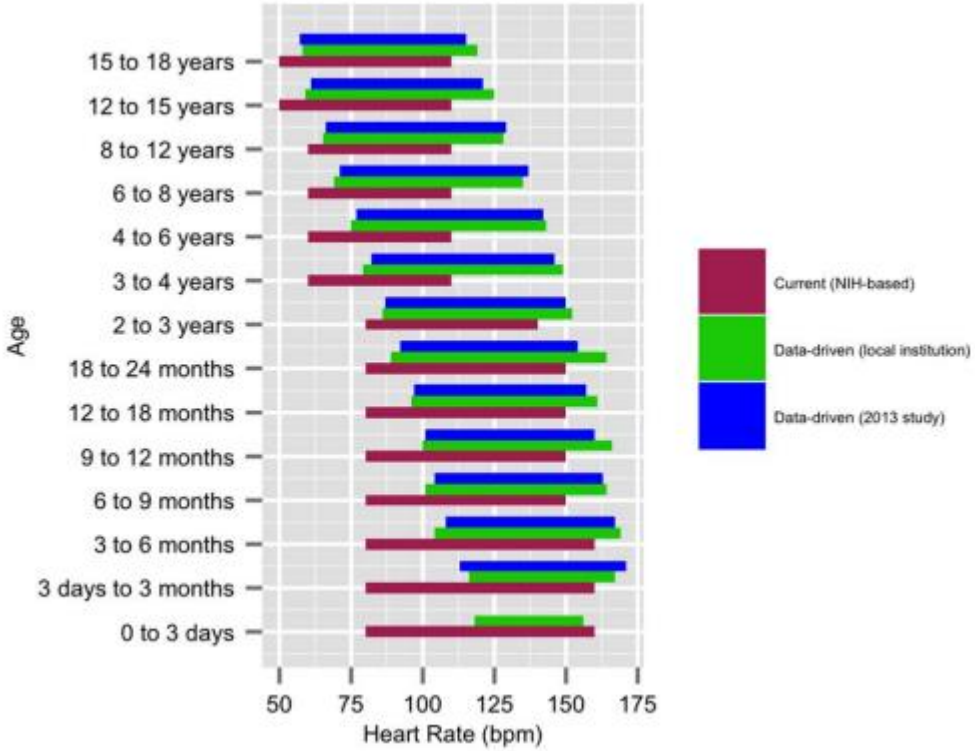
J Hosp Med. 2016 Dec;11(12):817-823. doi: 10.1002/jhm.2635. Epub 2016 Jul 14.

# Alarm Fatigue - Visualized




J Hosp Med. 2016 Dec;11(12):817-823. doi: 10.1002/jhm.2635.
Epub 2016 Jul 14.


# Alert Fatigue Results

- There were 55.6% fewer out-of-range measurements using data driven vital sign limits
- Basically there would have been no change in RRT response using these data driven parameters (RRT was involved by other vital sign abnormalities or clinical context)

"By decreasing the quantity of out-of-range vital sign values while preserving the ability to detect patient deterioration, data-driven vital sign alarm limits have the potential to decrease false monitor alarms, alarm generated noise, and alarm fatigue."

J Hosp Med. 2016 Dec;11(12):817-823. doi: 10.1002/jhm.2635. Epub 2016 Jul 14.

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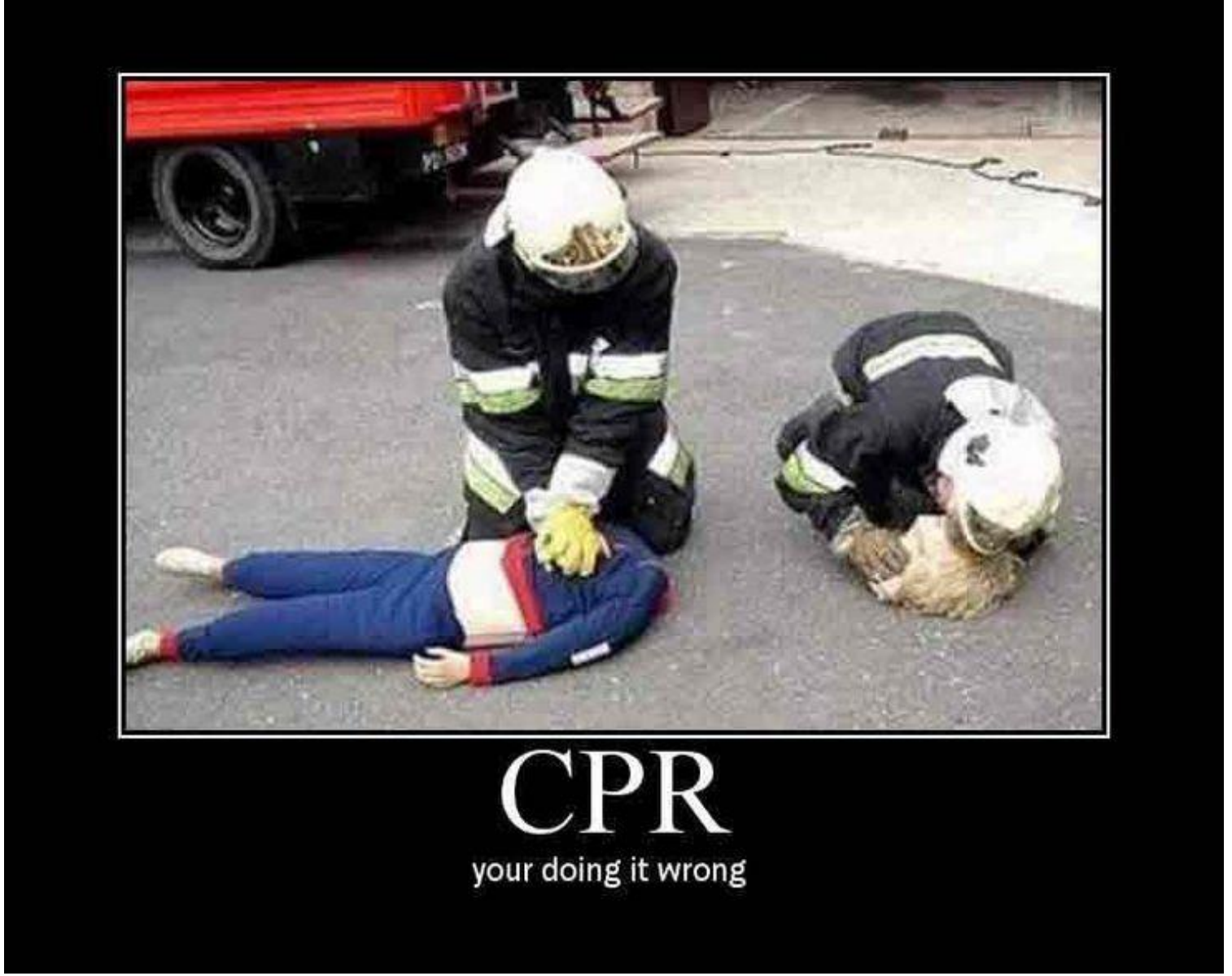


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# A national survey assessing the number of records allowed open in electronic health records at hospitals and ambulatory sites

Jason S Adelman,[1,2,3] Matthew A Berger,[4] Amisha Rai,[3] William L Galanter,[5] Bruce L Lambert,[6] Gordon D Schiff,[7] David K Vawdrey,[2,3] Robert A Green,[2,3] Hojjat Salmasian,[2,3] Ross Koppel,[8] Clyde B Schechter,[9] Jo R Applebaum,[3] and William N Southern[10]

**Table 1.** Organization-configured number of records allowed open in EHR systems vendor-designed to open multiple records at once

| Study facilities | Unrestricted (≥3 records) (%) | Restricted (1 record) (%) | Hedged (2 records) (%) | Total EHRs |
|---|---|---|---|---|
| Inpatient | 38 (41.8) | 37 (40.7) | 16 (17.6) | 91 |
| Outpatient | 36 (47.4) | 27 (35.5) | 13 (17.1) | 76 |
| Overall | 74 (44.3) | 64 (38.3) | 29 (17.4) | 167 |

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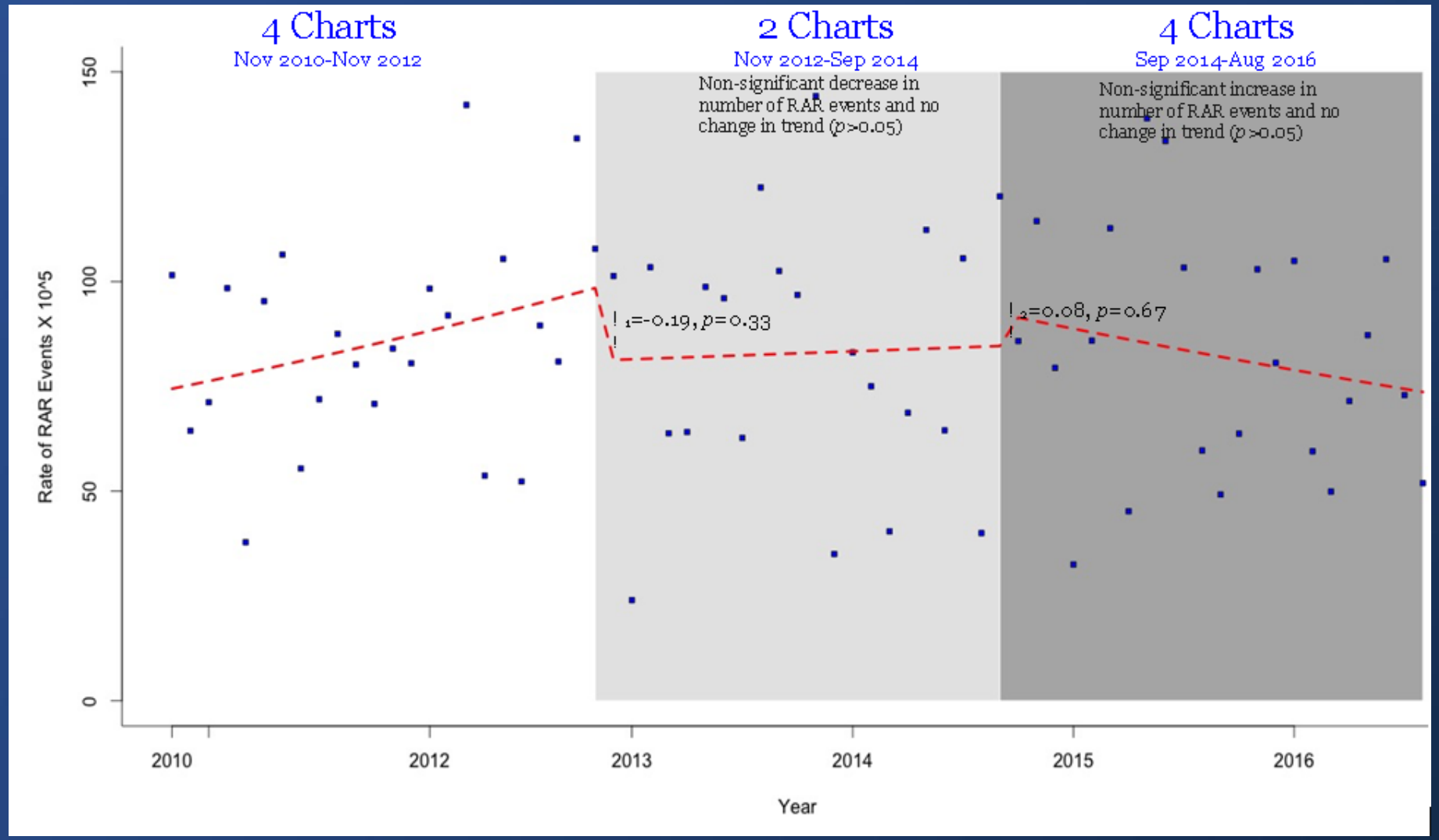
# Retract and Reorder Events in the UIH ED as a surrogate of wrong patient errors

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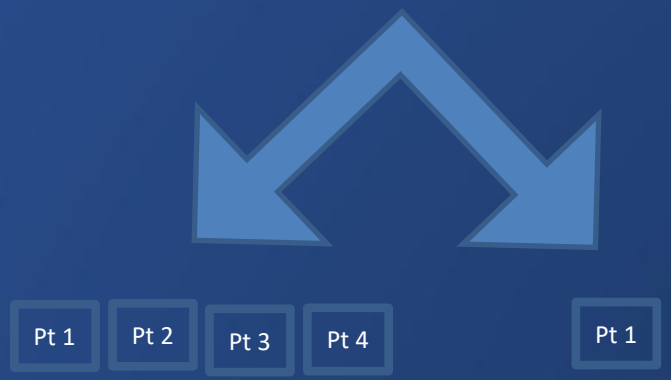
**Publication Pending**

# Pending Study on the # of charts

**Adelman et al.**

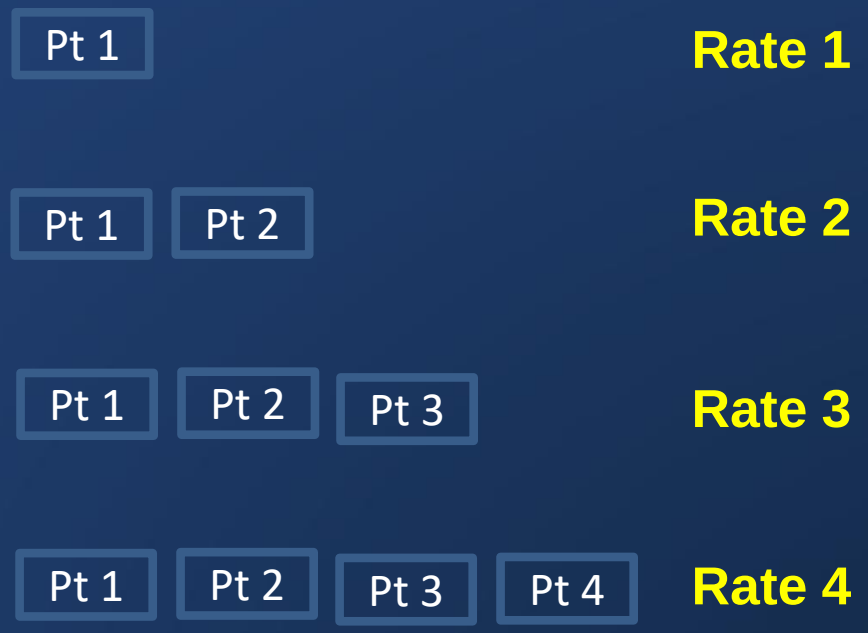
Does setting at 1 chart open maximum produce less intercepted wrong patient ordering errors than setting at 4 charts open maximum?




**Rate 4** **Rate 1**

2-Site RCT (crossover) ED, Inpatient, Ambulatory

Is the # of charts open associated with the likelihood of intercepted wrong patient ordering errors?

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Original Paper

# Mortality Benefit of a Fourth-Generation Synchronous Telehealth Program for the Management of Chronic Cardiovascular Disease: A Longitudinal Study

Chi-Sheng Hung[1], MD, PhD; Jiun-Yu Yu[2], PhD; Yen-Hung Lin[3], MD, PhD; Ying-Hsien Chen[1], MD; Ching-Chang Huang[1], MD; Jen-Kuang Lee[1], MD; Pao-Yu Chuang[4]; Yi-Lwun Ho[1], MD, PhD; Ming-Fong Chen[3], MD, PhD

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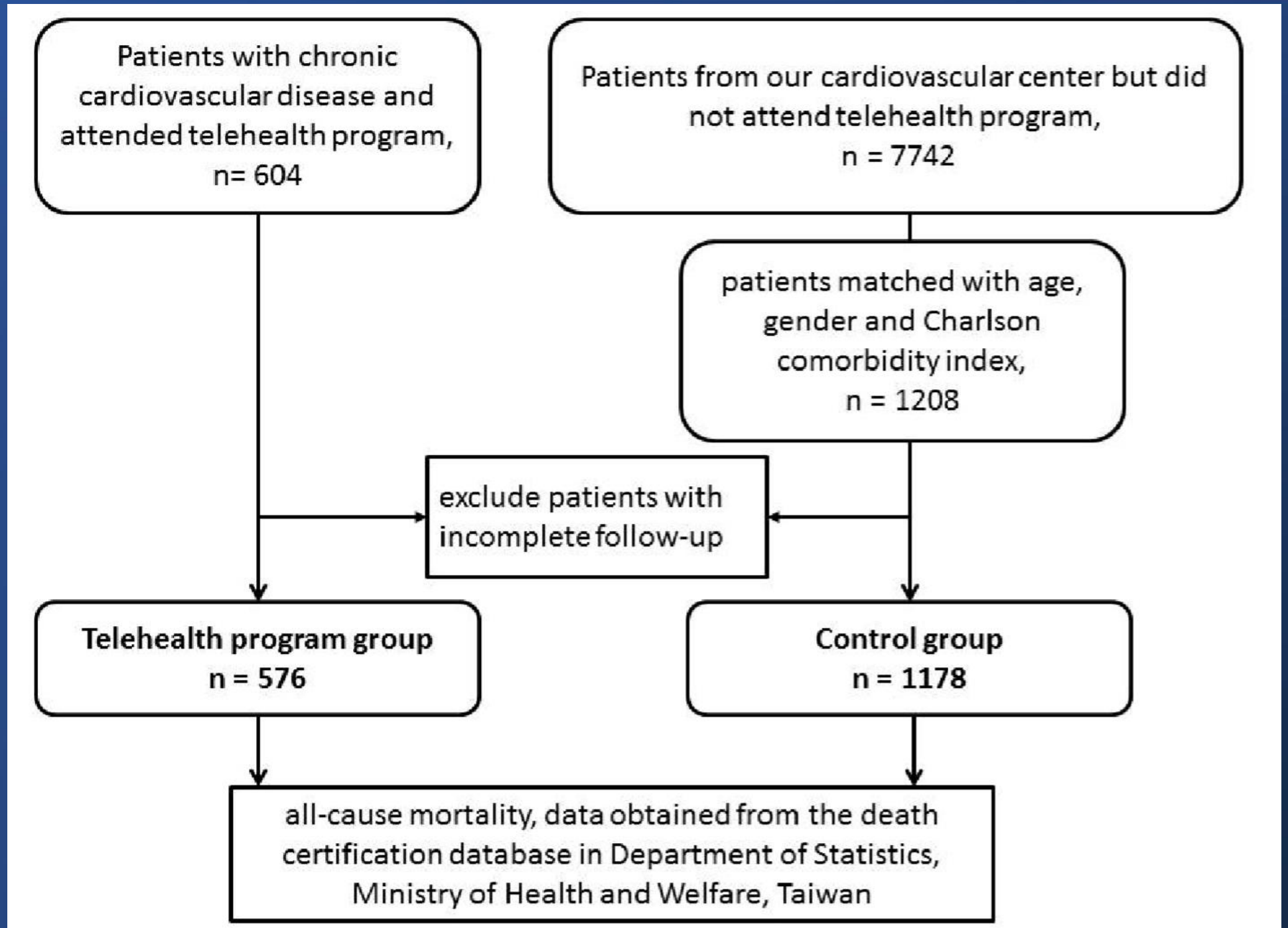

Patients with chronic cardiovascular disease and attended telehealth program, n= 604
Patients from our cardiovascular center but did not attend telehealth program, n = 7742
patients matched with age, gender and Charlson comorbidity index, n = 1208
exclude patients with incomplete follow-up
Telehealth program group n = 576
Control group n = 1178
all-cause mortality, data obtained from the death certification database in Department of Statistics, Ministry of Health and Welfare, Taiwan

# Mortality Benefit of a Fourth-Generation Synchronous Telehealth Program for the Management of Chronic Cardiovascular Disease: A Longitudinal Study

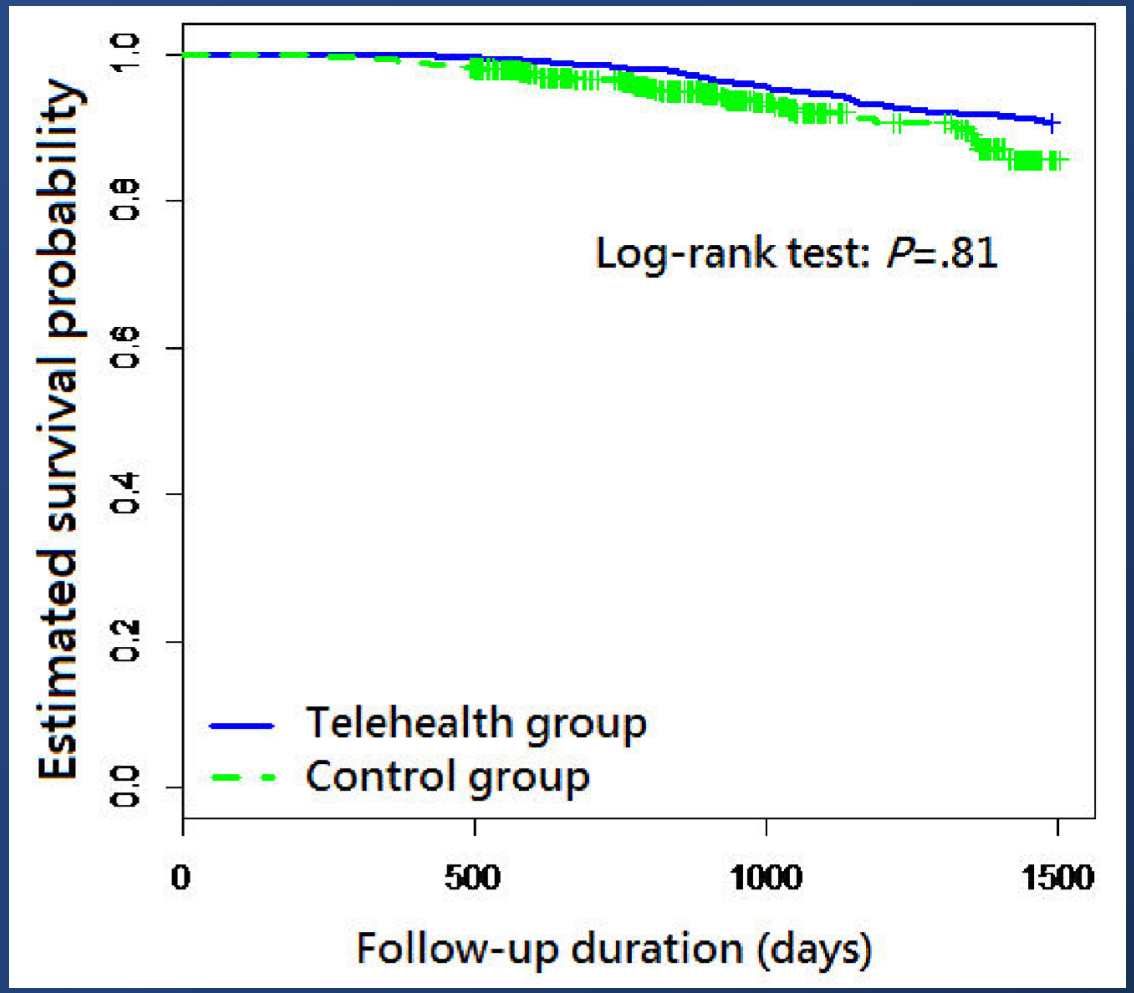
Synchronized and integrated remote management program for chronic diseases.

(1) biometric data, including single-lead electrocardiography, blood pressure, heart rate, and oximetry, are transferred from patients to our telehealth center daily and on-demand;

(2) nurse case managers telephone patients daily and on-demand for communication and health promotion

(3) full-time nurse case managers and cardiologists are in charge of care 24 hours a day.

# Mortality Benefit of a Fourth-Generation Synchronous Telehealth Program for the Management of Chronic Cardiovascular Disease: A Longitudinal Study



# Effect of a Web-Based Guided Self-help Intervention for Prevention of Major Depression in Adults With Subthreshold Depression

## A Randomized Clinical Trial

Claudia Buntrock, MSc; David Daniel Ebert, PhD; Dirk Lehr, PhD; Filip Smit, PhD; Heleen Riper, PhD; Matthias Berking, PhD; Pim Cuijpers, PhD

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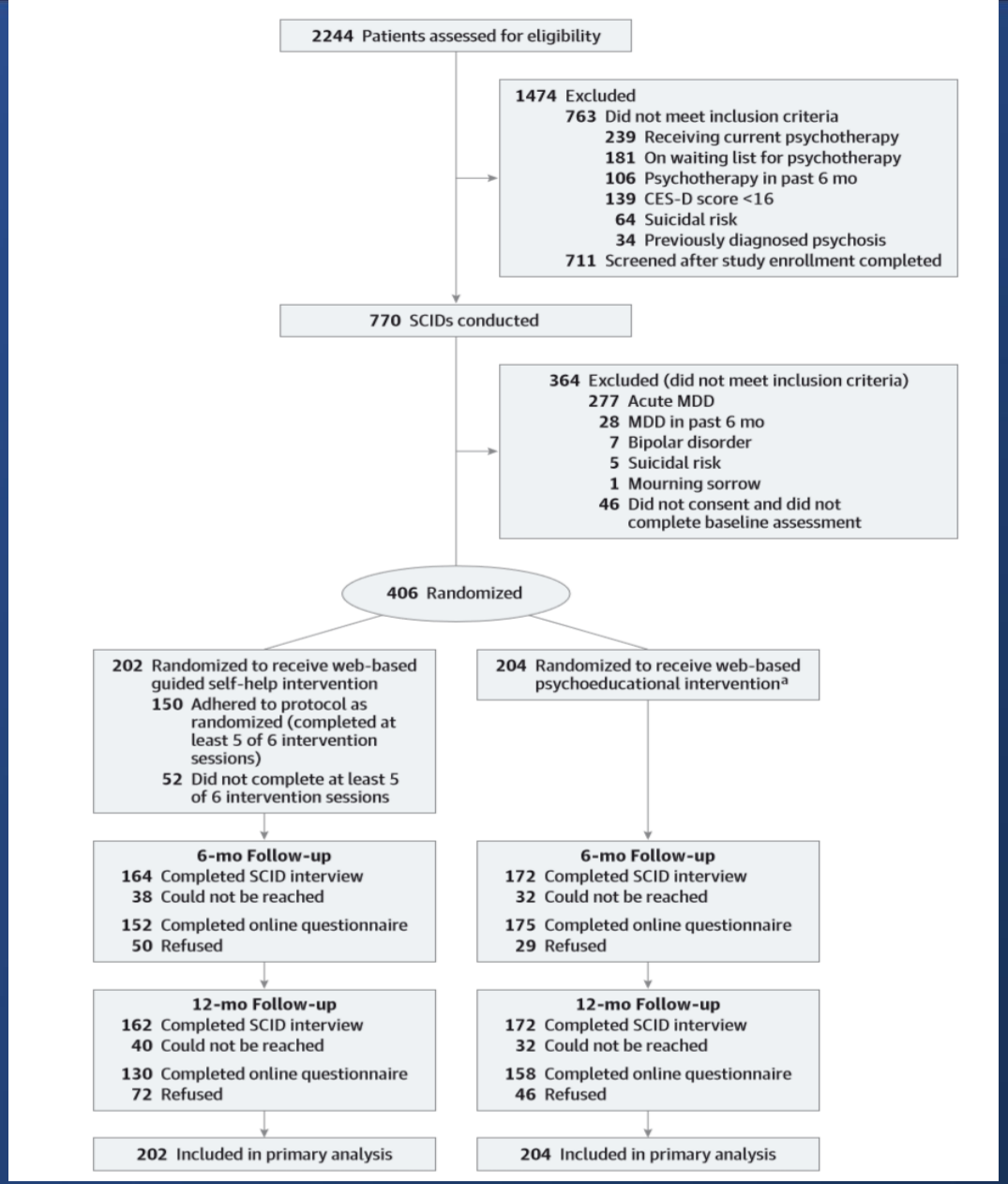
JAMA May 3, 2016 Volume 315, Number 17

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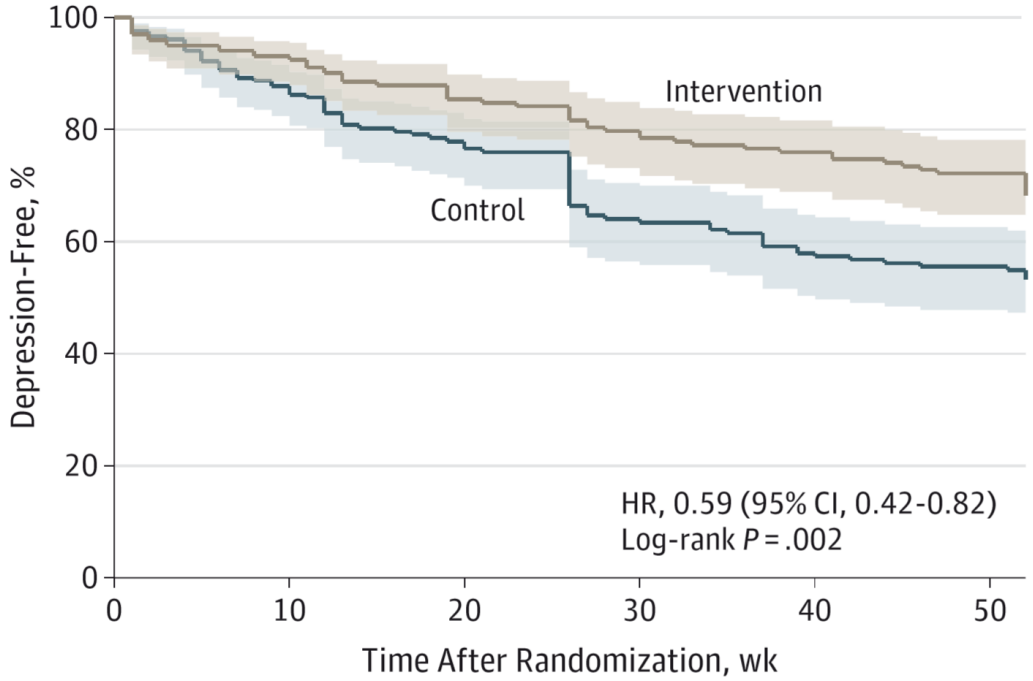
# Effect of a Web-Based Guided Self-help Intervention for Prevention of Major Depression in Adults With Subthreshold Depression

Figure 2. Kaplan-Meier Survival Estimates of Time to Onset of Major Depressive Disorder by Study Group

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**Report: 55% of Time Spent in Front of EHRs, Other 45% Spent Cursing at EHRs**

By Dr. 99

Transition Comedy Slide

| COMPANY | EHR | ADMIN'S TAKE | NURSES' TAKE | DOCTORS' TAKE |
|---|---|---|---|---|
| Cerner Corporation | PowerChart | Fantastic! | Sucks | Sucks |
| Epic Systems Corporation | EpicCare | Fantastic! | Sucks | Sucks |
| Allscripts | Allscripts | Fantastic! | Sucks | Sucks |
| NextGen Healthcare Information Systems Inc. | NextGen | Fantastic! | Sucks | Sucks |
| athenahealth | athenaClinicals | Fantastic! | Sucks | Sucks |
| GE Healthcare | Centricity | Fantastic! | Sucks | Sucks |
| eClinicalWorks | eClinicalWorks | Fantastic! | Sucks | Sucks |
| McKesson | iKnowMed EHR | Fantastic! | Sucks | Sucks |
| Abraxas Medical Solutions (Merge Healthcare) | iConnect Network | Fantastic! | Sucks | Sucks |

# National trends in safety performance of electronic health record systems in children's hospitals

RECEIVED 1 June 2016
REVISED 8 August 2016
ACCEPTED 15 August 2016

Juan D Chaparro,[1] David C Classen,[2] Melissa Danforth,[3] David C Stockwell,[4] and Christopher A Longhurst[5]


- Study of Pediatric hospitals CPOE and CDS safety utilizing data from the Leapfrog Simulation
- 41 hospitals (pure Peds and mixed)
- Also included longitudinal analysis of Leapfrog performance

| | Category | Description |
|---|---|---|
| Basic decision support | Drug-drug interactions | Medication that results in known dangerous interaction when administered in combination with another medication in a new or existing order for the patient |
| | Allergies and cross-allergies | Medication for which patient allergy or allergy to other drugs in same category has been documented |
| | Therapeutic duplication | Medication with therapeutic overlap with another new or active order; may be same drug or within drug class, or involve components of combination products |
| | Inappropriate single dose | Medication with a specified dose that exceeds recommended dose ranges |
| | Contraindicated route of administration | Order specifying a route of administration (eg, oral, intramuscular, intravenous) not appropriate for the identified medication |
| Advanced decision support | Contraindication/dose limits based on patient diagnosis | Medication either contraindicated based on patient diagnosis or diagnosis affects appropriate dosing |
| | Contraindication/dose limits based on laboratory studies | Medication either contraindicated for this patient based on laboratory studies or for which relevant laboratory results must be considered in appropriate dosing |
| | Cost of care in redundant testing | Laboratory test that duplicates a service within a time frame in which there are typically minimal benefits from repeating the test |
| | Monitoring | Intervention that requires an associated or secondary order to meet the standard of care (eg, prompt to order drug levels during medication ordering) |
| | Inappropriate cumulative (daily) dose | Medication for which a shortened dosing interval or repeated doses can lead to exceeding recommended daily dose limit |
| | Nuisance order | Order with such a mild or typically inconsequential interaction that clinicians typically ignore the advice provided; scoring is based on not causing an alert to be displayed for these orders |

VCU Health

Chaparro JD, et al. J Am Med Inform Assoc 2016;0:1–8.
doi:10.1093/jamia/ocw134, Research and Applications

SYSTEMATIC REVIEW

# Peds Hospitals, CPOE, CDS, and Leapfrog… Oh My

Table 3: Overall scores and scores by category for last evaluation performed ($n = 41$)

| Decision support categories | Mean percent detected (95% confidence interval) |
|---|---|
| Basic decision support | |
| Drug-drug interactions | 60.1 (50.5–69.8) |
| Allergies and cross-allergies | 99.2 (98.0–100) |
| Therapeutic duplication | 52.0 (39.3–64.6) |
| Inappropriate single dose | 81.1 (72.7–89.5) |
| Contraindicated route of administration | 70.8 (61.2–80.5) |
| Advanced decision support | |
| Contraindication/dose limits based on patient diagnosis | 28.9 (17.0–40.7) |
| Contraindication/dose limits based on other laboratory studies | 56.1 (46.0–66.2) |
| Cost of care | 35.4 (22.0–48.7) |
| Monitoring | 38.0 (26.8–49.2) |
| Inappropriate cumulative (daily) dose | 70.2 (60.8–79.6) |
| Nuisance order | 39.0 (28.1–49.9) |

- Pediatric computerized physician order entry (CPOE) systems on average are able to intercept a majority of potential medication errors
- This varies widely among implementations
- Prospective and repeated testing using the Leapfrog Group's evaluation tool is associated with **improved ability** to intercept potential medication errors.

Chaparro JD, et al. J Am Med Inform Assoc 2016;0:1–8.
doi:10.1093/jamia/ocw134, Research and Applications

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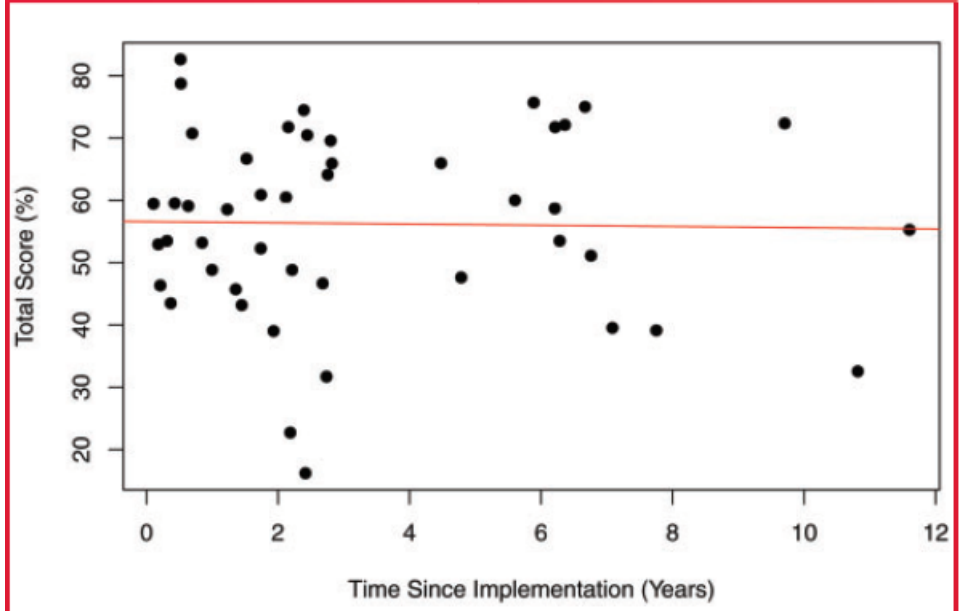
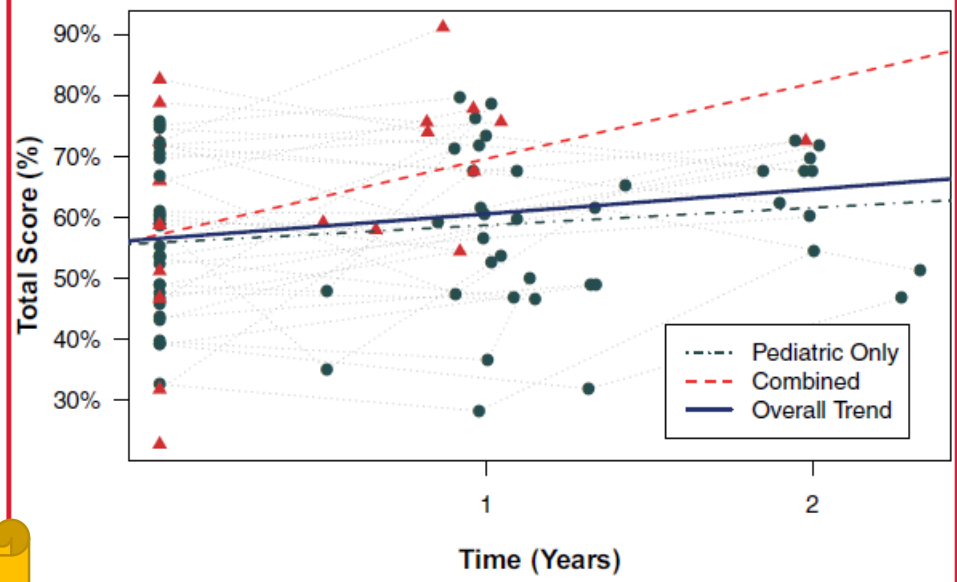
SYSTEMATIC REVIEW

**Figure 5.** Total score on initial testing as a function of time since implementation of computerized physician order entry system.




Taking the test once and then again does influence your ability to improve on the score

**Figure 6:** Longitudinal trends of overall test scores relative to initial test date (time zero). "Pediatric" (circles) refers to pediatric-only institutions, and "combined" (triangles) refers to pediatric hospitals within adult institutions.




- Time from initial go-live doesn't really affect your Leapfrog score, but…..

Conclusion – take the damn test, it will make you better

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Review

Applied Clinical Informatics 12

# Safe Practices for Copy and Paste in the EHR

## Systematic Review, Recommendations, and Novel Model for Health IT Collaboration

Amy Y. Tsou[1,2]; Christoph U. Lehmann[3]; Jeremy Michel[1,4,5]; Ronni Solomon[1]; Lorraine Possanza[1]; Tejal Gandhi[6,7]

SYSTEMATIC REVIEW

- A workgroup consolidating prior literature as well as recommendations from leading groups (for example – the AMDIS group from 2013 – thanks Shoolin)
- Points out responsibilities for authors, organizations, and EHR developers
- Prevalence of copy/paste; the good of copy/paste; and the evil….

- Goal of coming up with recommendations for copy/paste practices


Appl Clin Inform. 2017 Jan 11;8(1):12-34. doi: 10.4338/ACI-2016-09-R-0150.

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# Why does copy/paste matter?

Patient was discharged from the emergency room after a new diagnosis of atrial fibrillation and potential heart disease; he was instructed to follow up with his primary care physician (PCP) for a stress test.

However, **the PCP failed to diagnose cardiac disease and copied and had pasted the A/P over 12 office visits during the next 2 years.** The patient died from a heart attack and the physician was found liable in the death

An infant was seen for fever, rash, and fussiness. The initial EHR note documented no history of tuberculosis (TB) exposure, despite the infant's recent travel to a TB endemic country.

Successive office visits propagated this erroneous negative exposure to TB using copy and paste for two weeks until the **child was diagnosed with TB meningitis in the emergency room and left with significant residual deficits**

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Appl Clin Inform. 2017 Jan 11;8(1):12-34. doi: 10.4338/ACI-2016-09-R-0150.


# Prevalence

- 66-90% admit to utilizing copy/paste
- But…. 80% of physicians agree that copy/paste improves efficiency and should continue
- Copy/paste contributes to 2.6% of all errors (Singh et al)

# Adverse Events?

1. Facilitating introduction of new inaccuracies
2. Accelerating propagation of inaccurate information
3. Promoting creation of internally inconsistent notes
4. Generating lengthy notes that may obscure important clinical information (“note bloat”)

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Appl Clin Inform. 2017 Jan 11;8(1):12-34. doi: 10.4338/ACI-2016-09-R-0150.

# Copy/Paste - Recommendations – 2 ½ for the vendor / 1 ½ on us

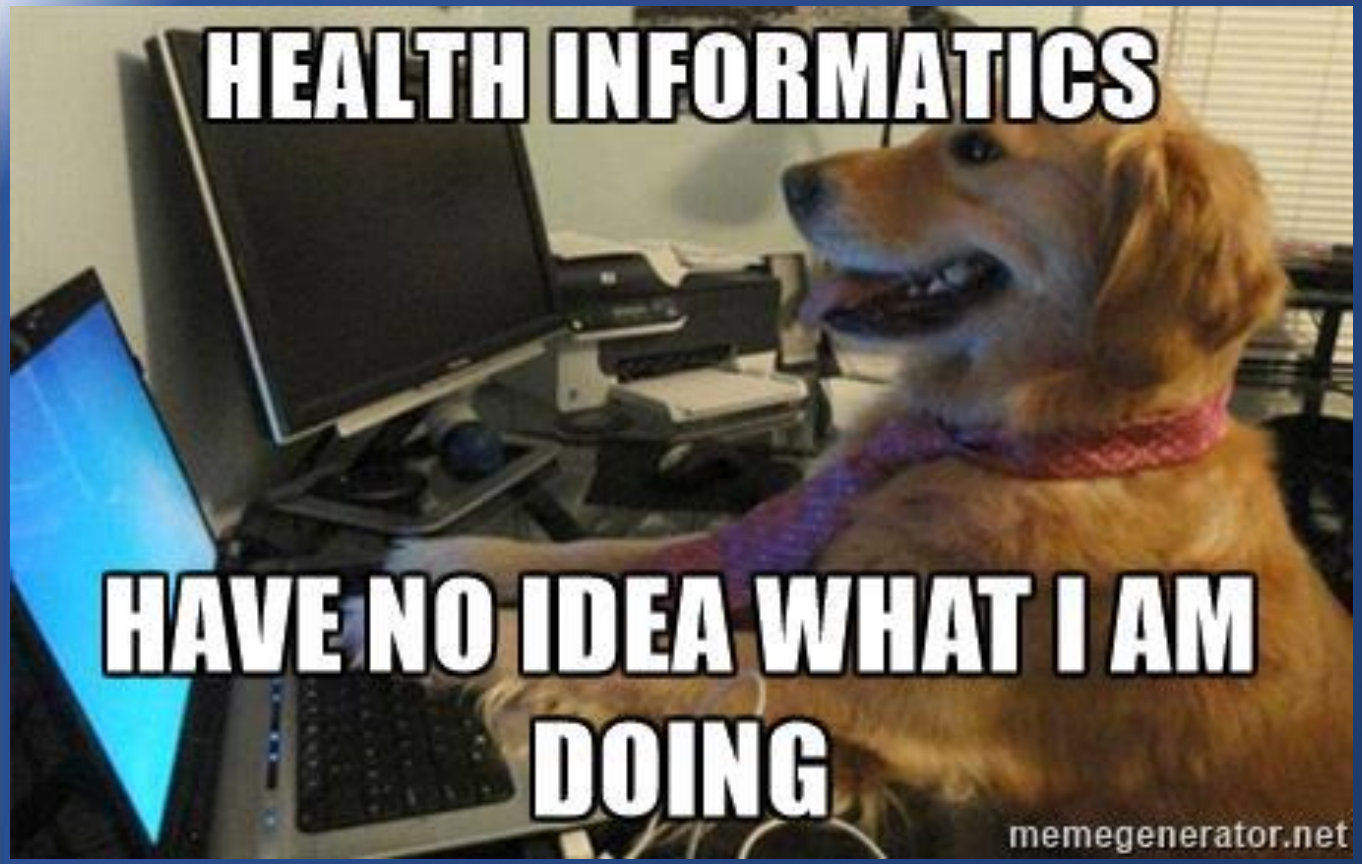
1) Provide a mechanism to make copy and paste material easily identifiable – ***tighten up vendors***

2) Ensure the provenance of copy and paste material is readily available – ***yup, vendors***

3) Ensure adequate staff training and education –***that's on us***

4) Ensure copy and paste practices are regularly monitored, measured, and assessed – ***us (? HIM) and maybe the vendors***


Appl Clin Inform. 2017 Jan 11;8(1):12-34. doi: 10.4338/ACI-2016-09-R-0150.





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Research and Applications

# Learning from errors: analysis of medication order voiding in CPOE systems

Thomas G Kannampallil,[1] Joanna Abraham,[2] Anna Solotskaya,[3] Sneha G Philip,[3] Bruce L Lambert,[4] Gordon D Schiff,[5] Adam Wright,[5] and William L Galanter[3,6]

I did not know Banas was going to do this…..

J Am Med Inform Assoc. 2017 Feb 19. doi: 10.1093/jamia/ocw187. [Epub ahead of print]

# Learning from errors: analysis of medication order voiding in CPOE systems

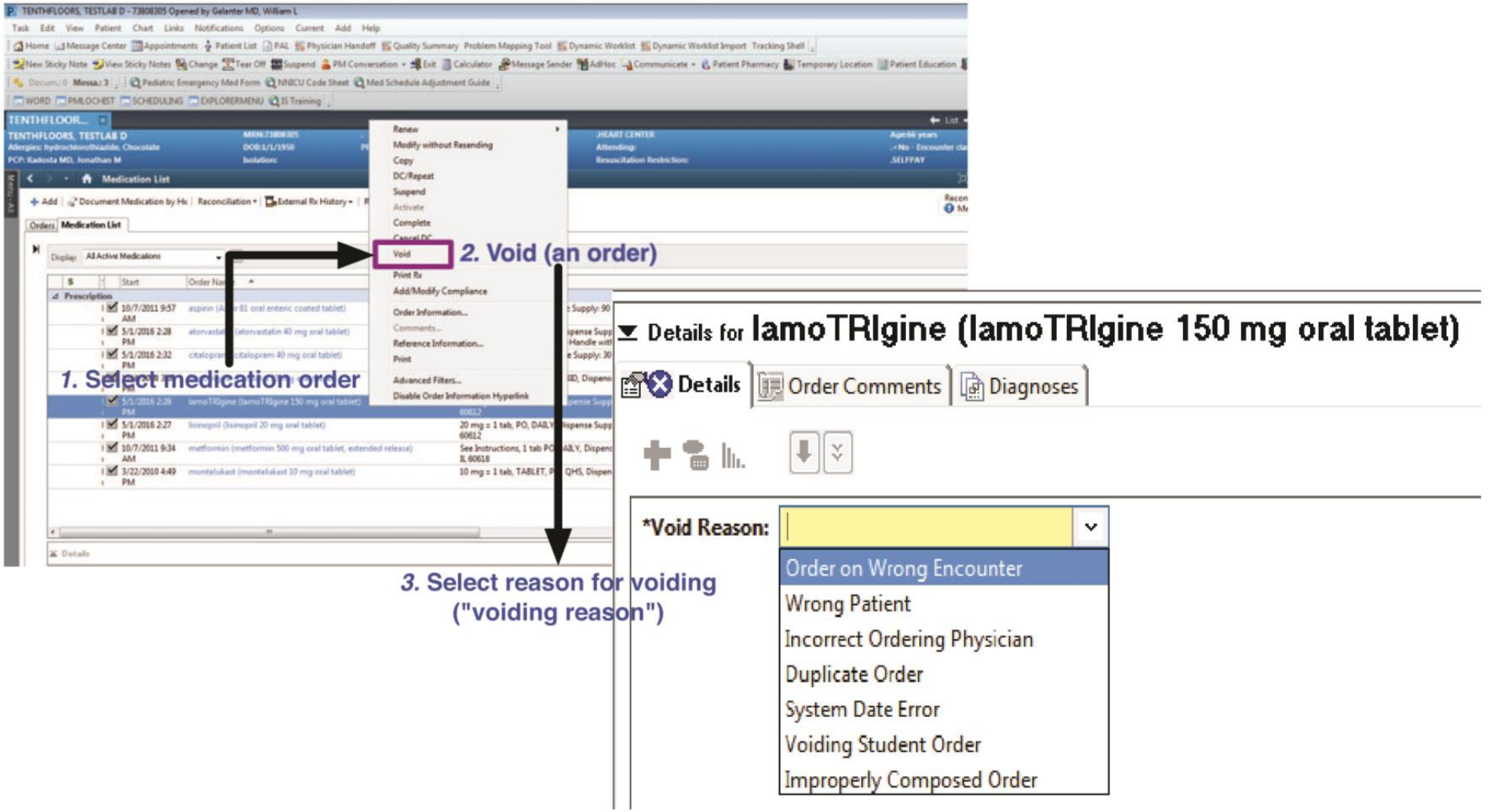


**Figure 1.** Clinical workflow of the medication order voiding process within the study site implementation of Cerner; the presented case is for a test patient.

J Am Med Inform Assoc. 2017 Feb 19. doi: 10.1093/jamia/ocw187. [Epub ahead of print]

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Thomas G Kannampallil,[1] Joanna Abraham,[2] Anna Solotskaya,[3] Sneha G Philip,[3] Bruce L Lambert,[4] Gordon D Schiff,[5] Adam Wright,[5] and William L Galanter[3,6]

**Table 4.** Proportion of medication ordering errors for clinician-provided reasons and actual reasons for order voiding

| Clinician-Provided Reason for Voiding | *N* | Proportion of Medication Ordering Error (±SEP) (%) | Corresponding Actual Reason for Medication Ordering Error (Based on Chart Review) | Proportion of Medication Ordering Error (± SEP) |
|---|---|---|---|---|
| Duplicate order | 25 | 72 ± 9 | Duplicate order | 72 ± 9% |
| Incorrect ordering physician | 25 | 76 ± 9 | Incorrect ordering physician | 12 ± 6% |
| Order on wrong encounter | 24 | 79 ± 8 | Order on wrong encounter | 8 ± 6% |
| Wrong patient | 25 | 100 | Wrong patient | 48 ± 10% |
| Improperly composed order | 25 | 80 ± 8 | Wrong route/dose/schedule/ strength | 48 ± 10% |
| System date error | 24 | 75 ± 9 | Not applicable | NA |
| Voiding student order | 25 | 80 ± 8 | NA | NA |
| No reason given | 25 | 52 ± 10 | NA | NA |

**PPV 70±10%**

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J Am Med Inform Assoc. 2017 Feb 19. doi: 10.1093/jamia/ocw187. [Epub ahead of print]

Contents lists available at ScienceDirect

International Journal of Medical Informatics

journal homepage: www.ijmijournal.com

# The effect of short message system (SMS) reminder on adherence to a healthy diet, medication, and cessation of smoking among adult patients with cardiovascular diseases

Laila M. Akhu-Zaheya*, Wa'ed Y. Shiyab

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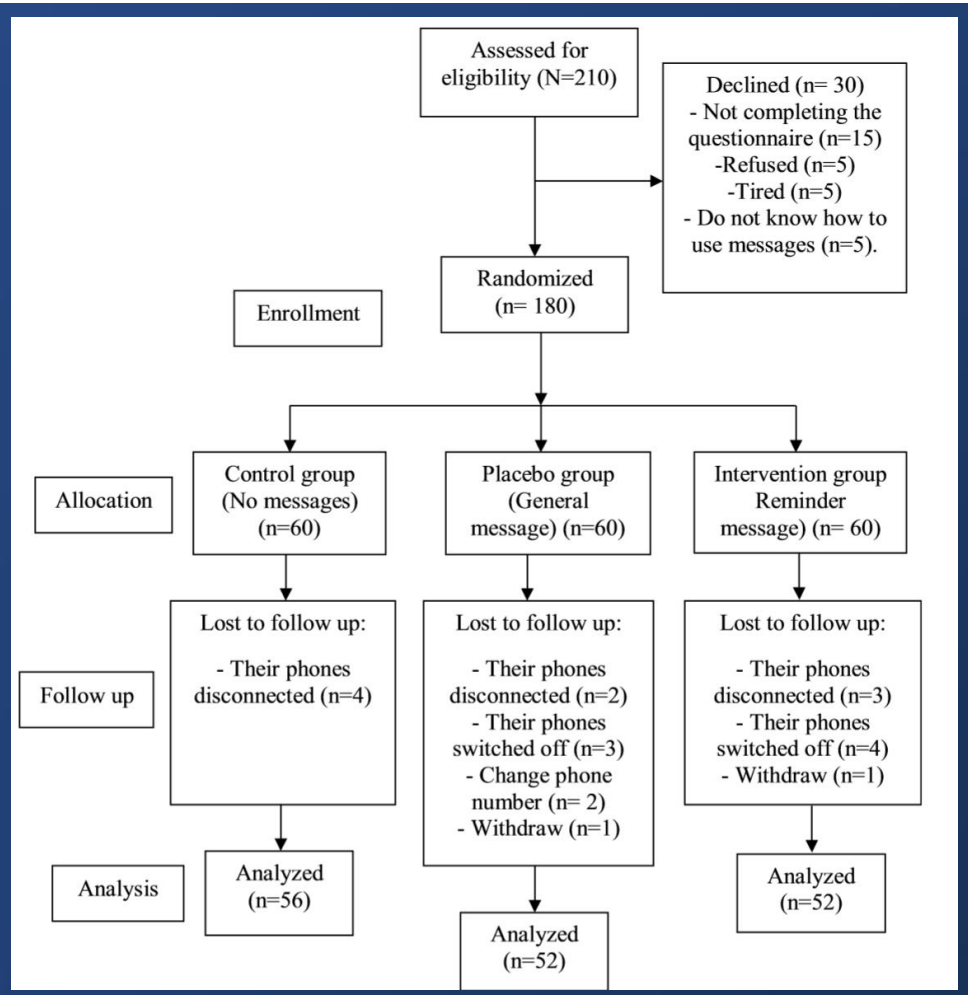


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Laila M. Akhu-Zaheya*, Wa'ed Y. Shiyab

*Comparison of Medication Adherence, Adherence to Mediterranean Diet, and Intent to Quit Smoking between Study Groups.*

| Variable | Experimental Group n = 52 | | Control Group n = 56 | | Placebo Group n = 52 | | F | p |
|---|---|---|---|---|---|---|---|---|
| | *M(SD)* | *R* | *M(SD)* | *R* | *M(SD)* | *R* | | |
| Medication Adherence | 6.29(1.03) | 2.25–7 | 5.24(1.66) | 0.75–7 | 5.56(1.48) | 0.75–7 | 7.21 | .001* |
| Mediterranean Diet Adherence | 8.86(1.8) | 2–12 | 5.80(1.97) | 2–11 | 8.11(2.03) | 4–13 | 36.5 | .000* |
| Intention to Quit Smoking | 7.13(2.09) | 0–10 | 5.81(3.68) | 0–10 | 6.75(2.59) | 0–10 | 1.137 | .327 |
| Cigarette Number | 4.65(10.1) | 0–50 | 5.79(10.8) | 0–40 | 7.85(12.59) | 0–40 | 1.087 | .34 |

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# SMSaúde: Evaluating Mobile Phone Text Reminders to Improve Retention in HIV Care for Patients on Antiretroviral Therapy in Mozambique

*Dvora Joseph Davey, MPH, PhD,*† José António Nhavoto, PhD (c),‡§*
*Orvalho Augusto, MD,‖ Walter Ponce, MPH,* Daila Traca, MSc,*
*Alexandre Nguimfack, MD,* and Cesar Palha de Sousa, MD, PhD‖*

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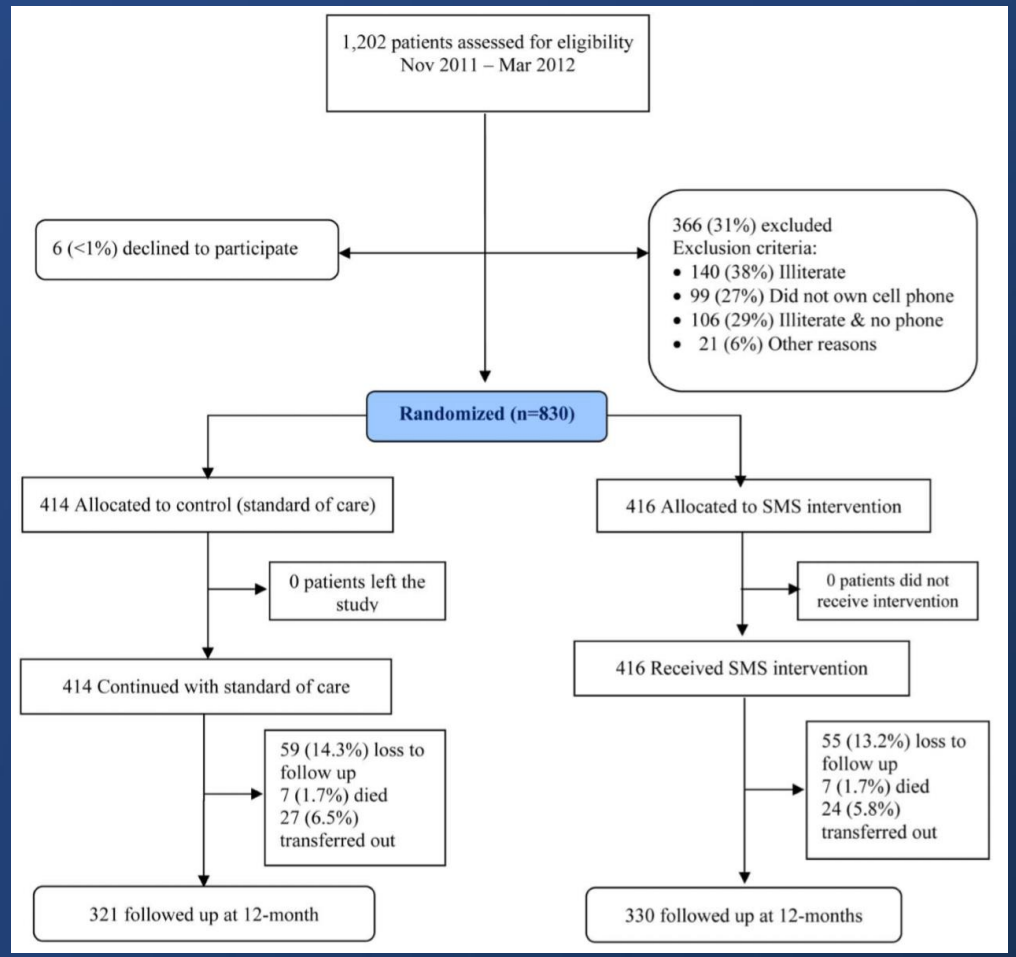


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**TABLE 3.** Risk Differences and Risk Ratios of Retention in Antiretroviral Care Comparing Text Message Intervention to Standard of Care in 3 Health Facilities in Mozambique, 2011–2013

| | | | Rate Differences† | | Rate Ratios | |
|---|---|---|---|---|---|---|
| | Control | Intervention | PE (95% CI) | *P* | PE (95% CI) | *P* |
| Retention at 12 mo%, (95% CI)* | | | | | | |
| All sites | 91.0 (87.7 to 93.4) | 93.8 (90.9 to 95.7) | 2.8 (−0.9 to 6.4) | 0.139 | — | — |
| Urban | 89.9 (86.1 to 93.1) | 94.3 (91.3 to 96.4) | 4.4 (0.4 to 8.5) | 0.032 | — | — |
| Rural | 96.8 (87.9 to 99.2) | 90.7 (80.4 to 95.7) | −6.1 (−14.5 to 2.2) | 0.148 | — | — |
| Attrition incidence per 100 person-yrs within first 12 mo of follow-up, PE (95% CI) | | | | | | |
| All sites | 9.5 (6.8 to 13.1) | 6.4 (4.3 to 9.5) | −3.0 (−7.0 to 1.0) | 0.139 | 0.68 (0.41 to 1.13) | 0.139 |
| Urban | 10.7 (7.6 to 15.0) | 5.8 (3.7 to 9.1) | −4.9 (−9.3 to −0.4) | 0.031 | 0.54 (0.31 to 0.95) | 0.032 |
| Rural | 3.2 (0.8 to 12.9) | 10.0 (4.5 to 22.2) | 6.8 (−2.4 to 15.9) | 0.166 | 3.10 (0.63 to 15.34) | 0.166 |

Original Paper

# Text to Move: A Randomized Controlled Trial of a Text-Messaging Program to Improve Physical Activity Behaviors in Patients With Type 2 Diabetes Mellitus

Stephen Agboola[1,2,3*], MPH, MD; Kamal Jethwani[1,2,3*], MPH, MD; Lenny Lopez[4], MPH, MDiv, MD; Meghan Searl[5], PhD; Sandra O'Keefe[2], MPH; Joseph Kvedar[1,2,3], MD

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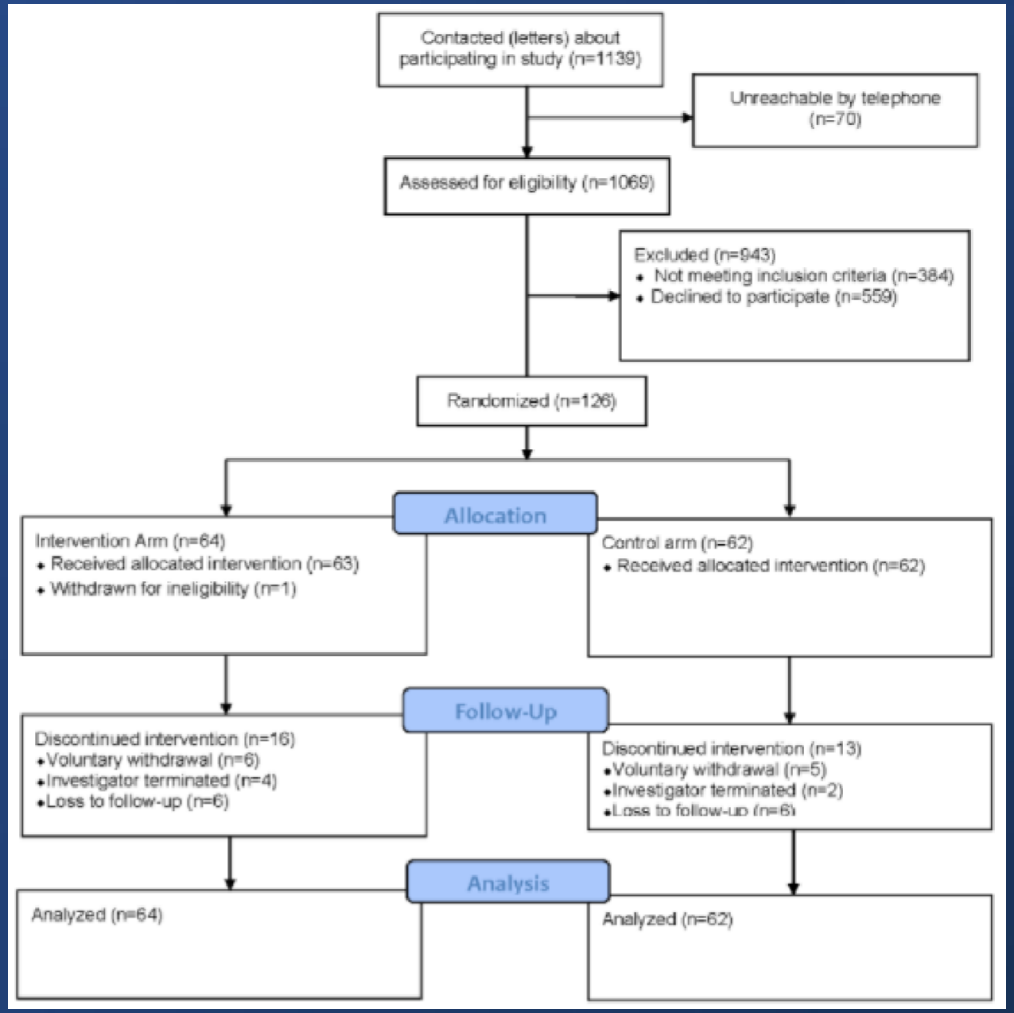


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**Table 2.** Total monthly least squares means of step counts.

| Month | Intervention, least squares means | Control, least squares means | Effect estimate, RR (95% CI) | *P* value |
|---|---|---|---|---|
| 1 | 35,786 | 31,002 | 1.15 (0.36 to 3.73) | .81 |
| 2 | 31,138 | 13,493 | 2.31 (0.59 to 9.08) | .23 |
| 3 | 37,436 | 7653 | 4.89 (1.20 to 19.92) | .03 |
| 4 | 14,254 | 2072 | 6.88 (1.21 to 39.00) | .03 |
| 5 | 913 | 1170 | 0.78 (0.10 to 6.37) | .82 |
| 6 | 1041 | 342 | 3.04 (0.36 to 25.93) | .31 |

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**Table 4.** Glycated hemoglobin $A_{1c}$ ($HbA_{1c}$).

| Follow-up period | TTM (%), mean (SD) | Control (%), mean (SD) | Mean difference (95% CI) | *P* value |
|---|---|---|---|---|
| Baseline | 9.02 (1.63) | 8.38 (1.37) | 0.64 (–0.11 to 1.17) | .02 |
| Closeout | 8.59 (1.60) | 8.17 (1.60) | 0.42 (–0.14, 0.99) | .14 |
| Change scores | –0.43 | –0.21 | 0.22 (–0.19 to 0.64) | .29 |
| ANCOVA | | | –0.07 (–0.47 to 0.34) | .75 |

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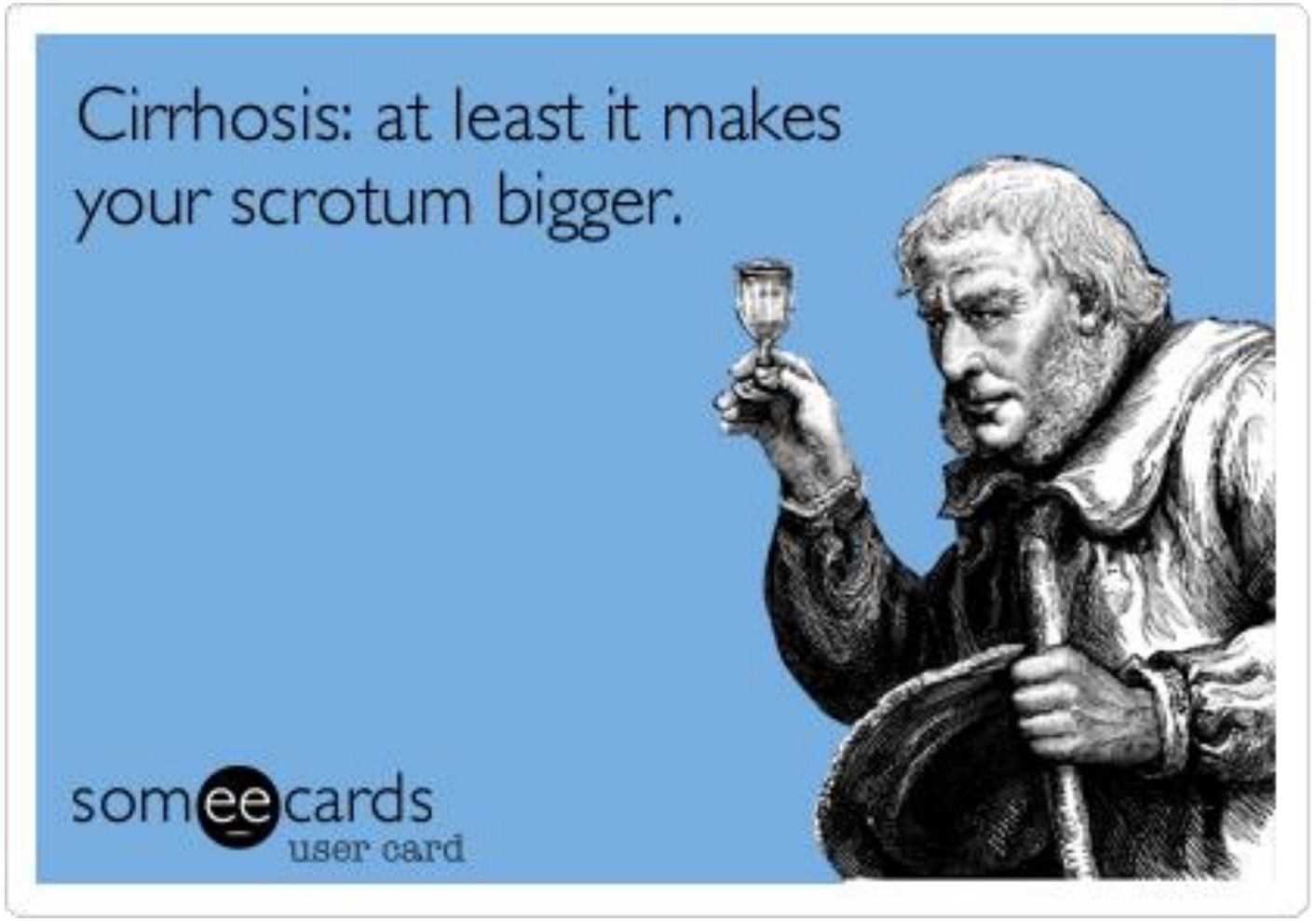
# Transition Comedy Slide:Here's to Happy Hour



- Happenings from the year (June 2016 – June 2017)
- ListServ hot topics
- Articles worth checking out
- aka – this is the Appendix…

## OIG Report Estimates CMS Overpaid $729M in MU Payments; How Concerning are the Findings?

June 13, 2017 by Rajiv Leventhal | Reprints

**The report is based on a sample of 100 EPs over a three-year span, but AMIA's Jeffrey Smith cautions stakeholders not to panic**

Department of Health and Human Services

**OFFICE OF INSPECTOR GENERAL**

# MEDICARE PAID HUNDREDS OF MILLIONS IN ELECTRONIC HEALTH RECORD INCENTIVE PAYMENTS THAT DID NOT COMPLY WITH FEDERAL REQUIREMENTS

Love the math on this. Because 14 clinicians were able to fudge their data we can extrapolate that into $792M across the industry. I could use this logic to say I found $20 in the parking lot this morning, so by the end of the year I will have $7,300.

VCUHealth

https://oig.hhs.gov/oas/reports/region5/51400047.pdf

# Cerner scores VA EHR system contract

By Rachel Z. Arndt | June 5, 2017

The U.S. Veterans Affairs Department has picked Cerner Corp. to develop its electronic health record system, VA Secretary Dr. David Shulkin announced Monday.

I don't know that it's "seismic." I think it was a wise decision, given the choice that the DoD already made, and the desire for consistency and interoperability.

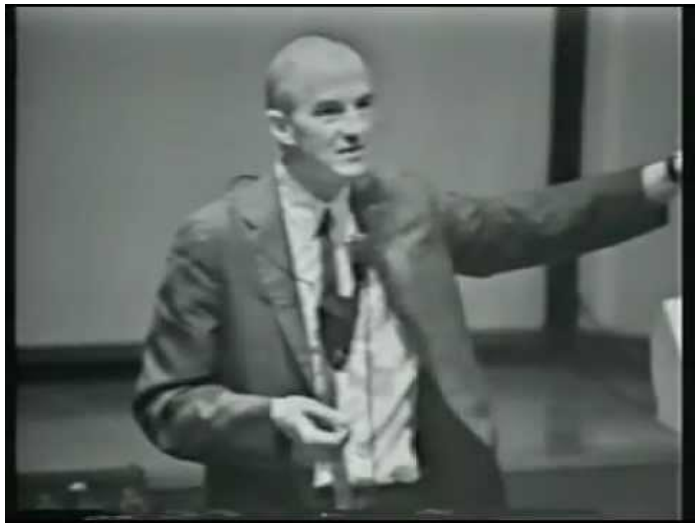
- Official link to announcement **https://www.va.gov/opa/pressrel/pressrelease.cfm?id=2914**
- Report from the GAO http://www.gao.gov/products/GAO-17-408T

VCU Health

http://www.csoonline.com/article/3196827/data-breach/ransomware-makes-healthcare-wannacry.html

Cerner

# The Death of an icon - Dr. Larry Weed



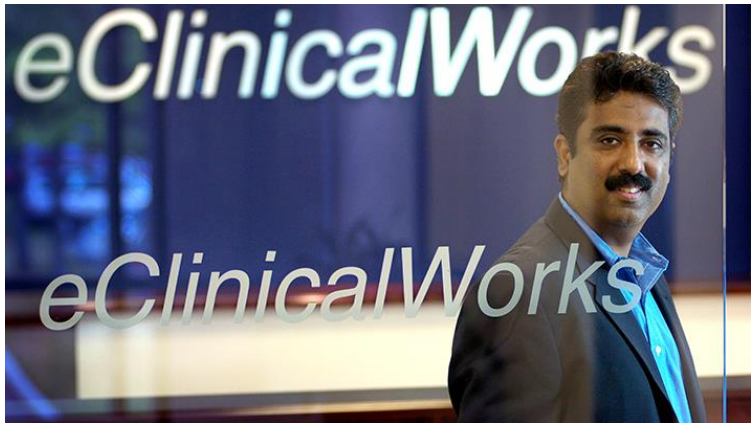
- https://www.youtube.com/watch?v=qMsPXSMTpFI&feature=youtu.be

FOR IMMEDIATE RELEASE

Wednesday, May 31, 2017

# Electronic Health Records Vendor To Pay The Largest Settlement In The District Of Vermont

## eClinicalWorks LLC to Pay $155 Million to Resolve Civil False Claims Act Allegations




- The DOJ alleges that eClinicalWorks opted to added the 16 drug codes necessary for certification into its software rather than enable the product to access those from a complete database, failed to accurately record user actions with audit log functionality, did not always accurately record diagnostic imaging orders or conduct drug-drug interaction checks and, finally, eClinicalWorks did not satisfy data portability requirements designed to enable doctors to transfer patient data to over vendor's EHRs.



https://www.justice.gov/usao-vt/pr/electronic-health-records-vendor-pay-largest-settlement-district-vermont

# Ransomware makes healthcare wannacry

What companies need to be do next to protect patient data

By Ryan Francis
Managing Editor, CSO | MAY 15, 2017 9:48 AM PT


# HHS task force says healthcare cybersecurity in 'critical condition'

A cybersecurity task force report released Friday revealed a laundry list of vulnerabilities including the lack of capable security workforce.

Perspective

**Cyberattack on Britain's National Health Service — A Wake-up Call for Modern Medicine**

Rachel Clarke, M.D., and Taryn Youngstein, M.D.

N Engl J Med. 2017 Jun 7. doi: 10.1056/NEJMp1706754. [Epub ahead of print]

# A Socio-technical Approach to Preventing, Mitigating, and Recovering from Ransomware Attacks

Dean F. Sittig[1]; Hardeep Singh[2,3]

[1] University of Texas Health Science Center at Houston, School of Biomedical Informatics and UT-Memorial Hermann Center for Health Care Quality and Safety, Houston, Texas;
[2] Houston Veterans Affairs Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey Veterans Affairs Medical Center, Houston, Texas;
[3] Section of Health Services Research, Department of Medicine, Baylor College of Medicine, Houston, Texas

**Table 1** An Eight Dimensional Socio-technical Approach for Preventing or Mitigating Ransomware Attacks. (Based on Sittig & Singh's Eight Dimensional Socio-technical model) [32]

| Socio-technical dimension | Recommendations for Health Care Organizations |
|---|---|
| Hardware/Software | • Perform regular backups of your data. Be sure to back up frequently (continuous or real-time backup may be ideal), and store your backups offline<br>• Maintain a "gold image" of system configurations (i.e., allows an organization to reset systems to the pre-attack state)<br>• Test your backup's restore function regularly (e.g., quarterly for key data resources, yearly for less important aspects of the system)<br>• Keep your operating system, application software, browsers and plug-ins, firmware, and anti-virus software up-to-date with the latest patches<br>• Make sure your firewall is properly configured (e.g., require passwords on Remote Desktop Protocol [RDP] ports)<br>• Segment your network by categorizing IT assets (e.g., desktops, servers, routers), data, and personnel into groups, and restricting access to these groups using entry and exit traffic filtering<br>• Consider disabling USB (Universal Serial Bus) ports to prevent malicious software delivery<br>• Following a successful attack, disconnect the infected computers from the network<br>• Turn off wireless network functionality of the infected machine<br>• If the attack is widespread, shut down all network operations to prevent the malware from spreading |
| Clinical Content | • "Whitelist", or allow only specified programs to run, while blocking all others, to prevent malicious executables from running<br>• Block email messages with attachments *.exe, *.zip, *.rar, *.7z, *.js, *.wsf, *.docm, *.xlsm, *.pptm, *.rtf, *.msi, *.bat, *.com, *.cmd, *.hta, *.scr, *.pif, *.reg, *.vbs, *.cpl, and *.jar from suspicious sources |
| User Interface | • Legitimate messages should have a telephone number someone can call (i.e., out of band check), and a personal email address which has a legitimate user name that people can check in their local directory; email and website links should display complete internet address (URL) to build trust<br>• Often the first indication that an attack has occurred is an alarming message sent to the desktop background, or a window opens to a ransomware program that you cannot close, with instructions on how to pay the ransom; users should turn off the computer and report it to their IT support team immediately |

Appl Clin Inform. 201
2016-04-

VCU Health

PRESCRIPTION DRUGS

By Jennifer M. Polinski, Janice M. Moore, Pavlo Kyrychenko, Michael Gagnon, Olga S. Matlin, Joshua W. Fredell, Troyen A. Brennan, and William H. Shrank

# An Insurer's Care Transition Program Emphasizes Medication Reconciliation, Reduces Readmissions And Costs

- Not informatics "per-se" but a pretty powerful demonstration of the power of Medication Reconciliation
- 50% reduction in all-cause readmissions when Med Rec (and Pharmacy talent) follow up post discharge

Medication reconciliation is an important tool that takes much time and effort; it makes sense that it should help; and it is required under meaningful use, the Joint Commission, and CMS rules. We need the science to back up that it is valid and worthwhile Although this article has its limitations, it goes a long way to clarifying the methodology we need to study this important component of hospital care. I recommend reading it in depth

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10.1377/hlthaff.2015.0648
HEALTH AFFAIRS 35,
NO. 7 (2016): 1222–1229

# Also worth checking out


PERSPECTIVE

**Coming Back from the Dead**

Thomas H. Lee, M.D.


COMING BACK FROM THE DEAD

- The amazing efficiency of EMRs and electronic processes to propagate through the system and thoroughly screw up your life

N Engl J Med. 2016 Aug 11;375(6):507-9. doi: 10.1056/NEJMp1606163. No abstract available.
PMID: 27509099

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# Worth checking out…

JOURNAL OF MEDICAL INTERNET RESEARCH Meyer et al

Original Paper

Crowdsourcing Diagnosis for Patients With Undiagnosed Illnesses: An Evaluation of CrowdMed

- An experiment to try online crowdsourcing for making diagnoses… not sure it worked, but it’s a start

# Worth checking out

*Journal of the American Medical Informatics Association*, 0(0), 2017, 1–6
doi: 10.1093/jamia/ocw188
Case Report

Case Report

**Orders on file but no labs drawn: investigation of machine and human errors caused by an interface idiosyncrasy**

**Richard Schreiber,[1] Dean F Sittig,[2] Joan Ash,[3] and Adam Wright[4]**

- Our own Dick Schreiber, say hi Dick

# Worth checking out

NEJM Catalyst

NEW RISK, NEW BUSINESS MODELS

## Blockchain in Health Care: Decoding the Hype

Article · February 9, 2017

William Gordon, MD, Adam Wright, PhD & Adam Landman, MD, MS, MIS, MHS

Brigham & Women's Hospital
Harvard Medical School

- Pretty good, breaks down the technology

http://catalyst.nejm.org/decoding-blockchain-technology-health/?utm_campaign=editors-picks&utm_source=hs_email&utm_medium=email&utm_content=51796723&_hsenc=p2ANqtz-94b54NyQOyM0-stav41UUpfeFUDvFKNE568h5RbwCHE405osPI69XDhnjrPYuCEKvIrCJvrRVDMwgSYUk1xbn5Puk3MbYvqCeJEoQXHA-fq5IZ4Uo&_hsmi=51796723

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# Worth checking out

**A 21st-Century Health IT System — Creating a Real-World Information Economy**

Kenneth D. Mandl, M.D., M.P.H, and Isaac S. Kohane, M.D., Ph.D.

- The eco-system of APIs, FHIR, and apps

# Worth Checking out – PAMA (Please Go Away….)

REVIEWS AND COMMENTARY ■ OPINION

## New CMS Clinical Decision Support Regulations: A Potential Opportunity with Major Challenges[1]

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The Protecting Access to Medicare Act (PAMA) (1), enacted into law on April 1, 2014, will affect almost

PAMA 2014 mandates that ordering professionals consult approved appropriate-use criteria through a certified

Radiology

- Ugh…. This isn't going to end well.

# And it wouldn't be AMDIS without……

## BREAKING: CMS Releases Quality Payment Program Proposed Rule for 2018

June 20, 2017 by Rajiv Leventhal | Reprints

**In all, the government is estimating that nearly two-thirds of eligible Medicare clinicians will be once again exempt from MIPS in 2018**


The Centers for Medicare & Medicaid Services (CMS) has released a proposed rule that would make changes in the second year of MACRA's Quality Payment Program (QPP), with the aim to simplify the program, especially for small, independent and rural practices.

The rule, which dropped late in the afternoon on June 20, is 1,058 pages in length and is the first major update to the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) under new federal healthcare leaders in the Trump administration. The MACRA final

VCUHealth

The rules are changing yet again…..

# Fin……

- Questions?

We made it! Take a bow Bill!!!!