Update in Medical Informatics

(Some even more random papers that we found)

PCC Ojai, California June 2016

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

Changing medicine. For good. -



DISCLOSURES

 We've not been paid off by anyone as of yet but we are happy to receive offers











Hmmm. What cool things did I read this year? What was hot on the listserv? What was of interest in our field (even if not scientifically rigorous)?



Unnecessarily complex 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] 5/1/15-4/30/16 & +English +Humans







"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



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We have CPOE and CDS figured out

"Decision Support Systems, Clinical"[Majr] OR "Medical Order Entry Systems"[Majr] AND "Clinical Trial" AND "Observational Study" AND "Meta-Analysis"



Publications in Clinical Informatics



The "Talk/Study" Ratio®



When Studies are done, how often are they RCT's?



What's in the Research Corpus



Ontology

Oncology

NLP

CrossMaps Simple word counting



What's in the Research Corpus





Log [What's in the Research Corpus]

Decision aidAnalytics Personalized Medicine Shared decision Making Problem List Genomics ontology Patient Safety Predictive Analytics adverse events telemedicine ICD-10 Decision Support Medication reconciliation Adherence Medication/drugweb-Based Precision Medicine Medication list

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Log [What's in the Research Corpus]

Form Factors



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What's in the Research Corpus

Who



Best Title Award/Segue to Colin

Abstract -

See 1 citation found by title matching your search:

J Autism Dev Disord. 2015 Jul;45(7):2115-27. doi: 10.1007/s10803-015-2374-0.

Randomized Controlled Trial of Mind Reading and In Vivo Rehearsal for High-Functioning Children with ASD.

Thomeer ML¹, Smith RA, Lopata C, Volker MA, Lipinski AM, Rodgers JD, McDonald CA, Lee GK.



Send

Automated integration of continuous glucose monitor data in the electronic health record using consumer technology



Rajiv B Kumar,^{1,2,*} Nira D Goren,¹ David E Stark,³ Dennis P Wall,¹ and Christopher A Longhurst⁴ ABSTRACT

- Automatic integration of continuous glucose monitoring via widely available consumer products and smart phone / Apple Health Kit
- Prior studies required highly custom interfaces
- An excellent example of how one Academic Health system architected a solution and governance for patient generated data coming into their EMR



HealthKit

Kumar R B, et al. J Am Med Inform Assoc 2016;23:532–537. doi:10.1093/jamia/ocv206, Brief Communication







Kumar R B, et al. J Am Med Inform Assoc 2016;23:532–537. doi:10.1093/jamia/ocv206, Brief Communication

- 10 kids with IDDM
- Subcutaneous sensor communicates with smart phone 5 minute intervals
- Sometimes ~290 readings per day
- So much data that standard flowsheet could not help visualize





😲 Clinical Decision Support

GluVue



https://gluvue.stanfordchildrens.org/

VCU Medical Center Every Day, A New Discovery.

01:10 to 02:05

Significant Lows



Low (20.6%)



Results / Discussion

- Examples of saves:
 - Toddler with nocturnal hyperglycemia; resolved with dinner titration
 - Proactive discovery of a teen not carb counting correctly
 - Proactive discovery of a teen with nighttime lows after exercise
- Patient portal not only served as the infrastructure for sharing data, but simultaneously facilitated secure discussion among adolescents, parents, and providers.

Kumar R B, et al. J Am Med Inform Assoc 2016;23:532–537. doi:10.1093/jamia/ocv206, Brief Communication



Driving Innovation in Health Systems through an Apps-Based Information Economy

Kenneth D. Mandl,^{1,2,3,*} Joshua C. Mandel,^{1,2} and Isaac S. Kohane³ ¹Computational Health Informatics Program, Boston Children's Hospital, Boston, MA 02115, USA ²Department of Pediatrics, Harvard Medical School, Boston, MA 02115, USA ³Department of Biomedical Informatics, Harvard Medical School, Boston, MA 02115, USA *Correspondence: kenneth_mandl@harvard.edu http://dx.doi.org/10.1016/j.cels.2015.05.001

- A thoughtful description of the direction of "appification" of EHRs
- Recommendations for next steps and a listing of existing resources for the myriad of involved stakeholders
- The play with "precision medicine"
- Who will pay for the apps? Vet them? Regulate them?





"A good app, distributed widely, could reshape practice overnight."



Recent ONC grant to make the formal "app store"

Moving one step closer to smartphone-like, interoperable EHR apps

Posted on June 1, 2016 by Nancy Fliesler Posted in Information technology, Innovation

More On: CHIP, healthcare IT, Joshua Mandel, Kenneth Mandl, SMART







SMART on FHIR: a standards-based, interoperable apps platform for electronic health records

RECEIVED 27 December 2015 REVISED 7 September 2015 ACCEPTED 7 November 2015



Joshua C. Mandel,^{1,2,4} David A. Kreda,³ Kenneth D. Mandl,^{1,2} Isaac S. Kohane,^{1,4} Rachel B. Ramoni^{3,5}

- For the nerds... a very technical deep dive into the history of SMART and a technical comparison of SMART on FHIR vs SMART classic vs FHIR alone
- Discussion of real use cases for first round of SMART on FHIR apps
 - Meducation
 - Bilirubin
 - Cardiac Risk
 - VisualDx

Mandel JC et al. J Am Med Inform Assoc 2016;0:1–10. doi:10.1093/jamia/ocv189, Research and Applications





Comedy Transition Slide



Mandatory Rectal Tone Checks Reduce Non-Emergent ER Visits

ED PAC - June 18, 2016

NEWARK, NJ - Grace Regional's ER physicians complained to leadership for years about the excess number of patients going to the ER for non-emergent...



If something is Individualized, Personalized and Predictive Medicine, it must be great.

Heart Risk Calculator		
Age (years)	20-79	le:
Gender	Male	
	⊖ Female	
Race	O African American	
	 Other 	
Total cholesterol (mg/dL)	130-320	
HDL cholesterol (mg/dL)	20-100	H#H
Systolic blood pressure (mmHg)	90-200	
Diastolic blood pressure (mmHg)	30-140	
Treated for high blood pressure	No	
	⊖ Yes	
Diabetes	No	
	⊖ Yes	
Smoker	No	
	⊖ Yes	
	Calculate	



Maybe Individualized, Personalized and Predictive Medicine, isn't so great.

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY © 2016 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION PUBLISHED BY ELSEVIER VOL. 67, NO. 18, 2016 ISSN 0735-1097/\$36.00 http://dx.doi.org/10.1016/j.jacc.2016.02.055

Accuracy of the Atherosclerotic Cardiovascular Risk Equation in a Large Contemporary, Multiethnic Population



-300k 5 year observation (1.5 M Patient Years)
-2000 Events
-100k AA Patient Years
-250k Asian Patient Years
-100k Hispanic Patient Years



Accuracy of the Atherosclerotic Cardiovascular Risk Equation in a Large Contemporary, Multiethnic Population



Accuracy of the Atherosclerotic Cardiovascular Risk Equation in a Large Contemporary, Multiethnic Population



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Accuracy of the Atherosclerotic Cardiovascular Risk Equation in a Large Contemporary, Multiethnic Population



Observed Rate Expected Rate

RECEIVED 9 November 2015 REVISED 21 January 2016 ACCEPTED 17 February 2016



<u>Pre-CPOE (Baseline)</u> - Apr. 2011 to Apr. 2012	Handwritten provider order for vitamin D test	Unit clerk fills lab requies 25-OH vitamin D if not	isition with t specified
<u>Initial CPOE</u> - Hospital A May 2012 - Hospital B Sep. 2012	User Order Search	User selects order from related labs and related labs are	n vitamin D meds
	Find: vitamin D	calcium-vitamin D 315 mg-250 in Vitamin D 1,25 Dihydroxy Level Vitamin D 25 Hydroxy Level Vitamin D2 Vitamin D3	tl units oral tablet











Comedy Transition slide



Coming next... the evil of EHRs






The Burden of Inbox Notifications in Commercial Electronic Health Records

With wider use of electronic health records (EHRs), physicians increasingly receive notifications via EHR-based inboxes (eg, Epic's In-Basket and General Electric Centricity's Documents). Examples of types of notifications include test results, responses

← Editor's Note to referrals, requests for medication refills, and messages from physicians and other

- Physicians spend an extra 67 minutes per day processing notifications
- PCPs receive twice the notifications of specialists
- Strategies to help filter messages and EHR designs that support team-based care are needed to handle this influx of information







Primary care providers (PCPs) received an overall mean of 76.9 notifications per day (blue line). Specialists (site A only) received a mean of 29.1 notifications per day (P < .001).





Inbox Burden...

- "To me, this just looks like increased ease of quantification of an already existing phenomenon."
- "What triggered my annoyance was the title, which equates informational work to burden."
- "This was just an observation without a control."

"So now we are looking at messaging back re referrals (closing the loop – actually an NQF measure – albeit a dopey one) – and calling it a burden."

"What's it to be guys? Does it not seem foolish when we argue out of one side of our mouth that we are inundated with information – and don't want to be FYI'ed on everything... and then argue out of the other side of our mouths that EHRs need to talk to each other so we can be sent more information from colleagues "



JAMA Internal Medicine Rublished online March 14, 2016

VCU Medical Center Every Day, A New Discovery.



Is Your Doctor Getting Too Much Screen Time?

Study finds patients are unhappy when doctors spend a lot of time looking at a computer screen





Transitional Chaos or Enduring Harm? The EHR and the Disruption of Medicine

Lisa Rosenbaum, M.D.

A decade ago, a primary care physician I admired seemed to come undone. His efficiency had derived not from rushing between patients but from knowing them so well that his charting was effort-

For inh down worl Horrors" There's th who, unal formation

Association Between Clinician Computer Use and Communication With Patients in Safety-Net Clinics

Safety-net clinics serve populations with limited proficiency in English and limited health literacy who experience communication barriers that contribute to disparities in care and

Invited Commentary page 128

health.¹ Implementation of electronic health records in safety-net clinics may affect communication between pa-

http://www.wsj.com/articles/is-your-doctorgetting-too-much-screen-time-1450118616







The Methodology

- 2011 2013; MD visits are video recorded and scored according to eye contact, typing, nonverbal pauses etc.
- 47 patients, 39 doctors
- Higher score = higher computer use

- Patients are interviewed after the fact for perceptions and satisfaction
- Scored for rapport building
 - Postive, negative, etc.



	Computer l	Computer Use						
		Moderate			High			
Characteristic	Low, Mean	Mean	Adjusted Difference	Adjusted P Value ^a	Mean	Adjusted Difference	Adjusted P Value ^a	
Patient								
Rapport-building statements, No.								
Positive	43.7	33.1	-18.3	<.01	36.6	-9.5	.16	
Negative	1.7	3.1	1.9	.10	1.3	-0.4	.96	
Emotional	10.3	17.1	6.4	.40	11.7	2.1	.75	
Social	5.5	4.4	3.4	.28	10.9	9.6	.04	
Information exhange statements, No.								
Biomedical	114.4	119.7	-3.6	.89	146.8	8.6	.77	
Psychosocial	10.7	11.3	-8.0	.34	7.6	-11.1	.13	
Activation statements, No.	3.8	2.3	-1.2	.37	3.0	-0.6	.68	
Positive affect score	18.2	19.9	2.4	.02	18.0	0.4	.55	
Clinician								
Rapport-building statements, No.								
Positive	32.9	26.0	-9.7	.15	36.6	-8.9	.15	
Negative	0.2	0.7	1.7	.30	1.3	2.7	<.01	
Emotional	13.3	13.6	-0.3	.95	11.7	0.68	.89	
Social	4.2	4.2	2.7	.60	10.9	9.7	<.01	
Information exchange statements, No.								
Biomedical	110.9	126.5	-23.5	.35	157.5	18.1	.56	
Psychosocial	12.9	51.2	23.0	.07	11.1	4.4	.71	
Activation statements, No.	20.4	27.7	4.9	.37	26.6	-0.6	.88	
Positive affect score	24.6	24.7	-1.5	.15	21.2	-4.1	<.01	
Encounter								
Verbal dominance ratio	1.24	1.60	0.18	.29	1.65	0.23	.12	
Patient-centeredness score	0.75	1.14	0.22	.31	0.69	-0.1	.50	

Table 2. Differences in Communication Outcomes by Degree of Clinician Computer Use in Safety-Net Encounters

^a Analyses used low computer use as the reference and were adjusted for patient educational level and quality of life, clinician years in practice, clinician type (physician, nurse practitioner, physician assistant), clinic, and visit length.

The results?

- High computer use is associated with lower patient satisfaction and notable communication differences
- Concurrent computer use may inhibit authentic engagement
- Multitasking means you are missing chances for connection

What the WSJ "said"

• EHRs are evil, you're a terrible doctor...









Limitations of the study

- Low number of observations
- Eye contact deviation does not necessarily correlate with EHR use
- The "moderate users" data is actually in conflict between low and high





Invited Commentary by Dr. Frankel – stay "POISED"



• Prepare

- Read the record before entering the room
- Orient
 - Spend 1-2 minutes no PC and then explain what you are doing with the EHR
- Information Gathering
 - Patients actually expect you to look to some extent

• Share

- Turn the screen to show them what you are seeing
- Educate
 - Use things like graphing features to explain
- Debrief
 - Teach back / talk back based on what was discussed / recorded





BRIAN BARRETT SECURITY 02.16.16 5:26 PM

HACK BRIEF: HACKERS ARE HOLDING AN LA HOSPITAL'S COMPUTERS HOSTAGE

Hollywood hospital pays \$17,000 in bitcoin to hackers; FBI investigating

Wed.	03/	/30	/201	16 -	12:30

GADGETS

Ransomware Is Hitting Dozens Of Healthcare Organizations; Why File-Encrypting Malware Is Infiltrating Health Systems



Comedy Transition Slide





Apparently it's - E75.4



The most studied clinician in Informatics Experiments: "The Web"

Web-Based Cognitive Behavioral Therapy Intervention for the Prevention of Suicidal Ideation in Medical Interns: A Randomized Clinical Trial. Web-Based Cognitive Behavioral Therapy for Female Patients With Eating Disorders: Randomized Controlled Trial. Web-Based STAR E-Learning Course Increases Empathy and Understanding in Dementia Caregivers: Results from a Randomized Controlled Trial in the Netherlands and the United Kingdom. Web-based treatment for substance use disorders: differential effects by primary substance. A Web-Based, Social Networking Physical Activity Intervention for Insufficiently Active Adults Delivered via Facebook App: Randomized Controlled Trial. A Web-Based Adolescent Positive Psychology Program in Schools: Randomized Controlled Trial. A Web-Based Self-Help Intervention With and Without Chat Counseling to Reduce Cannabis Use in Problematic Cannabis Users: Three-Arm Randomized Controlled Trial. Effect of a Web-Based Behavior Change Program on Weight Loss and Cardiovascular Risk Factors in Overweight and Obese Adults at High Risk of Developing Cardiovascular Disease: Randomized Controll Effects of a Web-Based Personalized Intervention on Physical Activity in European Adults: A Randomized Controlled Trial. Evaluation of a Web-based tailored intervention (TAVIE en santé) to support people living with HIV in the adoption of health promoting behaviours: an online randomized controlled trial protocol. It's LiFe! Mobile and Web-Based Monitoring and Feedback Tool Embedded in Primary Care Increases Physical Activity: A Cluster Randomized Controlled Trial. Exposure to a patient-centered, Web-based intervention for managing cancer symptom and quality of life issues: impact on symptom distress. Comparing a Video and Text Version of a Web-Based Computer-Tailored Intervention for Obesity Prevention: A Randomized Controlled Trial. Use and Effectiveness of a Video- and Text-Driven Web-Based Computer-Tailored Intervention: Randomized Controlled Trial. Impact of Educational Level on Study Attrition and Evaluation of Web-Based Computer-Tailored Interventions: Results From Seven Randomized Controlled Trials. Improving Pediatric Basic Life Support Performance Through Blended Learning With Web-Based Virtual Patients: Randomized Controlled Trial. Diabetes Prevention and Weight Loss with a Fully Automated Behavioral Intervention by Email, Web, and Mobile Phone: A Randomized Controlled Trial Among Persons with Prediabetes. Presentation of Diagnostic Information to Doctors May Change Their Interpretation and Clinical Management: A Web-Based Randomised Controlled Trial. A web-based personally controlled health management system increases sexually transmitted infection screening rates in young people: a randomized controlled trial. A web-based cognitive behaviour therapy for chronic fatigue in type 1 diabetes (Dia-Fit): study protocol for a randomised controlled trial. Ў veb-based psychoeducational program for informal caregivers of patients with Alzheimer's disease: a pilot randomized controlled trial. Acceptability of a web-based community reinforcement approach for substance use disorders with treatment-seeking American Indians/Alaska Natives. Comparing the efficacy of a web-assisted calprotectin-based treatment algorithm (IBD-live) with usual practices in teenagers with inflammatory bowel disease: study protocol for a randomized controlle Evaluating the efficacy of a web-based self-help intervention with and without chat counseling in reducing the cocaine use of problematic cocaine users: the study protocol of a pragmatic three-arm range An exploratory randomised controlled trial of a web-based integrated bipolar parenting intervention (IBPI) for bipolar parents of young children (aged 3-10). A randomized controlled trial evaluating the effectiveness of a web-based, computer-tailored self-management intervention for people with or at risk for COPD. Rationale, design and baseline characteristics of a randomized controlled trial of a web-based computer-tailored physical activity intervention for adults from Quebec City.

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Web-Based Cognitive Behavioral Therapy Intervention for the Prevention of Suicidal Ideation in Medical Interns: A Randomized Controlled Trial

Design, Setting and Participants—A randomized controlled trial conducted at two university hospitals with 199 interns from multiple specialties during academic years 2009-10 or 2011-12.

Interventions—Interns were randomly assigned to study groups (wCBT, n=100; attentioncontrol group (ACG), n=99), and completed study activities lasting 30-minutes each week for four weeks prior to starting internship year. Subjects assigned to wCBT completed online-CBT modules and subjects assigned to ACG received emails with general information about depression, suicidal thinking and local mental health providers.

Main Outcome Measure—The Patient Health Questionnaire (PHQ-9) was employed to assess suicidal ideation (i.e., "thoughts that you would be better off dead, or hurting yourself in some way") prior to the start of intern year and at 3-month intervals throughout the year.

Results—62.2% (199/320) of individuals agreed to take part in the study. During at least one time point over the course of internship year 12% (12/100) of interns assigned to wCBT endorsed suicidal ideation, compared to 21%(21/99) of interns assigned to ACG. After adjusting for covariates identified a priori that have previously shown to increase the risk for suicidal ideation, interns assigned to wCBT were 60% less likely to endorse suicidal ideation during internship year (RR: 0.40, 95% CI 0.17-0.91; p=0.03), compared to those assigned to ACG.

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—— Changing medicine. For good. ——

Hospital & Health Sciences System AMDIS





The Journal of Emergency Medicine, Vol. 49, No. 1, pp. 78–84, 2015 Copyright © 2015 Elsevier Inc. Printed in the USA. All rights reserved 0736-4679/\$ - see front matter

http://dx.doi.org/10.1016/j.jemermed.2014.12.052

Computers in Emergency Medicine



ACCURACY OF ELECTRONIC MEDICAL RECORD MEDICATION RECONCILIATION IN EMERGENCY DEPARTMENT PATIENTS



ACCURACY OF ELECTRONIC MEDICAL RECORD MEDICATION RECONCILIATION IN EMERGENCY DEPARTMENT PATIENTS

Table 2. The Accuracy of the Reconciled Electronic Medical Records

		EMR Includi	ng Medication	EMR Not Includ	ling Medication		
Medication Class, Number Taking the Class (n = 502)	Accurate EMRs in Subjects Taking the Class, n (%)	History Positive (True Positive)	History Negative (False Positive)	History Negative (True Negative)	History Positive (False Negative)	PPV, %	NPV, %
Prescriptions (n = 438)	229 (45.6)	365	218	64	73	62.6	46.7
Nonprescriptions ($n = 372$)	275 (54.8)	190	81	130	182	70.1	41.7
Vitamins $(n = 209)$	401 (79.9)	117	27	293	92	81.3	76.1
Supplements $(n = 111)$	409 (81.5)	55	9	493	75	85.9	86.8
Herbals (n = 100)	448 (89.2)	64	9	402	46	87.7	89.7

Table 3. The Composition of Inaccurate Medication Ingestion Histories by Medication Class

Medication Class	Number Inaccurate, n (%)	EMR Missed a Medication Subject Reported, n (%)	EMR Included Medication Subject Did Not Report, n (%)
Prescriptions	392 (78.1)	104 (26.5)	313 (79.8)
Nonprescriptions	226 (45.0)	172 (76.1)	72 (31.8)
Vitamins	100 (19.9)	73 (73.0)	29 (29.0)
Herbals	55 (10.9)	37 (67.3)	7 (12.7)
Supplements	92 (18.3)	81 (89.1)́	11 (11.9)

EMR = electronic medical records



UNIVERSITY OF ILLINOIS Hospital & Health Sciences System Scandinavian Cardiovascular Journal, 2015; 49: 193–199

ORIGINAL ARTICLE

Patient-centred home-based management of heart failure

Findings from a randomised clinical trial evaluating a tablet computer for self-care, quality of life and effects on knowledge



Patient-centred home-based management of heart failure

Findings from a randomised clinical trial evaluating a tablet computer for self-care, quality of life and effects on knowledge



-20% Relative Risk Reduction in readmissions-60% relative risk reduction in hospital days- vs. Mediocre care





EMR Developers Shocked to Learn How Their Software is Actually Used

Gomerblog Team - April 12, 2016

Several developers of widely-used electronic medical record (EMR) software were invited out of their cubicles last week for a muchhyped tour of the real-world...

Analysis of clinical decision support system malfunctions: a case series and survey

Adam Wright^{1,2,3,*}, Thu-Trang T. Hickman¹, Dustin McEvoy³, Skye Aaron¹, Angela Ai¹, Jan Marie Andersen¹, Salman Hussain^{1,4}, Rachel Ramoni^{2,5}, Julie Fiskio¹, Dean F. Sittig⁶, David W. Bates^{1,2,3}





- 4 case studies of anomalous CDS firing at Partner's LMR
- Buckets of why CDS fails or misfires
- Results of the AMDIS survey that many of us filled out



Figure 3: Firing rate of four alerts at Brigham and Women's Hospital over a 5-year period (weekend days are represented by darker dots, and weekdays are represented by lighter dots), with anomalies indicated (superimposed horizontal bars show anomalous periods).



Wright A, et al. J Am Med Inform Assoc 2016;0:1–9. doi:10.1093/jamia/ocw005, Research and Applications VCU Medical Center Every Day, A New Discovery.



- Drug code for Amio changed but rule logic didn't
- Legacy patients still on Amio carried the old drug code



 2 year olds inadvertently had gender and smoking status clauses added; rule didn't fire for 3 years





- Massive 2 day spike in health maintenance alerts
- Coincided with upgrade
- 5x alerting during the period



- Excess in what was supposed to be tailored anti-platelet alert for CAD
- External drug classification service down
- Users reported it but took 19 days to sort



Every Day, A New Discovery.

Table 1: Results of Preliminary Survey of CMIOs

n of 29 (%)

Survey Item and Responses

Which	types	of	CDS	are	currently	in	use	at	your	site	?
-------	-------	----	-----	-----	-----------	----	-----	----	------	------	---

Drug-drug interaction alerts	28 (97)
Allergy alerts	27 (93)
Screening/preventive care reminders	21 (72)
Renal dose adjustments	16 (55)
Alerts about abnormal test results	16 (55)
Drug-pregnancy alerts	11 (38)
Reminders to patients	5 (17)
How often has your site experienced CDSS malfunction	ons?
4 or more times a year	11 (38)
1–6 times a year	8 (28)
Less than 1 time a year	8 (28)
Never	2 (7)
Did any of these factors contribute to CDSS malfunct that you experienced?	ions
Upgrade of your EHR software	18 (62)
Changes to underlying codes or data fields	18 (62)
Inadvertent disabling or enabling of a rule	12 (41)
Upgrade of another clinical information system	10 (34)
Database corruption or another system malfunction	7 (24)



How did you find the malfunctions? 24 (83) Report from users Noticed in my own use of the system 14 (48) Ongoing system testing 9 (31) Reviewing reports of CDSS performance 6 (21) How confident are you that your existing processes and procedures are sufficient to prevent or detect all CDSS malfunctions before they reach the user? 0 (0) Totally confident 2 (7) Very confident Somewhat confident 7 (24) Not very confident 12 (41) Not at all confident 6 (21)





Table 2: Recommendations for Increased CDSS Reliability and the Prevention of Malfunctions

Recommendation	Related Case Studies
CDS rules should be tested in the live envi- ronment after any CDS-related change and after major EHR software upgrades. This testing should be done for both new rules and existing rules (regression testing).	Cases 2 and 3
Reliable communication strategies should be employed to ensure that changes in clinical terminologies are communicated to all CDSS teams.	Case 1
Tools to support terminology management should have the capability to detect and miti- gate the downstream impact of terminology changes. As terms and codes are changed, it should be possible to determine the effects of those changes on order sets, CDS rules, documentation tools, etc.	Case 1
Proactive monitoring tools and strategies should be employed to enable quick detec- tion of malfunctions in the production systems.	Cases 1-4



Proactive monitoring tools and strategies should be employed to enable quick detec- tion of malfunctions in the production systems.	Cases 1-4
External services that a CDSS depends on should also be proactively monitored.	Case 4
Critical external systems that support a CDSS, such as classification and terminology systems, should be fault-tolerant and robust.	Case 4
Enhanced software quality assurance testing methods, including unit and integration test- ing, supported by test scripts, tools, and au- tomated tests, should be employed to ensure that CDSSs function correctly. These tests are particularly important at the time of software upgrades and CDSS content changes.	Cases 1-4 (particularly Case 3)
CDSSs should be tested by a different ana- lyst than the one that built the content.	Case 2





Comedy Transition Slide



CDC Urges Mosquitos to Wear Tiny Condoms to Fight Zika Virus

Dr Pablo Pistola - April 9, 2016

ATLANTA, GA - During a landmark press conference yesterday afternoon, CDC Chief Epidemiologist Dr. Sri-Sheshadariprativadibayankaram implored mosquitos to wear small condoms during intercourse in...



Personal health record use for children and health care utilization: propensity score-matched cohort analysis

Characteristics	PHR Registered $(n = 1143)$	Nonregistered $(n=1143)$	<i>P</i> Value ^a
Children			
Number of caregivers, mean	1.57	1.59	.2
Number of chronic conditions, mean	0.16	0.13	.15
Time in study, mean, d	346.1	346.2	.93
Female, No. (%)	558 (48.8)	504 (44.1)	.03
Payment source, No. (%)	•		
Medicaid	54 (4.7)	47 (4.1)	.54
Commercial insurance	1075 (94.1)	1087 (95.1)	.31
Private payment	63 (5.5)	58 (5.1)	.71
Caregivers	•		
Age, mean, y	32.1	32.7	.48
Female, No. (%)	824 (72.1)	729 (63.8)	<.0001
Years of membership, mean	6.1	6	.43
Number of no-shows, mean	2.1	2	.58
Number of PCP visits, mean	1.8	1.9	.19
Number of physical exams, mean	0.29	0.29	.97



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Changing medicine. For good.

Zhou YY, et al. J Am Med Inform Assoc 2015;22:748–754.

Characteristics	PHR Registered $(n = 1143)$	Nonregistered $(n = 1143)$	<i>P</i> Value ^a
Race, No. (%)		•	
Asian	188 (16.5)	162 (14.2)	.5
Black	20 (1.8)	15 (1.3)	
Hawaiian/Pacific Islander	87 (7.6)	80 (7)	
Native American	13 (1.1)	10 (.87)	
Unknown	139 (12.2)	148 (13)	
White	696 (60.9)	728 (63.7)	
Preferred language, No. (%)			
English	994 (87)	977 (85.4)	.4
Other than English	12 (1)	18 (1.6)	
Unknown	137 (12)	148 (13)	
Educational level, No. (%)	•		
< Grade 9	38 (3.3)	29 (2.5)	.4
Grades 9-12	112 (9.8)	102 (8.9)	
High school graduate	280 (24.5)	275 (24.1)	
Some college	307 (26.9)	319 (27.9)	
Associate degree	93 (8.1)	112 (9.8)	
Bachelor's degree	215 (18.8)	192 (16.8)	
Graduate/professional degree	98 (8.6)	114 (10)	
Encounters			
Outpatient clinic visits, mean	5.2	4.1	<.0001
Telephone encounters, mean	3.5	2.6	<.0001
Emergency department visits, mean	0.28	0.23	.11
With PCPs			
Outpatient clinic visits, mean	4.1	3.6	<.0001
Telephone encounters, mean	2.3	1.8	< .0001
With non-PCPs			
Outpatient clinic visits, mean	1.1	0.5	<.0001
Telephone encounters, mean	1.2	0.8	< .0001





Personal health record use for children and health care utilization: propensity score-matched cohort analysis

Table 2: Adjusted average utilization and 95% CI for PHR-registered and nonregistered children

Utilization	PHR registered, ($n = 1143$)	Nonregistered, ($n = 1143$)	<i>P</i> Value
With all providers			
Outpatient clinic visits	5.26 (5.03–5.51)	4.34 (4.18–4.51)	< .0001
Telephone encounters	3.31 (3.12–3.51)	2.63 (2.46–2.81)	< .0001
Emergency department visits	0.28 (0.24–0.34)	0.24 (0.20–0.28)	p = 0.11
With PCPs			
Outpatient clinic visits	4.21 (4.07–4.36)	3.77 (3.64–3.91)	< .0001
Telephone encounters	2.14 (2.0–2.29)	1.77 (1.64–1.91)	< .0001
With non-PCPs			
Outpatient clinic visits	0.95 (0.81–1.11)	0.52 (0.46–0.60)	< .0001
Telephone encounters	1.0 (0.9–1.1)	0.73 (0.65–0.83)	< .0001

Abbreviations: CI, confidence interval; PHR, primary health record; NS, not significant; PCP, primary care providers.





Hospital Gets Rid of Patients, Doctors to Spend 100% of Time Writing Notes

The Joint Commissioner - April 7, 2016

State Hospital Medical Center has made headlines across the nation today by shutting its doors to human patients. Physicians will now spend 100% of...

Healthcare **IT** News

Published on *Healthcare IT News* (<u>http://www.healthcareitnews.com</u>) <u>Home</u> > The path forward for meaningful use



Posted on Nov 11, 2015 By John Halamka, Beth Israel Deaconess Medical Center

Health Affairs **Blog**

HOME TOPICS ARCHIVE SUBMIT

HEALTH POLICY LAB

ASSOCIATED TOPICS: COSTS AND SPENDING, HEALTH IT, MEDICAID AND CHIP, MEDICARE, PAYMENT POLICY, QUALITY

It's Time To Fix Meaningful Use

Peter Basch and Thomson Kuhn

January 14, 2016







- Meaningful Use has served its purpose
- Stage 3 is repeating the same mistakes as Stage 2
- We can't regulate ourselves into success
- Current structured element and quality measures do not create disruptive innovation

- Replace MU with MACRA
- Replace certification with enabling infrastructure
- Evolve ONC to a focused Policy shop; laser focus
- Providers and Health IT are not the enemy
- Focus on things that mater
 - FHIR / OAuth/ Apis

Every Day, A New Discovery.





- Use MACRA to repeal or even end MU – period, Congress has a chance for an MU "doover"
- Transition from Stage 2 directly to MIPS starting in 2019

But.... Since that doesn't appear to happen, the authors have 7 suggestions for the future of MU





- Eliminate all functional measure thresholds
- Carefully continue functional measures (sans thresholds) to learn and improve usability
- Demonstrate continuing medical education within HIT
- 4) Advance interoperability

5) Support less burdensome and bidirectional public health reporting

6) Develop Patient Engagement Measures that are flexible

7)Encourage Innovation by allowing alternative activities



Slavitt: Meaningful Use is all but dead

INCENTIVE PROGRAM

By NEIL VERSEL

2 Comments /
126 Shares / Jan 12, 2016 at 2:49 PM



Meaningful Use Stage 3 is scheduled to start as early as 2017, but now it looks like it may not happen at all.

Acting CMS Administrator Andy Slavitt dropped this news — in some ways a bombshell, but in other ways not much of a surprise — Monday at the J.P. Morgan Healthcare Conference in San Francisco.

Slavitt tweeted the following, referencing the

Medicare Access and CHIP Reauthorization Act, the "doc fix" legislation that passed last year:

And there was much rejoicing....



Andy Slavitt @ASlavitt

y Follow

In 2016, MU as it has existed-- with MACRA-- will now be effectively over and replaced with something better #JPM16 8:16 PM - 11 Jan 2016





Alas, it was not to be...



• As it stands MACRA is incorporating MU3 into the morass; making it worse

THURSDAY, MAY 5, 2016

A Deep Dive on the MACRA NPRM

As promised last week, I've read and taken detailed notes on the entire 962 page MACRA NPRM so that you will not have to.

Sometimes when you remodel a house, there is a point when additional improvements are impossible and you need to start again with a new structure. The 962 pages of MACRA are so overwhelmingly complex, that no mere human will be able to understand them.



THE ORIGINAL BBC TELEVISION SOUNDTRACK



http://geekdoctor.blogspot.com/2016/05/adeep-dive-on-macra-nprm.html





Worth checking out



Health IT Safe Practices: Toolkit for the Safe Use of Copy and Paste

February 2016

The map is not the territory: medical records and 21st century practice

Stephen A Martin, Christine A Sinsky



Worth checking out

ORIGINAL ARTICLE

Provider and Patient Perceptions of an External Medication History Function

Susan E. Wolver, MD, FACP,* Jeremy S Stultz, PharmD,† Arpita Aggarwal, MD, MSc,* Leroy Thacker, MS, PhD,‡ and Colin Banas, MD, MSHA*

> Testing electronic health records in the "production" environment: an essential step in the journey to a safe and effective health care system

RECEIVED 19 November 2015 REVISED 5 February 2016 ACCEPTED 16 February 2016





Adam Wright^{1,2,3}, Skye Aaron¹ and Dean F Sittig⁴


Questions?



