Künstliche Intelligenz: Wer trifft in Zukunft ärztliche Entscheidungen? Mensch und / oder Maschine?

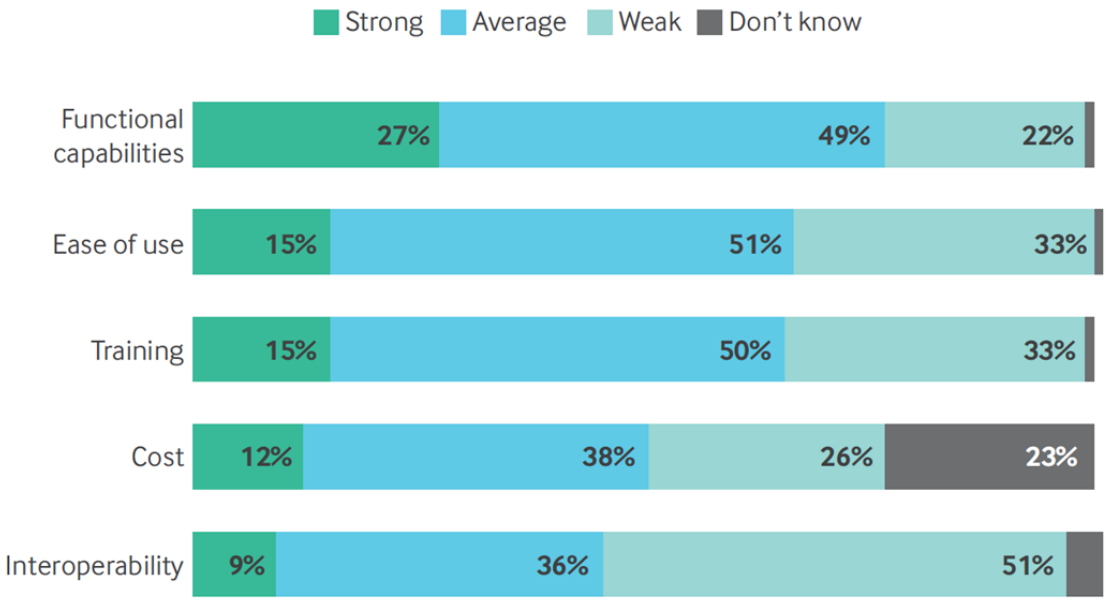
Gerhard Stark

Wien, 23. - 24. Mai 2017

EHEALT SUMMIT AUSTRIA

Effectiveness of Organization's EHR Systems

How do you rate the following aspects of your organization's electronic health record (EHR) system?



Base = 612 (Among applicable)

BARMHERZIGE BRÜDER ÖSTERREICH

Künstliche Intelligenz: Wer trifft in Zukunft ärztliche Entscheidungen? Mensch und / oder Maschine?

Wien, 23. - 24. Mai 2017
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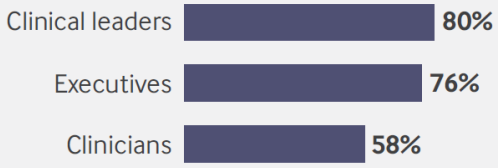
Biggest Opportunities for Use of Data in Health Care

What are the top three biggest opportunities for the use of data in health care?

There are significantly fewer clinicians than executives and clinical leaders who consider predictive analytics as one of the top three.



Base = 682 (Multiple responses)

NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

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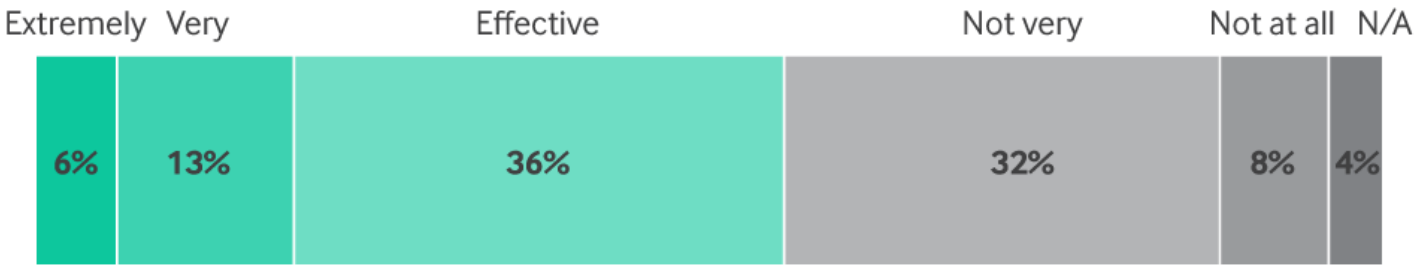
NEJM Catalyst, March 2017

Effectiveness of Organization's Use of Data for Patient Care

How effective do you consider your organization's use of data for direct patient care?



More than half of Council members rate their organization's use of data for direct patient care as effective, but only 19% rate it as extremely or very effective.

Base = 682

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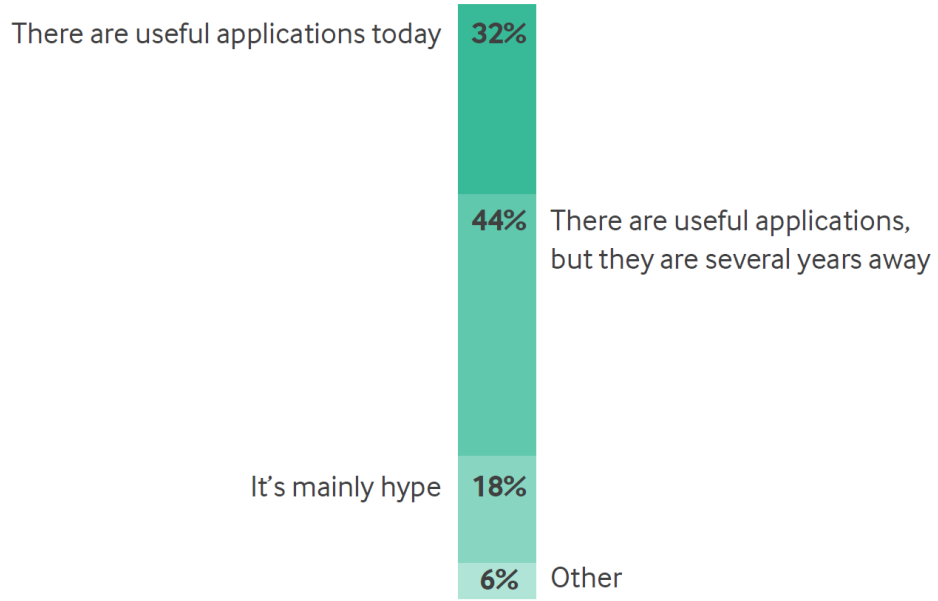
Current State of Big Data in Health Care

Which of the following statements best describes the current state of big data in health care?



Base = 682

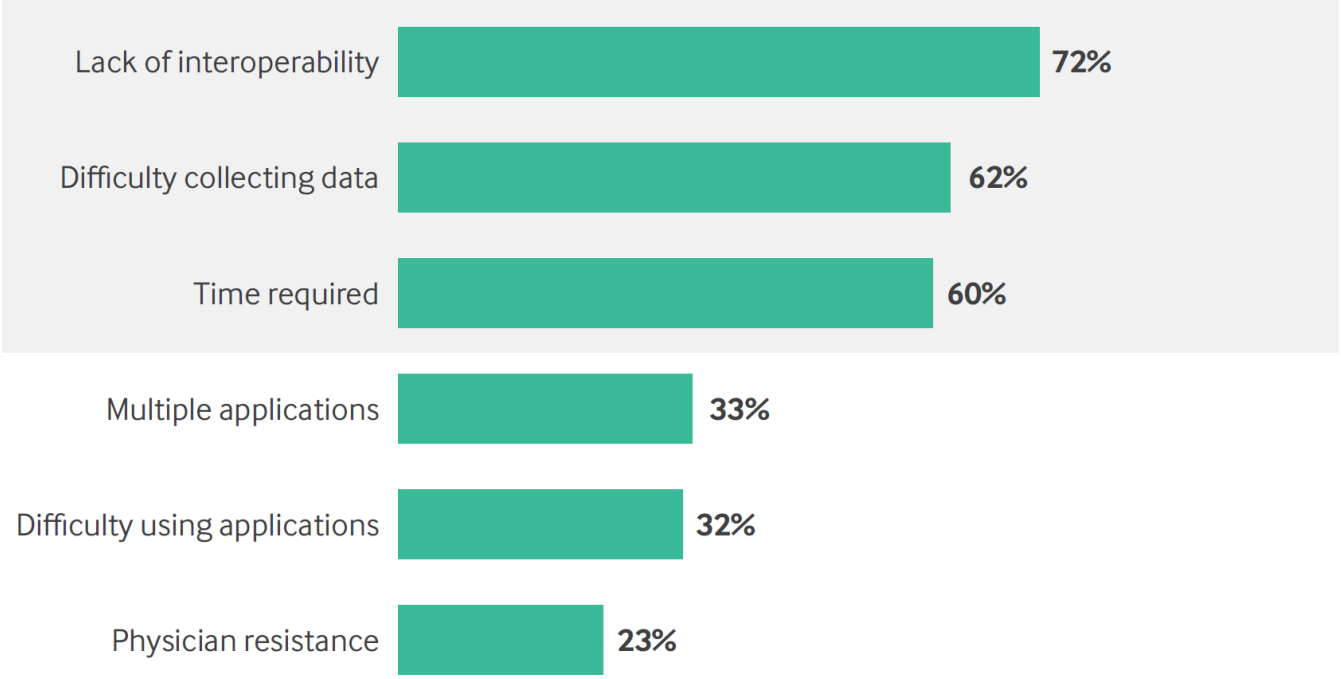
NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

BARMHERZIGE BRÜDER ÖSTERREICH

NEJM Catalyst, March 2017

Biggest Barriers to Better Use of Patient Data

What are the top three biggest barriers to better use of patient data?



Base = 682 (Multiple responses)

NEJM Catalyst (catalyst.nejm.org) © Massachusetts Medical Society

Allocation of Physician Time in Ambulatory Practice

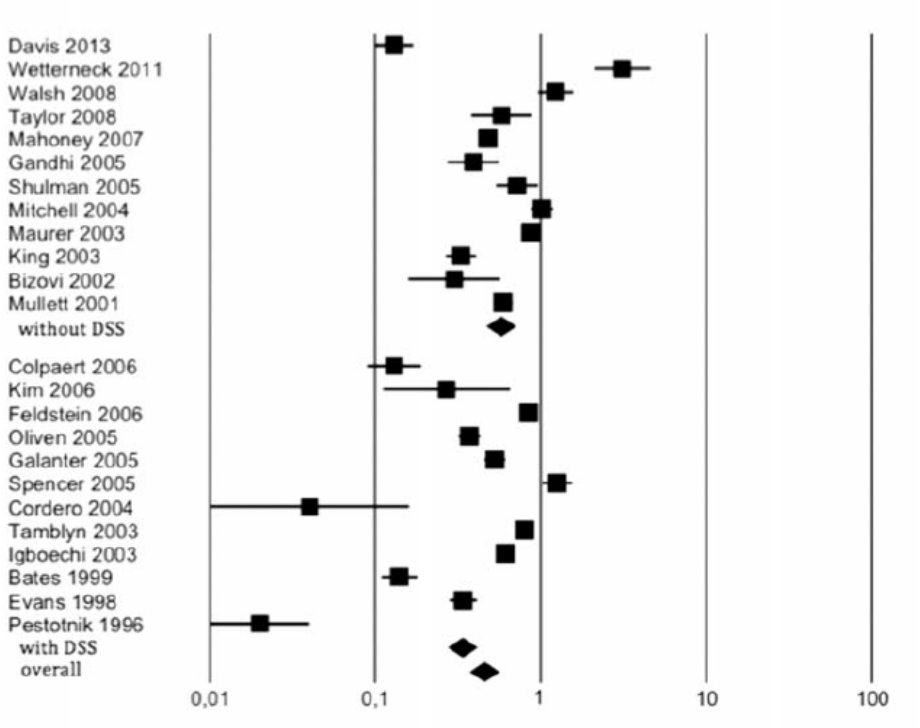
Table 4. Physician Time Distribution During Office Hours, by Task Category

Task Category, by Activity During Office Hours	Tasks, *n*	Mean Time to Complete Task, *s*	Tasks per Hour, *n*	Time Spent (95% CI), %	
				Total*	By Task Category
Direct clinical face time				33.1 (31.9-34.5)	
With patient	4483	93	10	-	27.0 (25.8-28.3)
With staff and others (patient not present)	2121	45	5	-	6.1 (5.7-6.5)
EHR and desk work				49.2 (47.8-50.6)	
Documentation and review	8623	69	20	-	38.5 (37.3-39.8)
Test result	1661	59	4	-	6.3 (5.8-6.8)
Medication order	622	59	1	-	2.4 (2.2-2.5)
Other order	610	52	1	-	2.0 (1.9-2.2)
Administrative tasks				1.1 (0.9-1.3)	
Insurance	191	49	<1	-	0.6 (0.5-0.7)
Scheduling	125	59	<1	-	0.5 (0.3-0.6)
Other tasks				19.9 (18.2-21.6)	
Closed to observation	163	524	<1	-	5.5 (4.5-6.5)
Other (aggregated)	969	183	2	-	5.2 (4.3-6.0)
Transit	2946	15	7	-	2.9 (2.8-3.0)
Personal	902	109	2	-	6.3 (5.6-7.1)

EHR = electronic health record.
* Total sums to 103.3% because the Work Observation Method by Activity Timing platform allows recording of 2 tasks done in parallel. Multitasking results in overlapping time records, which are additive. Thus, the total task time is >100% of the total time observed.

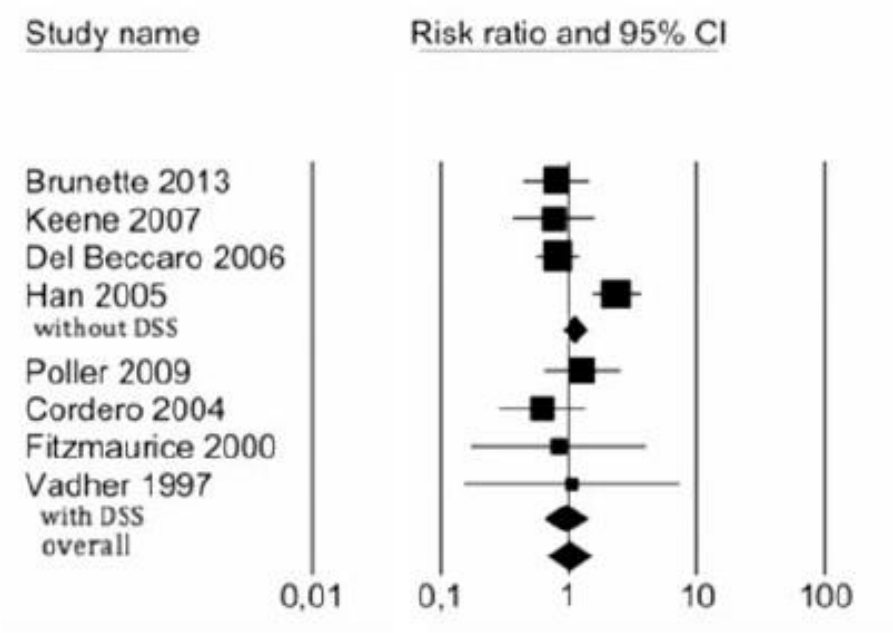
Ann Intern Med. 2016;165(11):753-760

EHR and medication errors



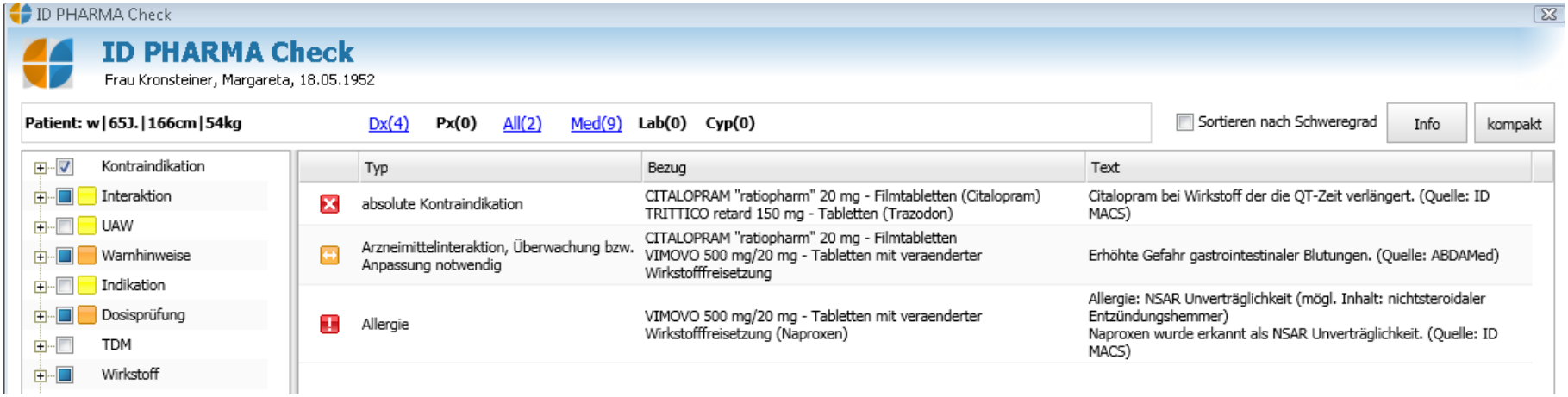
Eur J Public Health 2016; 26:60-64

EHR and mortality



Eur J Public Health 2016; 26:60-64

Künstliche Intelligenz: Wer trifft in Zukunft ärztliche Entscheidungen? Mensch und / oder Maschine?



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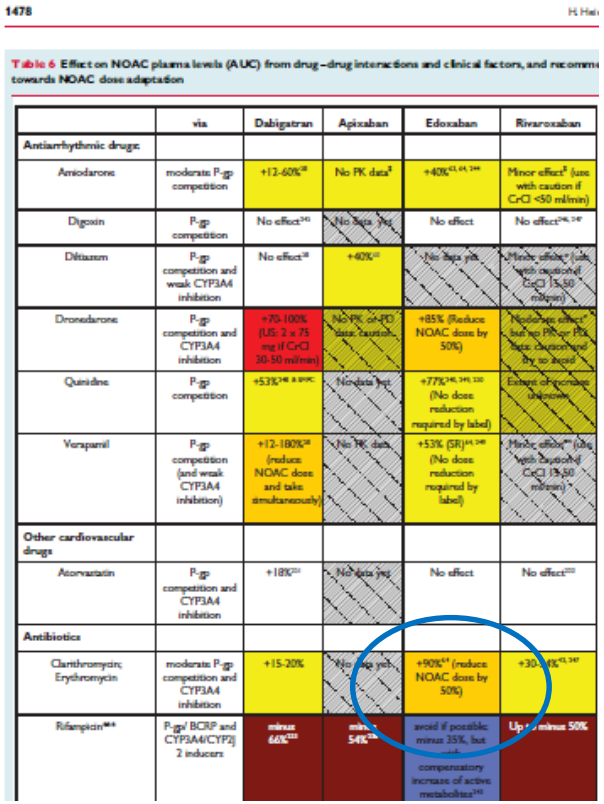
- Edoxaban (Lixiana) – Clarithromycin

  - keine Meldung von ID Berlin

  - Abfrage mediq.ch

IA-Stärke	Kommentar
■	**Clarithromycin und Edoxaban** Clarithromycin ist ein starker p-Glycoprotein und CYP-3A-Hemmer. In der Kombination kann es zu erhöhten Blutspiegeln von Edoxaban mit erhöhter Blutungsneigung kommen. Es liegen keine Interaktionsdaten vor. Gemäss US-Fachinformation wird eine vorsichtige Dosierung (30mg/d) bei Patienten mit tiefen Venenthrombosen und Lungenembolie, nicht aber bei Patienten mit Vorhofflimmern empfohlen.

  - esc – guidelines - Dosisreduktion



1478

Table 6 Effect on NOAC plasma levels (AUC) from drug–drug interactions and clinical factors, and recomm towards NOAC dose adaptation

	via	Dabigatran	Apixaban	Edoxaban	Rivaroxaban
Antiarrhythmic drugs					
Amiodarone	moderate P-gp competition	+12-60%[38]	No PK data[3]	+40%[43,44,144]	Minor effect[3] (use with caution if CrCl <50 ml/min)
Digoxin	P-gp competition	No effect[145]	No data yet	No effect	No effect[146,147]
Diltiazem	P-gp competition and weak CYP3A4 inhibition	No effect[38]	+60%[43]	No data yet	Minor effect[3] (use with caution if CrCl 15–50 ml/min)
Dronedarone	P-gp competition and CYP3A4 inhibition	+70–100% (US: 2 × 75 mg if CrCl 30–50 ml/min)	No PK- or PD data; caution	+85% (Reduce NOAC dose by 50%)	Moderate effect[3] but no PK- or PD data; caution and try to avoid
Quinidine	P-gp competition	+53%[38,8 (EMA)]	No data yet	+77%[38,144,110] (No dose reduction required by label)	Extent of increase unknown
Verapamil	P-gp competition (and weak CYP3A4 inhibition)	+12–180%[38] (reduce NOAC dose and take simultaneously)	No PK data	+53% (SR)[43,144] (No dose reduction required by label)	Minor effect[3] (use with caution if CrCl 15–50 ml/min) ?
Other cardiovascular drugs					
Atorvastatin	P-gp competition and CYP3A4 inhibition	+18%[111]	No data yet	No effect	No effect[112]
Antibiotics					
Clarithromycin; Erythromycin	moderate P-gp competition and CYP3A4 inhibition	+15–20%	No data yet	+90%[44] (reduce NOAC dose by 50%)	+30–44%[43,147]
Rifampicin[84,4]	P-gp/ BCRP and CYP3A4/CYP2J 2 inducers	minus 66%[113]	minus 54%[38]	avoid if possible; minus 35%, but compensatory increase of active metabolites[145]	Up to minus 50%

Updated European Heart Rhythm Association
Practical Guide on the use of non-vitamin K antagonist anticoagulants in patients with non-valvular atrial fibrillation
Heidbüchel et al, 2015

Breakdown of alerts overrides

	Total alerts		Alert overrides		
Alert type	N	(%)	N	(%)	Most common reason for override
Patient allergy	26 408	16.8	20 430	77.4	Patient took previously without allergic reaction
Drug–drug interaction	24 849	15.8	14 966	60.2	Will monitor as recommended
Duplicate drug	52 113	33.1	14 917	28.6	Patient requires different strengths of same drug
Drug–class interaction	19 593	12.4	4782	24.4	Transitioning from one drug to the other
Class–class interaction	4184	2.7	2918	69.7	Patient on long term therapy with combination
Age-based suggestion	10 501	6.7	8297	79.0	Patient has tolerated this drug in the past
Renal suggestion	3890	2.5	3035	78.0	Patient has tolerated this drug in the past
Formulary substitution	15 945	10.1	13 554	85.0	Intolerance/failure of suggested substitution
Total	157 483	100.0	82 899	52.6	

J Am Med Inform Assoc 2014; 21:487

Appropriateness of overrides by alert type

Table 3 Appropriateness of overrides by alert type

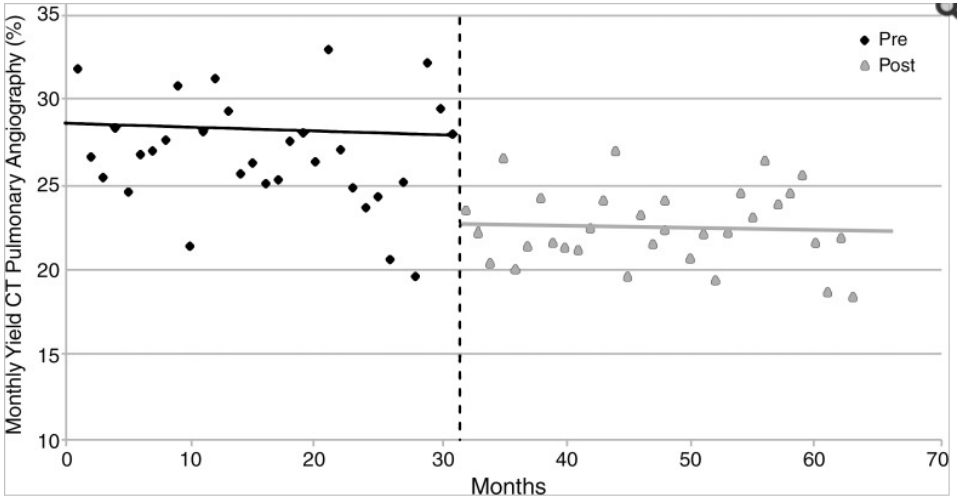
Alert type	Appropriate (%)	Not appropriate (%)	Exclusions* (%)
Patient allergy†	92	8	
Drug–drug interaction†	12	88	
Duplicate drug‡	82	18	
Drug–class interaction‡	88	12	
Class–class interaction‡	69	31	
Age-based suggestion†	39	60	1
Renal suggestion†	12	85	3
Formulary substitution†	57	43	
Average	53	47	

*Exclusions due to inability to access patient electronic record or medication list.
†Appropriateness analysis based on a random sample of 100 alert overrides from each of these alert domains.
‡Appropriate analysis based on a combined random sample of 100 alert overrides from these alert domains.

J Am Med Inform Assoc 2014; 21:487

Clinical decision support

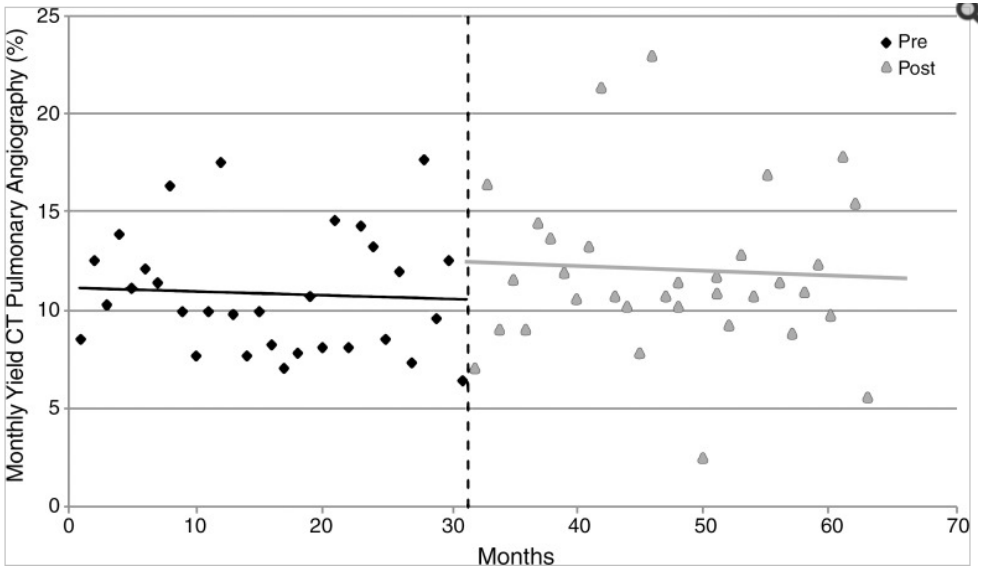
Graph shows linear trend analysis for use of CT pulmonary angiographic imaging before (*pre*) and after (*post*) implementation of CDS clinical decision support



Radiology. July 2015; 276(1): 167–174.

Clinical decision support

Linear trend analysis for yield of CT pulmonary angiographic imaging before (*pre*) and after (*post*) implementation of CDS clinical decision support

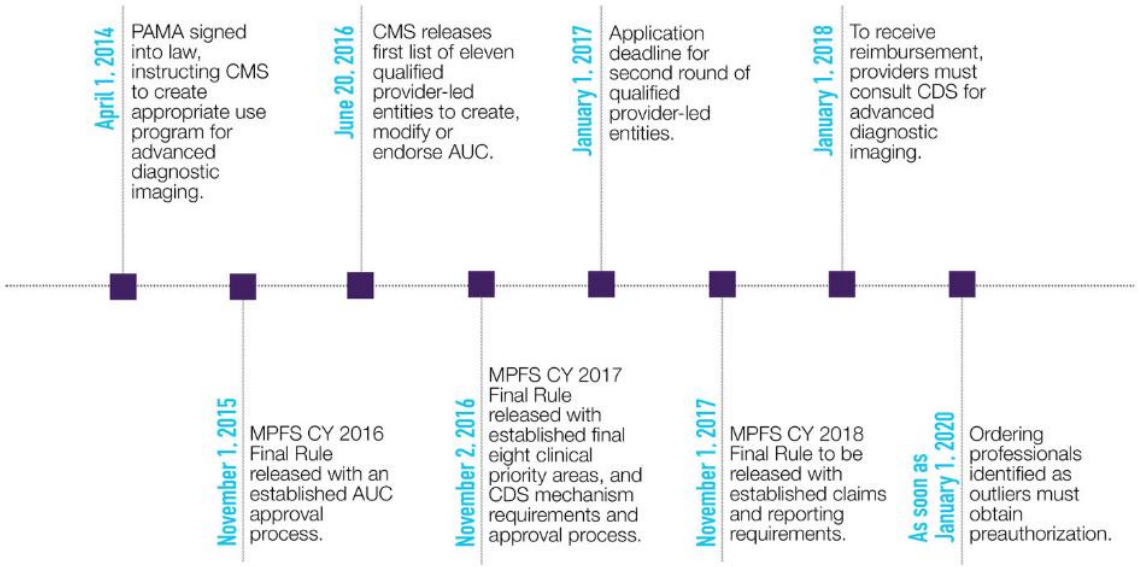


Radiology. July 2015; 276(1): 167–174.

PAMA
Protecting Access to Medicare Act of 2014

STARTING JANUARY 1, 2018...

Medicare reimbursement for advanced outpatient imaging procedures (CT, MR, NM, PET) will be at risk if providers do not meet the requirements of the Appropriate Use Criteria (AUC) Program initially set forth in the Protecting Access to Medicare Act (PAMA, 2014).



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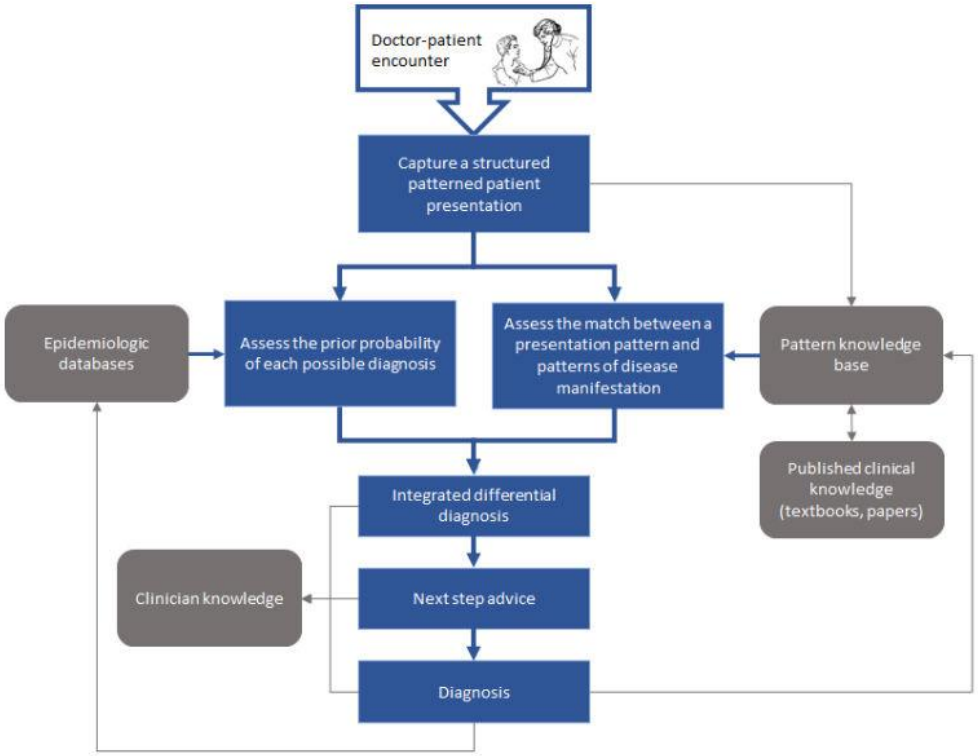
Generating a real-time structured representation of a patient presentation supports a computer-aided diagnostic process (blue arrows) and a learning health care system through knowledge reuse (gray arrows)



JMIR ; 2017 19: e54

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Big Data Bust: MD Anderson-Watson Project Dies

Top Cancer Center Spent $62M

Nick Mulcahy

|February 22, 2017

After 4 years of spiralling costs that now total at least $62 million, a grandiose big-data project that was a collaboration between MD Anderson Cancer Center and IBM's Watson artificial intelligence system is over. The details emerged in a 48-page audit report from the University of Texas System that surfaced last week in news stories.

IBM has made it clear that the Oncology Expert Advisor should not be used with patients.

The Oncology Expert Advisor "is not ready for human investigational or clinical use, and its use in the treatment of patients is prohibited," reads the audit report, quoting directly from an IBM contractual agreement with MD Anderson.

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

In 2009, the Health Information Technology for Economic and Clinical Health (HITECH) Act established an incentive payment program geared toward “meaningful use” of information technology (IT), which ultimately disbursed more than $34 billion for the promotion and purchase of electronic health records (EHRs).

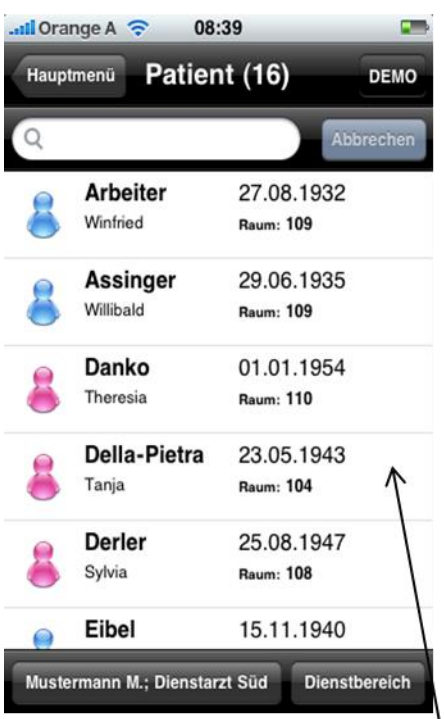
Eight years later, however, the U.S. health care system still doesn’t have a usable IT engine that can generate high-quality data, a restriction that may impede progress toward the use of real-world evidence to advance treatment and research.

If we make it our goal for a given app to be able to run on any EHR in the U.S. health care system, we minimize the risk that the 21st Century Cures Act will produce only local successes.

N Engl J Med 2017; 376:1905-1907May 18, 2017

Künstliche Intelligenz: Wer trifft in Zukunft ärztliche Entscheidungen? Mensch und / oder Maschine?

Wien, 23. - 24. Mai 2017
EHEALT SUMMIT AUSTRIA



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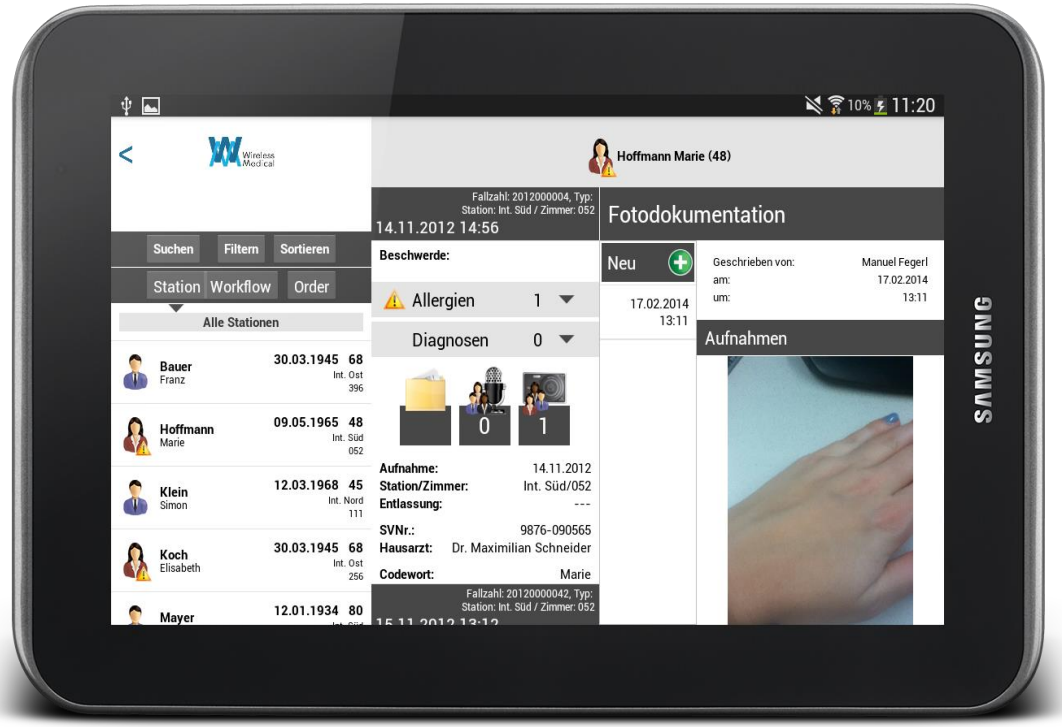

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Künstliche Intelligenz: Wer trifft in Zukunft ärztliche Entscheidungen? Mensch und / oder Maschine?

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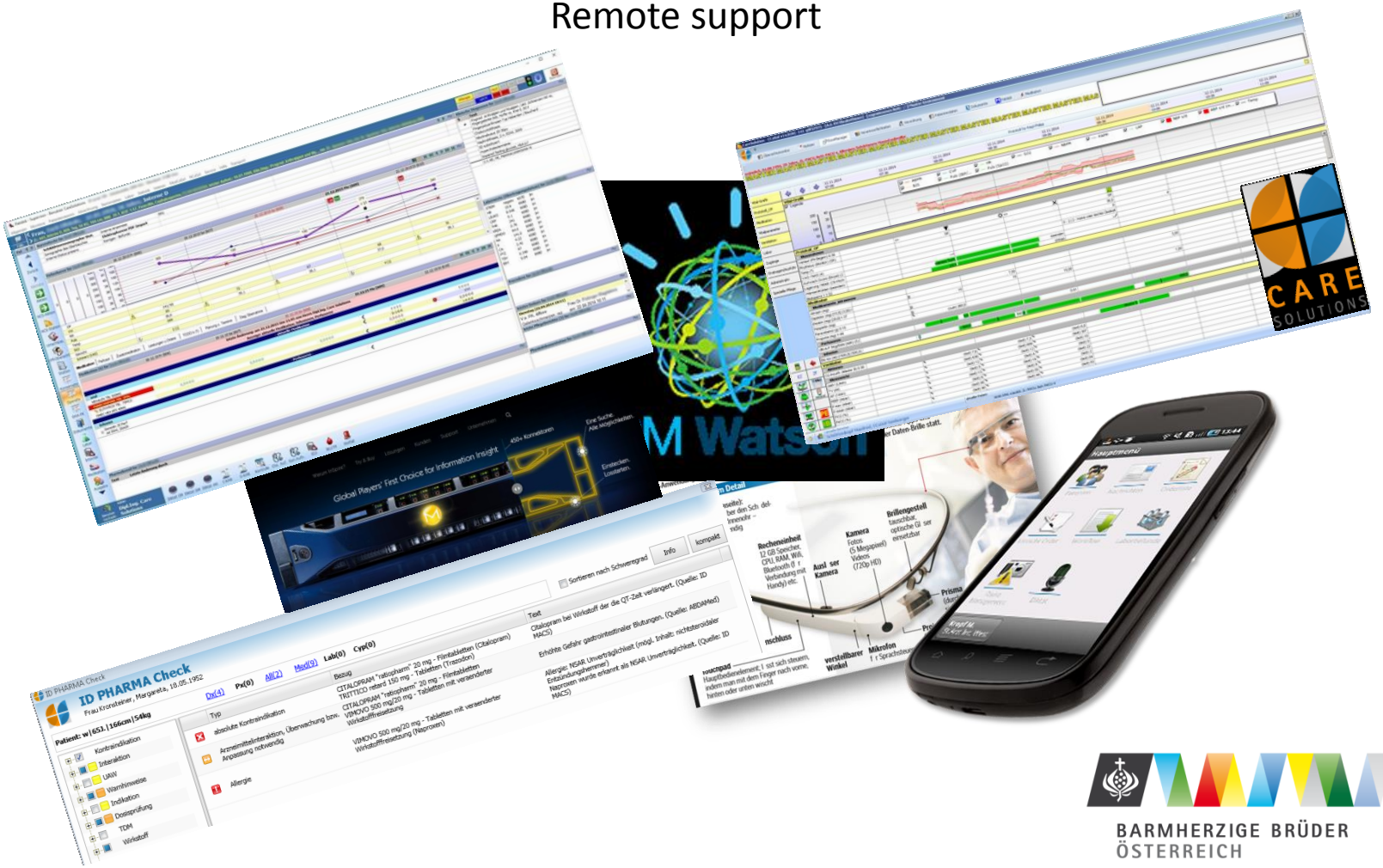
EMR + Telemedicine + clinical decision support
Remote support



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Ende

DANKE

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