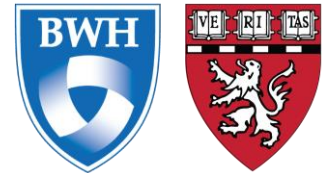


Remember Why We're Here!

A cranky call for action

Jonathan Teich, InterSystems, Brigham & Women's
June 22, 2018



Once upon a time...

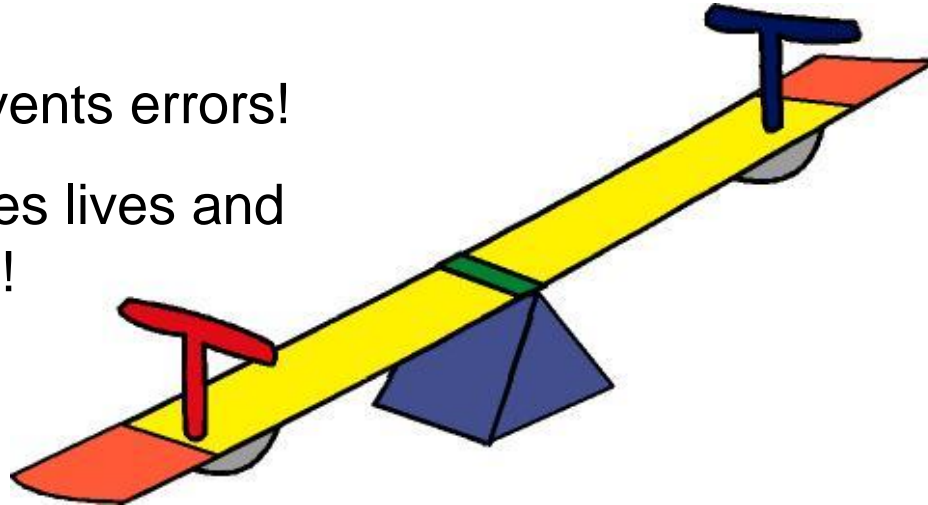




Mommy, I want to grow up
to help humanity document
reviews of systems and
prevent referral leakage!

News seems to fluctuate

Prevents errors!
Saves lives and
\$\$!



Causes errors!

Hurts patients!

Physicians equal to two medium sized medical school graduating classes commit suicide each year. Connection to stress from EHR and other computer related impositions that were meant to help, not harm?@...

   10

7 Comments

Meanwhile...

- We don't have continuity of care
- Can't make an appointment
- Don't have logistics for opioid treatment, social services, detox
- Miss tests
- Poorly manage chronic conditions
- Don't transmit end of life wishes
- Lack access to care
- Delayed or unavailable services



Catalog of Helping Your Mom

Smart Group

- Quality / Care management
- Safety (preventive and reactive)
- Cost of care
- Knowledge awareness (WDIDN)
- Learning through data (incl research support)

Easy Group

- Situational awareness
- User satisfaction (operational)

Patient Group

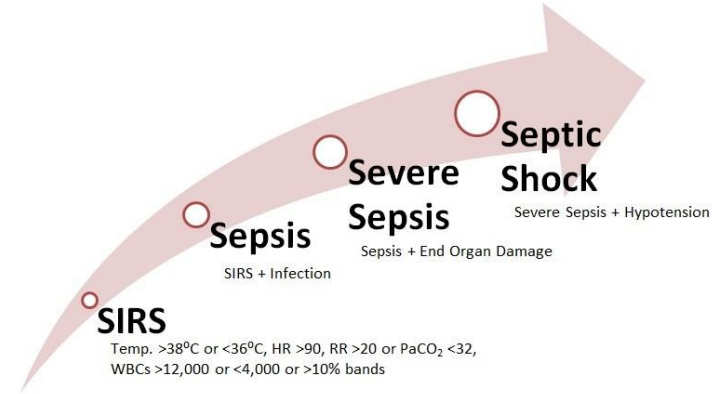
- Patient awareness
- Patient participation
- Patient access to services

Elsecare

- The underserved
- Global health
- Other venues
- Crises (fast and slow)

(Smart group) Proactive quality CDS

- **Acute:** sepsis, stroke tx, ERAS
- **Transition:** care continuity, med rec, pre-/post-procedure, care plans
- **Health targets:** immunization, opioids, suicide risk, readmission, end of life

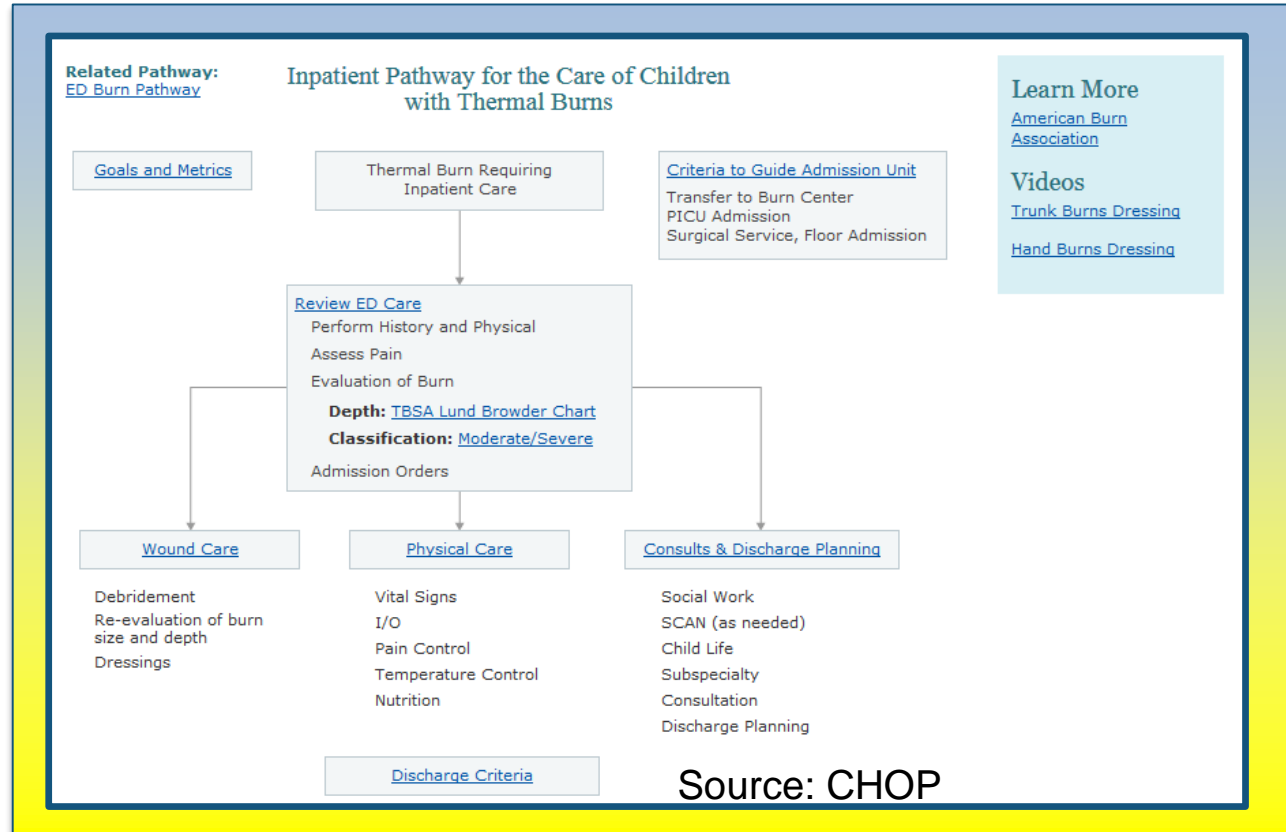


Vaccine	Age	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19-23 months	2-3 years	4-4 years
Hepatitis B ¹		HepB	HepB									
Rotavirus ²			RV	RV	RV ³							
Diphtheria, Tetanus, Pertussis ³			DTaP	DTaP	DTaP	see below ⁴	DTaP					DTaP
Neisseringituz influenzae type D ⁴			Hib	Hib	HIP							
Pneumococcal ⁵			PCV	PCV	PCV							PPSV
Haemophilus influenzae ⁶			IPV	IPV								IPV
Influenza ⁷							Influenza (yearly)					
Mumps, Measles, Rubella ⁸							MMR		see below ⁹			MMR
Varicella ⁹							Varicella		see below ⁹			Varicella
Hepatitis A ¹⁰									HepA (2 doses)			HepA Series
Meningococcal ¹¹												MCV



(Smart group) Care plans / pathways

- Multi-person, -step, -venue
- Promote timely care
- Prevent omissions
- Combine info and action



Also: Connect to services

- Transportation
- Communication
- Referral
- Monitoring

Walter Jones ¹
Discharge Date: 12 Aug 2015

Chief Complaint: Chronic Heart Failure
Contact: Susan Jones
111 222 3333

Problem List ▾ Team ▾ Notes ▾

Dashboard Daily Pathway Evidence Resources

RECOMMENDATIONS

Adult prevention guidelines

- 2013 Adult High Cholesterol Prevention
- 2013 Adult Obesity Prevention

View Guidelines > Add Guidelines >

Communicate ASCVD risk score.
Rationale ¹

ASCVD Patient Education

- 2013 Adult High Cholesterol Prevention
- 2013 Adult Obesity Prevention

View Education > Add Education >

DAILY SUMMARY

Goals [?] 18 Patient goals or tasks for 22 Aug 2015 >	Goals [?] 14 Patient goals or tasks for 23 Aug 2015 >	Goals [?] 9 Patient goals or tasks for 24 Aug 2015 >	Goals [?] 5 Patient goals or tasks for 25 Aug 2015 >
---	---	--	--

RECENT ACTIVITY

6:02a	New Order	Ambulate with assistance, 3 times per day
10:12a	New Order	Morphine Intravenous Injectable Solution; 4 MG Every hour
12:15p	Lab Result	Complete Blood Count (CBC) View Results >
3:30p	Therapies	Physical Therapy Session

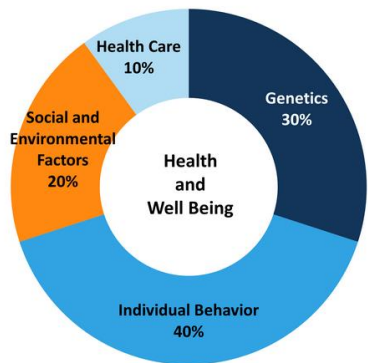
2 Messages >

5 Medications >

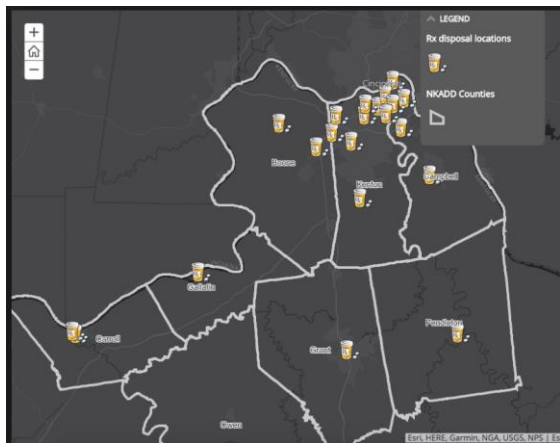
3 Symptoms >

4 Education >

New data sources

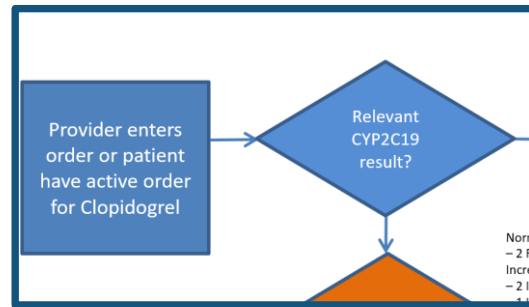


SDoH

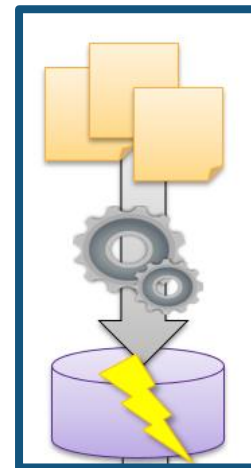


GIS

Genomics



NLP



Others in Smart group

- Readmission prediction and prevention – Indian Health
- Evaluate patients for Harvoni – U. Kentucky
- Intervene on care plan patients in the ED – Healthix
- Highlight relevant order sets – Brigham
- ED frequent flyer detect/intervene – Chicago

(Easy group) Smart summary

*
-

In general:
Write less
Read less

Schedule **Hope, Robert** Actionable Updates

Hope, Robert DOB: 11-25-1974 Age/Gender: 35/M Allergies: Penicillin G Language: English

Snapshot

- Results Review
- Synopsis
- Intake/Output
- Problem List
- History
- Notes
- Medications
- Flowsheet
- Order Review
- Order Entry
- Admission
- Pre-transfer
- Discharge
- Rounding
- Consult
- Procedures
- Discharge

Actionable Updates

- [Heart failure patients taking losartan \(Cozaar\) 50 mg/day should be switched to 150 mg/day](#)
- [Very low energy diet may improve ob](#)

Demographics

Mr. Robert A. Hope Male - Age 35
104 East 32nd Street Tel 1: (513) 251-1234
Cincinnati, OH 45044 Tel 2: (513) 251-1234

Problem List

- Heart Failure [new dose](#)
- Hypertension, uncontrolled
- Rheumatoid Arthritis
- Sleep Apnea [new study](#)

Reminders and Results

- none -

Heart failure patients taking losartan (Cozaar) 50 mg/day should be switched to 150 mg/day

Read Summary - Source: BMJ (3 Dec 2009)

Mr. Hope fits this criteria:

- ICD9 = 428.*
- Med = losartan (Cozaar)
- Dosage = 50mg PO qd

FirstConsult topic: Heart failure

methotrexate 15mg/week [new med](#)

nitrofurantoin (macrocrystal-monohydrate) (MACROBID) capsule 100 mg

Immunizations / Injections

- none -

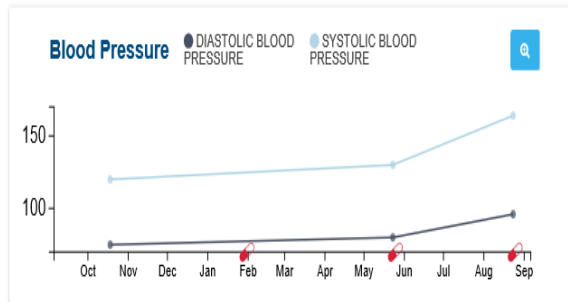
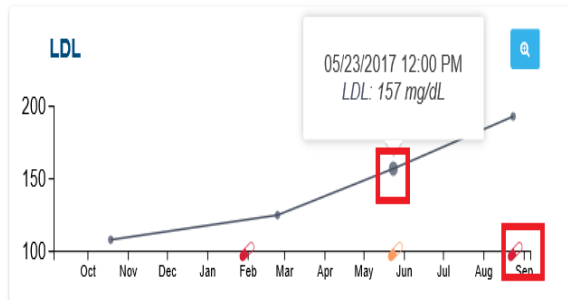
Focused views

- Summary
- Allergies & Alerts
- History
- Documents
- Lab Results
- Radiology Results
- Medications
- Vaccinations
- Conditions**
- Procedures
- Discharges
- Physical Exams
- Plan
- Encounters
- Appointments
- Care Team
- Programs
- Cardiac Risk

Benign essential hypertension

Graphs

Related Results



Related Medications

Search/Filter Drug Class Expand > Sort Sort by date

4 results

Calcium Channel Blocker (2)

Date	Medication	Dose	Route	Frequency	Duration	Ordering Provider	Instructions
2017-08-23	24 HR Diltiazem Hydrochloride 180 MG Extended Release Oral Capsule	1 Tablet	Oral	2 capsules a day	30 Days	Dr. Priya Gupta	Take 2 capsule(s) every day by oral route.
2017-01-29	Amlodipine 5 MG Oral Tablet	1 Tablet	Oral	Twice a day		Dr. Priya Gupta	Take 1 tablet(s) twice a day by oral route.

> Angiotensin II Receptor Antagonists (1)

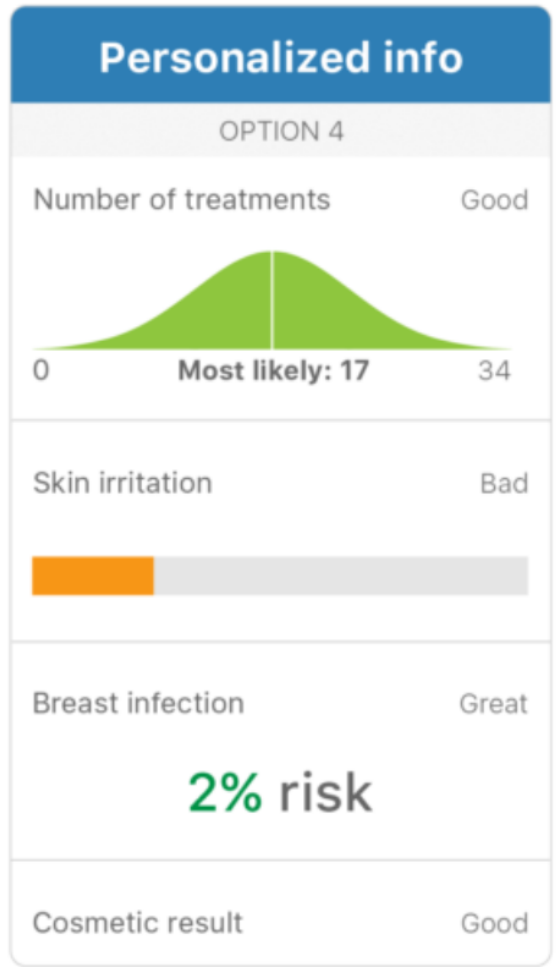
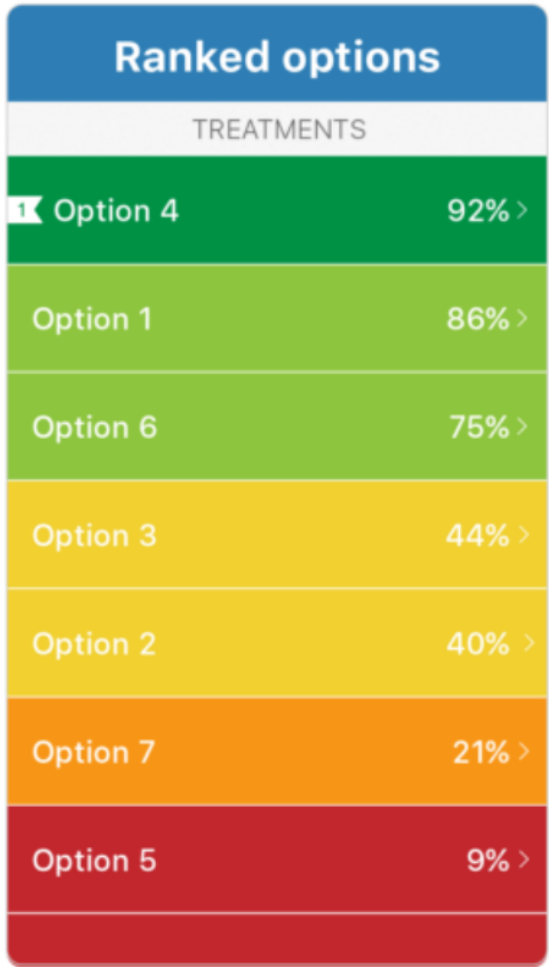
> Vasodilator (1)

Others in Easy group

- Cut-and-paste compressor
- Simplified documentation (hello, CMS...)
- Intelligent chart review
- Summaries for oncology, ICU, anticoag...
- Concierge: summarize patients, initiate communication, notify

(Patient group)

- Data views for patients
- Shared decision-making
- Self-assessments
- Visualizations
- Report PROMs

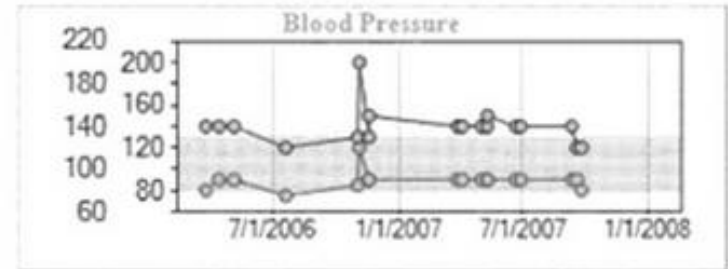


Automatic patient info sheets

should take aspirin regularly. Tip. Enteric-coated aspirin is effective and often safer than non-coated aspirin.

Blood Pressure

On average, your blood pressure has been running high recently (average of 120/85 from your last two visits). The recommended blood pressure goal is 130/80. If your blood pressure medicine has not been recently adjusted or you are not on blood pressure medicine, you should talk with your provider about steps you can take to help lower your blood pressure.



Urine Protein

People with diabetes have a higher risk of kidney

Awareness & transaction support

Quicken 2003 Basic - TEST - [Quicken Home]

File Edit Tools Online Cash Flow Investing Property & Debt Reports Help

Back Update Reports Reconcile Online Calc Accts Calendar AddrBk Customize

Quicken Home Home View 1 First Page

Welcome, Ann & Rob Monday, March 22, 2004

Cash Flow Center

- Primary Brokers... 580.74
- Primary Checkin... 2,589.34
- Primary Credit C... 20.51
- \$3,190.59**

Investing Center

- Primary Broker... 63,169.57
- 401 K - Health... 44,171.04
- \$107,340.61**

Property & Debt

- Primary Auto... 18,000.00
- Primary Home 200,000.00
- Primary Car ... -3,213.11
- Primary Hom... -123,122.68
- \$91,664.21**

Net Worth \$202,195.41

Customize Hide Amounts Account List

Expenses: 1/2004 - 3/2004

Category	Percentage
Exp	18.02%
Escrow	10.20%
Tax	10.18%
Int Exp	10.17%
Utilities	7.479%
Other	36.97%
Sub-Total	\$18,667.06

Show Full Graph Show Expense Report

Income vs. Expenses: 1/2004 - 3/2004

Month	Income (\$ in thousands)	Expense (\$ in thousands)
1/2004	~9	~14
2/2004	~12	~2
3/2004	~0	~3

Show Full Graph Show Income/Expense Report

Net Worth: 1/2004 - 3/2004

	Current	Year Ago	Diff.
Assets:	421,727.37	351,966.58	69,760.79
Liabilities:	126,315.28	139,258.09	-12,942.81
Net Worth:	295,412.09	212,708.49	82,703.60

\$ in 100,000.00

Assets Liabilities Net Worth

Save \$10 on faster, easier, Quicken 2004!

start C:\QUICKENW Quicken 2003 Basic - ... Microsoft PowerPoint ... 6:18 PM



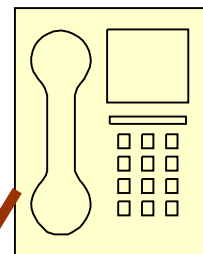
Reference



Forums



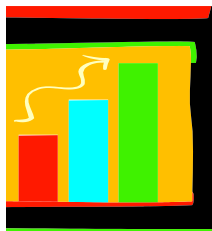
Classes



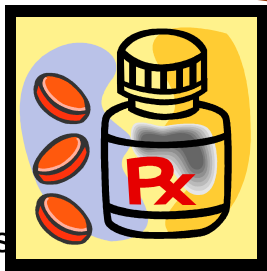
Appointment



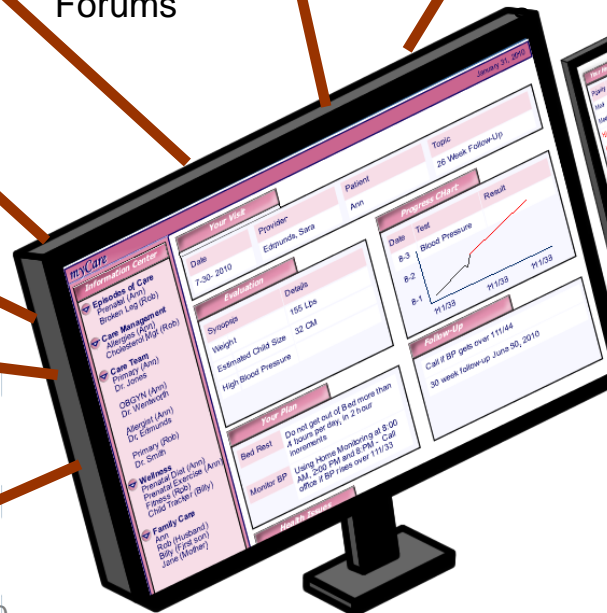
Personal record



Home monitoring



Medications



Patient CDS



-38 AT&T 6:27 PM 80%

“ How do I treat a pulmonary embolism ”

OK, here you go:

Input interpretation

pulmonary embolism and infarction	drugs prescribed at visit
-----------------------------------	---------------------------

Result

	male	female	all
coumarins and indandio nes	34%	40%	38%
phenylpini	0%	27%	22%



myfitnesspal

TUESDAY / Nov 17, 2009

Your Daily Summary

1569 CALORIES REMAINING

Goal	Food	Exercise	Net
2100	+1010	-479	531

Add to Diary

Nutrient Summary

	Total	Goal	Left
Total Fat (g)	20	104	84
Saturated (g)	1	34	33

Home My Diary Progress More

End of life

The screenshot shows a patient care system interface for 'Kenny (Kenny) BAJWA'. The patient's NHS number is 999 024 8966, born on 7 May 1951 (Age 66), and is male. The address is 1528 First Blvd, Boston, Shropshire PA70 6HE. The care plan is published and view-only. The last clinical approval was on 6 Mar 2018 at 15:28 by James Champion at TRINITY HOSPICE. A 'PATIENT ENROLLED' button is visible. A large red 'CPR' icon with a slash through it is overlaid on the screen, indicating that CPR should not be attempted. Below this, the text 'CPR Status: Do Not Attempt' is displayed. The interface also shows 'Should CPR Commence' with the answer 'No' and 'Location of Physical DNACPR Form, If Any' with the answer 'In desk'. A 'DNACPR Details' button is located at the bottom.

coordinate my care Home Help Contact CMC QUTUB SAMINA COORDINATE MY CARE TEAM My Account Logout

Kenny (Kenny) BAJWA Born: 7 May 1951 (Age 66) Address: 1528 First Blvd
NHS No: 999 024 8966 Gender: Male Boston, Shropshire PA70 6HE

State of Care Last clinical approval: 6 Mar 2018 at 15:28
Plan: Published, View Only Last clinical approver: James Champion at TRINITY HOSPICE

UPDATE CARE PLAN PATIENT ENROLLED SUBSCRIBE

CPR CPR Status: Do Not Attempt

Should CPR Commence No

Location of Physical DNACPR Form, If Any In desk

DNACPR Details

Others in Patient group

- Rides
- Bill understanding
- Coverage helper
- Appointment scheduling
- Telehealth (real-time and store/forward)
- Home hospital
- Social care (Eu)

(Elsecare group) Global health informatics

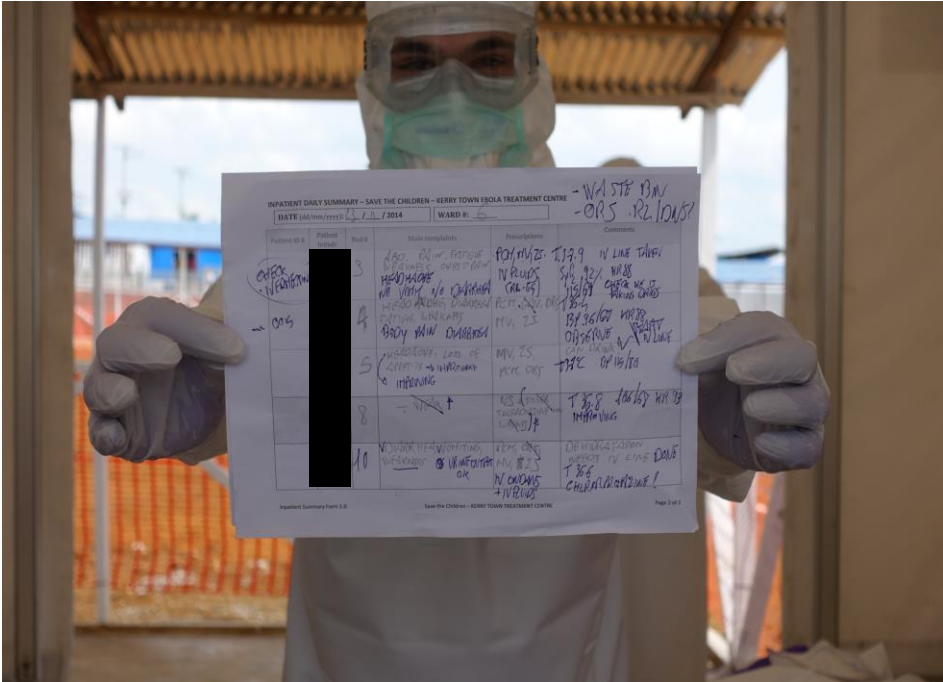
A world of...

- Great health and healthcare needs
- Low resources – technical, medical, supplies
- Poor infrastructure – electric power, transportation, sanitation

- Repeatable problems
- Great opportunities to help
- (Relatively) low regulation



Ebola 2014-15



PATIENT ID

NAME

GENDER - AGE

KT-9-99998 Demonstration Realistic M - 30

BED WARD

1 Conf 4

Paracetamol *Paracetamol 100mg Tablet*

I will fill this later

ROUTE *(Required)*

Oral

DOSE *(Required, >0)*

1

TIME OF DAY

Morning

Evening

Night

DURATION

3

OPTIONS

PRN

- Agitation
- Anxiety
- Constipation
- Cough
- Diarrhea
- Fever
- Indigestion
- Insomnia
- Nausea
- Pain

Cancel

Save

Opioid crisis

Elfvengren K	Clinical Decision Support System for Opioid Substitution Therapy - uploaded to academia.edu	Smart forms	Ch t
VHA	Clinical Pain Reminders	Reminder/ Assessment	Pai
Venebio	Venebio Opioid Advisor (commercial)	Risk calculation	ic
Regenstrief Institute	CPOE Opioid CDS	Alert	
CDC/ONC	CDC Opioid Guidance iOS app	Risk calculation	
Rutgers (Frank Sonnenberg)	CDS to conform to NJ opioid regulations	Smart forms	
U of Utah	CDS Hooks MME calculator	Dose calculator	

Pain Management Resources to Support Clinical Decision Support Artifact Development: An Environmental Scan

Others in Elsecare group

- Community care – dev world and here too (prenatal, nutrition)
- Find patient meds data after Katrina
- Oak Street health – community-based care IT
- Long-term care
- Sub-acute care

All of these are within reach

- **S** ummarize
- **C** ommunicate
- **A** lert
- **R** ecommend
- **F** ollow



The future is...

- **Helpful, practical and usable**, rather than just fancy
- Simple > complex
- We will be helped by future tech...after a few bumps



Thank you!

- jteich@intersystems.com or jteich@bwh.harvard.edu

