

Punk Informatics:

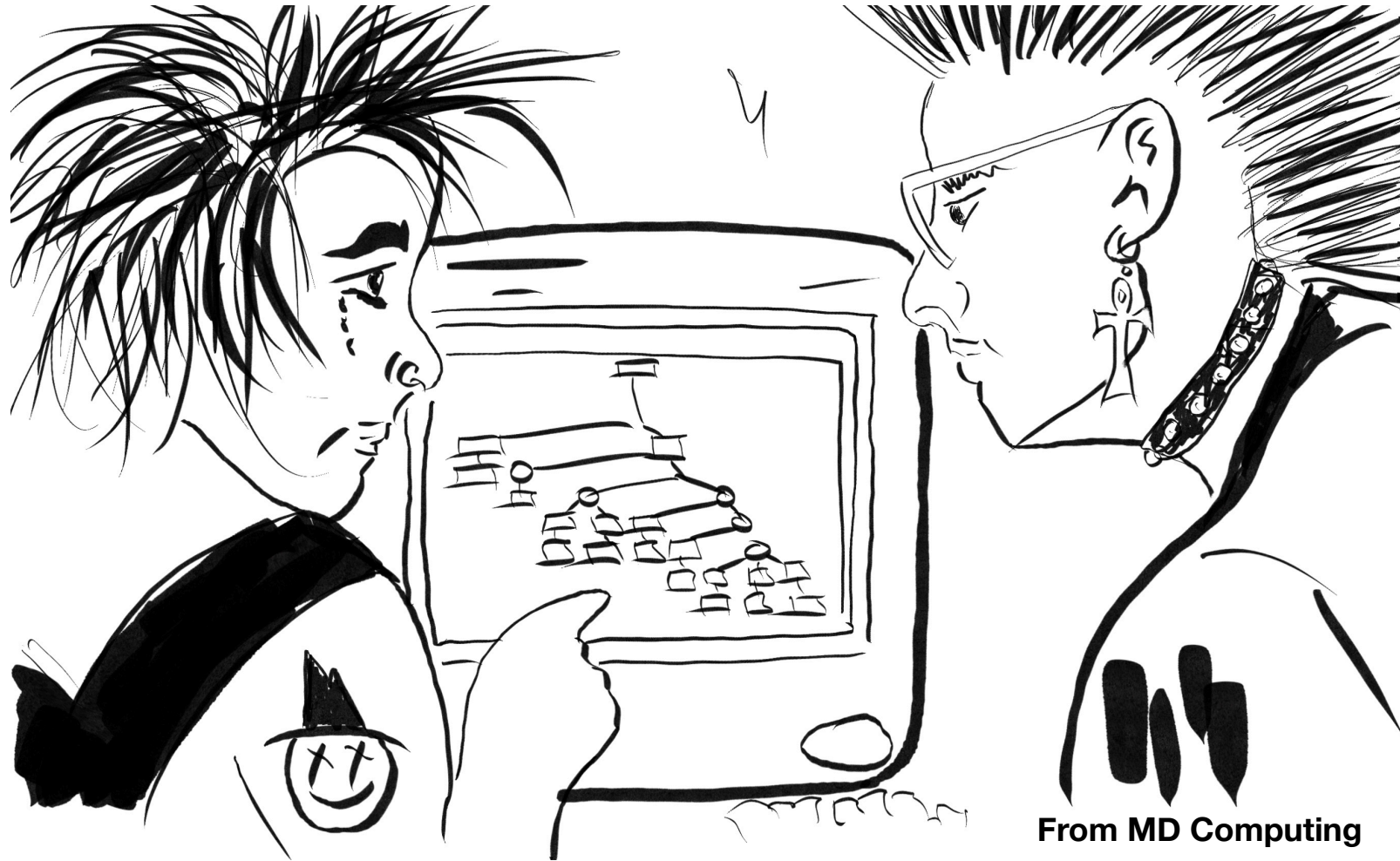
Technology Evolutions and Empowerment
of a Do-It-Yourself Health Professional

Brian E. Chapman, Ph.D.

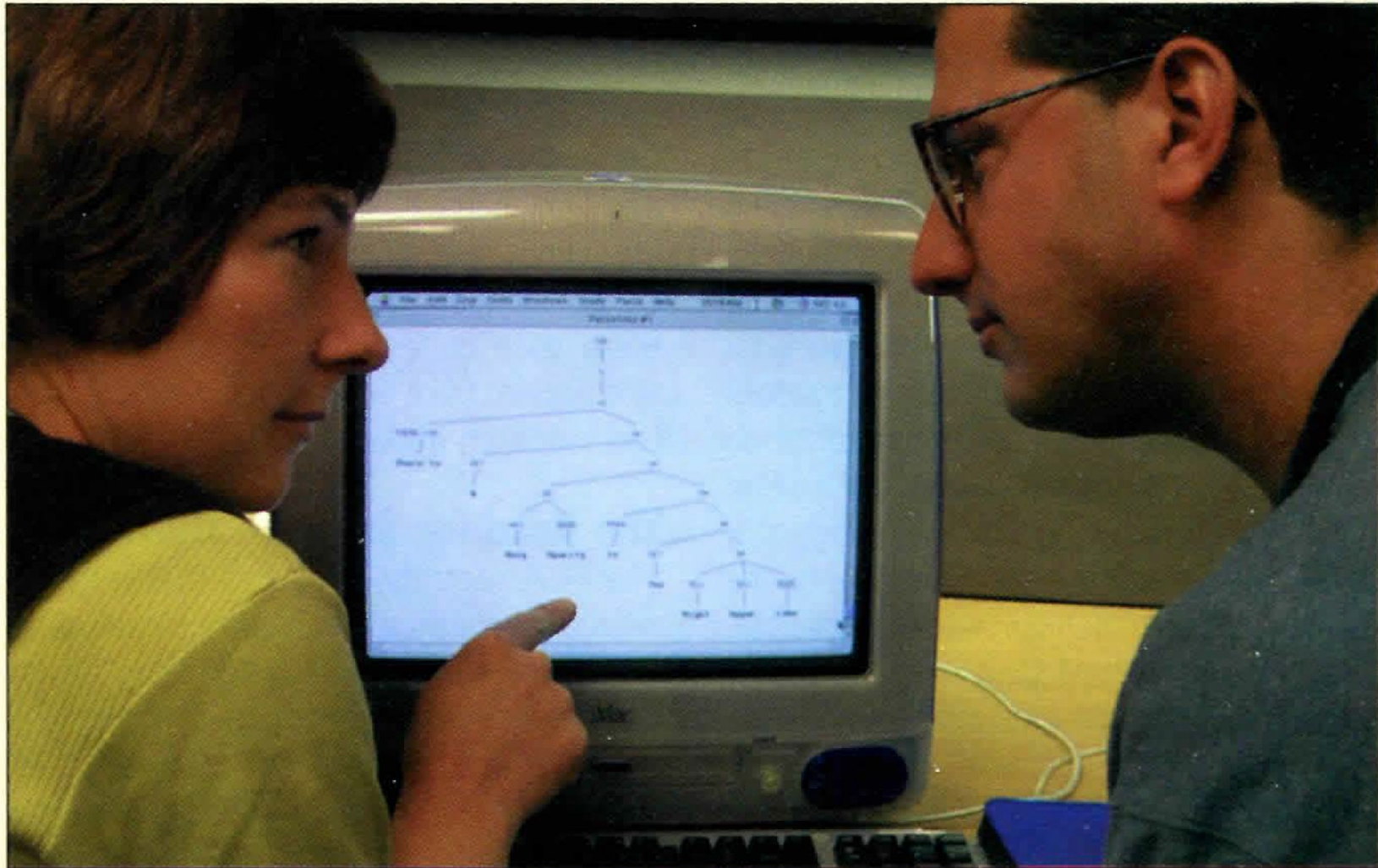
University of Melbourne 31 July 2019

**What comes to mind
when you hear, “punk
informatics”?**

Is it Something Like This?



From MD Computing

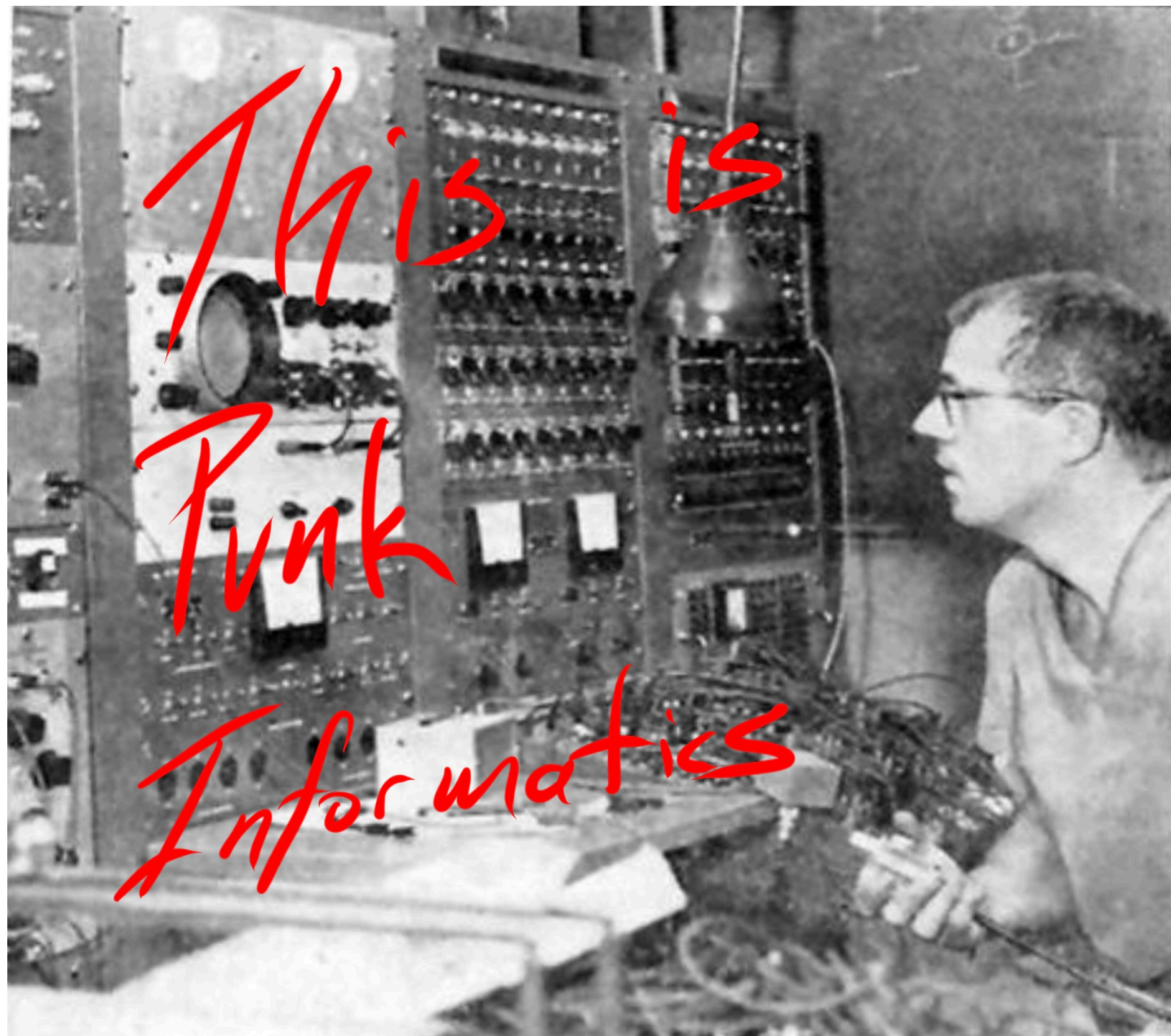


Wendy Chapman (left) and Marcelo Fiszman, M.D., both Ph.D. candidates in medical informatics, discuss the parsed results of their work in “natural language processing.” Future use of natural language processing techniques will have high utility in the development of enterprise clinical information systems.

...Or Maybe by day and by night...



[https://www.chicagomag.com/arts-culture/
November-2017/Daryl-Wilson/](https://www.chicagomag.com/arts-culture/November-2017/Daryl-Wilson/)



New York Times + BxCx

**Why in the world use
a punk metaphor?**

**...Well there's a little
autobiographical element...**



Punk <-> DIY



“[P]unk is not a narrow musical style or a particular fashion or hairstyle. Rather, it is a **commitment** to a DIY sensibility and, with that, a dedication to **self-empowerment.**”

Sounds Like Keith McNeil yesterday

Leadership in the Digital Age

As in any age, leadership is critical to encouraging and enabling *innovation*;

...and *engaging and empowering* those who actually deliver, and are recipients of, healthcare services

Why Do We Need Punk Informaticists?

Maia Hightower, MD, CMIO

University of Utah

‘Cerner and Epic provide “generic” EHRs to an international market that cannot possibly be a sufficient fit to any given health system/hospital.’



EPIC



Cerner®



SSST



I.R.S.



SLEAZE



Music Technologies

1948



1982



1992



Artistic Empowerment 

Technology Evolution: Intermountain Healthcare

LDS Hospital EHR 1967
HELP System

Create own operating system
Create own database
Create own query language

Intermountain EHR circa 1997
HELP System Rewrite 1990s

Use commercial OS:
DOS, OS/2, Unix
Use Oracle DB

Intermountain EHR circa 2017
Switch from HELP to Cerner

Let vendor provide infrastructure
Focus on building apps on top of Cerner

Junk Informatics Empowerment?

2009 USA HiTech Act

Federal program specifying detailed EHR
hospitals had to meet (Meaningful Use)

Combination of incentives and penalties

How did it turn out?

10:41 PM Fri Jul 26 thehospitalist.org 50%


Physician Burnout - EMR Shaming has to STOP

Posted by [Dike Drummond MD](#)

[Tweet](#) [Share](#) [Like 39](#) [Share](#)

Physician Burnout - EMR Shaming Has to STOP

Every time I survey a group of physicians asking, "What are the top three stressors in your practice day?" ... EMR and other documentation issues ALWAYS make the list. This is true regardless of specialty without exception.



EMR is a slave to Big Data, designed by people who have never seen a patient and it is a huge cause of physician burnout in a significant number of doctors.

AND we can do a MUCH better job of helping our physicians clear the EMR hurdle in their day if we STOP SHAMING the people who struggle the most.

10:46 PM Fri Jul 26 medcitynews.com 97%

HEALTH IT

Judy Faulkner asked the press to dig into physician burnout and EHR satisfaction. So we did

The Epic CEO contends there is not a high correlation between EHRs and doctor burnout, but discussions with physicians show the EHR has fallen short of freeing up doctors to better care for patients.

By ERIN DIETSCHÉ

4 Comments / Mar 7, 2019 at 4:51 PM

[Twitter](#) [Facebook](#) [LinkedIn](#) [Email](#)



10:42 PM Fri Jul 26 the-hospitalist.org 88%

ALL CONTENT

Research Shows Link Between EHR and Physician Burnout

The Hospitalist. 2016 April;2016(4)

Author(s): [Larry Beresford](#)

Hospitalists' struggles with the promise and pitfalls of the electronic health record (EHR) can also impinge on their personal satisfaction with their jobs.

PHYSICIAN ENGAGEMENT 2019 DEPARTMENT RESULTS – STRESS/CONTROL/BURNOUT



	"N"	Rate	My work-related stress is manageable.	I have control over my workload.	Burnout is <u>not</u> a problem for me.
Department			% Positive	% Positive	% Positive
Anesthesiology	60/99	61%	76	60	47
Dermatology	30/55	55%	80	80	53
Family & Preventive Medicine	29/51	57%	45	24	28
Internal Medicine	163/446	36%	63	41	34
Neurology	22/47	47%	68	68	45
Obstetrics/Gynecology	27/70	39%	85	59	56
Ophthalmology/Visual Sciences	21/43	49%	67	67	52
Orthopaedics	19/63	30%	58	53	47
Pathology	19/78	24%	89	63	58
Pediatrics	135/300	45%	70	39	41
PM&R	12/24	50%	67	67	58
Psychiatry	30/85	35%	67	43	37
Radiology and Imaging Sciences	50/71	70%	50	16	18
OVERALL			67	46	40
Community Physician Group				84/141	60%
Neurosurgery				10/32	31%
Surgery				88/241	37%

Chuck Friedman

- Chief Scientist at the ONC during the roll-out of Meaningful Use
- **“Top down doesn’t work!”**
- “Need to facilitate organic peer-to-peer collaborations.”

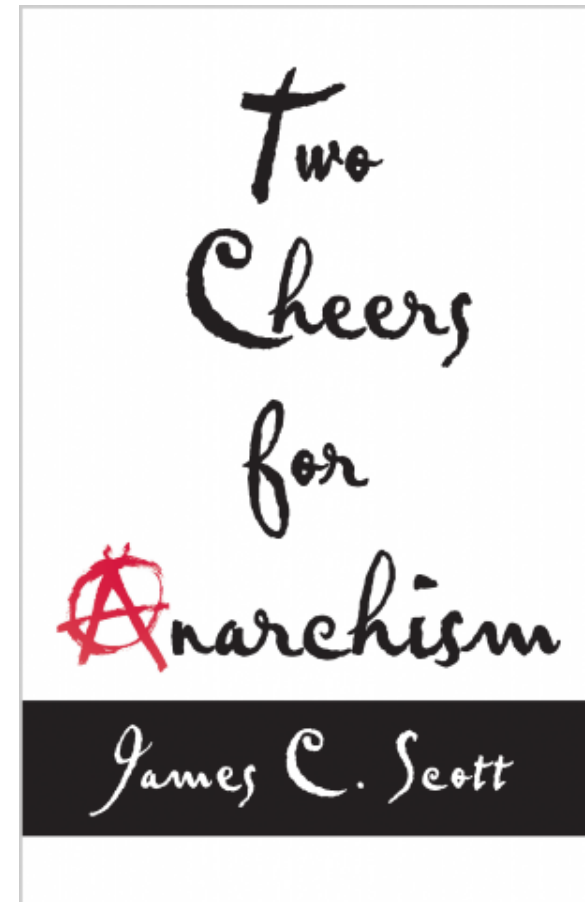


Informatics Needs Anarchy!



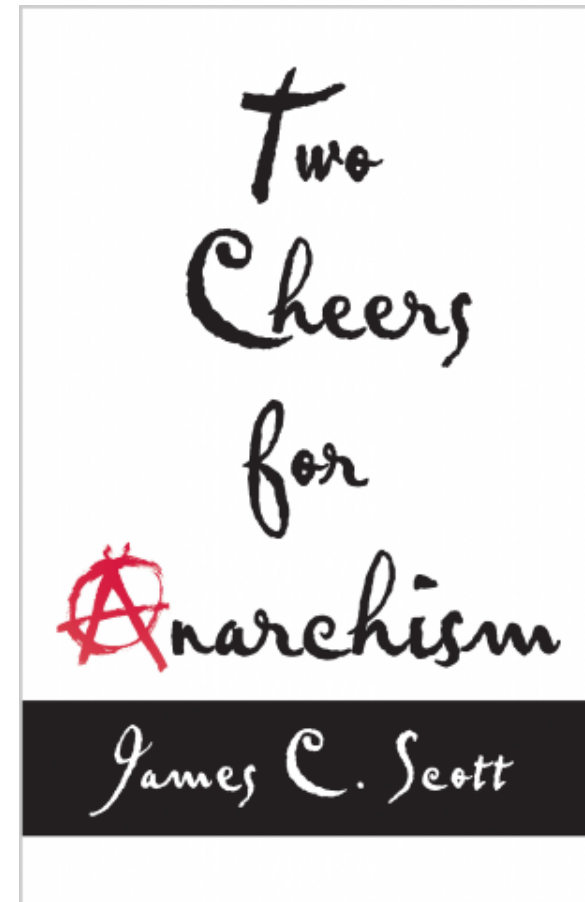
Anarchism?

“One thing that heaves into view, I believe, is what Pierre-Joseph Proudhon had in mind when he first used the term “anarchism,” namely, **mutuality, or *cooperation without hierarchy or state rule.***” (p. xii)



Anarchism?

“Another is the anarchist **tolerance for confusion and improvisation** that accompanies social learning, and confidence in spontaneous cooperation and reciprocity.” (p. xii)



**“Tell them they’ll be
disappointed.”**



**Peter Haug, MD.
Intermountain Healthcare
University of Utah**

**Disappoint can lead
to...**



Or

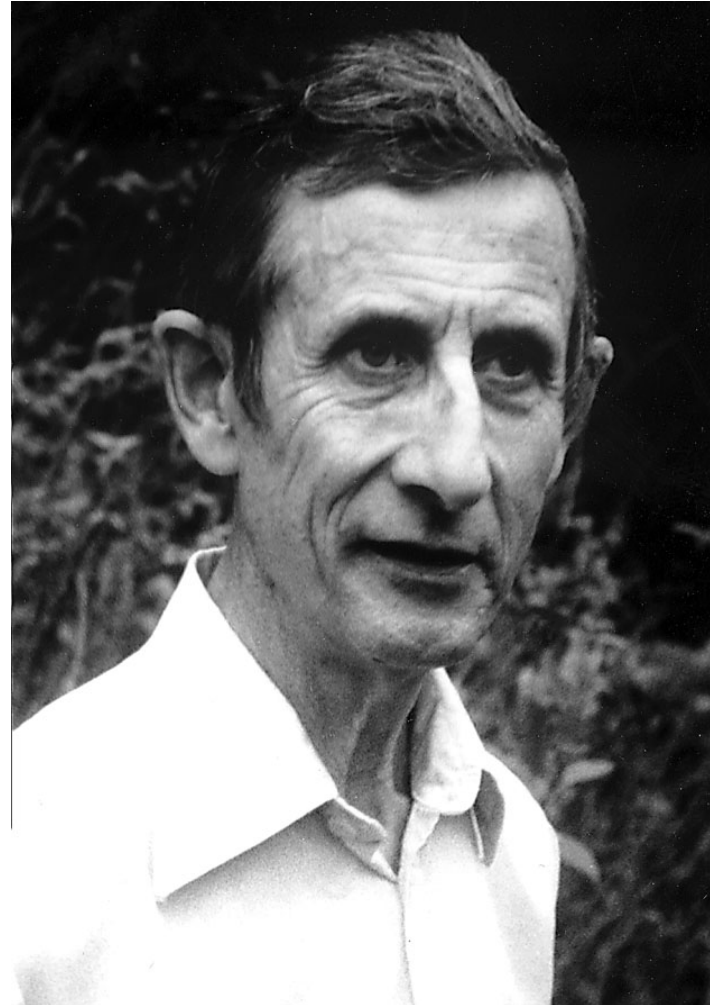
Creative Rebellion



Within a dominant culture that advocates passive consumerism, DIY punk promotes the idea that everyone's voice is worth being heard. Not only are problems identified, but creative solutions are imagined and championed. **In the face of passivity and nihilism, DIY punk promotes individual cultural production, engagement, and transformation.**

...Which Sounds Like Freeman Dyson

“Science is an alliance of free spirits...**rebell**ing against the local tyranny that each culture imposes.” (Scientist as Rebel, p. 4)



What Does it take to be a Punk Informaticist?

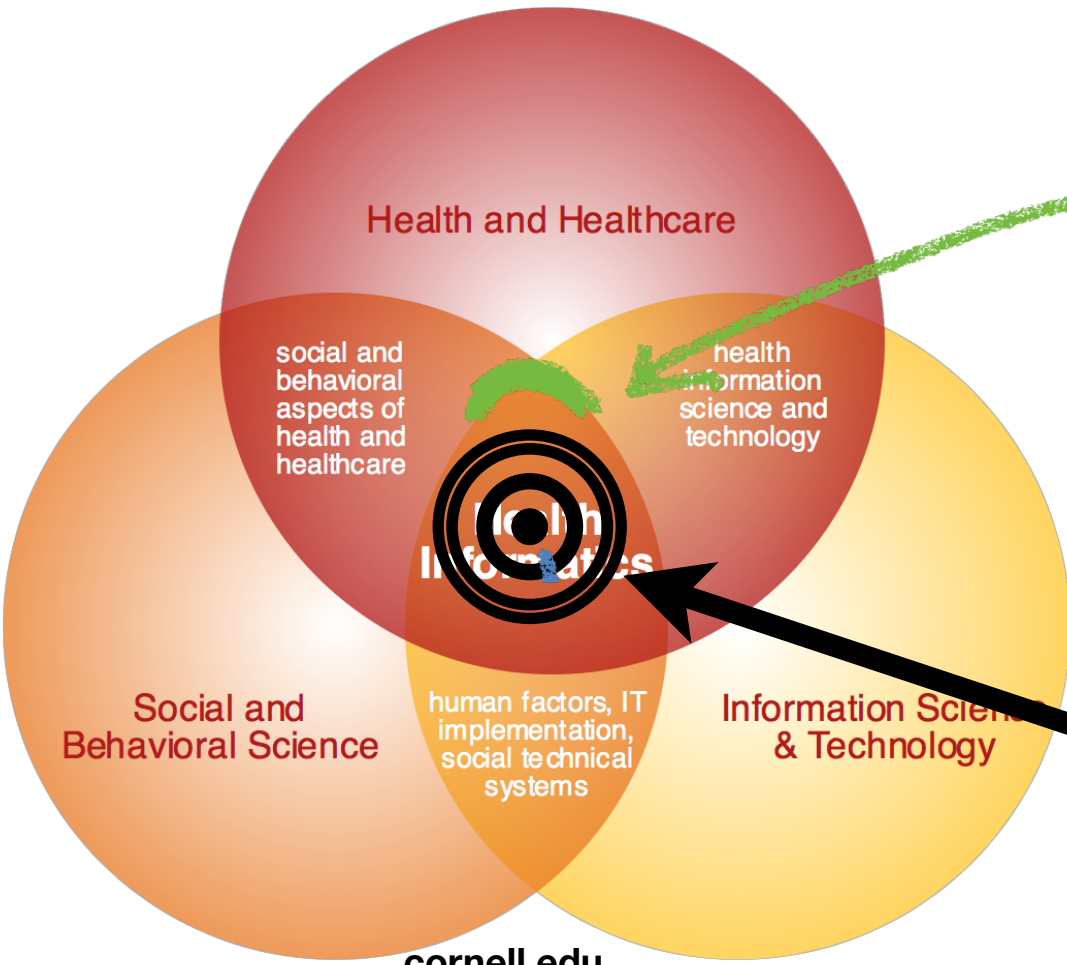
Four

A Tale of ~~Two~~ Clinicians



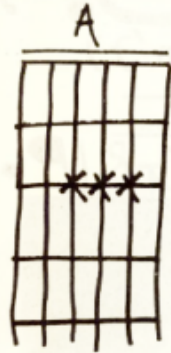
What is Punk Informatics?

The Punk Zone



Graduate Education

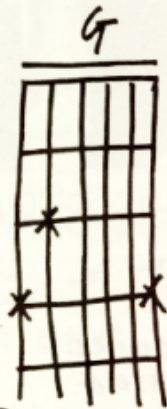
PLAY IN THE BAND...FIRST AND LAST IN A SERIES.....



THIS IS A CHORD



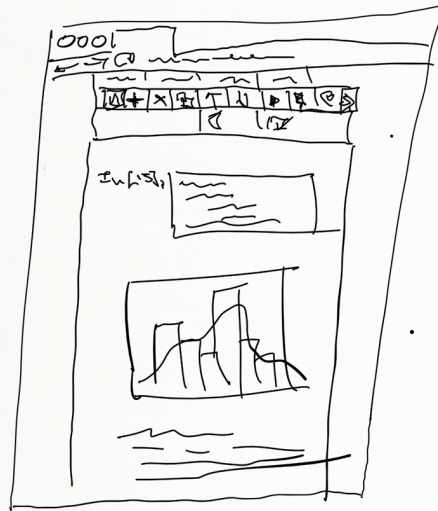
THIS IS ANOTHER



THIS IS A THIRD

NOW FORM A BAND

This is a Jupyter notebook



This is an IF/ELSE statement

if patient_age == 70:

~~~~~

else:

~~~~~

This is a for loop
for patient in icu:

~~~~~  
~~~~~

NOW WRITE A PROGRAM

Three Tiers of Training

1. Informal/Collaboration
2. Short-term training
 1. DeCART Biomedical Data Science Summer School
 2. Data Science Scholars
3. Graduate degree

Peter Kang

Non-Punk Pathology Informaticist

- Pathology Informatics Fellow, University of Pittsburgh
- Enrolled in Introduction to Programming for Biomedical Informatics
 - “Changed my life.”
- Where is he now?
 - MS in BMI from Stanford, Board certified Informaticist, Genomic testing start-up



Advocates and Peer- to-Peer Trainers

PROVIDERS GET EPIC HELP FROM COLLEAGUES

Where do you get help when needed?



UUHS Provider
Sensemaker Survey 2019

Amil Gentili, MD

Punk Radiologist

- **How to automate auditing of critical findings communication?**

- No prior programming experience
- He and I developed a Python script together
 - No formal instruction
- He learned enough Python to tweak and modify script

- **Rebel status**

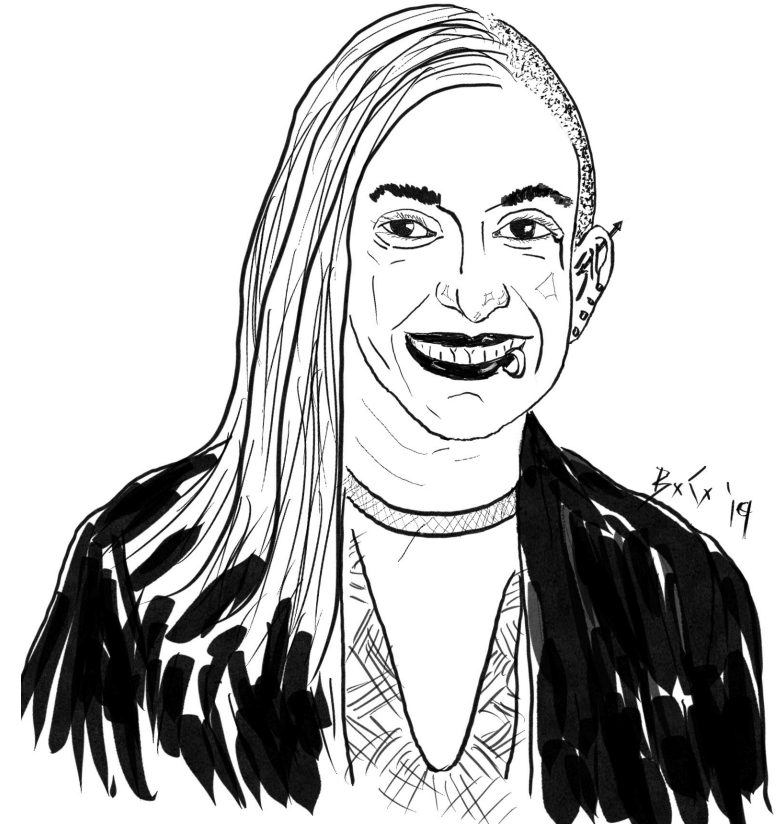
- Staying one step ahead of IT police
- Continued to learn Python with his high school son
- Envisioning additional products



Rashmee Shah, MD

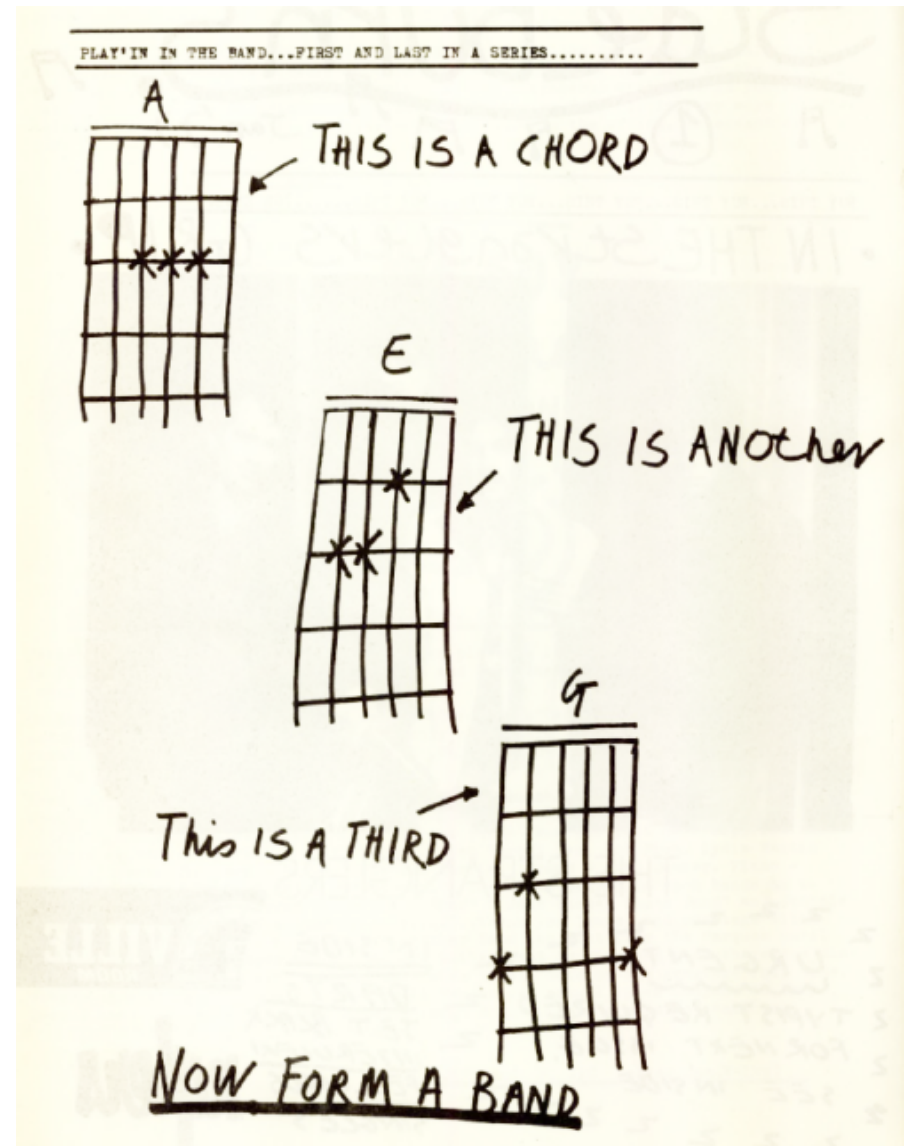
Punk Cardiology Informaticist

- Determine best methods for treating patients with atrial fibrillation based on identifying adverse events
- Identify Bleeding Events
 - Participated in DeCART summer school
 - Did not like programming BUT
 - Learned better how to work with/supervise others
- K and R03 grants



You Can Have Fun with Three Chords

But with more skills... "the world is your oyster."



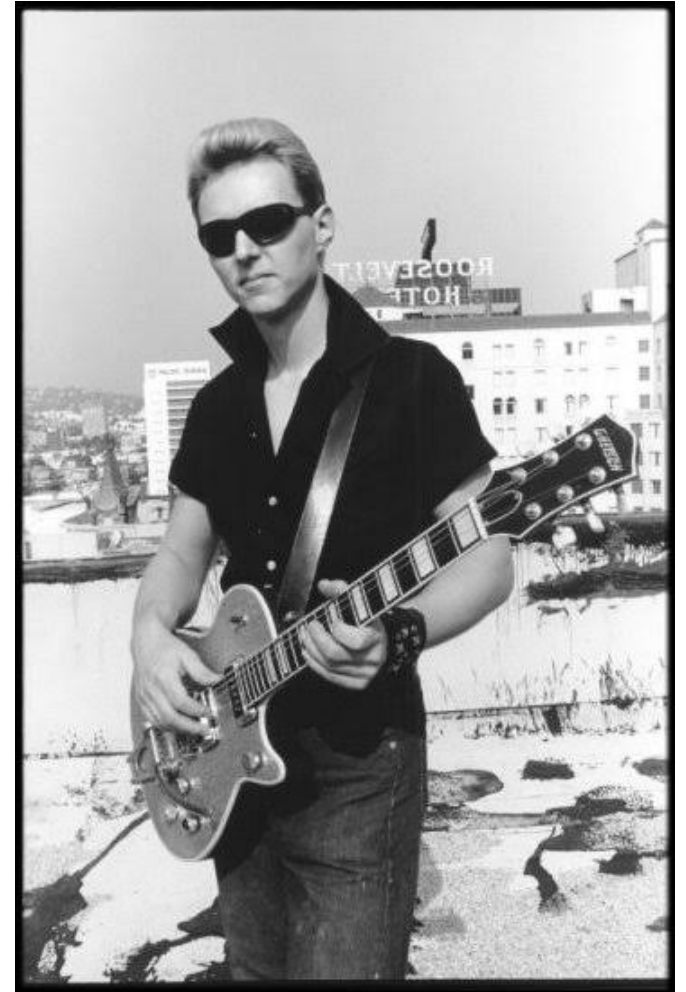
**Punk Doesn't Mean
Unskilled**

X



Billy Zoom

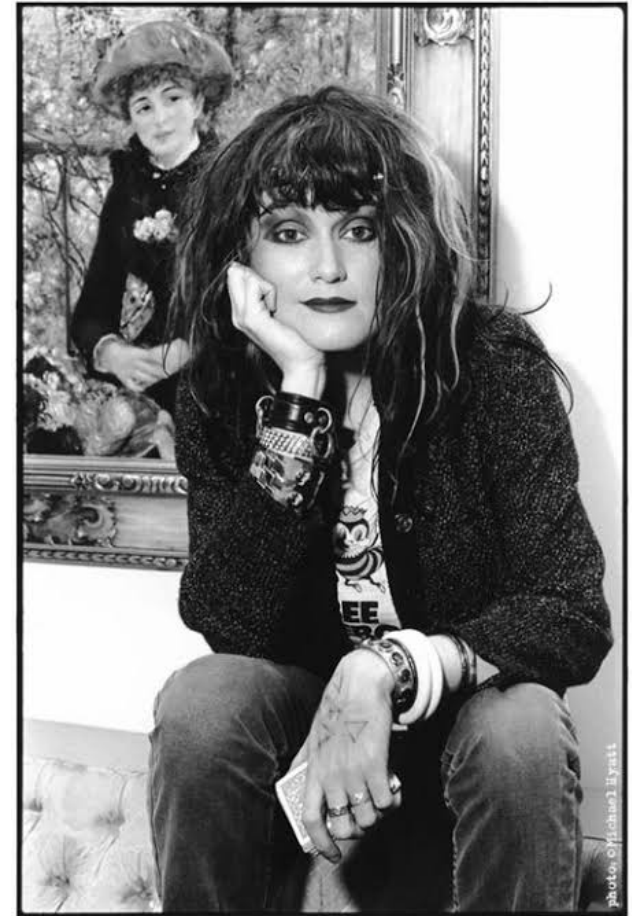
- Son of an accomplished jazz musician
- Started violin lessons at 4
- Proficient in 9 instruments
- Played with Etta James and Gene Vincent



**Punk Doesn't Mean You
Don't Learn and Grow**

Exene Cervenka

- Came to X as an amateur poet
- No musical training
- Eventually took voice lessons



Brian Bucher, MD

Punk Surgery Informaticist



- Decrease Prevalence of Surgical Site Infections
 - After a data science boot camp and one semester Python programming crash course was hacking away at his problem
 - Completed an MS degree
 - Now supervises other Punk informaticists
 - K grant



Data Science Scholars



Lori Gawron
OB/GYN



Brian Bucher
Pediatric Surgery



Jamie Rhoads
Dermatology



Rashmee Shah
Cardiology



Jia-wen Guo
Nursing



Youjeong Kang
Nursing



Brent Kious
Psychiatry



Marcus Pezzolesi
Nephrology



Sheetal Hardikar
PHS



Andrew Gawron
Gastroenterology



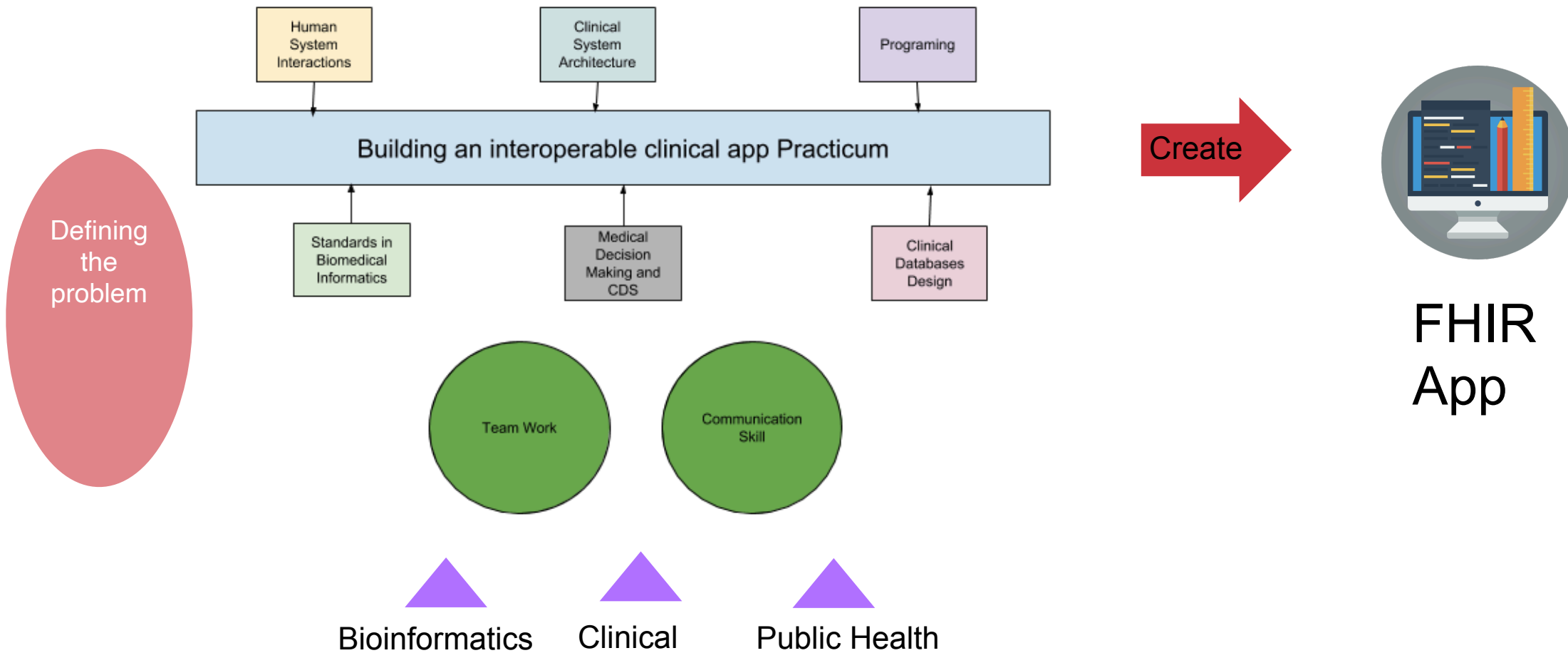
What Facilitates Punk Informatics?

- Support from clinical supervisors
- “Respecting” the Punk Product
- Thinking iteratively

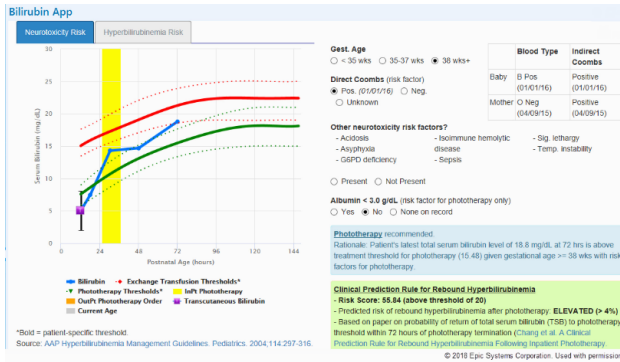
What Facilitates Punk Informatics?

- High-level Scripting Languages
 - Python, R, Ruby
- Powerful, easy to use libraries
 - Pandas, Keras, Spacy, scikit-learn, scikit-image
- Code and Data Sharing
 - GitHub, GitLab, Bitbucket
 - MIMIC II/III
- Focus on clinical data and applications
 - FHIR
- Scaffolding

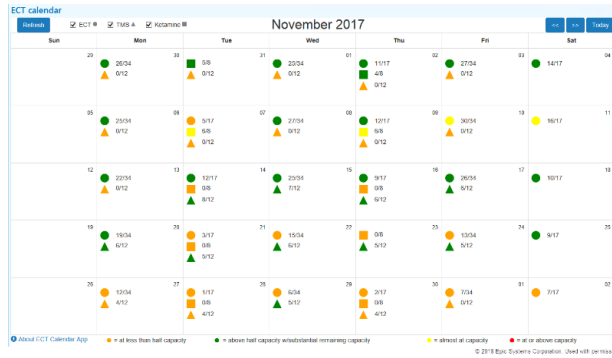
FHIR practicum/course



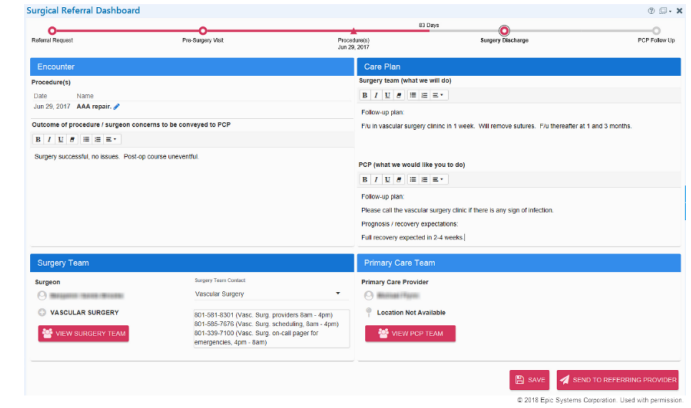
Example Epic-Integrated Applications



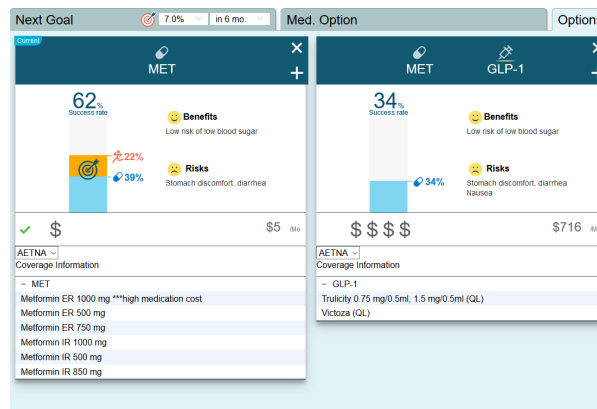
Neonatal bilirubin app



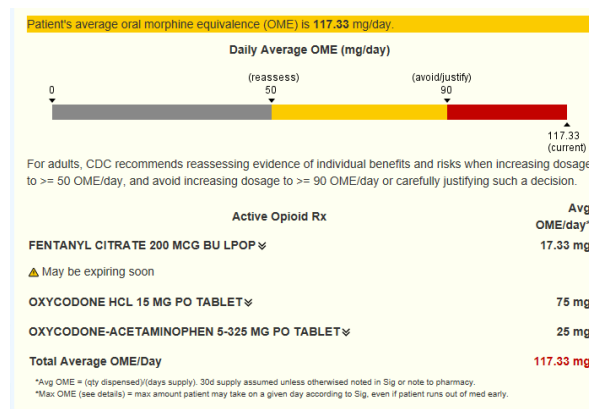
Procedure capacity mgmt.



Surgical referral dashboard



Diabetes Rx prediction app

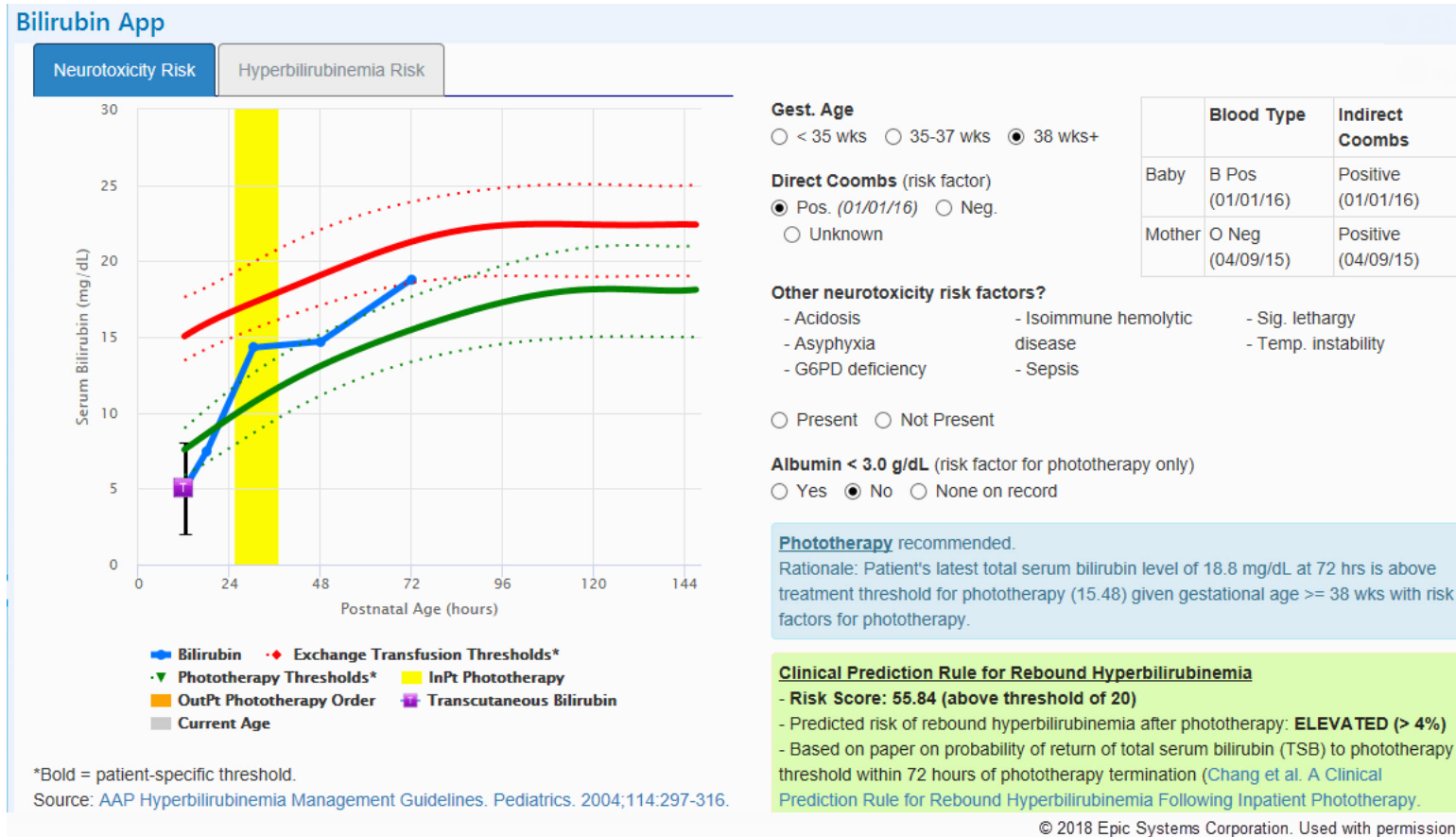


Opioid MME



MDCalc

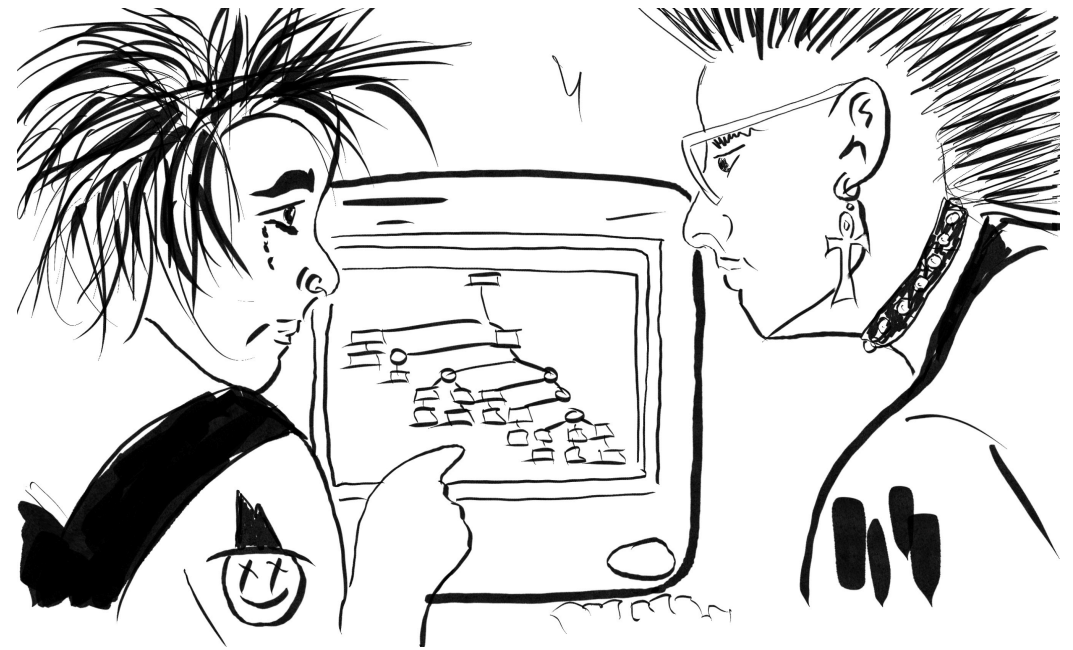
Neonatal Bilirubin Management App



- Recommendations based on AAP guidelines
- Pulls in baby and mother's EHR data
- Estimated to save >300 MD hrs/year
- HHS Provider User Experience App Challenge Awards

In Summary

“Ultimately, being a DIY punk has little to do with what you are wearing or listening to and everything with **how you choose to interact with the world around you.**” (Dunn, Kevin. *Global Punk: Resistance and Rebellion in Everyday Life* (p. 12). Bloomsbury Publishing.



Thanks for Your Attention!



“The fullness of life is in the hazards of life.”

