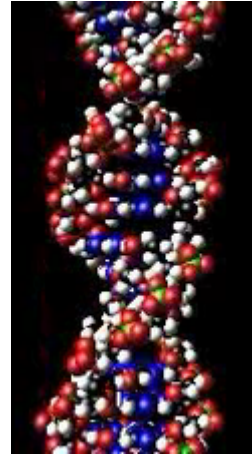


Big Data: Where are we now - and in 10 years?

Matthew Burriesci PhD

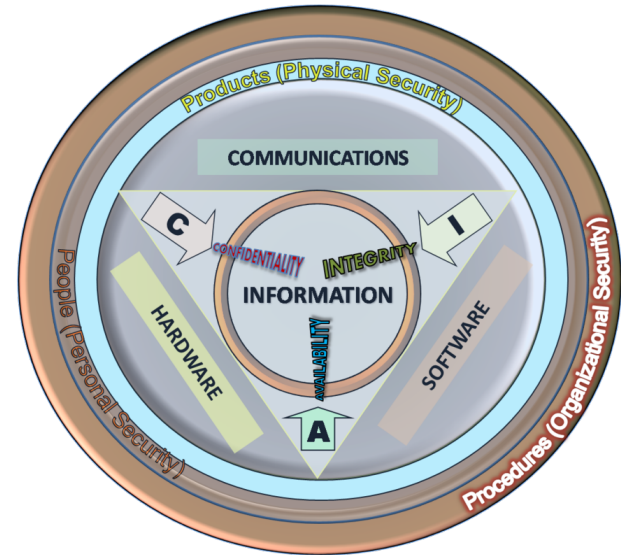
We can achieve some great things in 10 years

- Wearables and desktop testing stations will better detect and manage diseases
- Genetics and blood chemistry of patients will be used to customize individual treatments
- Analytics will suggest which facilities provide the best care for specific conditions



We need to build a strong foundation now

- We can enable sharing of certain information while protecting privacy
- Install technology (computers and other infrastructure) to enable the next 10 years of advances



Actions now: privacy-sensitive sharing

- Need to assure privacy is well respected
 - Anonymized data provides benefits
 - Some patients “opt into” sharing to help others - this should be responsibly supported
- For best patient service, it is necessary to at least share a patient’s records between hospitals
 - Electronic sharing can be more secure than physical sharing
 - Quicker sharing can lead to better care

Actions now: Modernize technology

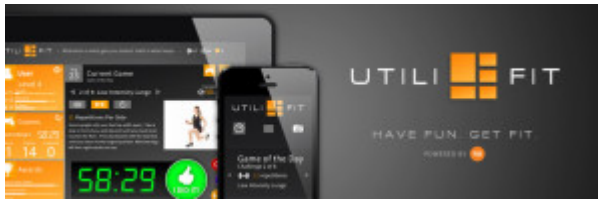
- Get paper and film records digitised
- Convince all doctors to use electronic methods to enter data
 - iPads can help
 - Some doctors may need transcriptionists
- Decide how long to store data¹
- Match outcomes with patient records to enable analytics



¹ [Storage costs of electronic health records surprisingly low](#)
[Prepare for disasters tackle terabytes when evaluating medical image archiving](#)

Wearables

- Remind people to stay healthy through “gamification” of health¹
- Wearables that can monitor disease state
 - Blood sugar and diabetes monitoring connected to the cloud - Glooko
 - Parkinson’s disease monitoring²

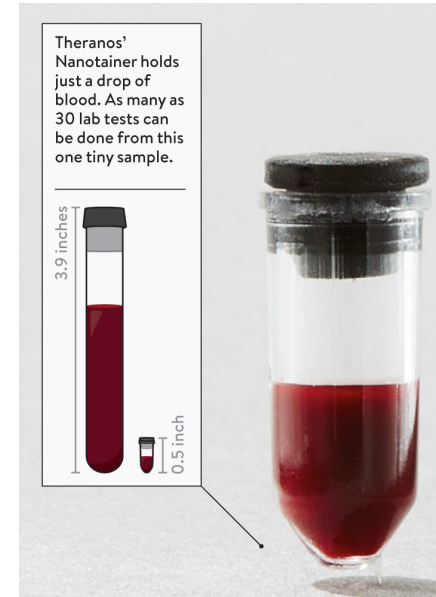
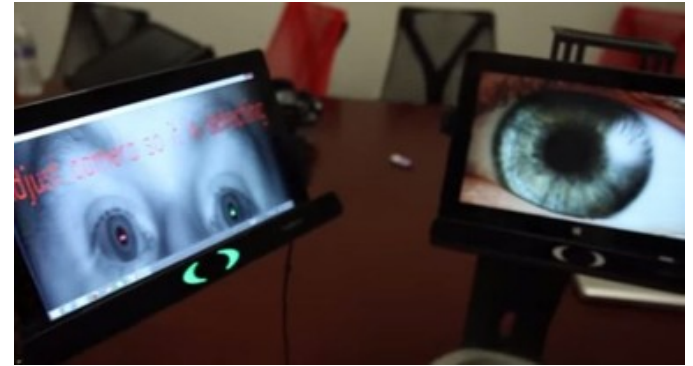


1 [15 healthcare gamification startups to watch](#)

2 [Home monitoring of patients with Parkinson's disease via wearable technology and a web-based application](#)

Desktop diagnostics

- Using standard computers to detect early Alzheimer's up to three years before official diagnosis¹
- Theranos at every pharmacy and doctor's office giving immediate results
 - Gives more areas access to diagnostics
 - Increases chances treatment can begin immediately



¹ [Eye tracking test enters into the running for an alzheimer's screen](#)

Drug/Drug interactions

- Use anonymized data or personal data shared with a patient's permission¹
 - Find drugs that should not be mixed
 - One examples: SSRI antidepressants and blood pressure medications
- Use a patient's records to automatically alert providers and druggists

PROZAC
fluoxetine hydrochloride

serzone
nefazodone HCl

zoloft
(sertraline HCl)

Cymbalta[®] DELAYED-RELEASE CAPSULES
duloxetine HCl

LUVOX
fluvoxamine maleate

Lexapro
escitalopram oxalate

PAXIL CR
PAROXETINE HCl
CONTROLLED-RELEASE TABLETS

VENIAFAXINE HCl
EFFEXOR XR
ORAL PEARL CAPSULE

¹ [Discovery and explanation of drug-drug Interactions via text mining](#)
[Scientists discover multitude of drug side effects interactions using new computer algorithm](#)

Determining facility specialization

- One example: For some infant cardiac surgeries, if a hospital does a low volume of surgeries, they may have higher mortality rate
- An unanswered question: should patients know the relative success rates of different facilities?
 - If the difference isn't statistically meaningful, how can you let patients know that two facilities are likely the same?



Targeted outreach to save lives

- Reach out to at-risk populations (as determined from medical records)
- Diabetes, substance abuse, obesity, and other conditions could be helped by early medical intervention driven by analytics¹
- Treating diabetes saves lives and thousands of dollars in complications per patient per year²



¹ [OPT Playbook Diabetes](#)

² [The economic costs of undiagnosed diabetes](#)

[Medical claim cost impact of improved diabetes control for medicare and commercially insured patients with type 2 diabetes](#)

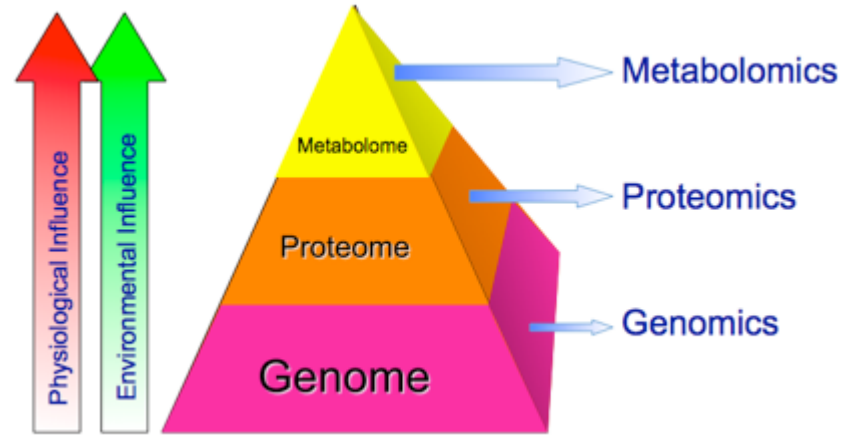
Genetic testing for public health

- Look for pre-dispositions in genetic tests and help patients assess their own risks¹
- Norway has a great chance to find genes most affecting a majority of its population through widespread, voluntary, genetic testing and intelligent and secure data analysis



Why stop at genes? Measure RNA, proteins, and metabolites

- Michael Snyder at Stanford found his Type II diabetes¹
- Predicting the effectiveness of the antidepressant Sertraline from metabolome information²



¹ [Making it personal geneticist michael snyder puts a face to personalized medicine](#)

² [Pretreatment metabolotype as a predictor of response to sertraline or placebo in depressed outpatients: a proof of concept](#)

Let's enable the future

- Assure we keep secure information sharing and technology modernization in mind as we plan computing system upgrades
- Keep an eye on advanced genetic, metabolic, and desktop testing
- Look to enable wearables to improve patient access to care