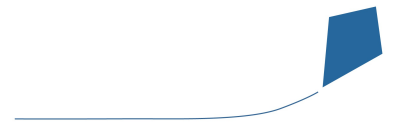




Disruptive tendenser indenfor healthcare

Thomas Riisgaard Hansen
kiteinvent.com



Slide fra præsentation

Her er en version af de slides, der blev præsenteret mandag d. 19. april 2018 i Nyborg.

Jeg håber præsentationen var inspirerende og du er meget velkommen til at skrive hvis der er specielle områder du er interesseret i eller med generel tilbagemelding på præsentationen.

Jeg er også meget interesseret i at høre hvis du kender til spændende projekter eller selv er i gang med spændende projekter, der kan forandre vores sundhedsvæsen.

Du kan fange mig på mailen: thomas@kiteinvent.com

På LinkedIn poster jeg interessante trends, så der kan du også enten connecte eller følge mig: www.linkedin.com/thomasr

På Twitter deler jeg links som jeg finder interessante indenfor trends i sundhed @thomasrdk

God fornøjelse,

Thomas Riisgaard Hansen

Baggrund

Thomas Riisgaard Hansen

Arbejdet 15 år med innovation, teknologi og sundhed
Co-founder af Cetrea



Kite Invent Aps

Innovationsfirma, der arbejder med strategisk innovation og entrepreneurship. Hjælper små og store firmaer, eksisterende sundhedsaktører og det offentlige med brug af teknologi indenfor sundhed



Baggrund for præsentationen

Exponential Medicine 2015 & 2016 & 2017, studieture i Europa, USA og Mellemøsten, HIMSS 2016 + dybdegående research

Hvilke værktøjer, ideer og frontline forskning kan vi lade os inspirere af internationalt og anvende i Danmark?



Fire udvalgte Disruptive trends



Sundhed flytter ud
af hospitalerne



Algoritmer og
big data



Fra sygdom til sundhed



Personlig medicin

Disruption

Disruption og innovation



Investing in healthcare disruption

Alphabet's Verily, Sanofi to Invest \$500 Million in Diabetes

by James Paton

12. september 2016 07:00 CEST Updated on 12. september 2016 09:55 CEST

JUN 16, 2015 @ 09:29 AM 8.3K, 1.8K VIEWS

Why Apple Is The Most Important Health Company In The World



Unity Stoakes, CONTRIBUTOR

Lower global health innovation and the reimagining of healthcare. FULL BIO ✓

Opinions expressed by Forbes Contributors are their own.

JUN 16, 2015 @ 09:29 AM 8.3K, 1.8K VIEWS

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TECHNOLOGY

IBM Is Counting on Its Bet on Watson, and Paying Big Money for It

By STEVE LOHR



TECHNOLOGY

IBM Is Counting on Its Bet on Watson, and Paying Big Money for It

By STEVE LOHR



MICROSOFT SCIENCE TECH

Microsoft announces new AI-powered health care initiatives targeting cancer

by James Vincent | @jvincent | Sep 20, 2016, 7:03am EDT

SHARE TWEET LINKEDIN

MICROSOFT SCIENCE TECH

Microsoft announces new AI-powered health care initiatives targeting cancer

by James Vincent | @jvincent | Sep 20, 2016, 7:03am EDT

SHARE TWEET LINKEDIN

Bill Gates' foundation to invest \$5 billion in Africa over five years

By Allen Cone | Updated July 18, 2016 at 11:40 AM

2 Comments Share Tweet Email Print

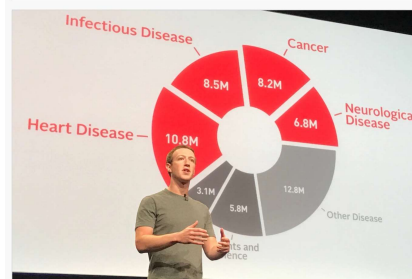


Microsoft co-founder Bill Gates said the Bill and Melinda Gates Foundation will invest \$5 billion in Africa over the next five years. File Photo by Kevin Dietsch/UPI | License Photo

Chan Zuckerberg Initiative announces \$3 billion investment to cure disease

Posted Sep 21, 2016 by Josh Constine (@joshconstine)

WATCH THEIR STORIES NOW



KITE INVENT

Human Longevity, Inc. Completes \$220 Million Series B Financing

(SAN DIEGO, CA)—April 4, 2016—Human Longevity, Inc. (HLI), the genomics-based, technology-driven company, announced today that the company has completed an offering of Series B Preferred Stock, raising in excess of \$220 million. HLI previously raised \$80 million in its Series A offering which closed in Summer 2014.

With 11 drugs in pipeline, Moderna wants to raise \$600m

WATCH THEIR STORIES NOW



Top 10 Trending Articles

Most Viewed Most Commented

Ten-month old Methuen child re-exposed to fentanyl

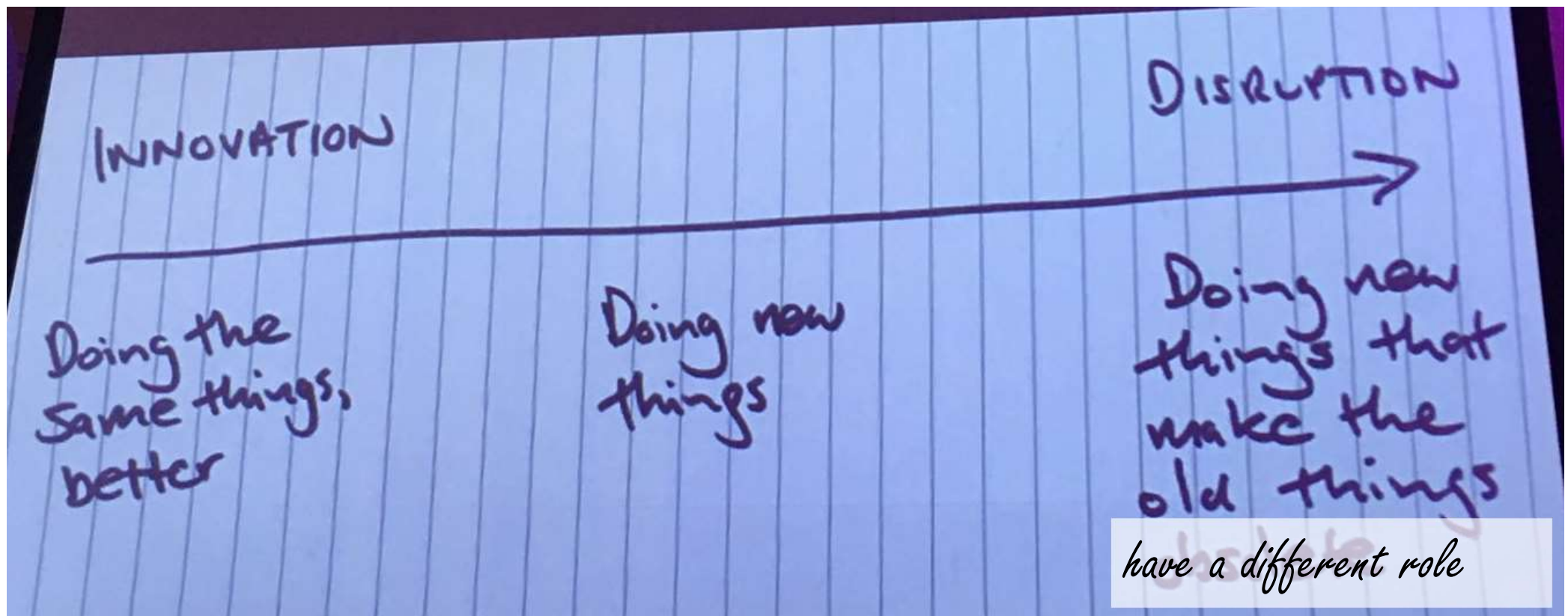
Doctors curtail opioids, but many

12.01.16 | 5:13 PM

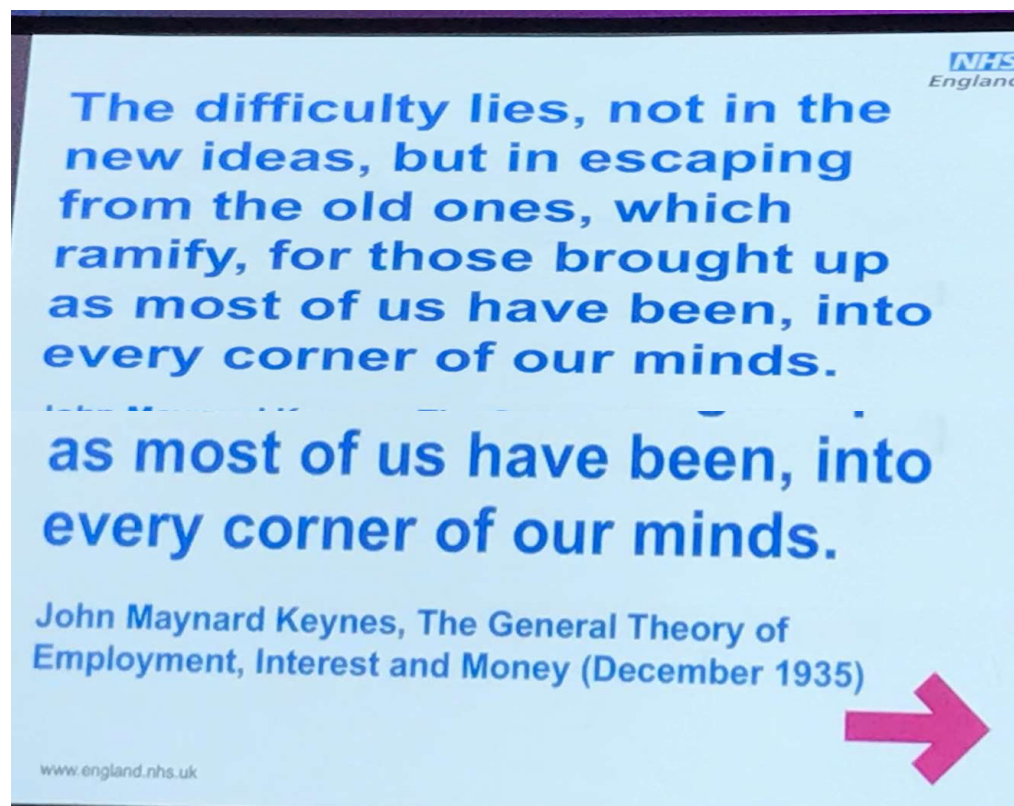
Illumina spinout Grail is seeking to raise \$1.7 billion for large-scale clinical trial: sources

Grail, a spinout company of the DNA-sequencing giant Illumina, has a very bold mission: to develop a blood-based screening test for cancer.

Disruption – mange definitioner



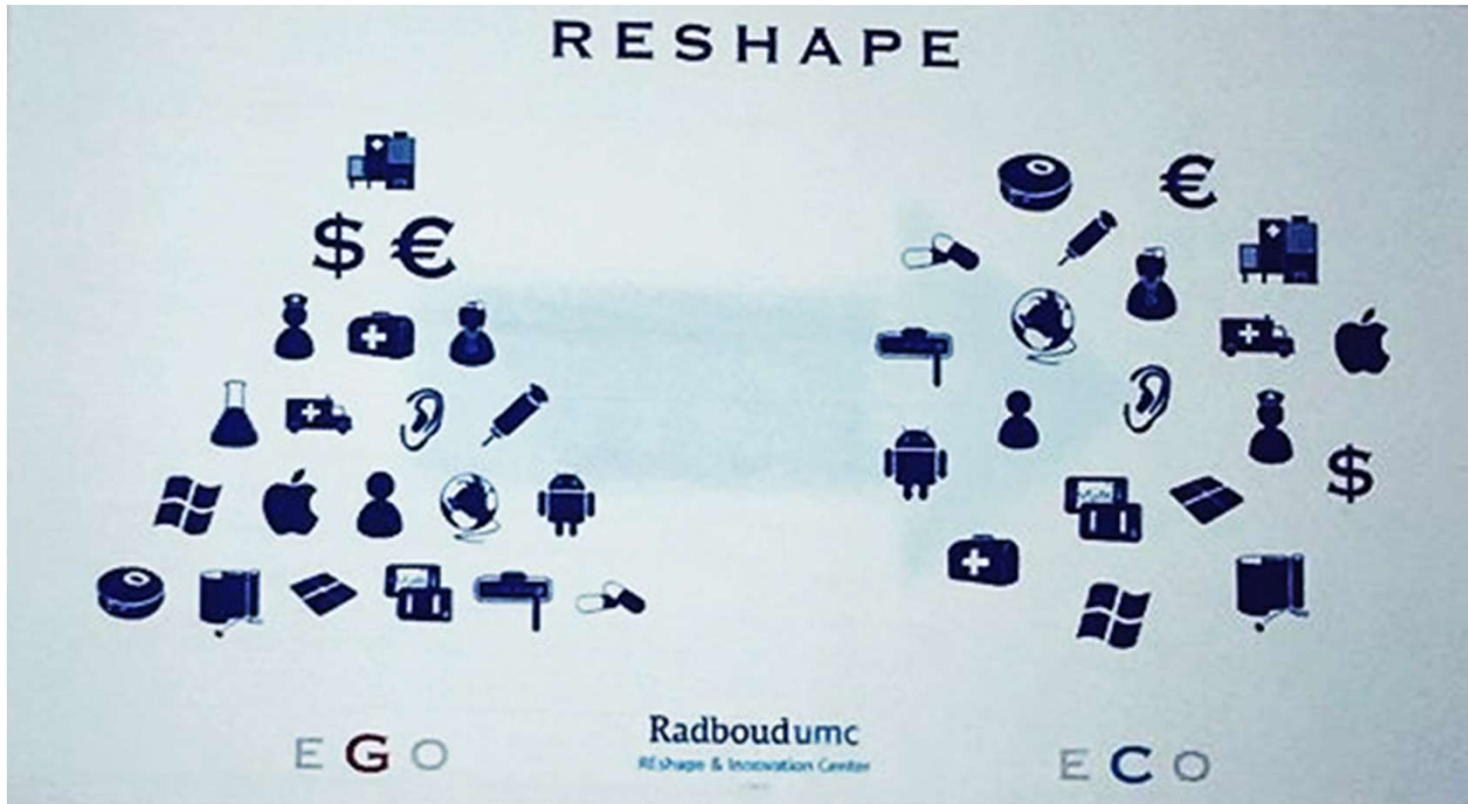
Udfordringer med disruptive ideer



Sundhedsteknologi flytter ud af hospitalerne



Fra Ego til Eco: Lucian Engelen



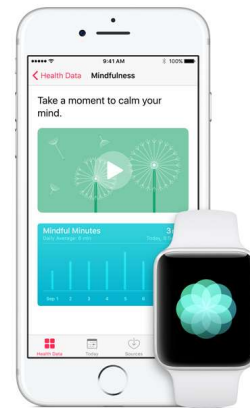
Apps og selvmonitorering: Apple Health – til patienten



Activity

The Health app keeps you motivated by showing you how much you move. It combines activity data from iPhone — like your steps and distance traveled — with metrics from third-party fitness apps. And Apple Watch automatically records simple but meaningful kinds of movement, like how often you stand, how much you exercise, and your all-day calorie burn.

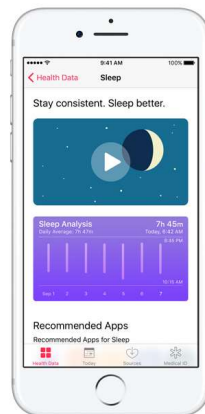
[Watch the Activity film](#)



Mindfulness

Finding a moment to take a few deep breaths and quiet your mind is a great way to relieve stress and improve your overall health. That's what mindfulness is all about. Many apps on iPhone, as well as apps like Breathe on Apple Watch, help you decompress and stay centered throughout your day. Whichever apps you choose, Health adds up the numbers to show you how much time you've spent being mindful.

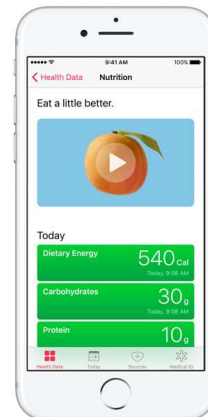
[Watch the Mindfulness film](#)



Sleep

Getting a good night's sleep helps restore and repair your body. So going to bed at the same time every night and getting the right amount of rest can improve how you feel. The new Bedtime tab in the Clock app helps you establish a target bedtime and wake time, and also lets you visualize your sleep patterns. It then feeds the information into Health — along with data from your third-party sleep apps — so you can get into a healthier sleep routine.

[Watch the Sleep film](#)



Nutrition

Whether you're counting carbs, calories, caffeine, or a host of other important nutritional metrics, the Health app makes it easier to manage your goals and watch exactly what you eat. Third-party apps can help you keep a closer eye on every meal, and since all the data is displayed in Health, you'll always know if you're getting the nourishment you need.

[Watch the Nutrition film](#)

Apple som den vigtigste sundhedsleverandør?

TECH

TECH | MOBILE | SOCIAL MEDIA | ENTERPRISE | CYBERSECURITY | TECH GUIDE

Apple CEO Tim Cook test-drove a device that tracks his blood sugar, hinting at Apple's interest in the space

- Tim Cook has been test-driving a glucose monitor to understand how his blood sugar responds to factors like food and exercise
- CNBC reported last month that Apple has a team dedicated to the "holy grail" in diabetes: Non-invasive and continuous glucose monitoring
- Cook iterated in a discussion with university students in February that Apple is "really excited" about its potential in health care

Christina Farr | @chrissyfarr
Thursday, 18 May 2017 | 3:15 PM ET



Getty Images

Apple CEO Tim Cook displays his personal Apple Watch to customers at an Apple Store on April 10, 2015 in Palo Alto, California.

Apple acquired Glimpse, a personal health data startup

Posted Aug 22, 2016 by [Jordan Crook \(@jordancrook\)](#)



JUN 16, 2015 @ 09:29 AM 13,183 VIEWS

Why Apple Is The Most Important Health Company In The World



Unity Stoakes, CONTRIBUTOR

I cover global health innovation and the reimagining of healthcare. [FULL BIO](#) ✓
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JUN 16, 2015 @ 09:29 AM 13,183 VIEWS

Why Apple Is The Most Important Health Company In The World



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The Little Black Book of Billionaires



The Little Black Book of Billionaires

Apple 11.3 - Integration med EPJ-systemer



Is Apple poised to enter EHR market? New patents have the industry buzzing

Apple is not the lone tech giant showing an interest in healthcare: Amazon, too, has kept a close eye on the market.

By [Bernie Monegain](#) | November 22, 2017 | 01:09 PM



UPDATE
JANUARY 24, 2018

Apple announces
effortless solution bringing
health records to iPhone



Apple Introduces 'Health Records' Section Coming to Health App in iOS 11.3

Wednesday January 24, 2018 4:49 AM PST by [Mitchel Broussard](#)

Hjertet - atrieflimmer



II



V1



<https://www.alivecor.com/>

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Trusted

FDA-cleared, medical-grade EKG recordings. 30-day money-back guarantee if you're not satisfied.

Nye light-weight dianostikapparater



Philips Lumify



Clarius

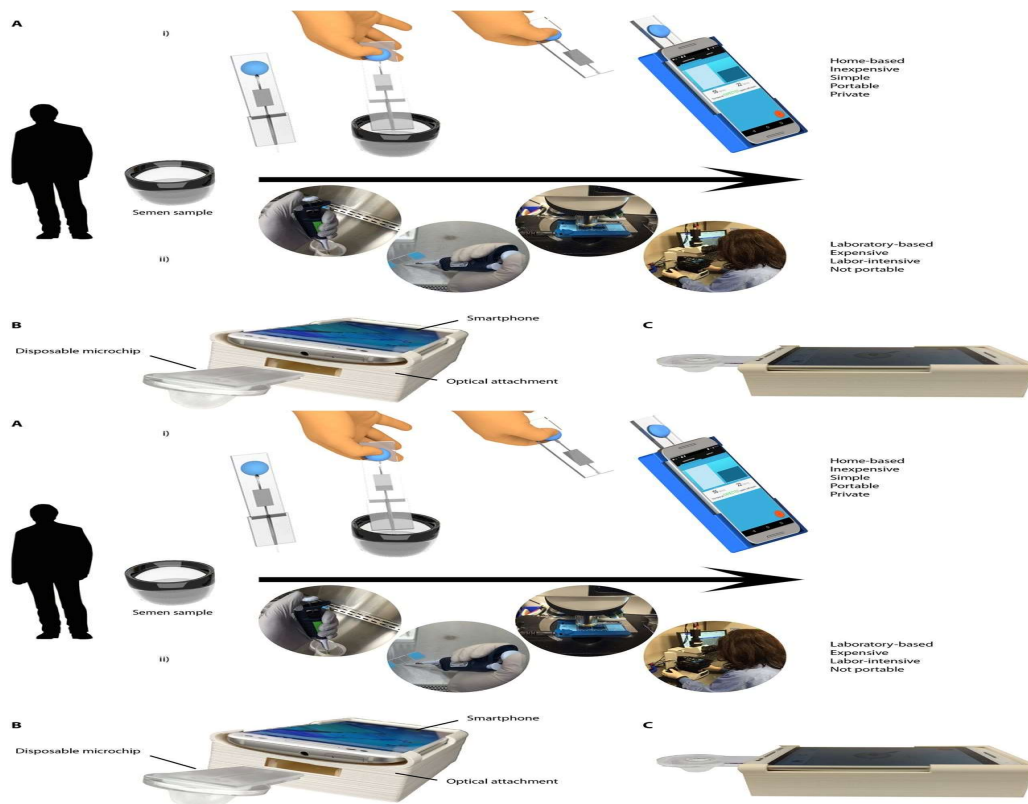


GE Vscan



Healcerion SONON

Sædkvalitetsanalyse på mobilen



Vurdere sædkvalitet med 98 %
nøjagtighed I følge WHO's guidelines

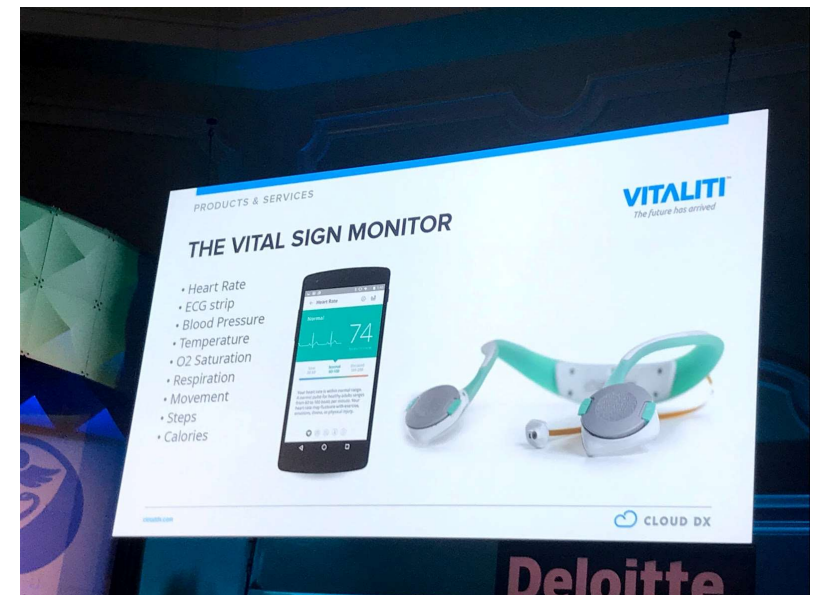
Pris for engangsdevice indkøb: \$4,45 = 30 kr.

Qualcomm Tricorder XPRIZE

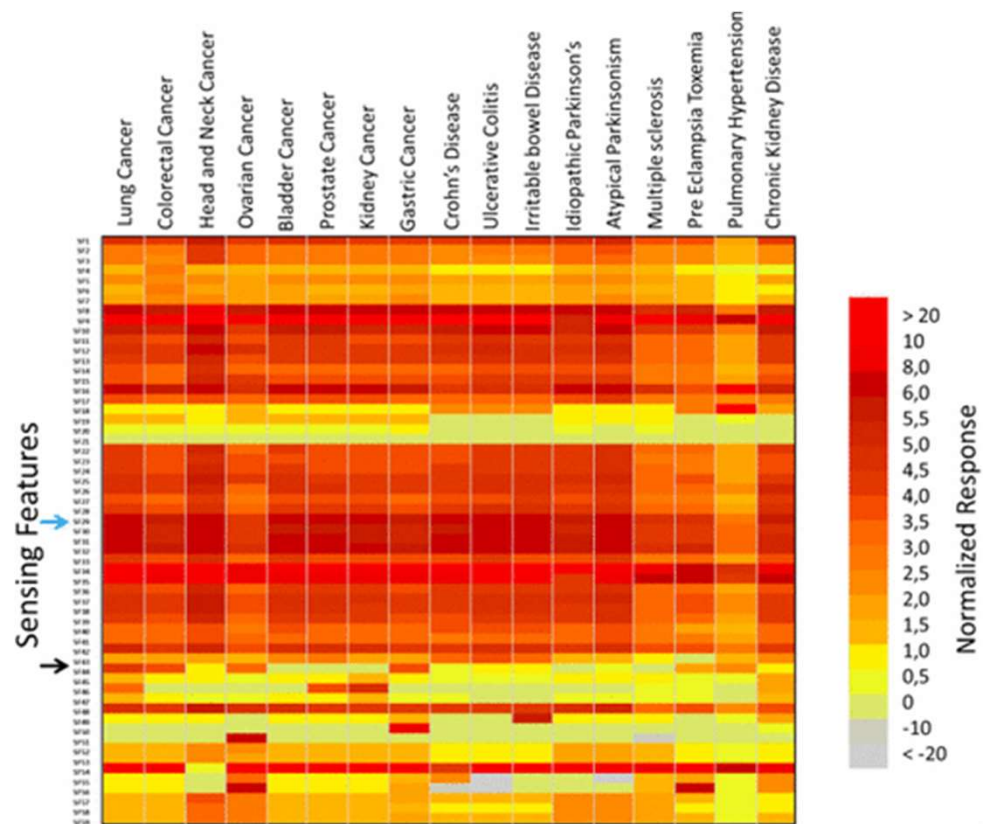
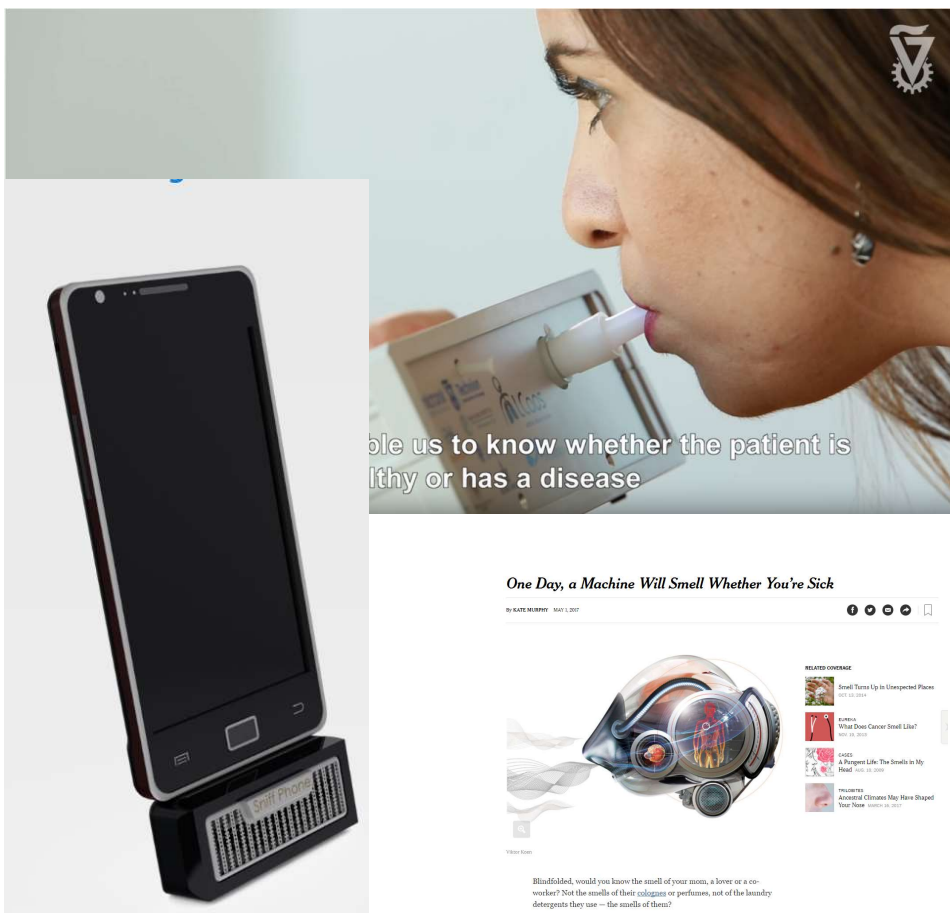
Krævede diagnoser(10): Blodmangel, Atrieflimre, KOL, Diabetes, Leucytosis, lungebetændelse, akut mellemørebetændelse, søvnapnø, Urinvejsinfektion, Absence of condition

Valgfri diagnoser (Valg af 3): Kolesterol screening, madforgiftning, HIV screening, Hypertension, Hypothyroidism/Hyperthyroidism, melanom, Kyssesygge, kighoste, helvedesild, Streptokokkhalsinfektion

Krævede vitalværdier (5): Blodtryk, puls, iltmætning, temperatur, respirationsfrekvens.



SniffPhone - volatile organic compounds



<http://pubs.acs.org/doi/full/10.1021/acsnano.6b04930>

KITE INVENT

Social Media og mental sundhed



Dynamikken omkring sundhedsydelser



Hospitaler



Praktiserende læge



Borgerens hjem



Overalt



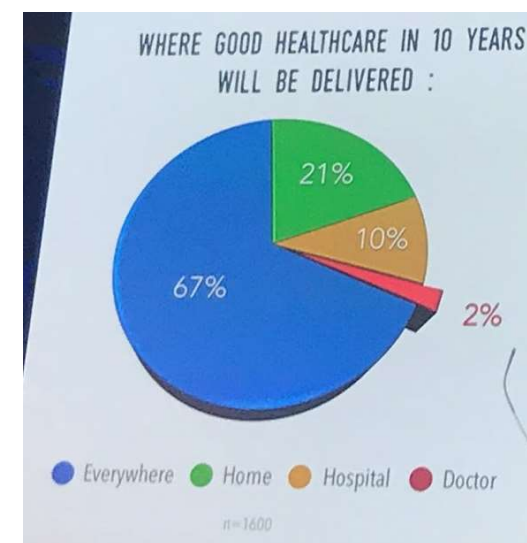
Nye patienter

1. Flere ældre
2. Nye komplekse behandlingsformer f.eks. genterapi m.m.

Drivkræfterne

- Ny teknologi
- Viden og intelligens
- Organisering

KITE INVENT



Nye sundhedsspillere: CVS og Walgreen



Price List

Affordable health care in your neighborhood

You'll find the cash payment prices for our services below. We accept most insurance, too.

If you will be using insurance, we recommend contacting your insurance company before your visit to be sure that the service you're seeking is covered. Your payment responsibility may vary based on your insurance coverage.

If you're uninsured or prefer to pay out of pocket, we welcome cash, checks* and credit cards.

Our charges vary based on the number of symptoms or conditions a patient has, and whether we provide more than one service. Most visits fall within the ranges provided but charges can exceed these ranges in more complex cases.

Make sure to check the individual [service pages](#) for age and service restrictions.

Lab, tests and additional services may result in additional charges. Labs and tests cannot be purchased separately and are only performed as part of a standard visit.

[Minor Illnesses](#) | [Minor Injuries](#) | [Skin Conditions](#) | [Wellness & Physicals](#)

[Screenings & Monitoring](#) | [Vaccinations & Injections](#) | [Travel Health](#) | [Women's Services](#) | [Labs & Tests](#)

Minor illnesses \$89 - \$129

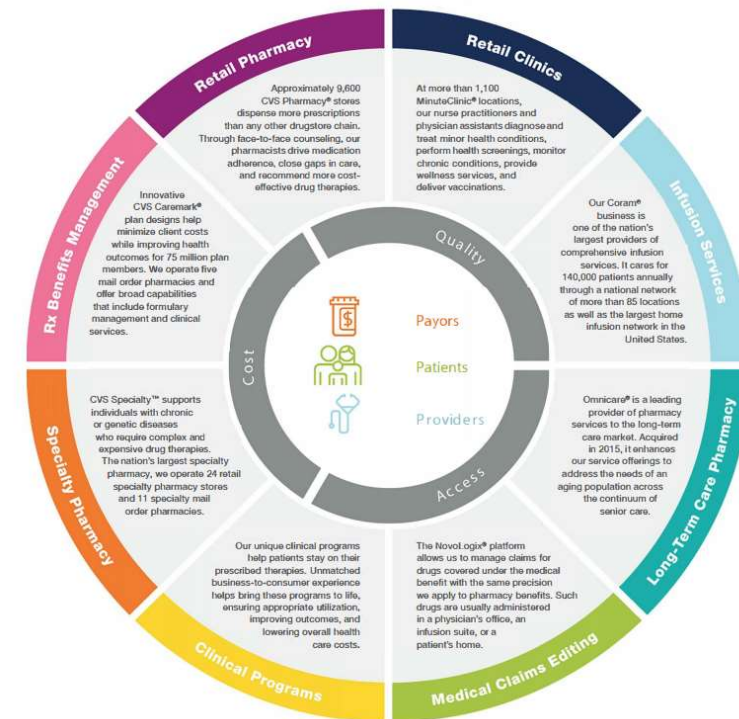
- Allergy symptoms
- Bronchitis & coughs
- Earaches & ear infections
- Flu-like symptoms
- Gout
- Indigestion & Heartburn
- Mouth & oral conditions
- Mouth & oral pain
- Mononucleosis (mono)
- Nausea, vomiting & diarrhea
- Sinus infections & congestion
- Sore & strep throat
- Upper respiratory infections
- Urinary tract & bladder infections
- Zika

Minor injuries \$89 - \$129

- Bug bites & stings
- Minor burns
- Minor cuts, blisters & wounds
- Splinter removal
- Sprains, strains & joint pain
- Suture & staple removal
- Tick bites

Skin conditions \$89 - \$129

- Acne
- Athlete's foot
- Chicken pox



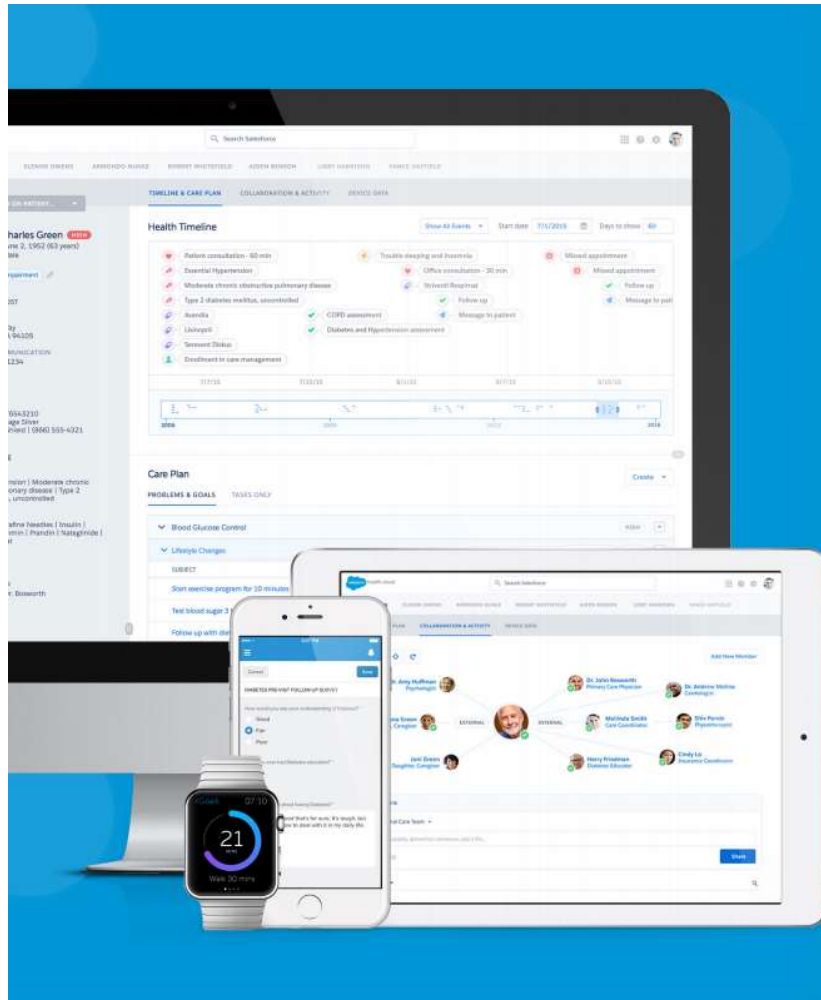
Forward – alternativ forebyggelse/lægepraksis



KITE INVENT



Nye teknologiske spillere: Salesforce



Salesforce Health Cloud works synchronously with your health system's EHRs to make patient data easily referenced, actionable and current from any device. And with medical devices and wearables integrated directly to Salesforce Health Cloud, you can even gather data from at-home devices, such as glucose levels, sleep patterns and activity measures.

Salesforce Health Cloud delivers a holistic and real-time view of each patient's health, giving healthcare providers the information they need to provide care that improves outcomes for patients and populations.

BRIEF

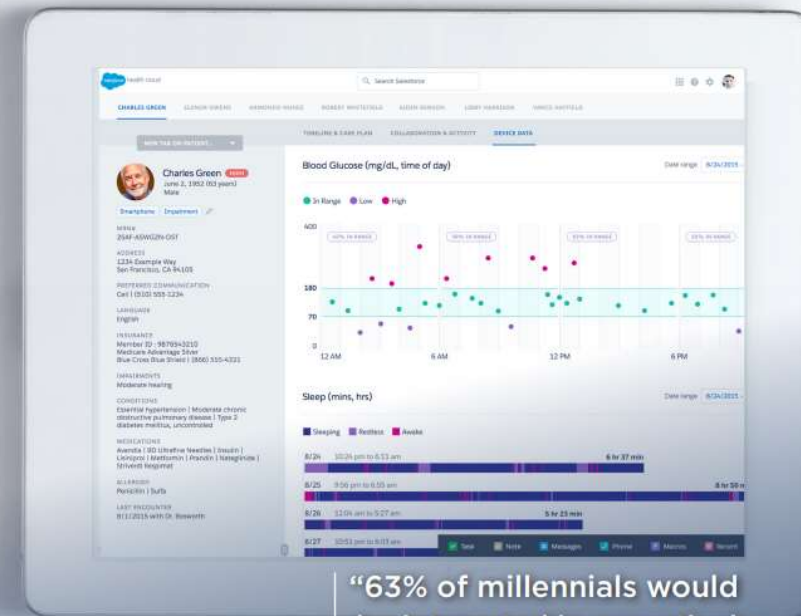
Cerner, Salesforce partner on population health

AUTHOR
Meg Bryant

PUBLISHED
March 7, 2018

Dive Brief:

- Cerner and Salesforce are teaming up to enable greater patient participation in healthcare decision-making via cloud-based population health solutions.
- The collaboration — announced Monday at HIMSS18 — integrates



“63% of millennials would be interested in proactively providing their health data from wearables to their doctors, so they can monitor their well-being.”

-Salesforce “State of the Connected Patient” Report, 2015

Disruption: Sundhed flytter ud af hospitalerne



Sundhedsdata er ikke længere sygehusets, lægen, EPJ-systemer eller det offentlige. Det er et **økosystem**, hvor nye løsninger og spillere vil komme.



Borgeren og patienten vil få en langt mere **aktiv rolle i koordineringen** og der vil komme nye services til at støtte alle borgere i denne transformation.



Tung hardware baseret hospitalsinfrastruktur vil blive erstattet **af lettere løsninger med software services**



Screening – nye sensor gør screening og diagnostik mindre invasiv. Dette kan åbne op for yderligere **screening af patienter**



Fra sygdom til sundhed



Forebyggelse

Healthy Living Is the Best Revenge

Findings From the European Prospective Investigation Into Cancer and Nutrition–Potsdam Study

Earl S. Ford, MD, MPH; Manuela M. Bergmann, PhD; Janine Kröger; Anja Schienkiewitz, PhD, MPH; Cornelia Weikert, MD, MPH; Heiner Boeing, PhD, MSPH

Background: Our objective was to describe the reduction in relative risk of developing major chronic diseases such as cardiovascular disease, diabetes, and cancer associated with 4 healthy lifestyle factors among German adults.

Methods: We used data from 23 153 German participants aged 35 to 65 years from the European Prospective Investigation Into Cancer and Nutrition–Potsdam study. End points included confirmed incident type 2 diabetes mellitus, myocardial infarction, stroke, and cancer. The 4 factors were never smoking, having a body mass index lower than 30 (calculated as weight in kilograms divided by height in meters squared), performing 3.5 h/wk or more of physical activity, and adhering to healthy dietary principles (high intake of fruits, vegetables, and whole-grain bread and low meat consumption). The 4 factors (healthy, 1 point; unhealthy, 0 points) were summed to form an index that ranged from 0 to 4.

Results: During a mean follow-up of 7.8 years, 2006 participants developed new-onset diabetes (3.7%), myocardial infarction (0.9%), stroke (0.8%), or cancer (3.8%). Fewer than 4% of participants had zero healthy factors, most had 1 to 3 healthy factors, and approximately 9% had 4 factors. After adjusting for age, sex, educational status, and occupational status, the hazard ratio for developing a chronic disease decreased progressively as the number of healthy factors increased. Participants with all 4 factors at baseline had a 78% (95% confidence interval [CI], 72% to 83%) lower risk of developing a chronic disease (diabetes, 93% [95% CI, 88% to 95%]; myocardial infarction, 81% [95% CI, 47% to 93%]; stroke, 50% [95% CI, -18% to 79%]; and cancer, 36% [95% CI, 5% to 57%]) than participants without a healthy factor.

Conclusion: Adhering to 4 simple healthy lifestyle factors can have a strong impact on the prevention of chronic diseases.

Arch Intern Med. 2009;169(15):1355-1362

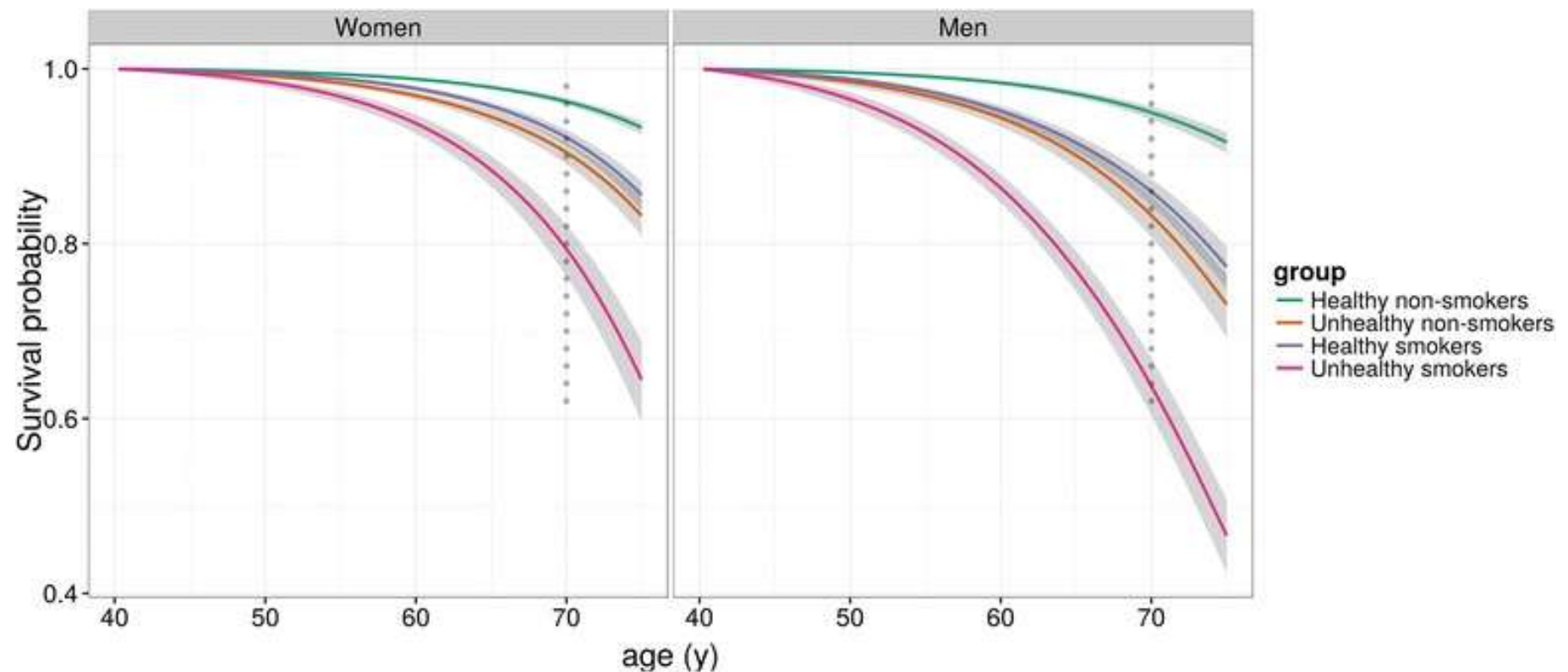
Fire kriterier

1. BMI<30
2. Ingen rygning
3. Mindst 3,5 timers bevægelse om ugen
4. Spise sundt

Effekt

78 % lavere risiko for kroniske sygdomme
93 % diabetes
81 % Blodprop i hjertet
50 % Slagtilfælde
36 % cancer

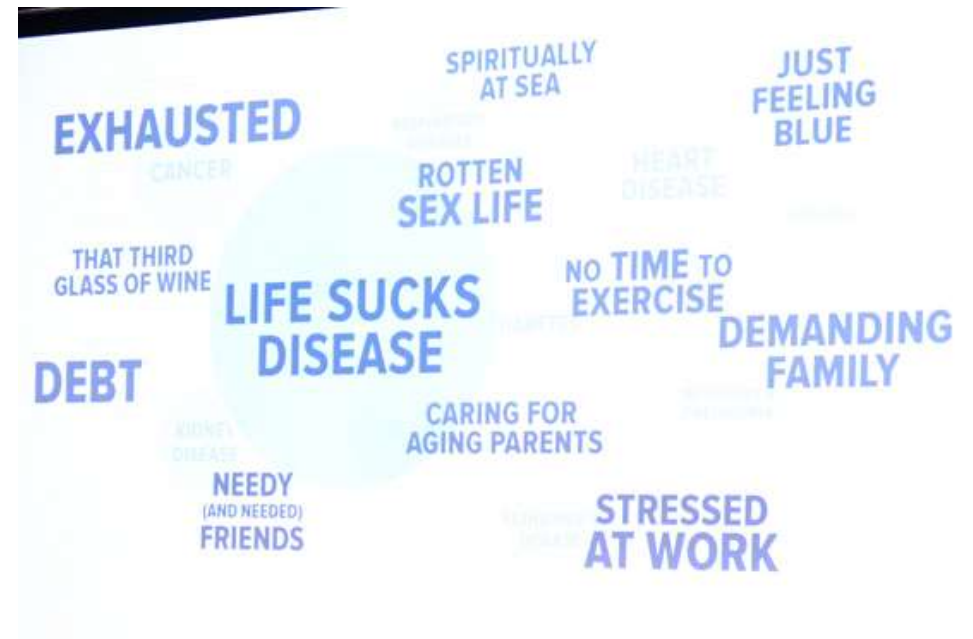
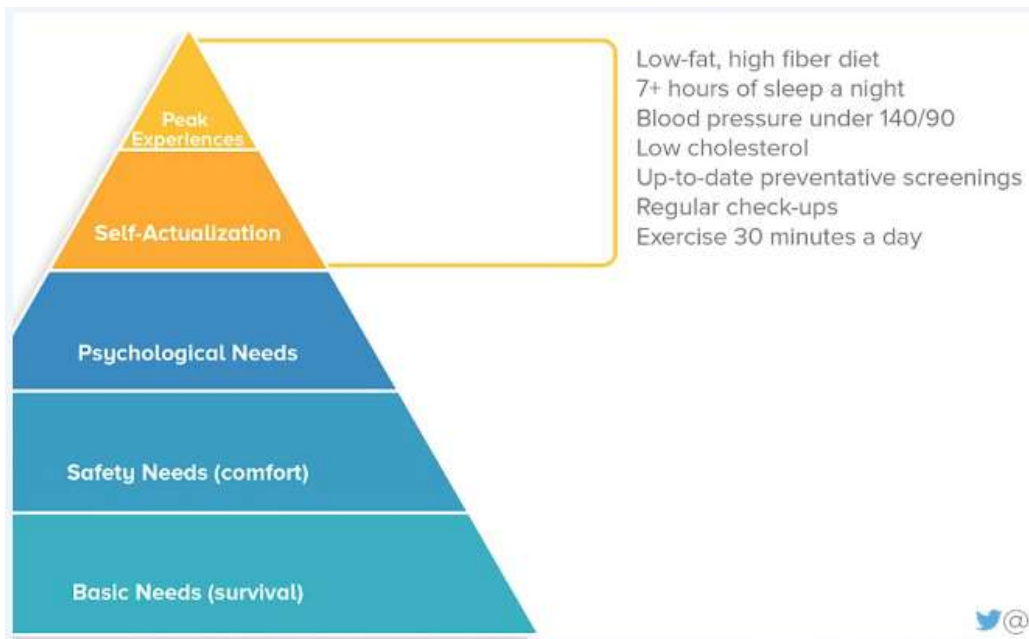
Effekten af rygning og sund livsstil



<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4907105/>

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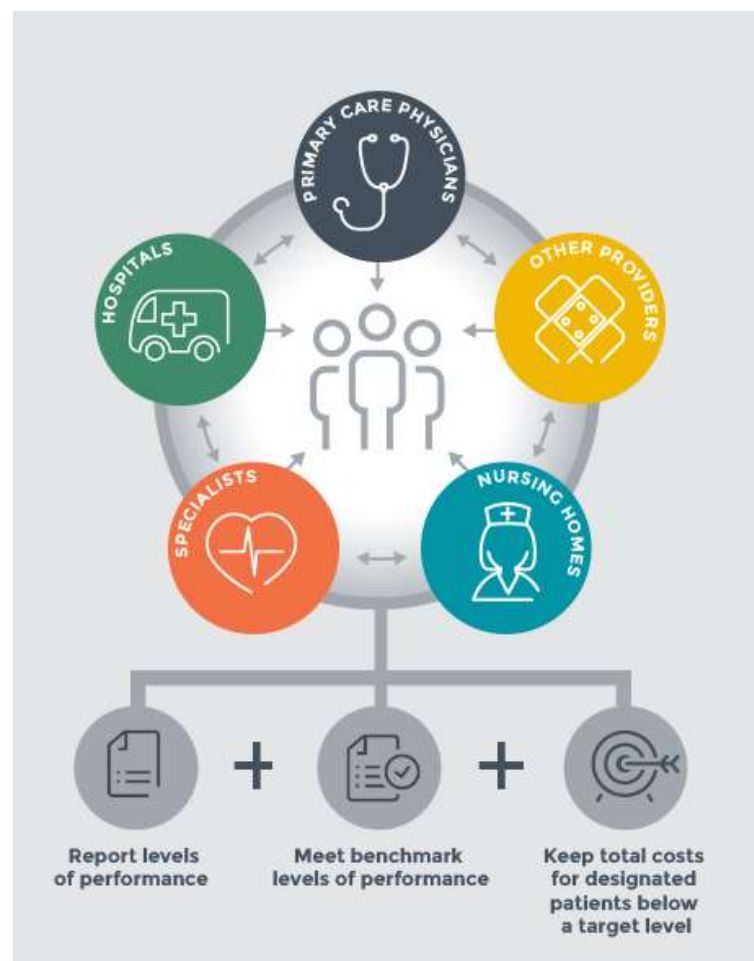
Forebyggelse: Alexandra Drane (Eliza Corp)



Fra "Vital værdier" til "Livs værdier"

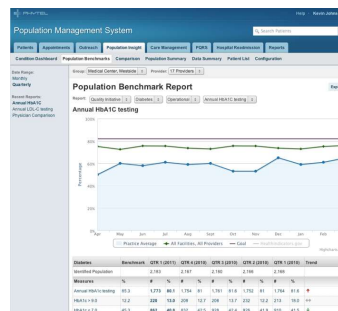
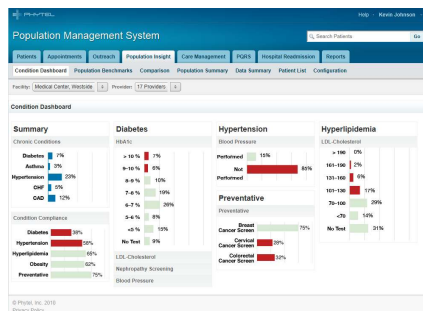
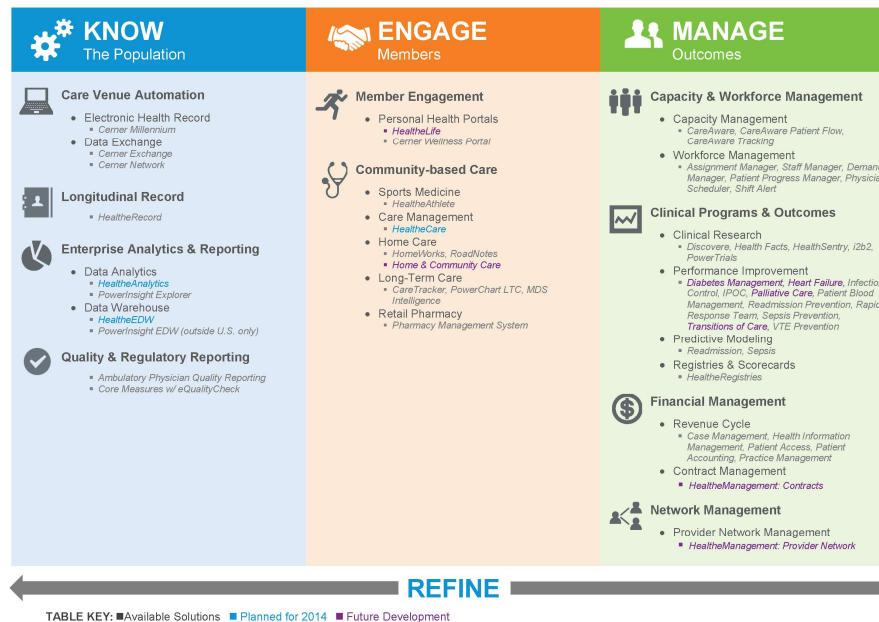


Affordable care organizations (ACO)



Population health management

POPULATION HEALTH MANAGEMENT



Eksempel: Arivale – Scientific wellness

Livsstilsændring + data

Programmer

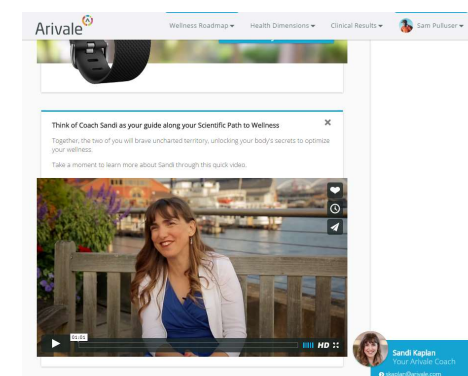
Tabesig

Optimeret aldring

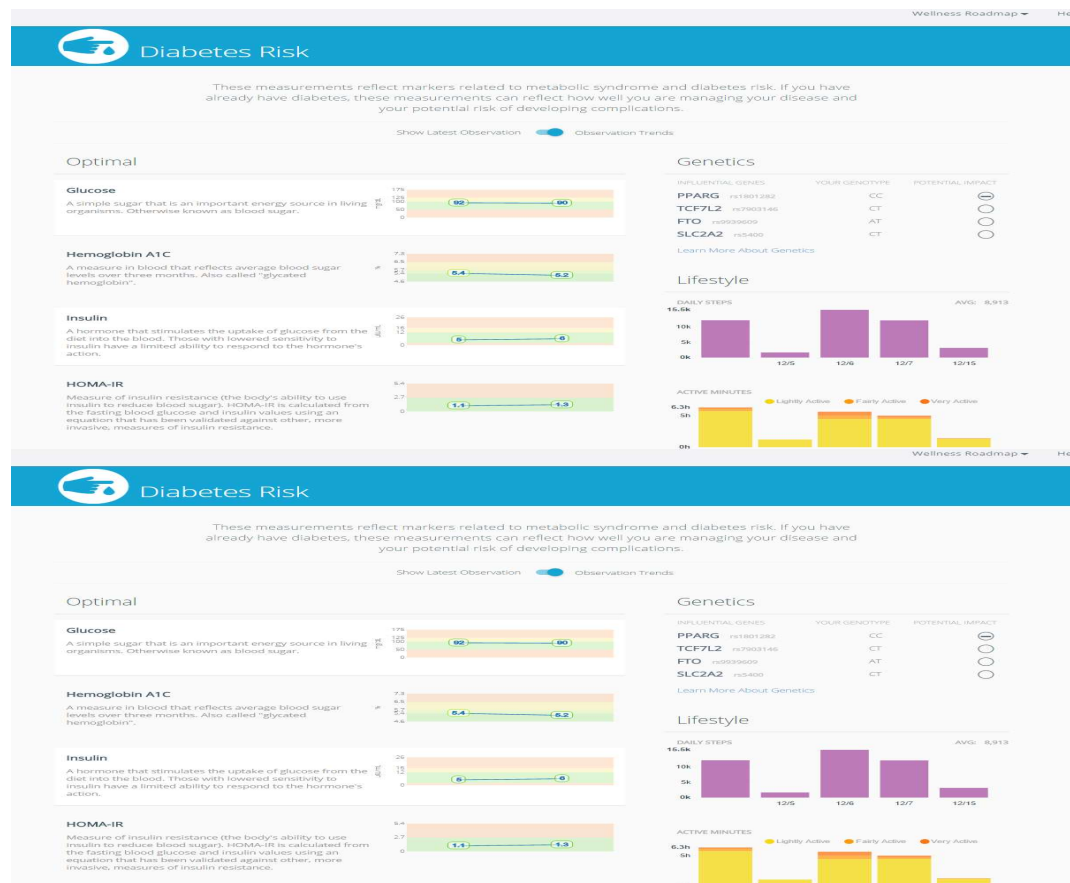
Bedre fysisk form

Reduktion af stress

- ✓ **Personal Arivale Coach**
Throughout the program, you'll work directly with a personal Arivale Coach who will help translate your data and hold you accountable to making lasting changes. Our coaching team is made up of expert clinicians and behavior change specialists—including Registered Dietitian Nutritionists, Certified Nutritionists, and Registered Nurses—all of whom have a solid foundation in functional nutrition and a systems approach to wellness.
- ✓ **Genetic Analysis**
With your Arivale Coach, explore genes related to weight management, fitness and wellness—and integrate them with your blood and saliva measurements.
- ✓ **2 Blood Analyses**
With your Arivale Coach, deep dive into 80+ blood measurements and integrate them with your saliva, genetics and lifestyle data. Blood analyses are conducted at the beginning of the program and again after six months.
- ✓ **1 Saliva Analysis**
Track your cortisol and DHEA levels—important hormones secreted by the adrenal glands that can help show how your body responds to stress.
- ✓ **1 Gut Microbiome Analysis**
Your gut microbiome is a fascinating, emerging area of science and wellness. Talk with your Arivale Coach about the diversity of bacteria in your gut and how it might relate to your overall wellness.
- ✓ **1 Fitbit Activity Tracker**
Gain insights into your lifestyle through activity, heart rate, and sleep tracking—all of which links to your Arivale Dashboard.
- ✓ **Personalized Wellness Dashboard**
From your Arivale Dashboard, explore your body's key systems that relate to wellness through six health dimensions: Heart Health, Diabetes Risk, Inflammation, Optimal Nutrition, Healthy Aging, and Stress Management. [Dive into the Arivale dashboard here.](#)
- ✓ **Monthly Calls (or More) and Unlimited Text/Email Check-ins with Arivale Coach**
Your Arivale Coach is with you every step of the way.
- ✓ **Concierge Service**
Throughout your journey, you'll have access to a concierge service to answer any questions, help set up blood draws, etc.

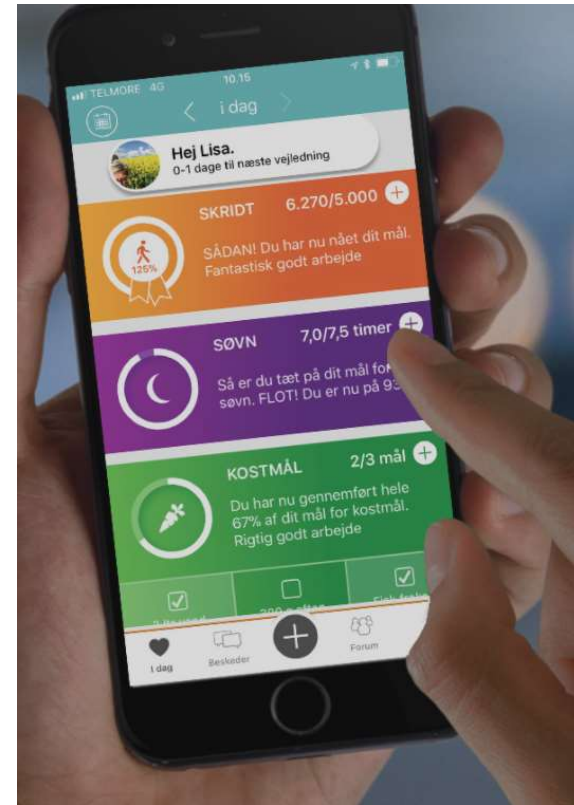
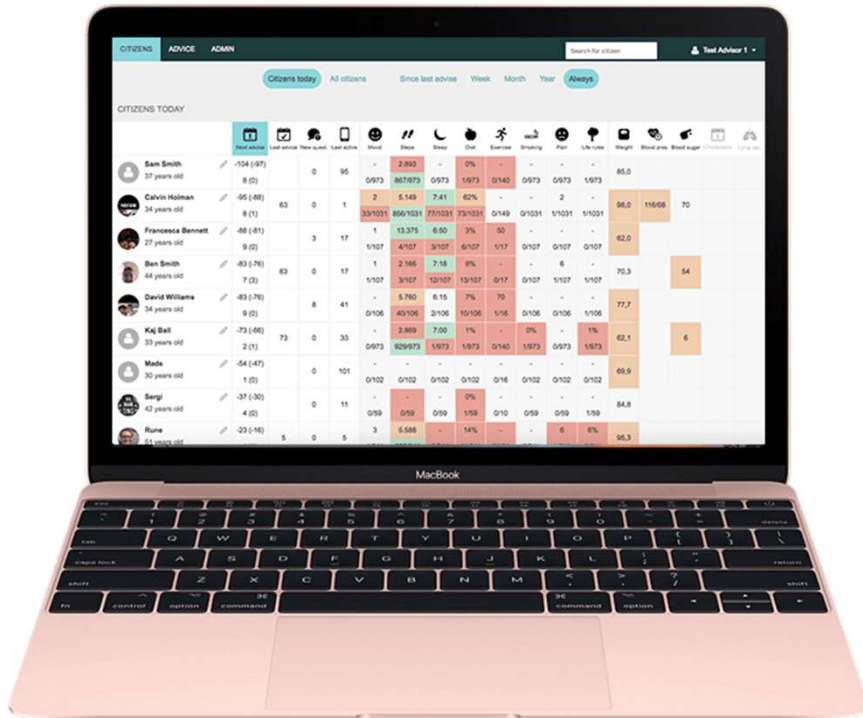


Eksempel: Arivale

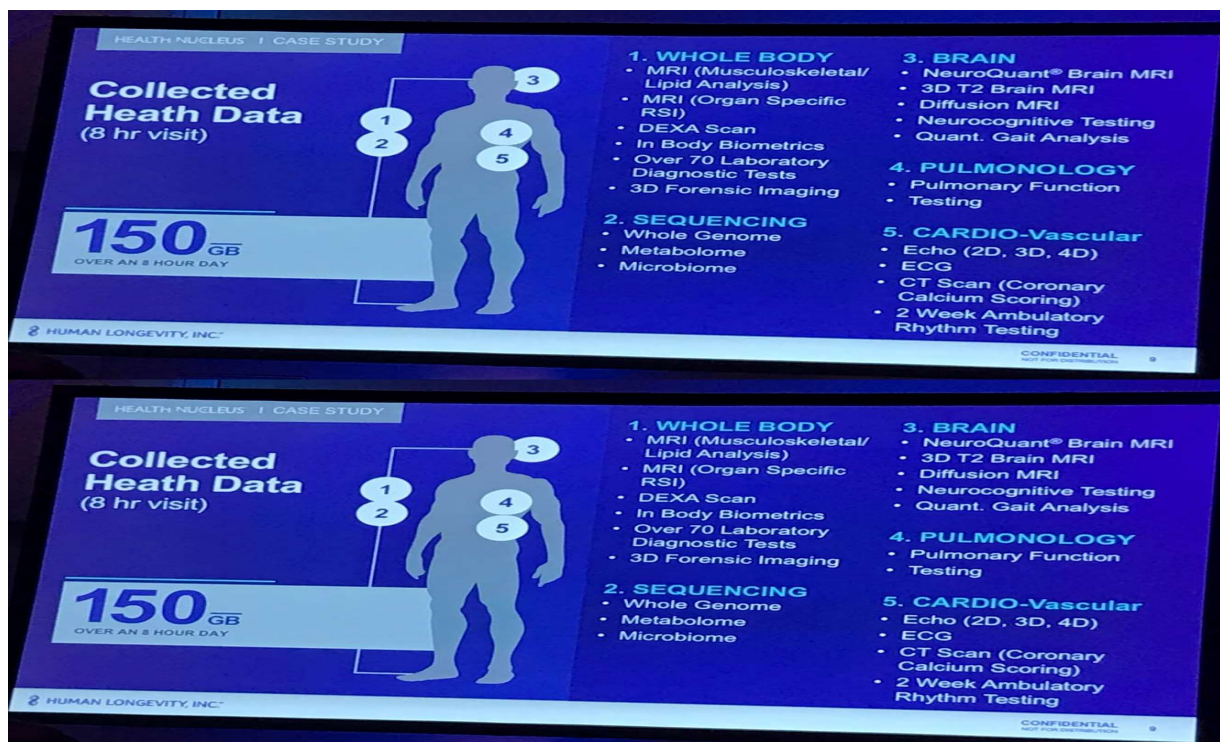


The one-time plan is \$3,499
(24.000 kr – 1 år).

Dansk eksempel: LivaHealth



Eksempel: Ekstremt sundhedstjek (Health Nucleus)



Pris: 175.000-350.000 kroner

Lyft og AARP (ældresagen i USA)



Getting Seniors Where They Need to Go

Transportation limitations have been shown to negatively affect seniors' access to health care resources, as well as their independence, self-confidence, and social connectedness. Ride-hailing apps are opening fresh avenues to connectedness, yet only 4% of U.S. adults aged 65 or older have ever used one.

AARP Foundation is working with Lyft, the USC Center for Body Computing, UnitedHealth Group, and other stakeholders to study whether using a ride-hailing app can improve overall health care in older adults—particularly those who have no previous experience with such applications.

We are launching this research project with three health systems in Los Angeles, Atlanta, and Chicago. Participants will be offered unlimited rides (medical and non-medical) and will be trained to use the Lyft app to request rides. Those unable or unwilling to use the app will schedule rides via a phone-based concierge.

Our aim is to use the data gathered, lessons learned, and strategic collaborations developed to create a long-term sustainable transportation model that improves health care utilization and reduces social isolation among older adults.

Disruption: Organisering omkring sundhed



Aktiv anvendelse af **"vitality" data** i tilgangen til sundhed koblet til understøttelse af den enkeltes sociale helhedssituation.



Nye samarbejdskonstellationer mellem traditionelle **sundhedsaktører og bløde livsstilsaktører**.



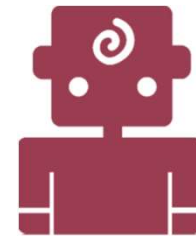
Nye afregningsmodeller for forebyggelse og nye services som følge heraf.



Nye værktøjer til borgere og patienter til at **forstå og understøtte sund livsstil og livsstilsændringer** (inklusive lovgivning)



Big data, Kunstig Intelligens og Blockchain



Kunstig Intelligens indenfor sundhed

HIMSS18 Is All About Artificial Intelligence in Healthcare

The 2018 HIMSS Conference and Exhibition will be all about applying machine learning and artificial intelligence to the biggest problems in healthcare.



Source: Xtelligent Media

Anvendelsesområder

Behandling og diagnostik

Afregning

Beslutningsstøtte

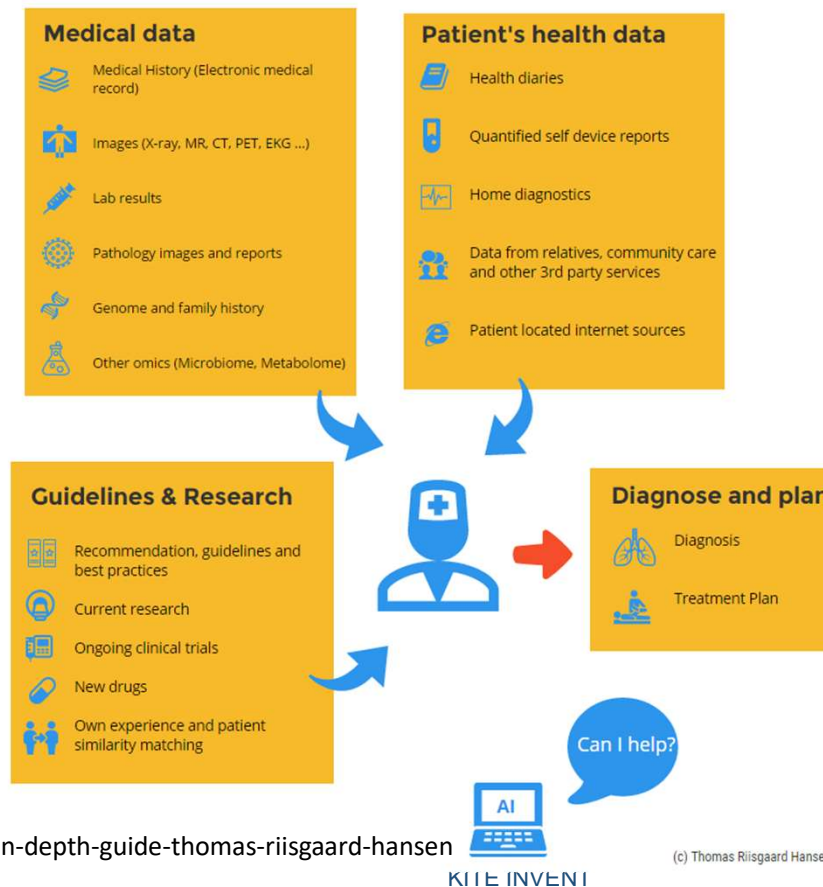
Cybersecurity

Folkesundhed (Population health)

Personlig medicin

Big data og kunstig intelligens

The need for AI in Healthcare



IBM Watson Oncology

Patient Cases

View more | DEMOGRAPHICS | DISEASE STATUS | TREATMENT HISTORY

Age: 62 Gender: Female Performance status: 0 Cancer type: Breast cancer Cancer stage: IIB Surgery: Not specified

Ask Watson

Clinical Information for: Stage IIB neoadjuvant with Case Notes

Summary 0 All Attributes Notes Filter attributes:

Disease Status

M Stage: M0 - No clinical or radiographic evidence
name_400000200 AdditionalNote: 9/29/2015 View Full Report
... aural woman from New York, accompanied by her daughter today to discuss neoadjuvant therapy for her stage IIB breast cancer.
HISTORY OF PRESENT ILLNESS: The patient initially palpated a right-sided breast mass around three ...

Staging characteristics

cT Stage: T3 - Tumor greater than 5 cm in
Derived Primary tumor size: 7.4
Derived

Cancer stage: IIB
name_400000200 AdditionalNote: 9/29/2015 View Full Report
... aural woman from New York, accompanied by her daughter today to discuss neoadjuvant therapy for her stage IIB breast cancer.
HISTORY OF PRESENT ILLNESS: The patient initially palpated a right-sided breast mass around three ...

Primary tumor pathologic findings

Histology: Lobular
name_400000200 AdditionalNote: 9/29/2015 View Full Report
... he then underwent an ultrasound-guided core biopsy that revealed moderately differentiated invasive lobular carcinoma.
HER2 1+ by IHC. LVI was present.

Tumor grade: Intermediate - moderately differentiate
name_400000200 AdditionalNote: 9/29/2015

Comorbidities Specify the severity of any comorbidities present

Neuropathy grade* Required NYHA Cardiac disease grade* Required

Please Verify: Attributes below correctly reflect the patient's condition.

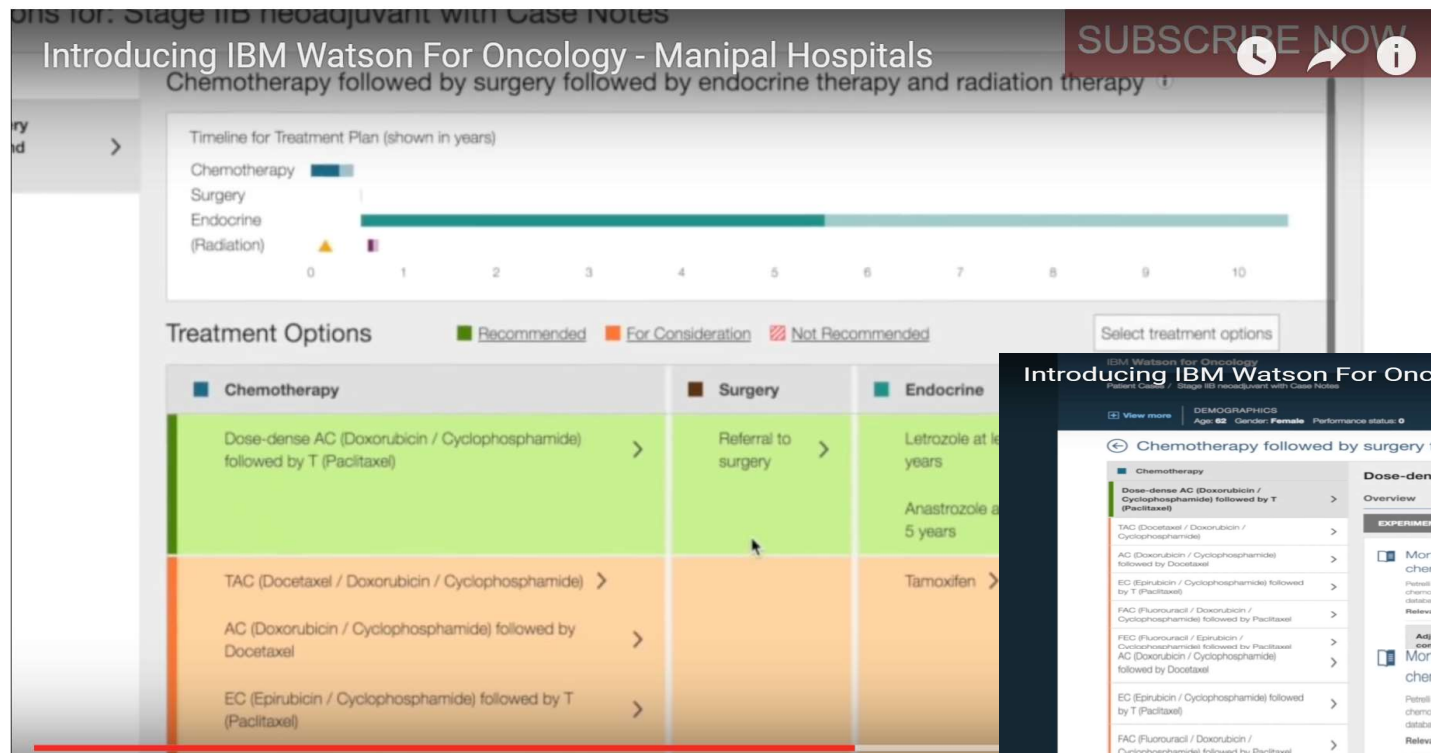
Patient characteristics

Gender: Female
name_400000200 AdditionalNote: 9/29/2015
... 29/2013 INITIAL CONSULTATION CHIEF COMPLAINT: The patient is accompanied by her daughter today to discuss neoadjuvant therapy for her

<https://www.youtube.com/watch?v=qG6jfHI4ucw>

KITE INVENT

IBM Watson Oncology



Introducing IBM Watson For Oncology - Manipal Hospitals

Chemotherapy followed by surgery followed by endocrine therapy and radiation therapy

Dose-dense AC (Doxorubicin / Cyclophosphamide) followed by T (Paclitaxel)

Overview Additional Publications Administration Drug Information

EXPERIMENTAL FEATURE: Additional publications Watson has identified as potentially relevant to this case.

Mortality, leukemic risk, and cardiovascular toxicity of adjuvant anthracycline and taxane chemotherapy in breast cancer: a meta-analysis.

Adjuvant anthracycline plus taxane may increase risk of non-breast cancer-related mortality but may reduce risk of some toxicities compared to higher doses or greater number of cycles of anthracycline alone in patients with breast cancer (level 2 [mid-level] evidence)

Mortality, leukemic risk, and cardiovascular toxicity of adjuvant anthracycline and taxane chemotherapy in breast cancer: a meta-analysis.

Adjuvant anthracycline plus taxane may increase risk of non-breast cancer-related mortality but may reduce risk of some toxicities compared to higher doses or greater number of cycles of anthracycline alone in patients with breast cancer (level 2 [mid-level] evidence)

- Trial quality assessment did not include evaluation of allocation concealment or intention-to-treat analysis
- Based on systematic review with incomplete assessment of trial quality
- Systematic review of 15 randomized trials evaluating risk of mortality, cardiotoxicity, leukemia, and neurotoxicity with adjuvant anthracycline and taxane chemotherapy in 27,039 patients with breast cancer
- Compared to >= 6 cycles of anthracycline alone, anthracycline plus taxane (all studies) associated with reduced risk of venous thromboembolism (RR 0.49, 95% CI 0.29-0.84) in analysis of 5 trials with 9,997 patients
- No significant differences in any other comparisons evaluated

Compared to >= 6 cycles of anthracycline alone, sequential anthracycline plus taxane associated with

<https://www.youtube.com/watch?v=qG6jfHI4ucw>

KITE INVENT

Behovet for Data

Strategier for at få adgang til data

Købe data (IBM and Merge)

Adgang gennem partnerskaber (IBM and Epic)

Data udvekslingsplatforme (CancerLinq, AACR Project GENIE, Foundation Medicine's PatientMatch)

Offentlige drevne databaser (Forskerservice)

Sundhedsdata i Danmark

Hvem ejer data?

Hvordan bruger vi data aktivt og forsvarligt?

Hvordan får vi gentænkt privat og offentlig sammenspil

Artikel 20

Ret til dataportabilitet

1. Den registrerede har ret til i et struktureret, almindeligt anvendt og maskinlæsbart format at modtage personoplysninger om sig selv, som vedkommende har givet til en dataansvarlig, og har ret til at transmittere disse oplysninger til en anden dataansvarlig uden hindring fra den dataansvarlige, som personoplysningerne er blevet givet til, når:

a) behandlingen er baseret på samtykke, jf. artikel 6, stk. 1, litra a), eller artikel 9, stk. 2, litra a), eller på en kontrakt, jf. artikel 6, stk. 1, litra b), og

b) behandlingen foretages automatisk.

2. Når den registrerede udøver sin ret til dataportabilitet i henhold til stk. 1, har den registrerede ret til at få transmitteret personoplysningerne direkte fra en dataansvarlig til en anden, hvis det er teknisk muligt.

3. Udøvelsen af den ret, der er omhandlet i denne artikels stk. 1, berører ikke artikel 17. Den nævnte ret finder ikke anvendelse på behandling, der er nødvendig for udførelse af en opgave i samfundets interesse eller som henhører under offentlig myndighedsudøvelse, som den dataansvarlige har fået pålagt.

4. Den ret, der er omhandlet i stk. 1, må ikke krænke andres rettigheder eller frihedsrettigheder.



Algoritmerne begynder at blive godkendt

FDA News Release

FDA permits marketing of clinical decision support software for alerting providers of a potential stroke in patients

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For Immediate Release

February 13, 2018

Summary

FDA permits marketing of clinical decision support software for alerting providers of a potential stroke in patients

News & Events

[Home](#) > [News & Events](#) > [Newsroom](#) > [Press Announcements](#)

FDA News Release

FDA permits marketing of artificial intelligence-based device to detect certain diabetes-related eye problems

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For Immediate Release

April 11, 2018



EDITORIAL • 13 MARCH 2018 • CORRECTION 26 MARCH 2018

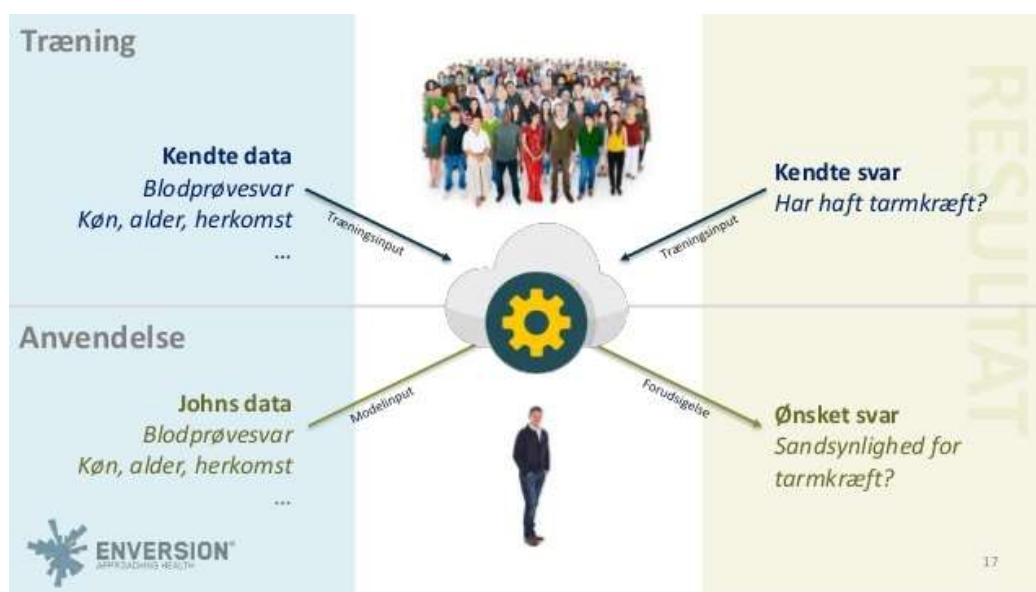
AI diagnostics need attention

Computer algorithms to detect disease show great promise, but they must be developed and applied with care.

<https://www.nature.com/articles/d41586-018-03067-x>

KITE INVENT

Udvalgte danske eksempler



Hovedstaden i ny aftale med IBM: Nu skal kunstig intelligens ind i sundhedssektoren



Klaus Ulrik Mortensen | 15. juni 2017 kl. 3:00 | 0 kommentarer

Print Facebook Twitter LinkedIn



FAKTA

- Watson er opkaldt efter IBM's stifter Thomas John Watson, Sr. (1874-1956).
- I 2011 vandt Watson en tre dage lang Jeopardy-dyst mod to tidligere stormestre.
- Watsons Jeopardy-sejre bygger på det, som teoretikere kalder dyb læring. Det vil sige, at adskillige algoritmer i såkaldte neurale netværk hver især analyserer forskellige dele af opgaven og bød ind med mulige svar, der så blev tillagt en sandsynlighed.
- Efterfølgende har IBM oprettet selskabet Watson Group med mere end 2.000 ansatte og et budget på godt seks milliarder kroner. Ambitionen er at udbrede Watson til mere seriøse formål lige fra diagnosticering af kræft over socialrådgivning til e-handel på nettet.
- Den afgørende forskel på Watson og andre søgemaskiner som Siri og Google Now er, at Watson forstår almindeligt sprogbrug. Den genkender ikke bare ord, men forstår deres betydning og kan levere meningsfulde svar inden for den kontekst, hvori spørgsmålene er stillet.

NYBRUD: Ny aftale mellem Region Hovedstaden og IBM skal teste, hvordan Watsons kunstige intelligens kan revolutionere det danske sundhedsvæsen. Først skal computeren lede efter brystkræftkuder på Herlev Hospital.

Machine learning fra dansk startup kan spotte hjertestop i 112-opkald

Analyse af 112-opkald i realtid kan understøtte livsvigtige telefonsamtaler, mener startup bag nyt AI-system.

Magnus Boye @magnusboyer Fredag, 23. september 2016 - 6:29



Der bliver postet enorme summer i udviklingen af intelligente assistenter som Siri, Cortana og Google Assistant.

Fælles for dem er dog, at de har til formål at understøtte et simpelt brugsscenarie: Hvor er den nærmeste bager, hvad tid går toget og ring venligst hjem.

Blockchain – har det en rolle i sundhed?

Problemstillinger

Integration

Sikkerhed

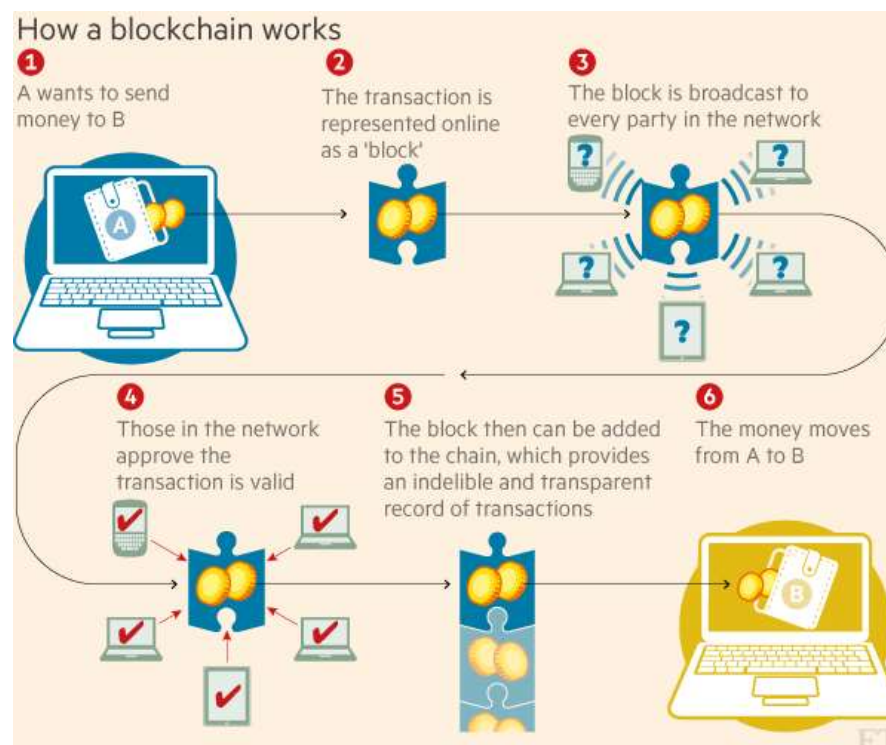
Unik ID

Innovation

Er blockchain løsningen?

På det store problem?

På en del af problemet?



Disruption: Algoritmer, big data og AI



Lægen – lægen kan blive **ekspert i at anvende værktøjer**
- ikke kende detaljer



Patienten – nye typer værktøjer kan hjælpe til
selvdiagnostik og selvmonitorering



Sundhedspersonale – nye former for beslutningsstøtte
kan flytte kompetencekrav og **flytte opgaver mellem faggrupper.**



Bedre og **mere ensartede behandlinger**



Personlig medicin



Personlig medicin

”Personlig Medicin dækker over en udvikling i sundhedsvæsenet, hvor bl.a. forebyggelse og behandling i højere grad **tilpasses den enkelte patients individuelle biologi og fysiologi**. Det kan være, at en analyse af generne kan hjælpe til at forstå, hvorfor patienten er blevet syg og dermed, hvordan patienten bedst kan behandles.”

INDUSTRY NEWS > TECHNOLOGY

Cerner Health Conference: Genomics is the 'next great frontier'

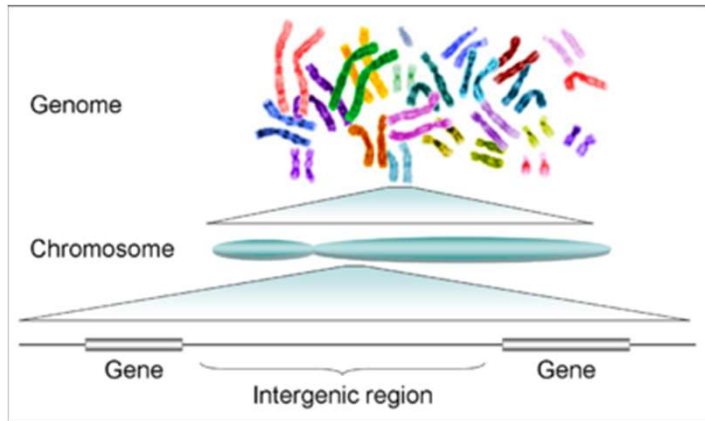
Nov 17, 2016, 10:14am CST

INDUSTRIES & TAGS Technology, Health Care, Biotech, Bioscience



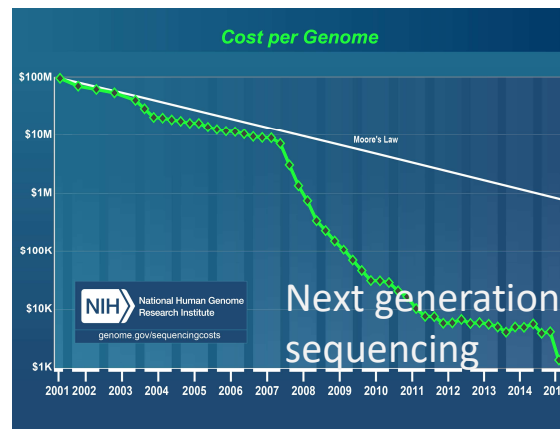
Genanalyse 101

Udvalgte eller fuld genom analyse?



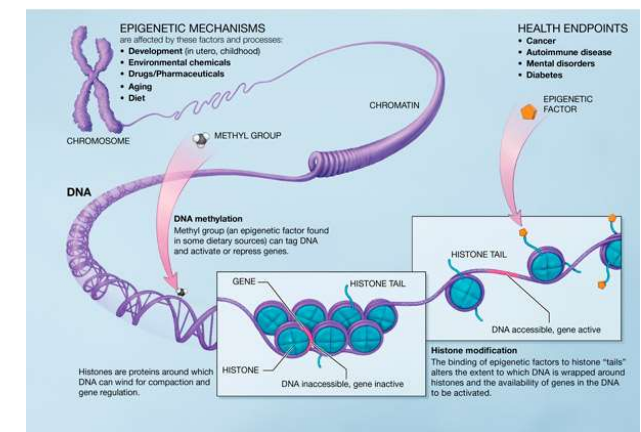
3 milliarder basepar
22 par autosomer samt 2 kønskromosomer
20.500 proteinkodende gener

Prisen er faldet kraftigt



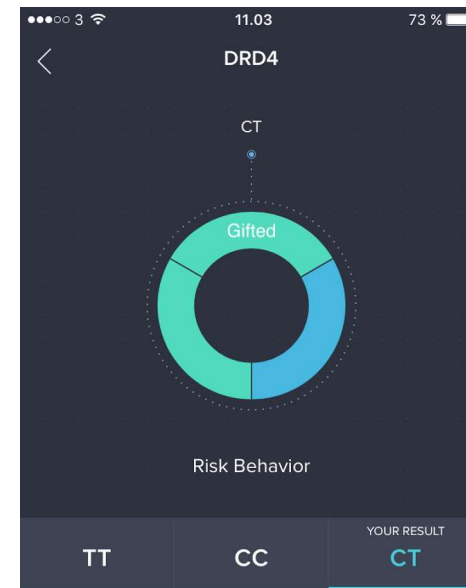
<http://www.nature.com/nrg/journal/v17/n6/full/nrg.2016.49.html>

Epigenetik, en af de næste udfordringer



Genanalyse: 23andme og Orign

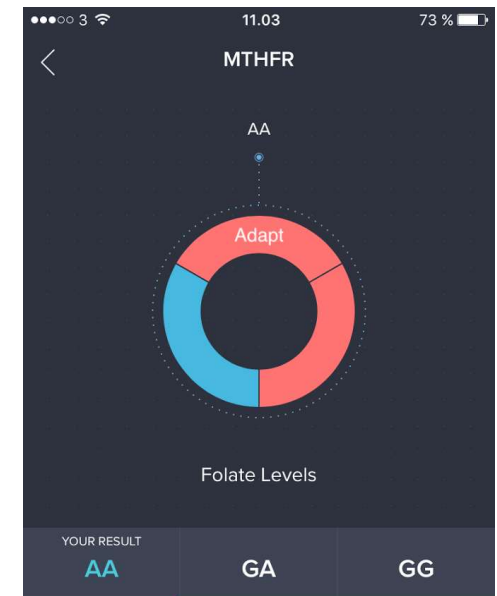
 HOME MY RESULTS FAMILY & FRIENDS RESEARCH & COMMUNITY  			
Health Overview			
Genetic Risk Factors		Inherited Conditions	
REPORT	RESULT	REPORT	RESULT
Alzheimer's Disease	Variant Present, Higher Risk	Bloom Syndrome	Variant Present
Factor XI Deficiency	Variant Absent, Typical Risk	Cystic Fibrosis	Variant Absent
Inherited Thrombophilia	Variant Absent, Typical Risk	Sickle Cell Anemia	Variant Absent
Parkinson's Disease	Variant Absent, Typical Risk	Tay-Sachs Disease	Variant Absent
See All Genetic Risk Factor Reports		See All Inherited Condition Reports	
Traits		Drug Response	
REPORT	RESULT	REPORT	RESULT
Bitter Taste Perception	Unlike to Taste	Clopidogrel (Plavix®) Efficacy	Reduced
Eye Color	Likely Brown	Proton Pump Inhibitor (PPI) Metabolism	Reduced
Lactose Intolerance	Like Tolerant	Warfarin (Coumadin®) Sensitivity	Typical



People like you have an increased susceptibility to risk seeking behavior. You are more likely to be an extrovert and may seek out novel and thrilling experiences.

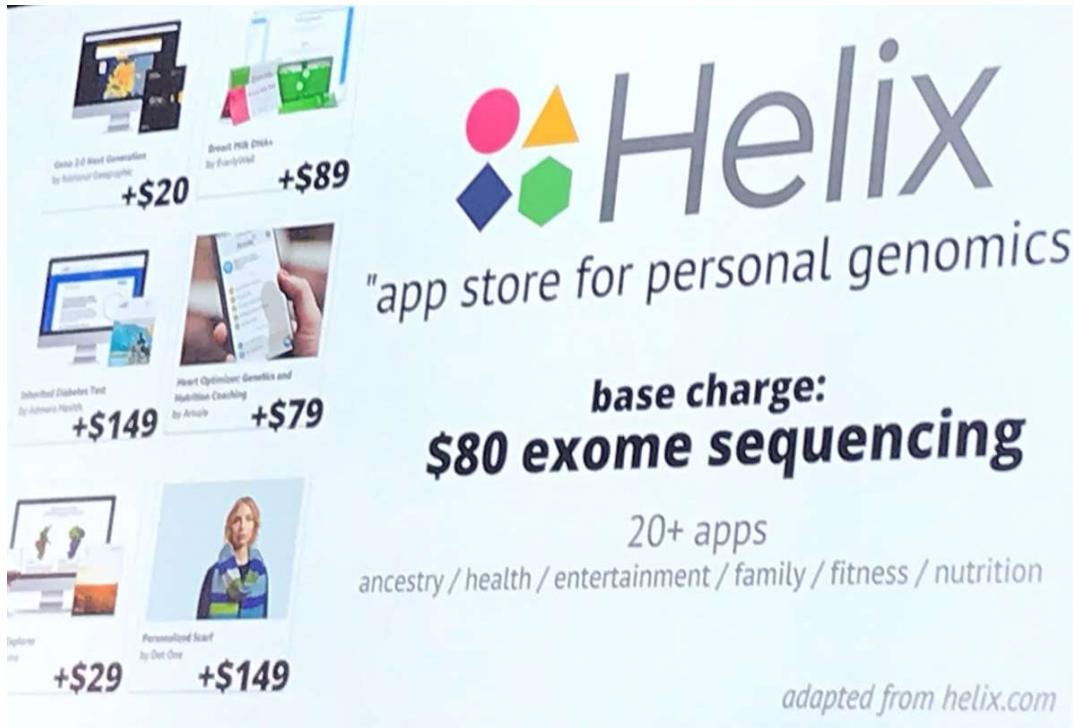
COMMENTS

Are you an extrovert? Scientists have studied aspects of human behavior such as how out-going and impulsive you are and how motivated you are to seek novel experiences. These behaviors seem to go together and the brain



This is the rare result found in 10% of the population. You have much reduced levels of the enzyme (30% of normal). This will give you lower levels of folate, Vitamin B12, and higher levels of homocysteine. Therefore you should actively seek food such as lentils, beans, asparagus, spinach, turnip greens, broccoli, and beets that are rich in folate and may consider an additional folate supplement, as needed and discussed with your doctor.

App store for genanalyser



Helix
"app store for personal genomics"

**base charge:
\$80 exome sequencing**

20+ apps
ancestry / health / entertainment / family / fitness / nutrition

adapted from helix.com

Additional app prices shown:

- Genus 2.0 Next Generation by National Geographic: +\$20
- Brave PBS DNA by PBS: +\$89
- Inherited Diabetes Test by Admera Health: +\$149
- Heart Optimizer Genetics and Nutrition Coaching by Activa: +\$79
- Explorer by: +\$29
- Personalized Start by Diet One: +\$149



Genanalyse: Arvelige sygdomme

Nuværende praksis

Præimplantations genetisk diagnostik (Ægselektion)

Tidlig screening f.eks. for down syndrome

Ved fund i familien - tilbyde at undersøge andre i familien

Voksende muligheder

Risikoanalyse

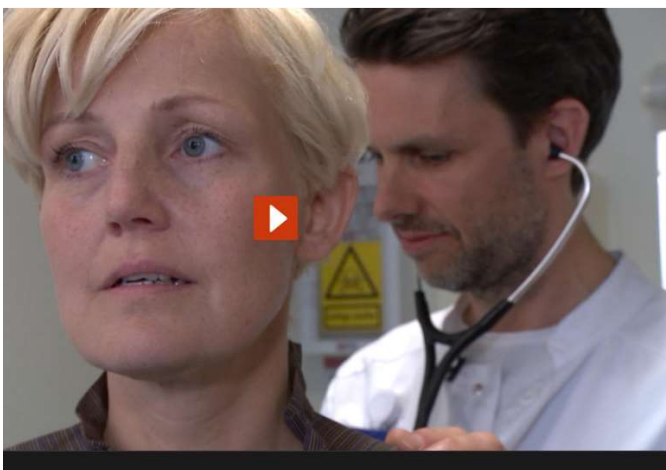
Disorder	Prevalence	Chromosome or gene involved
Chromosomal conditions		
Down syndrome	1:600	Chromosome 21
Klinefelter syndrome	1:500–1000 males	Additional X chromosome
Turner syndrome	1:2000 females	Loss of X chromosome
Sickle cell anemia	1 in 50 births in parts of Africa; rarer elsewhere ^[71]	β-globin (on chromosome 11)
Cancers		
Breast/Ovarian cancer (susceptibility)	~5% of cases of these cancer types	BRCA1, BRCA2
FAP (hereditary nonpolyposis coli)	1:3500	APC
Lynch syndrome	5–10% of all cases of bowel cancer	MLH1, MSH2, MSH6, PMS2
Neurological conditions		
Huntington disease	1:20000	Huntingtin
Alzheimer disease - early onset	1:2500	PS1, PS2, APP
Other conditions		
Cystic fibrosis	1:2500	CFTR
Duchenne muscular dystrophy	1:3500 boys	Dystrophin

Genanalyse i valg af kræftbehandling

INDLAND

Solveigs kræftbehandling er skræddersyet til hendes gener: Jeg vil have et skud til i bøssen

Fordelene ved at få kortlagt sin arvemasse trumfer ulemperne ved et nyt register, siger brystkræftpatient.



AF LISBETH QJASS OG SOPHE BROCHDORFF HIMMELSTRUP (VIDEO)
21. OKT 2017 KL. 12.15

[MAIL](#) [TWITTER](#) [FACEBOOK](#)

Et sted i Solveig Sandnes' gener er der en defekt.

Den er årsagen til, at hun for knap 12 år siden fik brystkræft, som siden har spredt sig til hendes knogler og lever, så hun i dag er uhelbredeligt syg.

For fem uger siden blev hun tilknyttet et medicinsk forsøg på Finsencentret på Rigshospitalet efter en kortlægning af sin arvemasse.

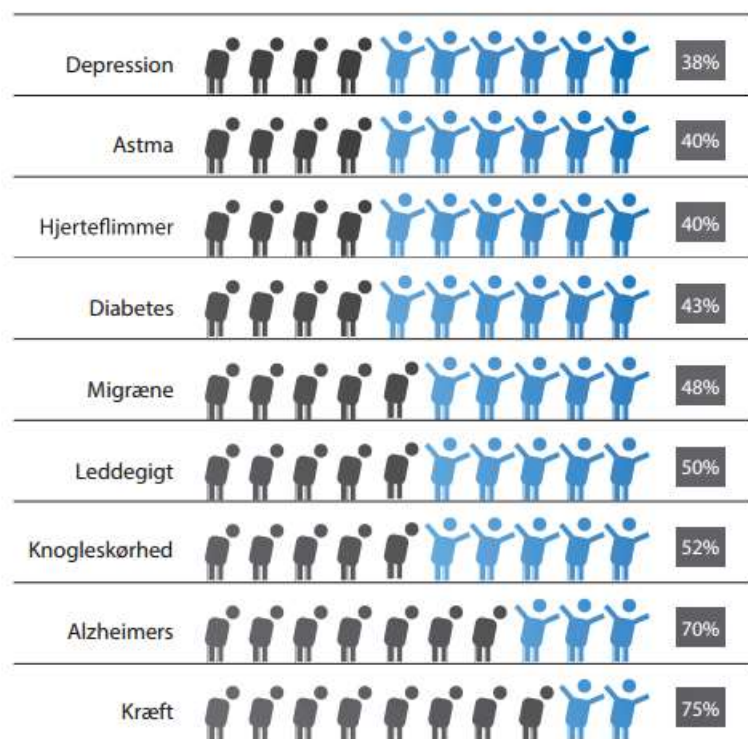
Behandlingen er målrettet lige præcis den genetiske defekt, hun har.

”Behandlingen er målrettet lige præcis den genetiske defekt, hun har.”

KITE INVENT

Farmakogenetik

Andelen af patienter, som ikke har gavn af medicinen



Kilde: FDA "Paving the Way for Personalized Medicine", oktober 2013

Farmakogenetik er studiet af hvordan gener påvirker personers medicinrespons

Rigtige medicin til rigtige patient

Færre bivirkninger

Bedre behandling

Reducere udgifter til medicin

Farmakogenetik: Eksempel

pro.medicin
INFORMATION TIL SUNDHEDSFAGLIGE

Menu

A-Z søgning

Information til patienten om Marevan

Indlægssedler for Marevan

Marevan

Warfarin

B01AA03

Amning | Andre anvendelsesområder | Anvendelsesområder | Bivirkninger | Bloddonor | Dispenseringsform | Doping | Doseringsforslag | Egenskaber, håndtering og holdbarhed | Farmakodynamik | Farmakokinetik | Firma | Forgiftning | Forsigtighedsregler | Foto og identifikation | Graviditet | Hjælpesoffer | Indholdsstoffer | Instruktioner | Interaktioner | Kontraindikationer | Pakninger, priser, tilskud og udlevering | Patientsikkerhed | Schengen-attest (pillepas) | Substitution | Tilskud | Trafik

Coumarinderivat. Indirekte virkende antikoagulans.

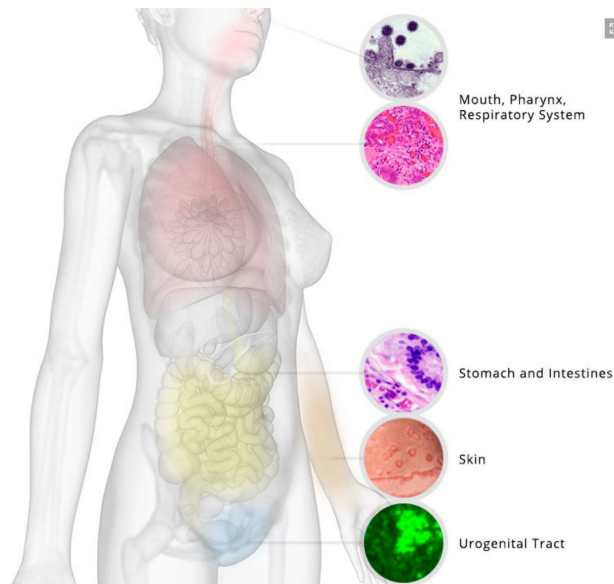
Anvendelsesområder

Forebyggelse og behandling af **dyb tromboflebit** og tromboemboliske komplikationer. Se endvidere: Vitamin K-antagonister

Induktorer af CYP2C9 eller CYP3A4 kan nedsætte den antikoagulerende virkning, mens hæmmere af CYP2C9 og CYP3A4 eller konkurrerende substrater for disse isoenzymer kan forstærke den antikoagulerende virkning. Se endvidere tabel 2 i **Elimination og cytokrom P450-systemet**.

Gene	Important Variants	Variation	Consequence of Variation	Effect on Enzyme Activity	Selected Medication Substrates
CYP2D6	CYP2D6*3	2549 del A (rs4986774)	Frameshift mutation, premature stop	Absent activity	Amitriptyline, atomoxetine, carvedilol, chlorpheniramine, chlorpromazine, citalopram, clomipramine, clozapine, codeine , debrisoquine, desipramine, dextromethorphan, doxepin, flecamide, fluoxetine, fluvoxamine, gefitinib, haloperidol, imipramine, maprotiline, metoprolol, mexiletine, mianserin, morphine, nortriptyline, paroxetine, risperidone, tamoxifen , thioridazine, timolol, tolterodine, tramadol
	CYP2D6*4	1846G→A (rs3892097)	Splicing defect	Absent activity	
	CYP2D6*5	n/a	Whole gene deletion	Absent activity	
	CYP2D6*6	1707 del T (rs3030655)	Frameshift mutation	Absent activity	
	CYP2D6*9	2615_2617delAAG (rs3030656)	Deletion of lys ²⁸¹	Reduced activity	
	CYP2D6*10	100C→T (rs1065852)	pro ³⁴ ser	Reduced activity	
	CYP2D6*17	1023C→T (rs28371706)	thr ¹⁰⁷ ile	Reduced activity ^a	
	CYP2D6*29	3183G→A (rs59421388) and 4180G→C (rs61736512)	val ³³⁸ met and ser ⁴⁸⁶ thr	Reduced activity	
	CYP2D6*41	2988G→A (rs28371725)	Splicing defect	Reduced activity	
	CYP2D6*UM	n/a	Additional functional copies (2-13) of gene	Increased activity	

Mikrobiomet



New Online Views 31,685 Citations 0 Altmetric 387

Viewpoint

December 22, 2016

The Microbiome and Risk for Obesity and Diabetes

Anthony L. Komaroff, MD¹

» Author Affiliations | Article Information

JAMA. Published online December 22, 2016. doi:10.1001/jama.2016.20099

ONLINE FIRST FREE

How Gut Bacteria Are Shaking Up Cancer Research

by Makiko Kitamura

14. marts 2016 06.00 CET

→ Roche says it plans to study role of microbiome in cancer

→ Vedanta expects more drug companies to enter the field

Top scientists at Roche Holding AG and AstraZeneca Plc are sizing up potential allies in the fight against cancer: the trillions of bacteria that live in the human body.

"Five years ago, if you had asked me about bacteria in your gut playing an important role in your systemic immune response, I probably would have laughed it off," Daniel Chen, head of cancer immunotherapy research at Roche's Genentech division, said in a phone interview. "Most of us immunologists now believe that there really is an important interaction there."

FEATURE HEALTH, MENTAL HEALTH

Microbes can play games with the mind

The bacteria in our guts may help decide who gets anxiety and depression

BY LAURA SANDERS 9:30AM, MARCH 23, 2016

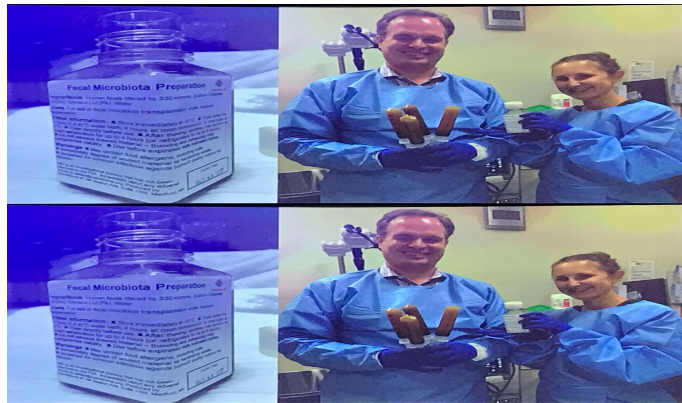
Table 1 Reported alterations in the gut microbiota in neurological and psychiatric disorders

Pathology type	Condition	Associated microbiota changes	Refs.
Autoimmune disease	Multiple sclerosis	Increased: <i>Methanobrevibacter</i> , <i>Akkermansia</i>	135
		Decreased: <i>Butyrivibrio</i>	136
		Increased: <i>Desulfovibrionaceae</i>	137
		Decreased: <i>Lachnospiraceae</i> , <i>Ruminococcaceae</i>	138
		Increased: <i>Pseudomonas</i> , <i>Mycoplana</i> , <i>Haemophilus</i> , <i>Blautia</i> , <i>Dorea</i>	139
Neurodegenerative disorders	Parkinson's disease	Decreased: <i>Parabacteroides</i> , <i>Adherentia</i> , <i>Prevotella</i>	140
		Increased: <i>Streptococcus</i> , <i>Eggerthella</i>	105
		Decreased: <i>Clostridia</i> clusters XIVa and IV, <i>Bacteroidetes</i> , <i>Faecalibacterium</i>	141
		Increased: <i>Ruminococcus</i>	142
		Decreased: <i>Bacteroidaceae</i> , <i>Faecalibacterium</i>	143
Injury	Spinal cord injury (SCI)	Increased: <i>Blautia</i> , <i>Coprococcus</i> , <i>Roseburia</i> , <i>Proteobacteria</i>	144
		Decreased: <i>Faecalibacterium</i> , <i>Prevotellaceae</i>	145
		Enterobacteriaceae correlate with motor impairments	146
		Association with bacterial and viral infection	147
		SCI with upper motor neuron bowel syndrome: decreased <i>Pseudobutyrvibrio</i> , <i>Dialister</i> , <i>Megamonas</i>	148
Neuropsychiatric conditions	Major depressive disorder	SCI with lower motor neuron bowel syndrome: decreased <i>Roseburia</i> , <i>Pseudobutyrvibrio</i> , <i>Megamonas</i>	149
		SCI with neuropathic bladder: increased <i>Klebsiella</i> , <i>Escherichia</i> , <i>Enterococcus</i>	150
		SCI with neuropathic bladder: decreased <i>Lactobacillus</i> , <i>Corynebacterium</i> , <i>Staphylococcus</i> , <i>Streptococcus</i> , <i>Prevotella</i> , <i>Veillonella</i>	151
		Decreased: <i>Bifidobacterium</i> , <i>Lactobacillus</i>	152
		Increased: <i>Actinomyces</i> , <i>Coriobacteriaceae</i> , <i>Lactobacillaceae</i> , <i>Streptococcaceae</i> , <i>Clostridiales</i> , <i>Eubacteriaceae</i> , <i>Lachnospiraceae</i> , <i>Ruminococcaceae</i> , <i>Erysipelotrichaceae</i>	86
Anxiety disorder	Major depressive disorder	Decreased: <i>Bacteroidaceae</i> , <i>Rikenellaceae</i> , <i>Lachnospiraceae</i> , <i>Acidaminococcaceae</i> , <i>Veillonellaceae</i> , <i>Sutterellaceae</i>	145
		Increased: <i>Enterobacteriaceae</i> , <i>Alistipes</i> , <i>Acidaminococcaceae</i> , <i>Fusobacteriaceae</i> , <i>Porphyromonadaceae</i> , <i>Rikenellaceae</i>	146
		Decreased: <i>Bacteroidaceae</i> , <i>Erysipelotrichaceae</i> , <i>Lachnospiraceae</i> , <i>Prevotellaceae</i> , <i>Ruminococcaceae</i> and <i>Veillonellaceae</i>	147
		<i>Faecalibacterium</i> negatively correlated with depressive symptoms	148
		Probiotic administration of <i>B. longum</i> and <i>Lactobacillus helveticus</i> decreased anxiety	149
Autism	Major depressive disorder	Probiotic administration of <i>Lactobacillus casei</i> , <i>Lactobacillus acidophilus</i> , <i>L. rhamnosus</i> , <i>Lactobacillus bulgaricus</i> , <i>Bifidobacterium breve</i> , <i>B. longum</i> , <i>Streptococcus thermophilus</i> and <i>Bifidobacterium lactis</i> decreased anxiety	150
		Increased: <i>Lactobacillus</i> , <i>Desulfovibrio</i> , <i>Clostridium</i> , cluster 1	151
		Decreased: <i>Bacteroides/Firmicutes</i> , ratio	152
		Increased: <i>Sutterella</i>	149
		Increased: <i>Clostridium</i> , <i>Bacteroides</i> , <i>Porphyromonas</i> , <i>Prevotella</i> , <i>Pseudomonas</i> , <i>Aeromonas</i> , <i>Enterobacteriaceae</i>	150

<http://www.nature.com/nrmicro/journal/v10/n11/full/nrmicro2876.html>
<http://www.nature.com/neuro/journal/vaop/ncurrent/full/nn.4476.html>

KITE INVENT

Interventioner baseret på mikrobiomet



NATURE | NEWS

Scientists swab C-section babies with mothers' microbes

Newborns were exposed experimentally to vaginal microbes to restore the microbiomes they missed.

Ewen Callaway

01 February 2016



<http://www.eliminatedengue.com>

KITE INVENT

Disruption: Personlig risikovægtet behandling



Fra ens behandling af alle til **personlig risikovægtet behandling** baseret på genetisk information hos kommunen, praktiserende læge og på hospitalet



Borgerne for mulighed for mange flere informationer om deres **sygdomsrisiko**. Hvordan håndtere borgere og sundhedsvæsen det?



Samfundet – Hvis bekostelige behandlinger kan undgås ved tidlig genetisk diagnostik – bør det så være et **krav fra samfundets side** (Kina-modellen)?



Mikrobiomet – potentielt **nyt paradigme** for forståelser af en række sygdomme og mulige forebyggelse og behandlingsmuligheder.



Disruption: Farmakogenetik



Patienten - **Bedre behandlinger** med målrettet medicin med **færre bivirkninger**



Sundhedsvæsenet – **færre udgifter** til nytteløst medicin



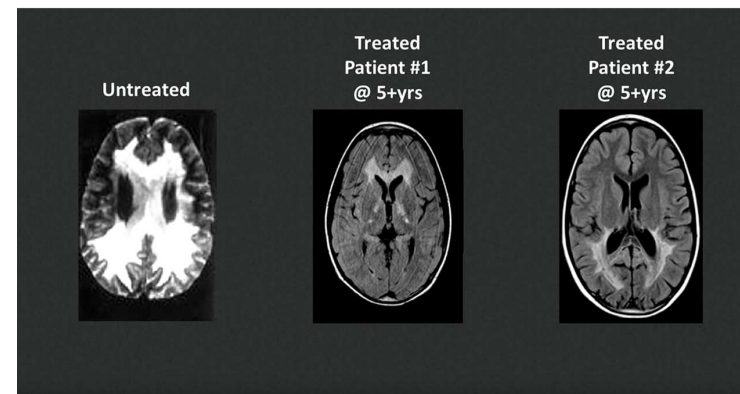
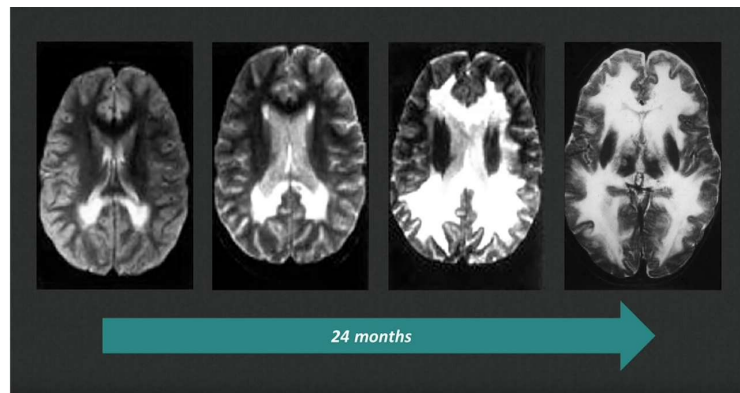
Medicinalindustrien – **øget krav til dokumentation** for genetisk indflydelse. **Potentiale for at ældre lægemidler**, der ikke virkede på den brede befolkning kan genintroduceres baseret på genetisk information

Personlig medicin II

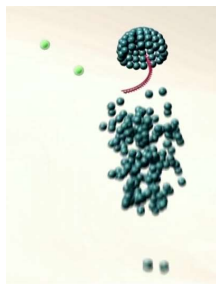
Geneditering



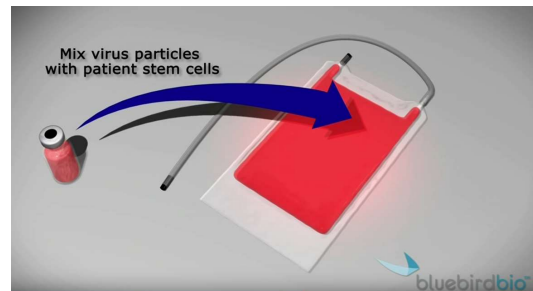
Eksempel: Adrenoleukodystrofi (ALD) lenti-D genterapi



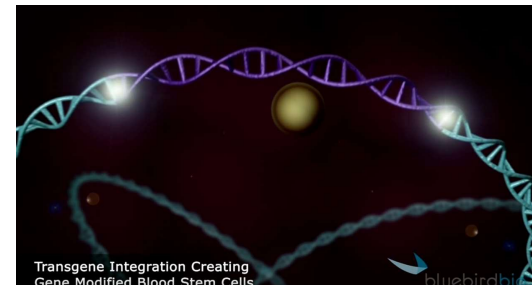
1. Design genændring og virus



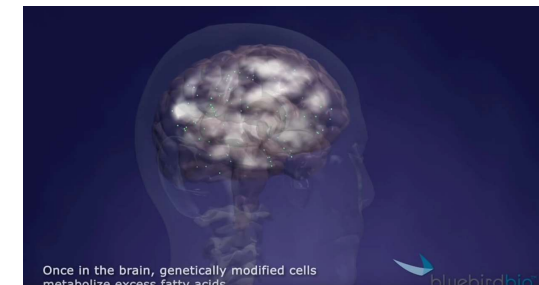
2. Tag stamceller og genmodificer dem



3. Genmodificerede stamceller sendes tilbage i kroppen



4. Stamcellerne laver nye modificerede celler



Priser

Strimvelis

4.4 millioner kroner

Penge tilbage garanti

14 tilfælde i Europa

Glybera

7.5 millioner kroner

Solgt en enkelt gang

Goldman Sachs asks in biotech research report: 'Is curing patients a sustainable business model?'

Tae Kim | @firstadopter

Published 3:15 PM ET Wed, 11 April 2018 | Updated 7:20 PM ET Wed, 11 April 2018



Biomedicine

The World's Most Expensive Medicine Is a Bust

The first gene therapy approved in the Western world costs \$1 million and has been used just once. The doctor who tried it says the price is "absolutely too high."

by Antonio Regalado May 4, 2016

Rewriting Life

The World's Most Expensive Medicine Is Being Pulled from the Market

The maker of the gene therapy Glybera says it doesn't have enough customers.

by Emily Mullin April 21, 2017

KITE INVENT



Fremtiden for genterapi

Sjældne sygdomme

Findes i dag omkring 5000 identificerede sjældne sygdomme der skyldes isolerede genmutationer

I Danmark er det måske 30.000–50.000 mennesker og typisk er der ofte 500-1000 eller færre patienter der karakteriseres som sjældne



Nye former for genterapi

Virus

CRISPR-CAS9

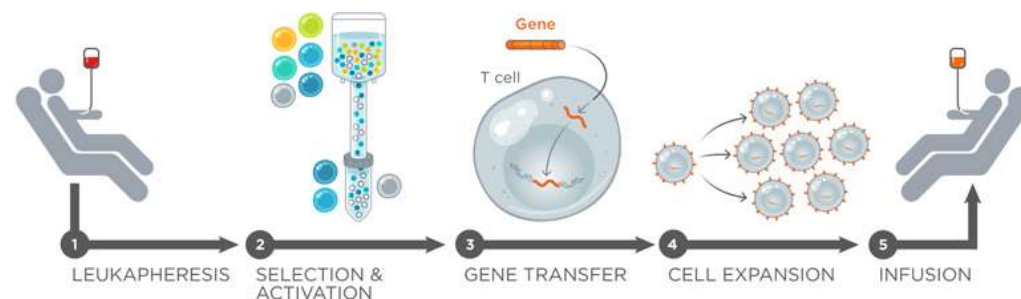
Varianter baseret på nanoteknologi



De almindelige sygdomme

Cancer

Diabetes



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Novartis receives first ever FDA approval for a CAR-T cell therapy, Kymriah(TM) (CTL019), for children and young adults with B-cell ALL that is refractory or has relapsed at least twice

Aug 30, 2017

KITE INVENT

- First-in-class therapy showed an 83% (52/63) overall remission rate in this patient population with limited treatment options and historically poor outcomes [1][2]

Disruption: Geneditering



Behandling - **Helbrede** genetiske sygdomme



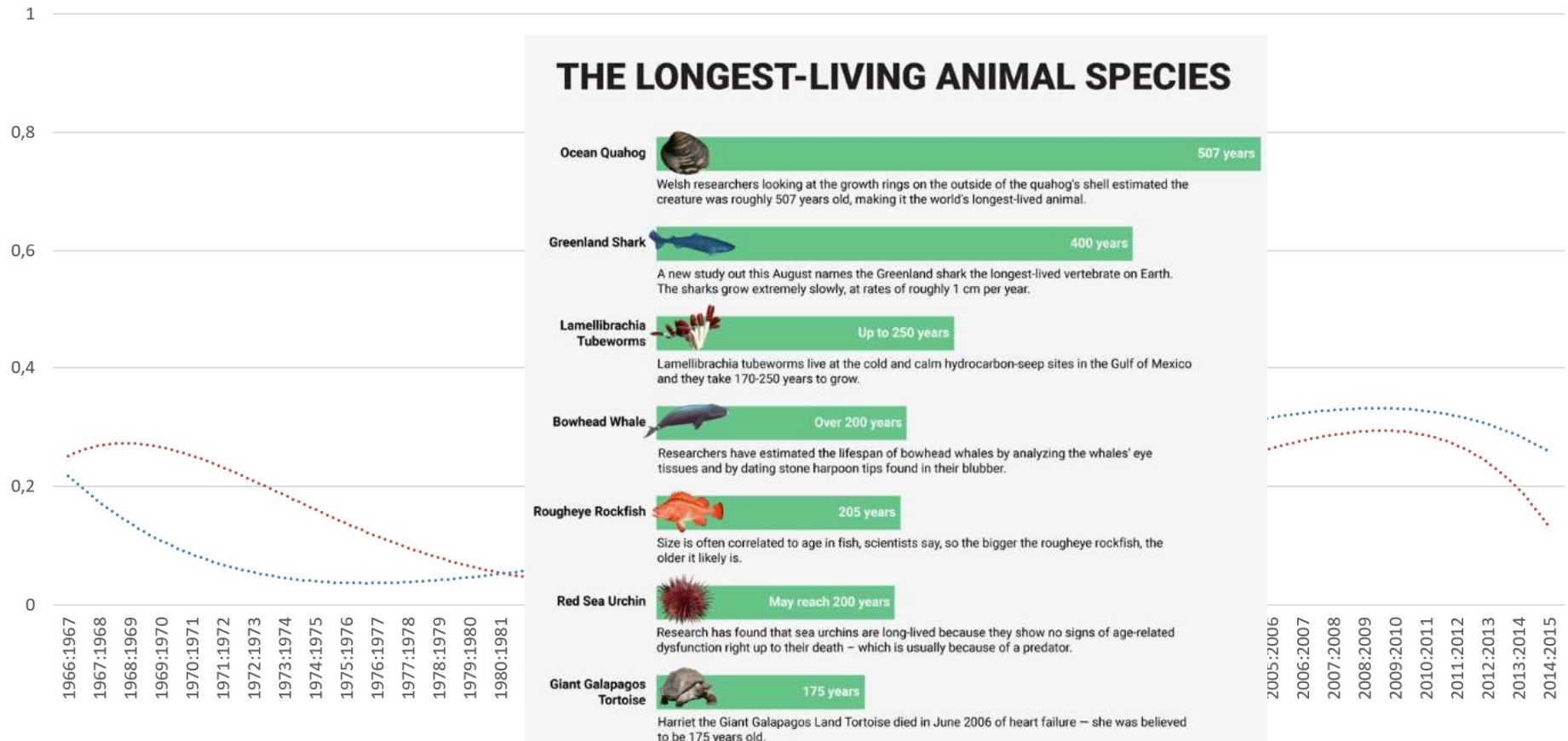
Behandling - Nye **behandlingsmuligheder** for kræft, andre sygdomme og måske diabetes?



Dilemma – **hvad må en behandling koste?** Hvordan sikrer vi udvikling og behandling af sjældne sygdomme?

Hvad viser denne graf?

Longevity escape velocity



KITE INVENT

Tusind tak for jeres tid - Spørgsmål?

Web

www.kiteinvent.com

LinkedIn – connect eller follow!

www.linkedin.com/thomasr

Twitter – links til healthcare nyt

@thomasrdk

E-mail – skriv gerne

thomas@kiteinvent.com



Trends der ikke kom med ...

Værdibaserede afregningsmodeller
Syntetisk RNA
Mitochondrial transplantation
Nye genetiske bogstaver
Stamcelle behandling af hjernedøde
3d printning
Robotter
Dyrkning af organer
Fosteroperationer
Nanoteknologiske diagnostikplatforme
Psykiatrisk diagnostik
Internet of things
IT-sikkerhed
Nanorobotter
Liquid biopsier
Innovationsmodeller
...



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advertising by Creative Stall from the Noun Project
Tornado by Hea Poh Lin from the Noun Project
Home by David Alexander Slaager from the Noun Project
Doctor by Gilad Sotil from the Noun Project
Doctor by Alexander Skowalsky from the Noun Project
international by Gregor Cresnar from the Noun Project
Robot by Creaticca Creative Agency from the Noun Project