

Personlig kirurgi baseret på en "patient like me"-platform

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REGION ZEALAND
ZEALAND UNIVERSITY HOSPITAL





Vigtige udfordringer i den kirurgiske behandling af cancer





Udfordringer i relation til kirurgisk behandling



N = 587 opererede for tarmkræft
(2015 - 2017)



> 96 % MIS

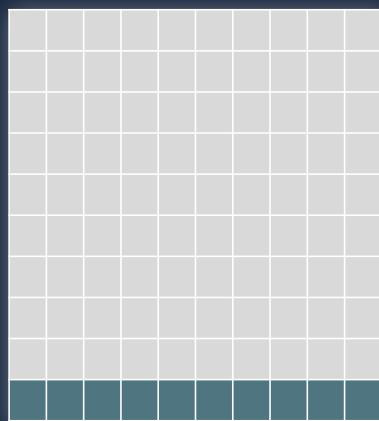
KORTSIGTEDE



Indlagt Colon = 2 dage

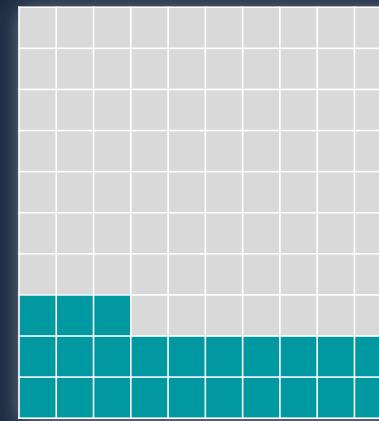


Indlagt Rectum = 4 dage



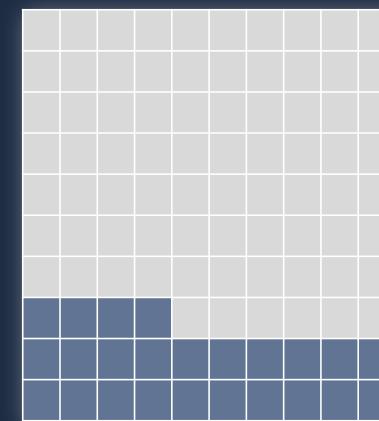
10%

Reopereret



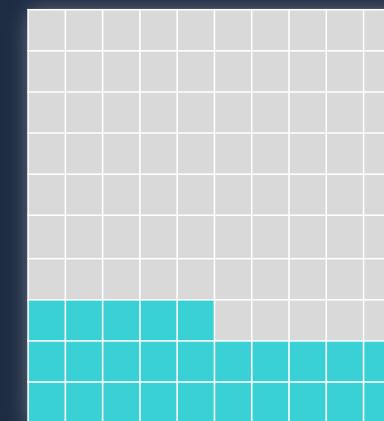
13%

Genindlagt



14%

LOS > 14 dage



25%

Komplikationer

Udfordringer i relation til kirurgisk behandling



20%
Stadie IV



80% Stadie I-III
>90% R0 Resection



25% - 35%
Tilbagefald < 5 år



LANGSIGTEDE

Diagnose

Kirurgi

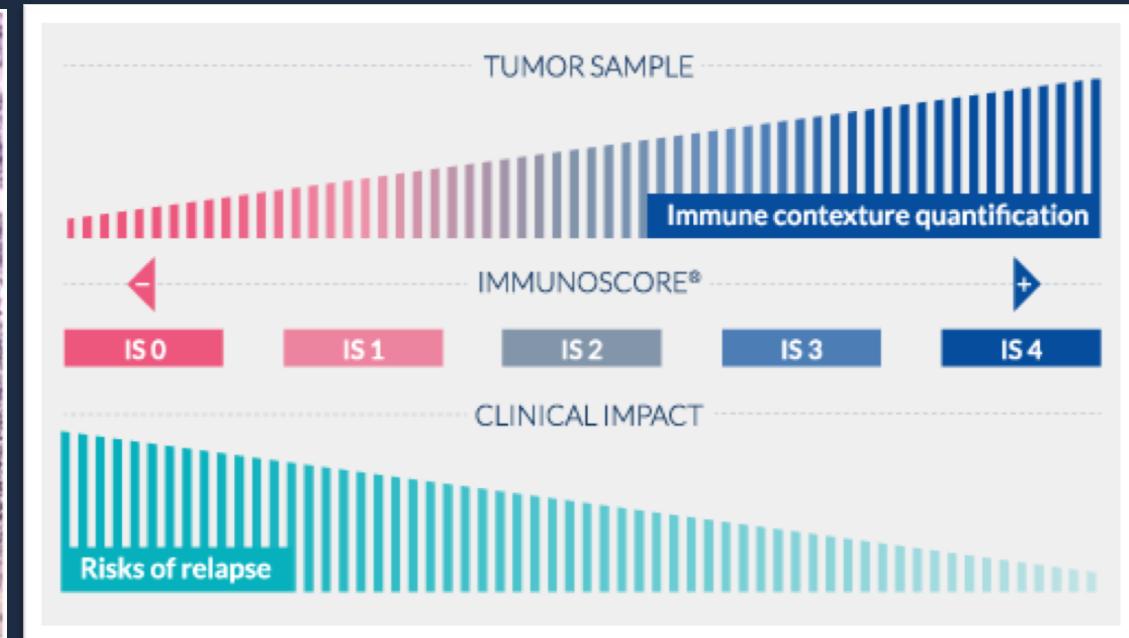
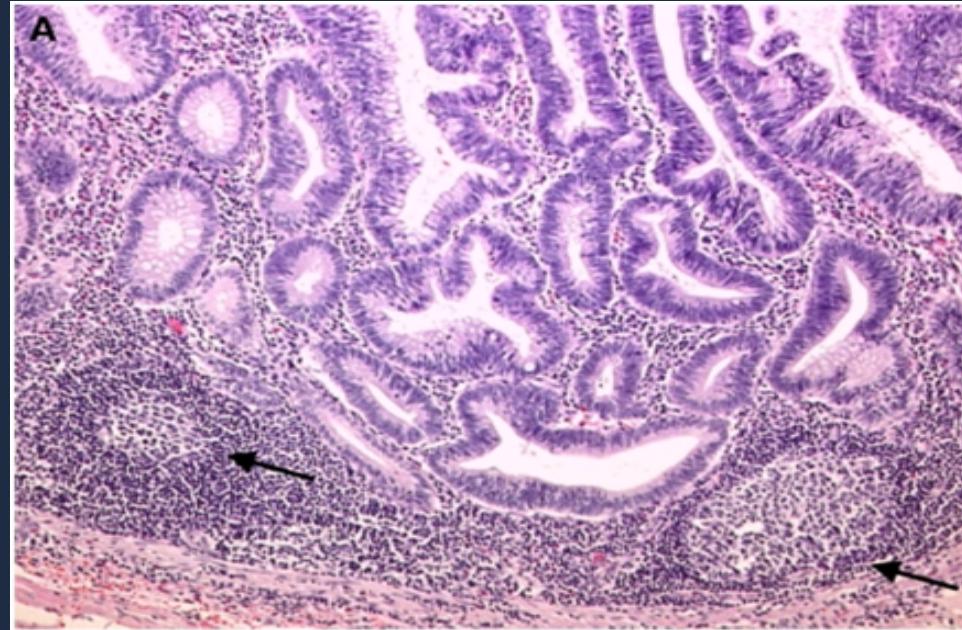
RECOVERY

Overlevelse

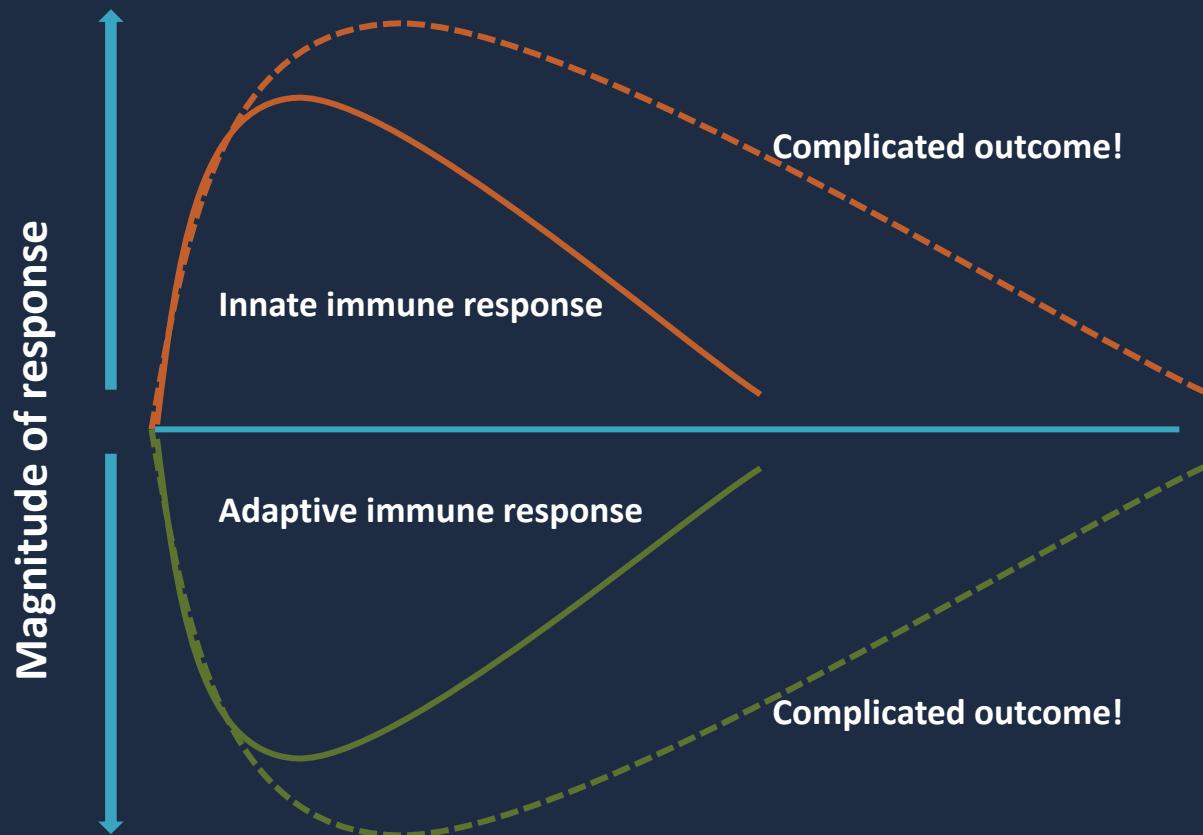


Immunsystemsets betydning for prognosen hos patienter med CRC

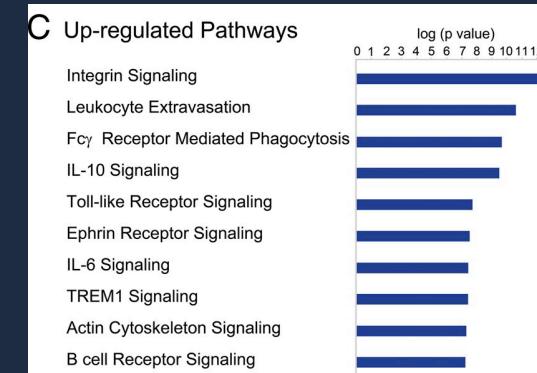
Lymfocytinfiltration er essentiel for prognosen efter cancer kirurgi!



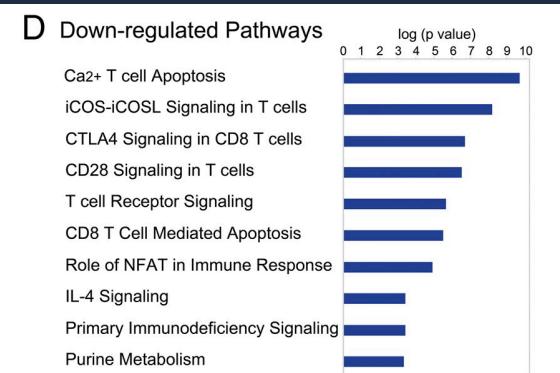
Stress after traumer



Up-regulated pathways



Down-regulated pathways



9/10 upregulated pathways was in the innate immune system

8/10 downregulated pathways was in the adaptive immune system

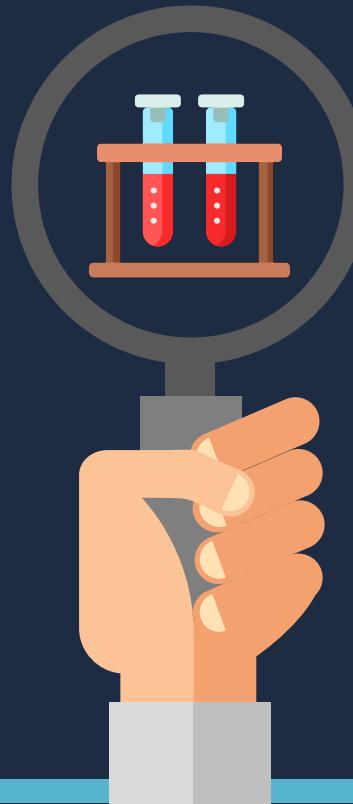


Blood Cultures after CRC surgery

All CRC in Denmark from 2009 to 2013

Ingen bloddyrkning
< 30 dges (n=21,349)

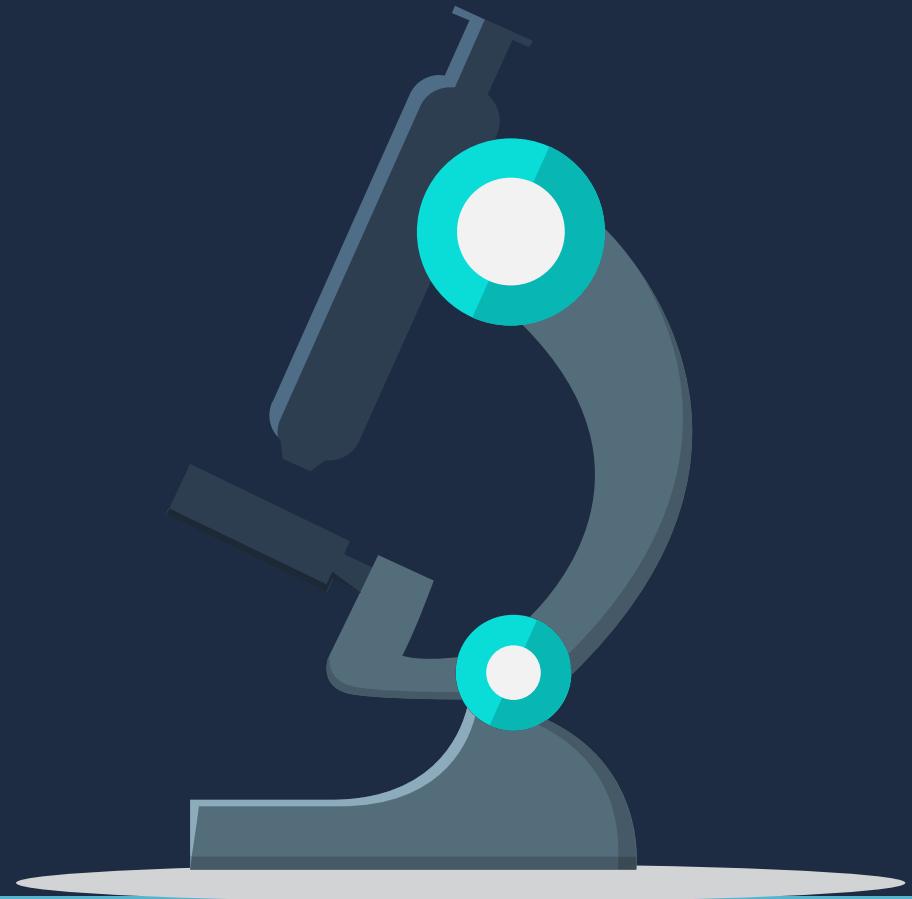
+ Bloddyrkning
< 30 dage (n=3,100).



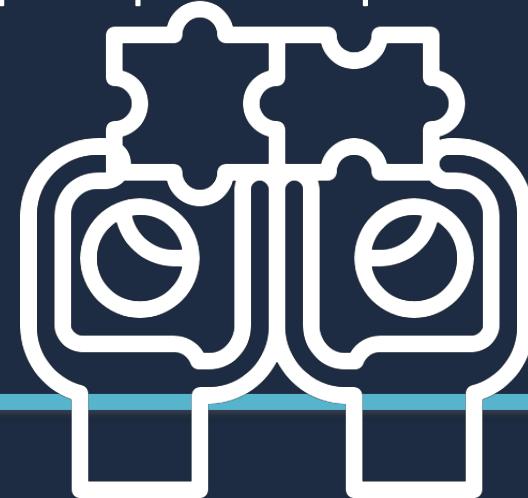
Overlevelse HR 1.27
(1.20-1.35)

Sygdomsfri overlevelse
HR 1.22 (1.16-1.29)

Tilbagefald
HR 1.15 (1.07-1.23)

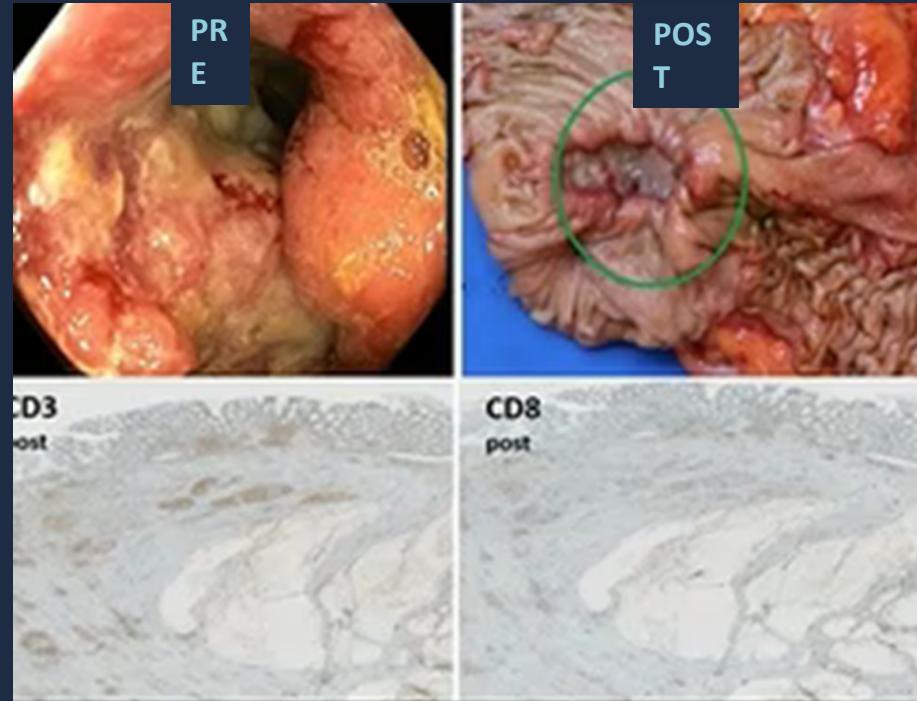


Nye lovende behandlinger i den
perioperative periode

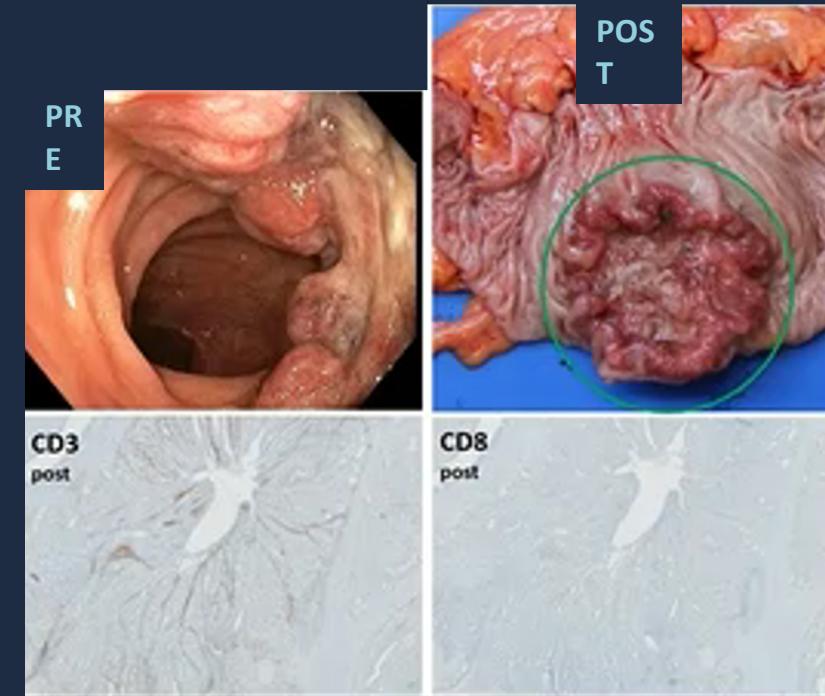


dMMR & pMMR tumor in single patient

MMR deficient tumor coecum;
cT3N2



MMR proficient tumor sigmoid; cT3N0



Kan skrøbelighed behandles?



Pt nr 1: 66 years:
Hb 5.0 -> 8.5
NLR 5.75 -> 3.05
V_{O2}_{max} 16.4 -> 21.7
LOS 3 days
PS 1 -> PS 0

Pt nr 2: 86 years:
Weight-3 kg -> + 4kg
V_{O2}_{max} 9.1 -> 11.5
LOS 4 dage
PS 2 -> PS 1

NNT = 7 forebyggelse af PPC
 NNT = 9 forebyggelse af pneumoni

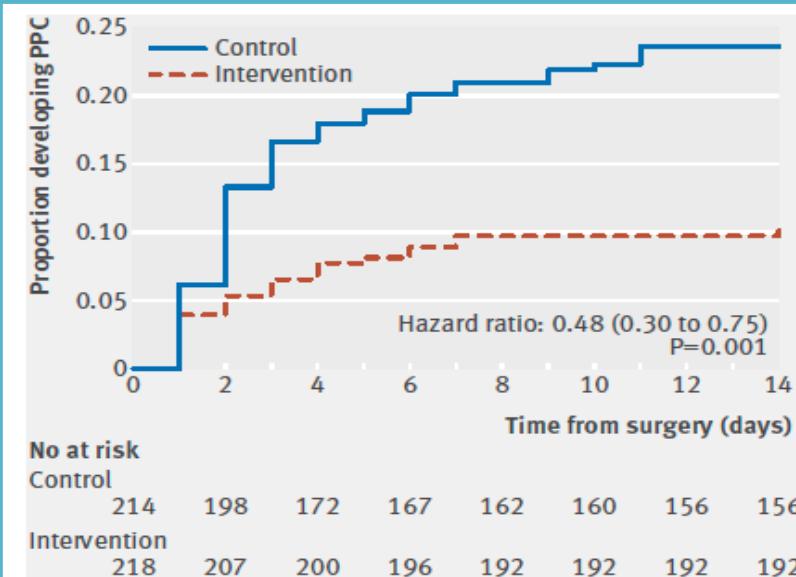
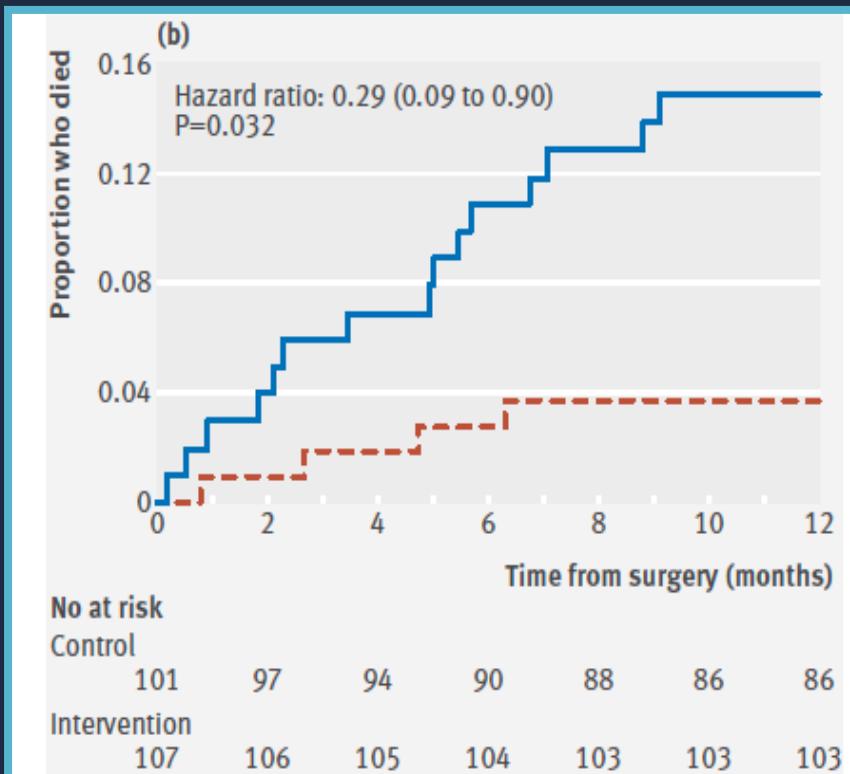


Fig 2 | Time to diagnosis of a postoperative pulmonary complication after surgery. Data are on an intention-to-treat basis and adjusted for age, previous respiratory disease, and surgical category. PPC=postoperative pulmonary complication



langtidseffekt!

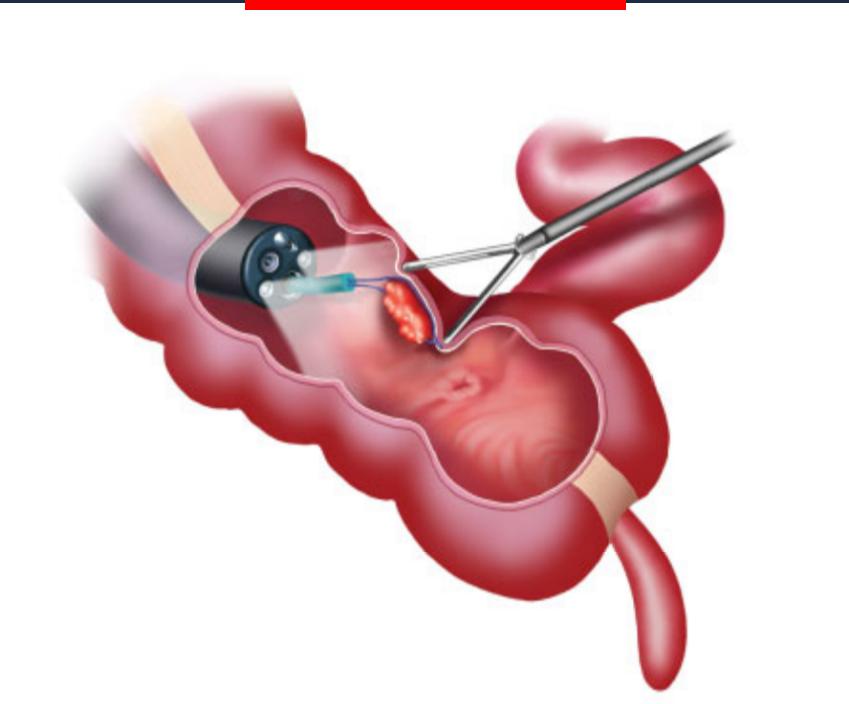
new techniques – CELS and/or eFTR

C.S.S

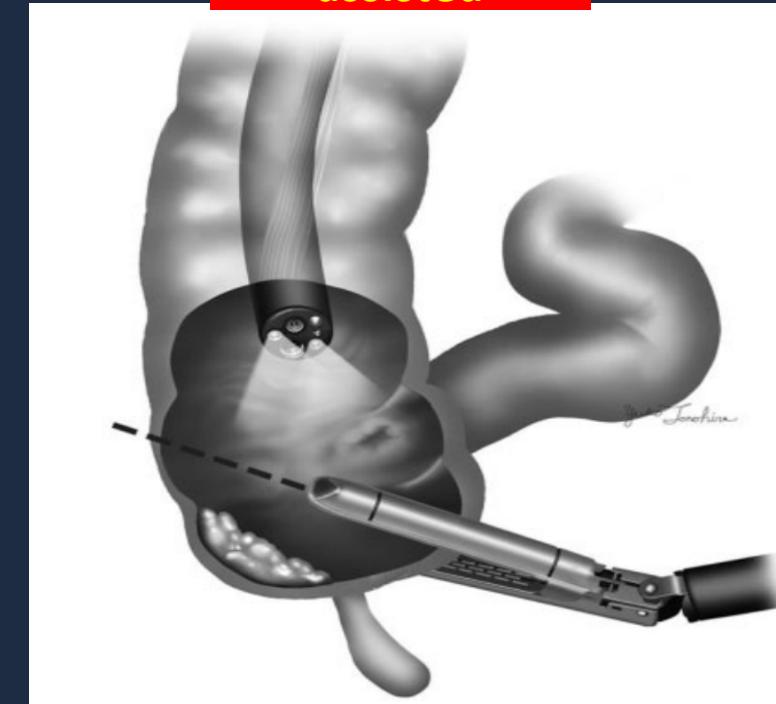
Center for Surgical Science

Improving Patient Care

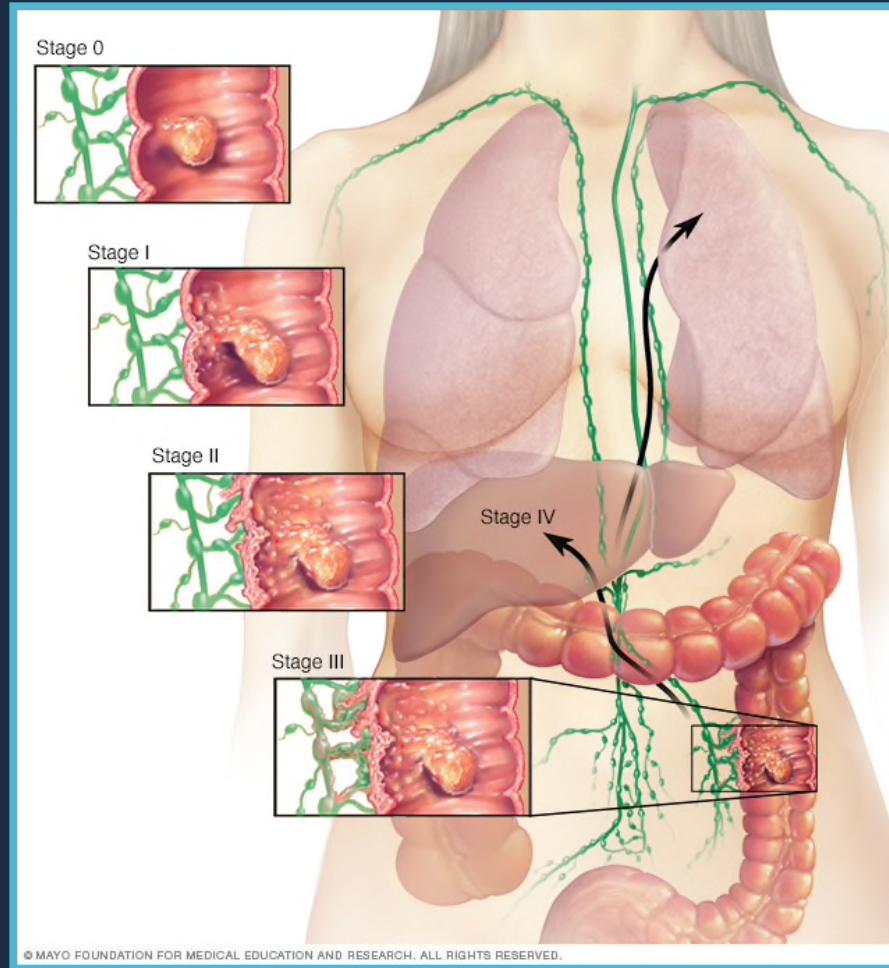
Lap-assisted



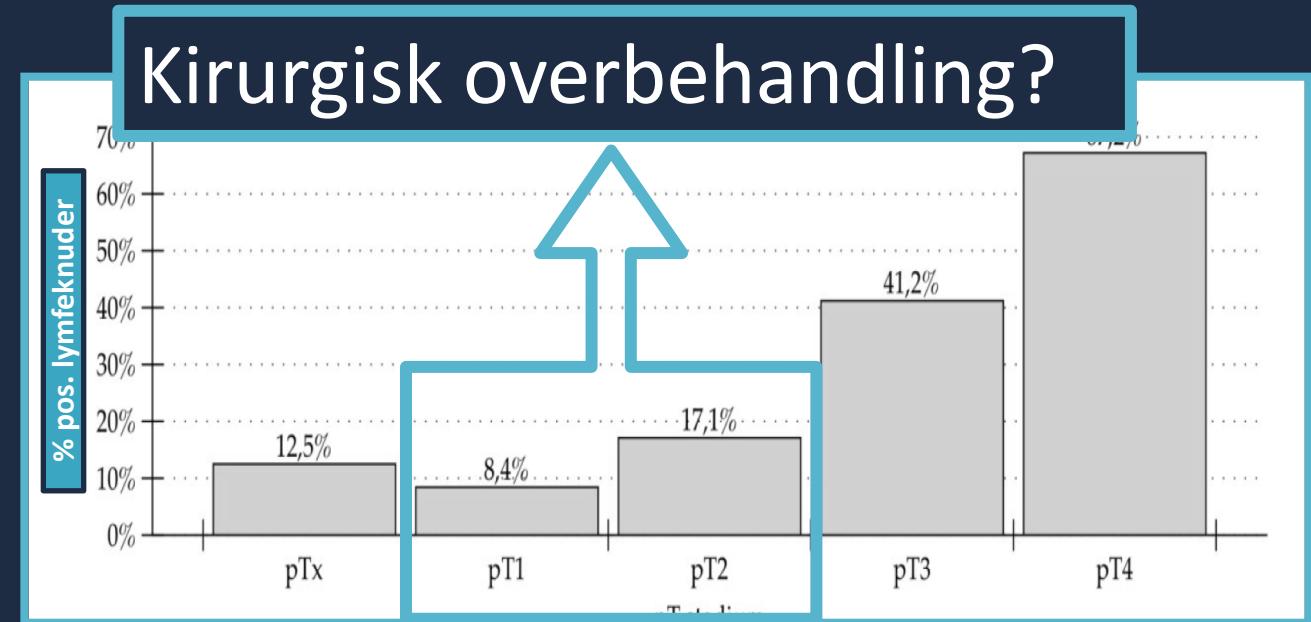
Endoscopic assisted



Individualiseret tilgang er essentiel



Kirurgisk overbehandling?



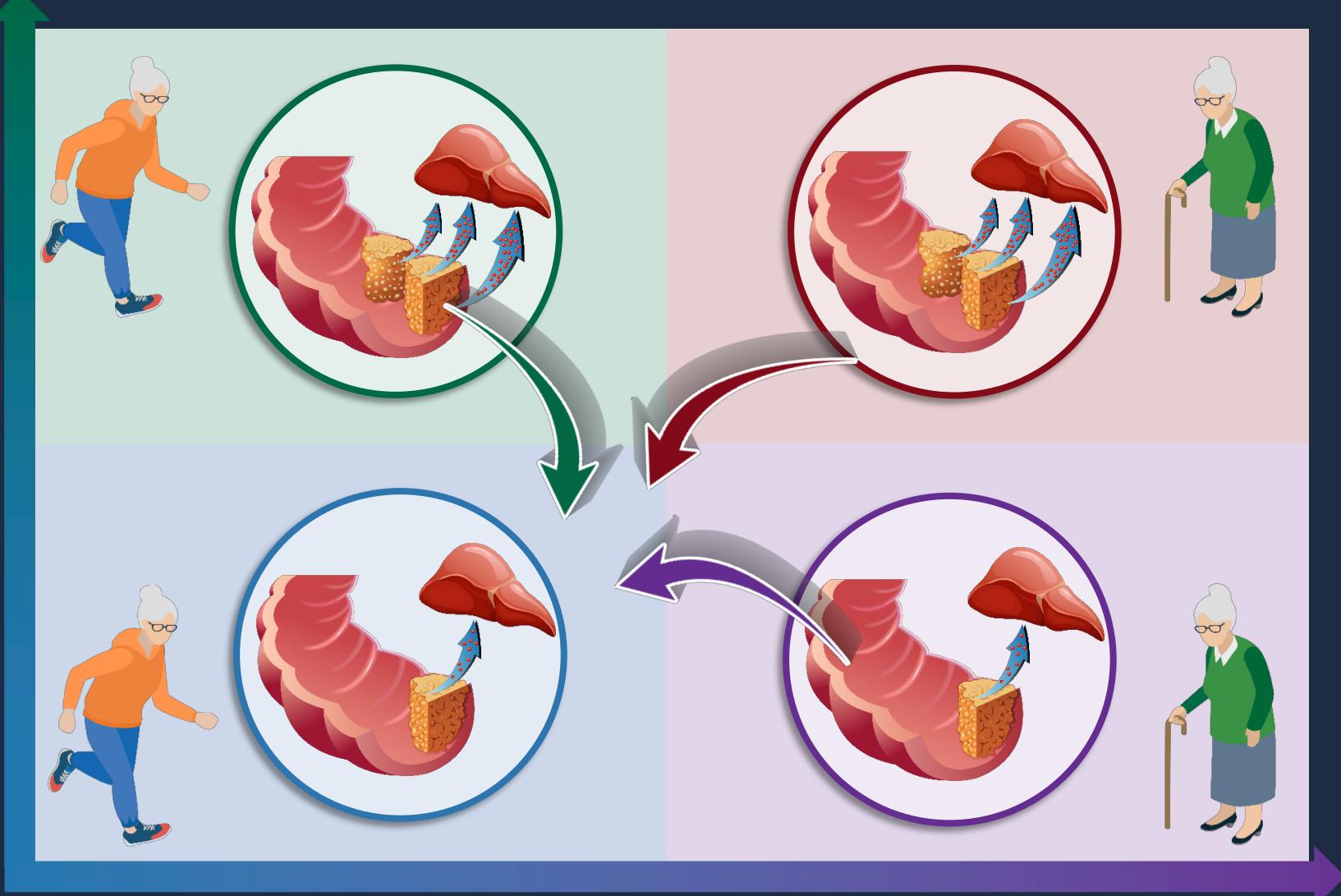


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RISIKO FOR TILBAGEFALD EFTER OPERATIONEN



RISIKO FOR KOMPLIKATIONER EFTER OPERATIONEN

CAG-POS



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Løsningen – Personlig Medicin?

REGION SJÆLLAND
SJÆLLANDS UNIVERSITETHOSPITAL
- vi er til for dig

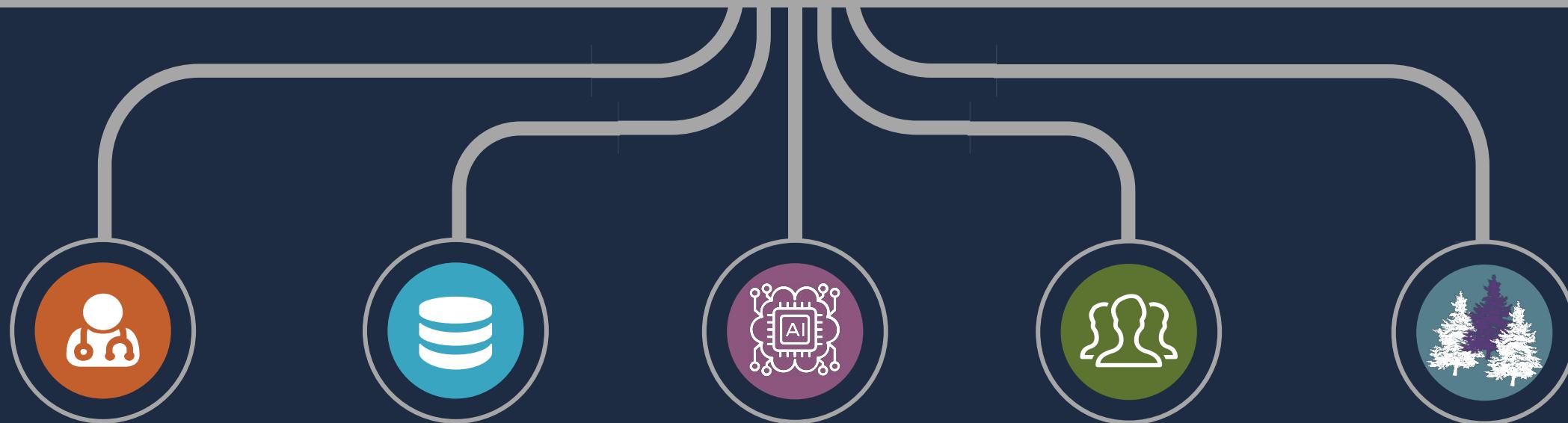
Anvendelse af kunstig intelligens mhp at bringe BIG DATA I den daglige klinik



**Personlig medicin kan kort beskrives som en ny tilgang der sigter mod at
stratificere patienter mere præcist**

=> grundlag for bedre diagnostik, behandling og prognose for det enkelte individ

Opnås ved at udvide spektret af sundhedsdata i beslutningsprocessen



Personlig Medicin

Den rigtige behandling til den rigtige patient på det rigtige tidspunkt

Personlig Medicin

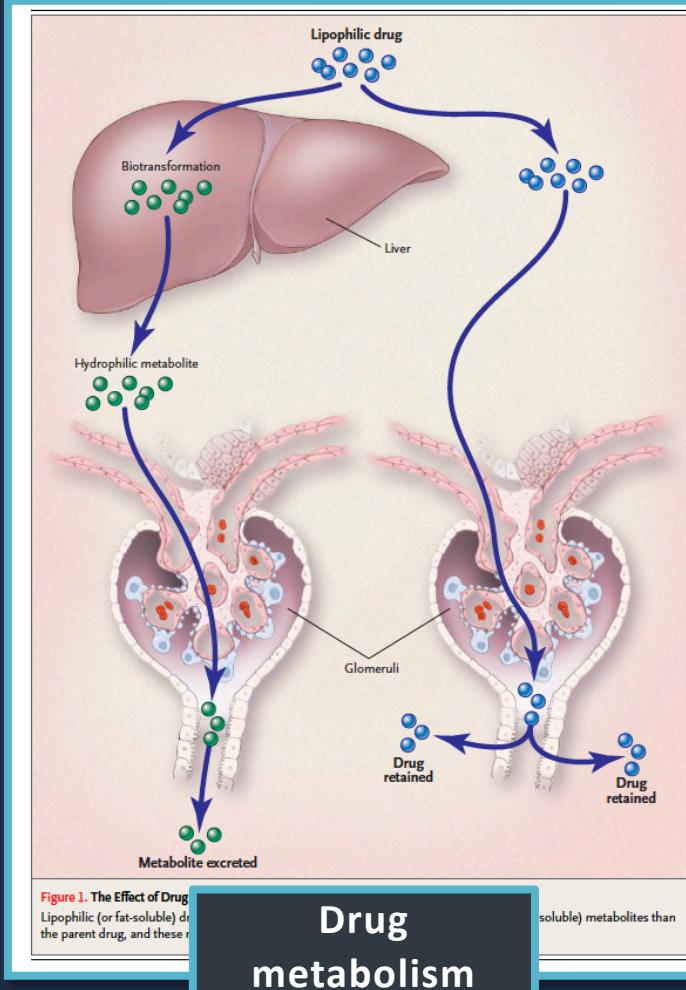
Anvendelse af data science og avanceret bioinformatik mhp at bringe orden i kaos og forbedre patienters sundhed

Kunstig Intelligens

Anvendelse af kunstig intelligens (machine eller deep lerning) til at høste de væsentligste informationer i Big Data



The classical example in personalized medicine



SNPs – a major source of variation

- Single Nucleotide Polymorphisms (SNPs)

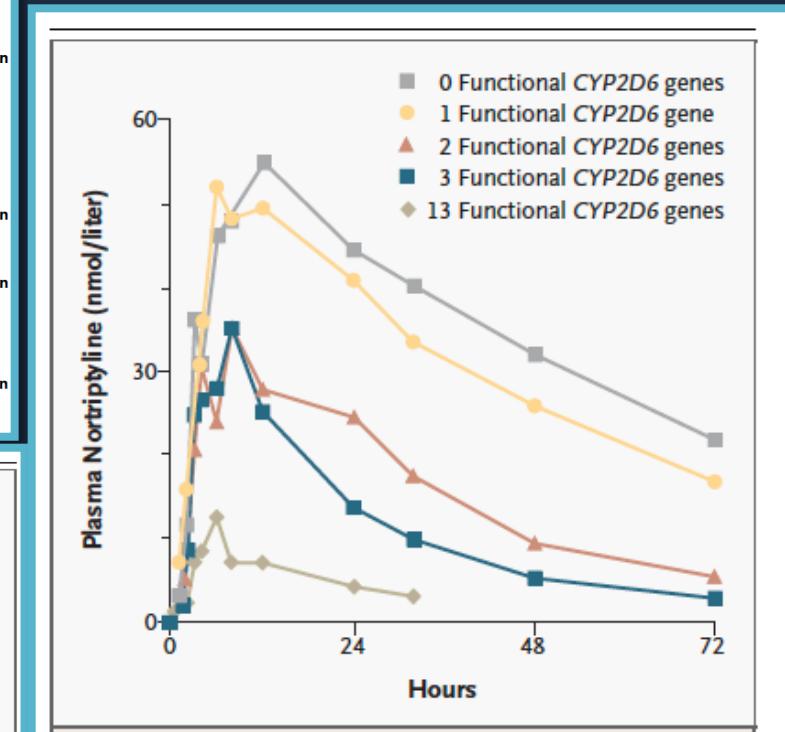
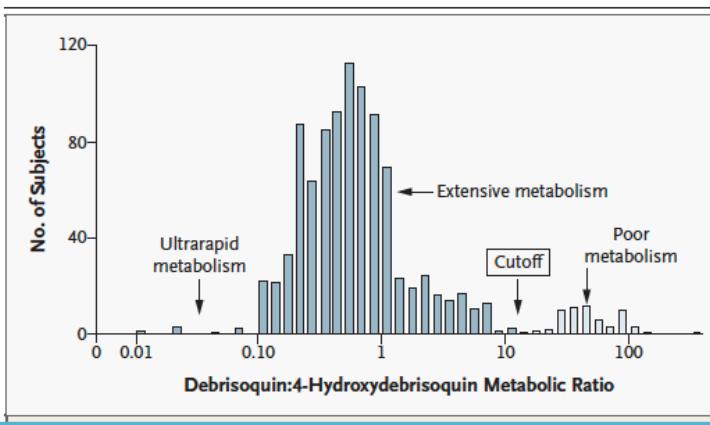
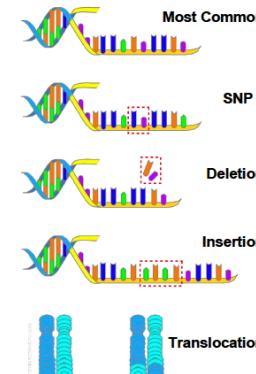
- Single base change in DNA



- SNPs arise as a consequence of mistakes during normal DNA replication
- Average frequency 1/1000bp

- Other sources of variation

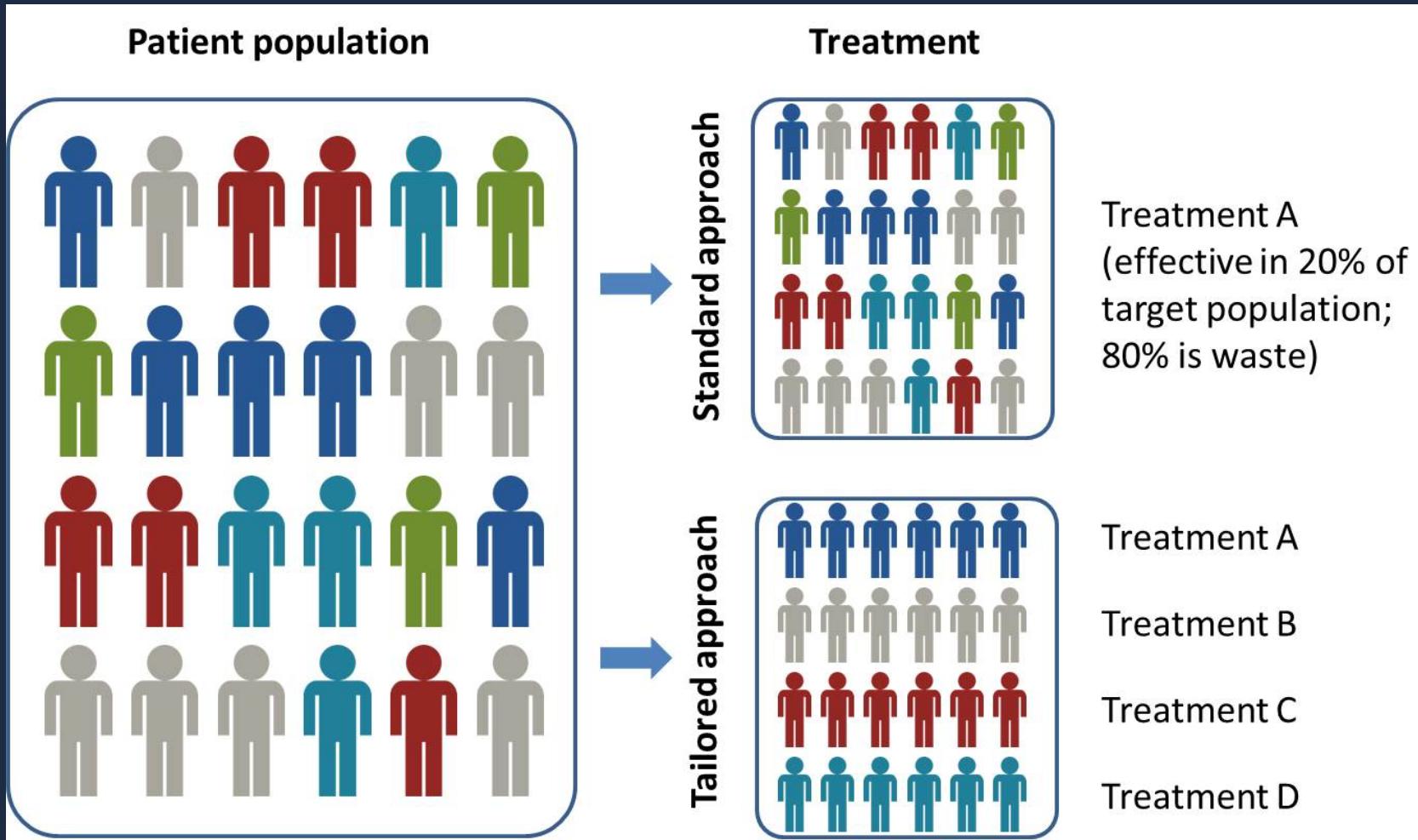
- Insertions, deletions, translocation, duplications, repeats
- copy number variation is a major element



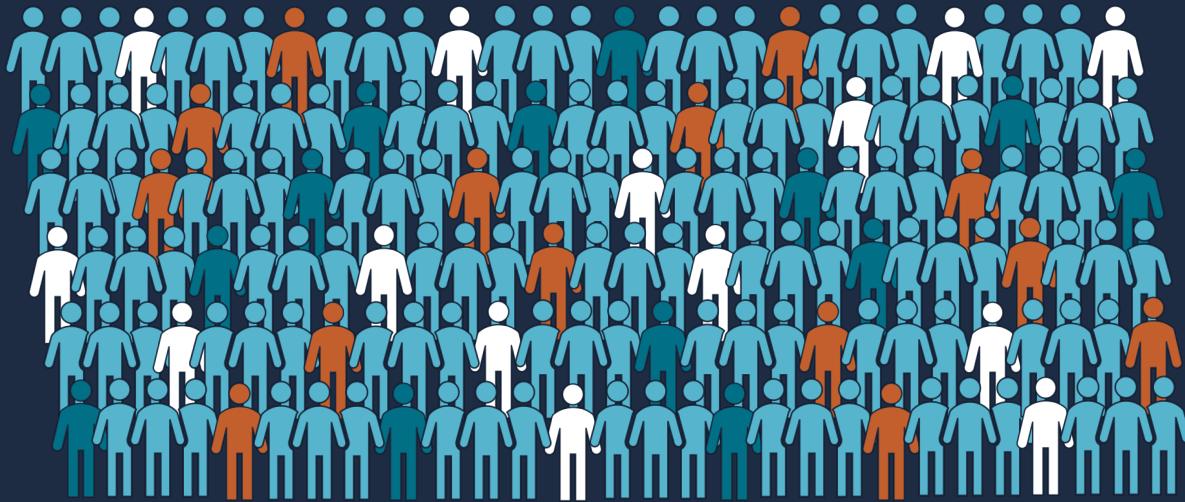
Personlig medicin – de klassiske eksempler



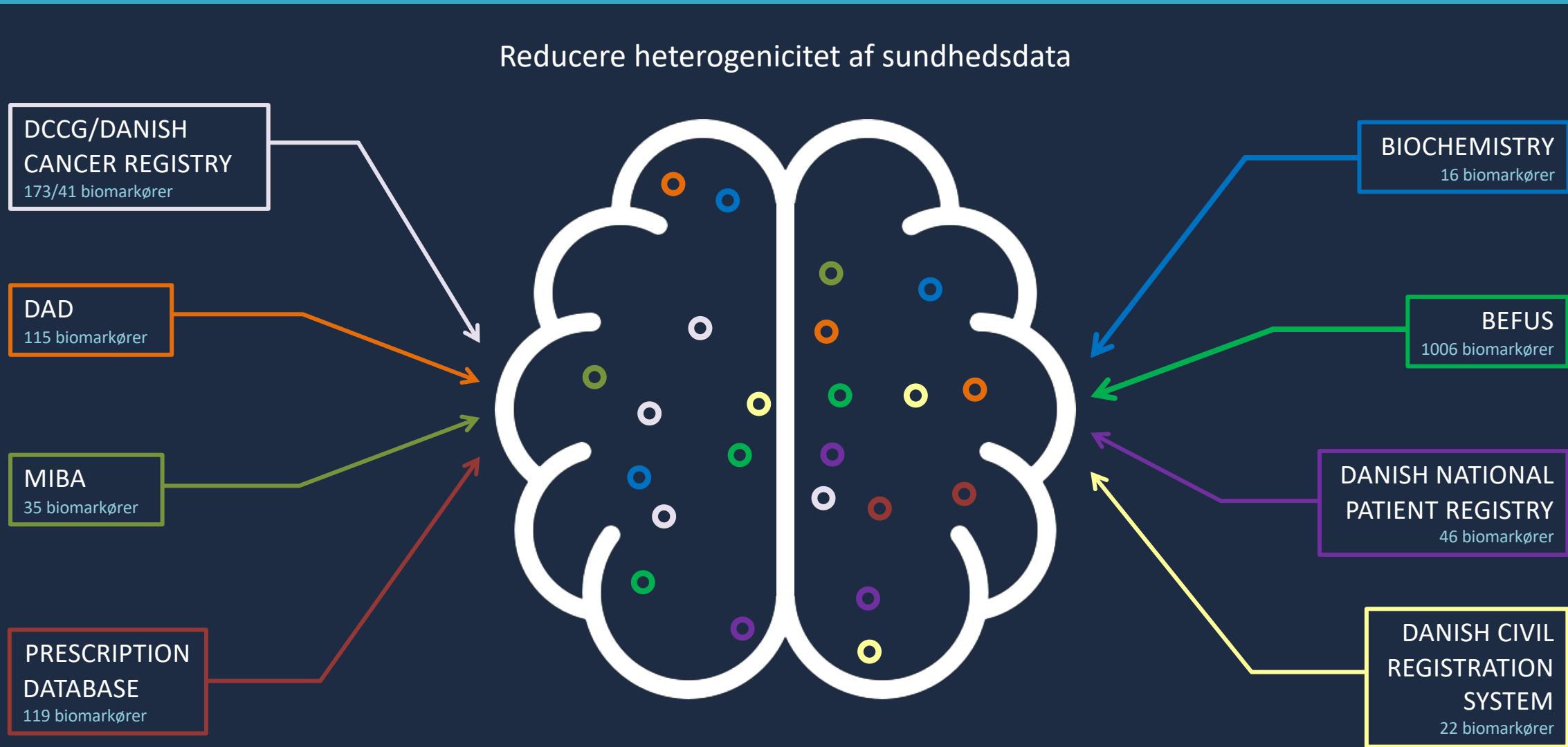
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Aiming toward precision medicine and surgery

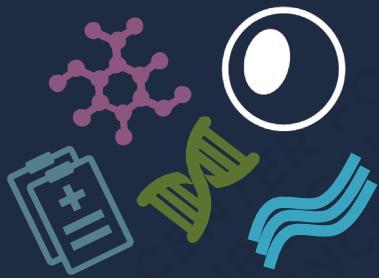


Udvikling af en BIG DATA platform



Foreløbige resultater

En standardiseret pipeline til at udvikle personlig medicin



Integration

Compiled an Observational Medical Outcomes Partnership Common Data Model from 13,683 SKS concepts



Studies Design

Using the Observational Health Data Sciences and Informatics community tools



Studies Results

Standardized and governed results on four studies conducted within a week



Data

Cancer, Anesthesia, Microbiology, Pathology and Causes of Death, as well as biochemistry and in-hospital medication for 54,761 patients

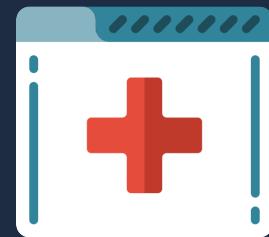
Quality Control

12 medical experts validating the integration results over the period of four months

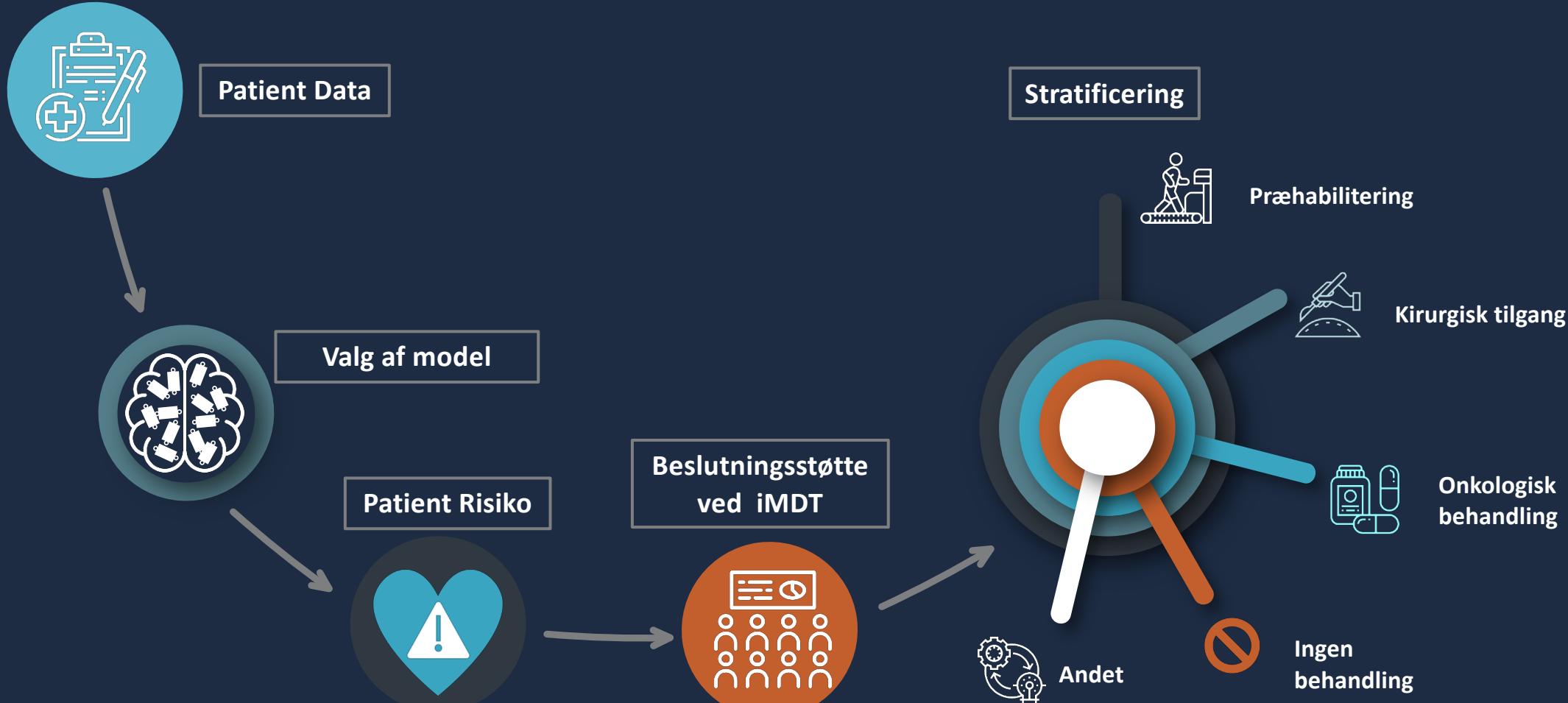


Studies Execution

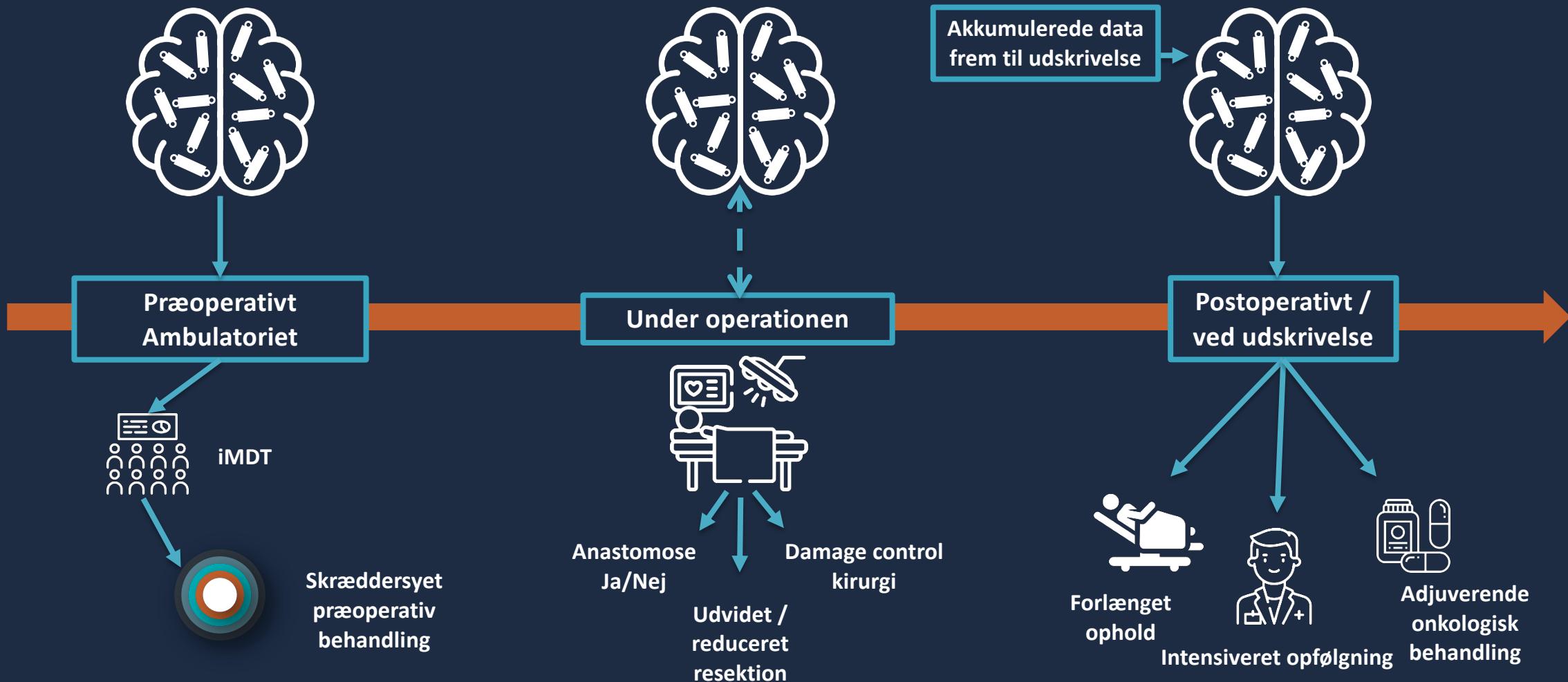
In real-time, empowered by the The Danish National Life Science Supercomputing Center (Computerome)



Patientens vej igennem “iMDT”



Kritiske faser hvor præcisions medicin vil forbedre patientbehandling





Tak for opmærksomheden!