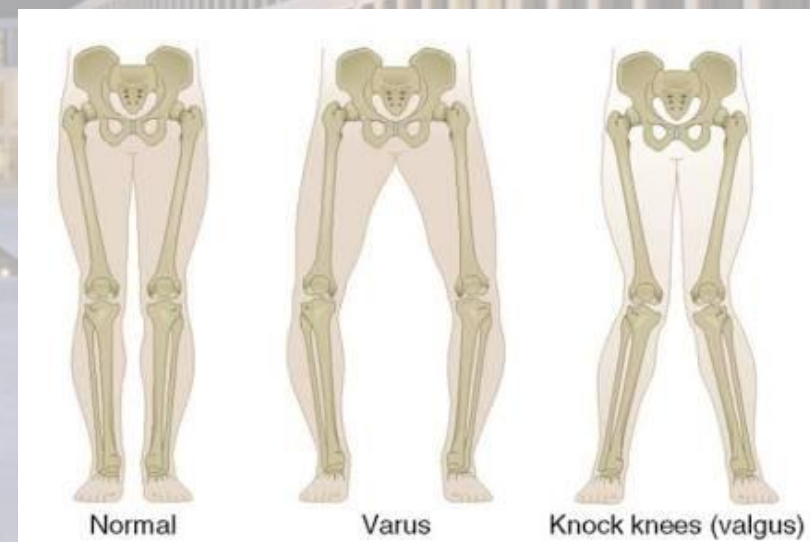


Robotchirurgie bij knieprothese

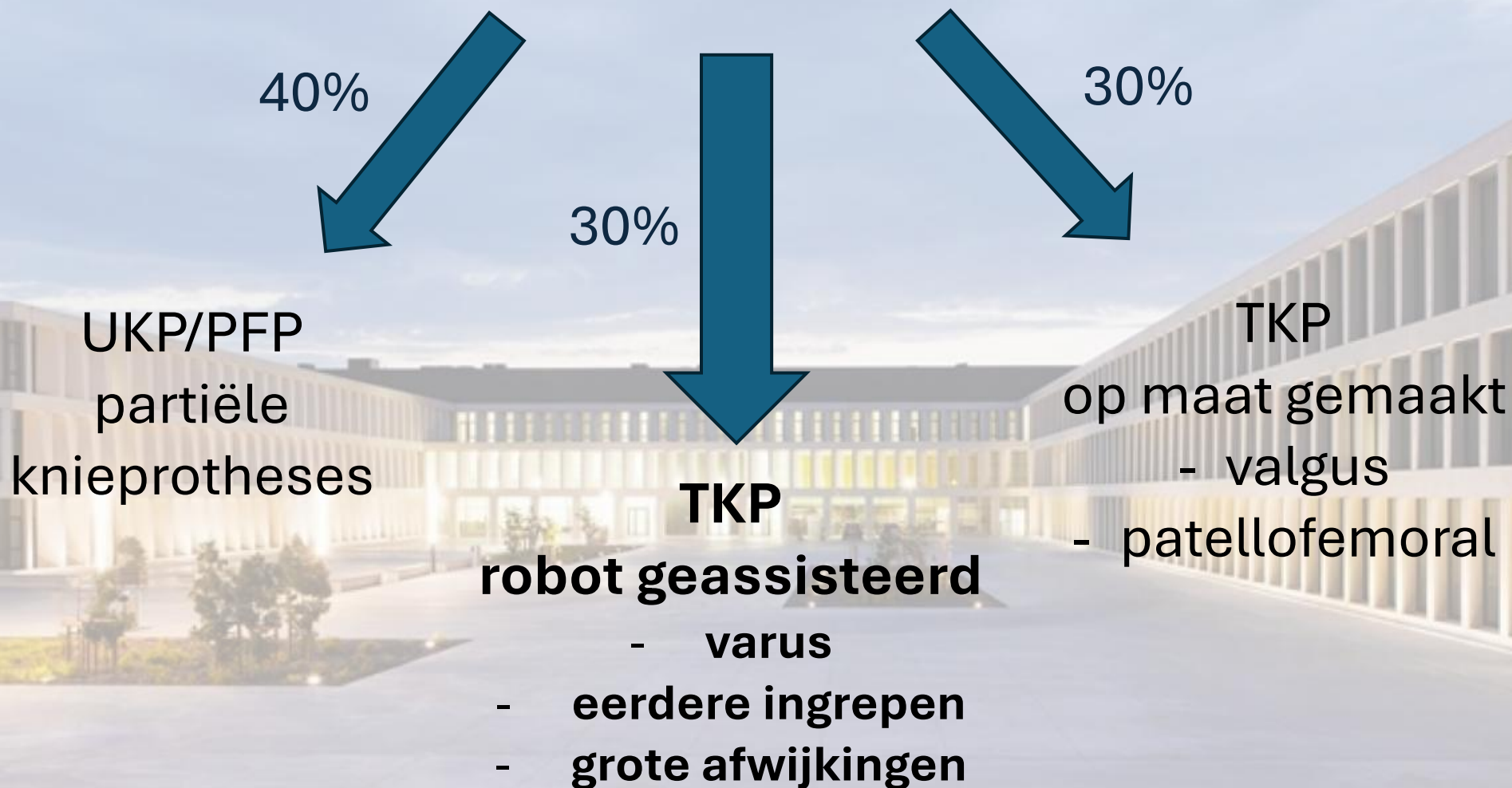
Dr J van der Maas
Dr W Beel

Kortrijk knieprothese à la carte

- type artrose
 - radiografie (4 incidenties)
- alignement
 - varus/valgus
- eerdere ingrepen (osteotomie, ligamentaire chirurgie)
- NIET
 - type patient (sportief/jong)
 - mindere graad artrose



Kortrijk knieprothese à la carte



Robot?



Robot

Passive

Systems with localized and tracked instruments (that is, surgical navigation systems supported by intra-operative imaging)



Orion surgical navigation platform with optical/electromagnetic tracking and multimodal imaging

Interactive

Surgical robots (grounded or hand-held) physically interacting with surgeons



Teleoperated

Surgical robots (patient side, slave) remotely controlled by a console (surgeon side, master)



da Vinci system
(multi-access
extraluminal MIS)

da Vinci system
(single incision
laparoscopic
surgery)

Autonomous

Autonomous robots without direct control; surgeon acting as supervisor



CyberKnife M6 for radiosurgery

Passief

- navigatie
- augmented reality bril

Passive

Systems with localized and tracked instruments (that is, surgical navigation systems supported by intra-operative imaging)



Orion surgical navigation platform with optical/electromagnetic tracking and multimodal imaging

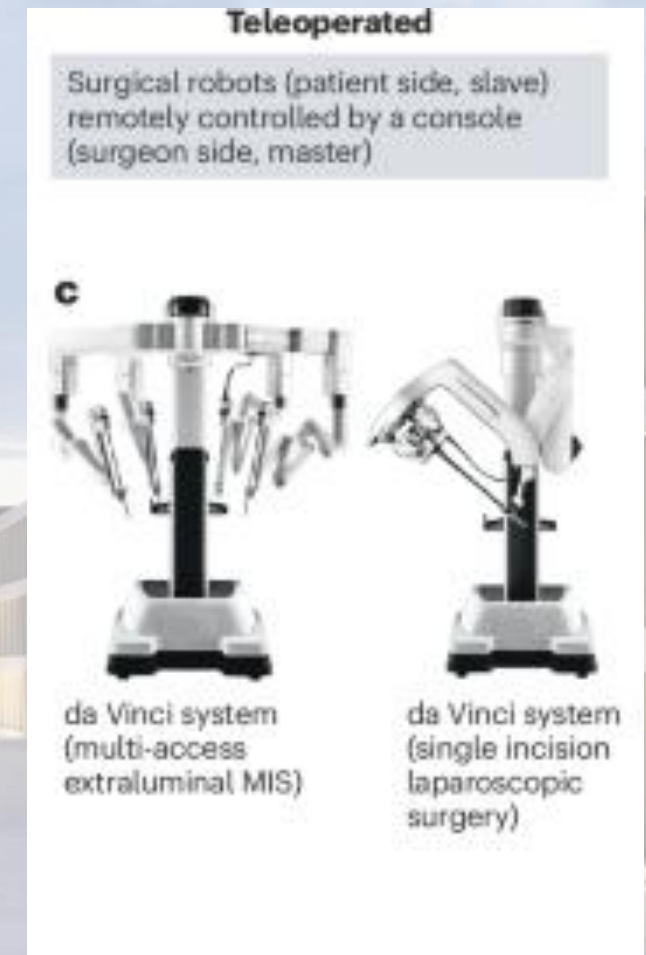
Interactief

- chirurg houdt controle
- imageless of imagebased
- haptic feedback/border control
- orthopedische chirurgie



Teleoperated

- chirurg opereert vanuit console
- verlengstuk
- abdominale chirurgie
- urologie/gynaecologie



Autonoom

- in theorie geen mens meer nodig
- toekomst (?)



ROSA

- RObotic Surgical Assistant
- TKP en THP
 - UKP mogelijk
- weinig complexe revisie TKP



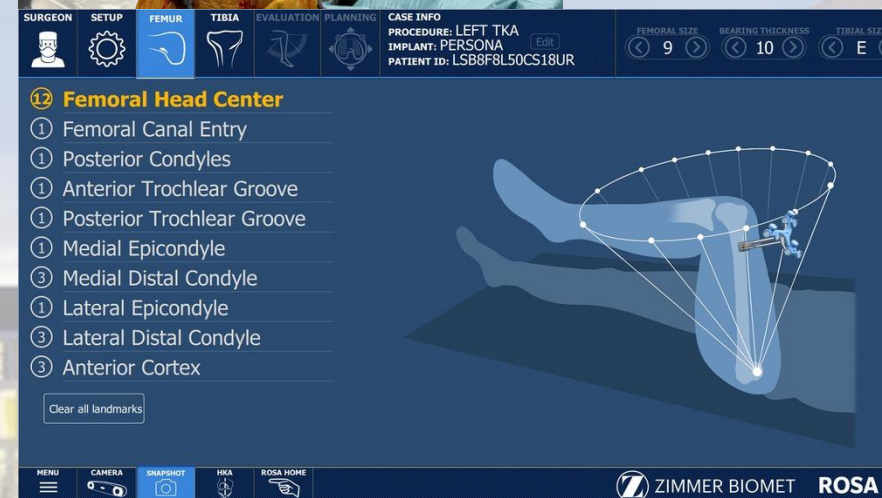
ROSA

- 2 modules
 - Robotarm
 - Navigatiestation
- imageless
- anatomische assen/landmarks te bepalen
- implantaatpositie te plannen
- balancing te ondersteunen
- cut guide precies te positioneren volgens het plan



Workflow

- plaatsing trackers
- registratie anatomische landmarks
- ligament balancing
- chirurgisch plan



Workflow

- kalibratie



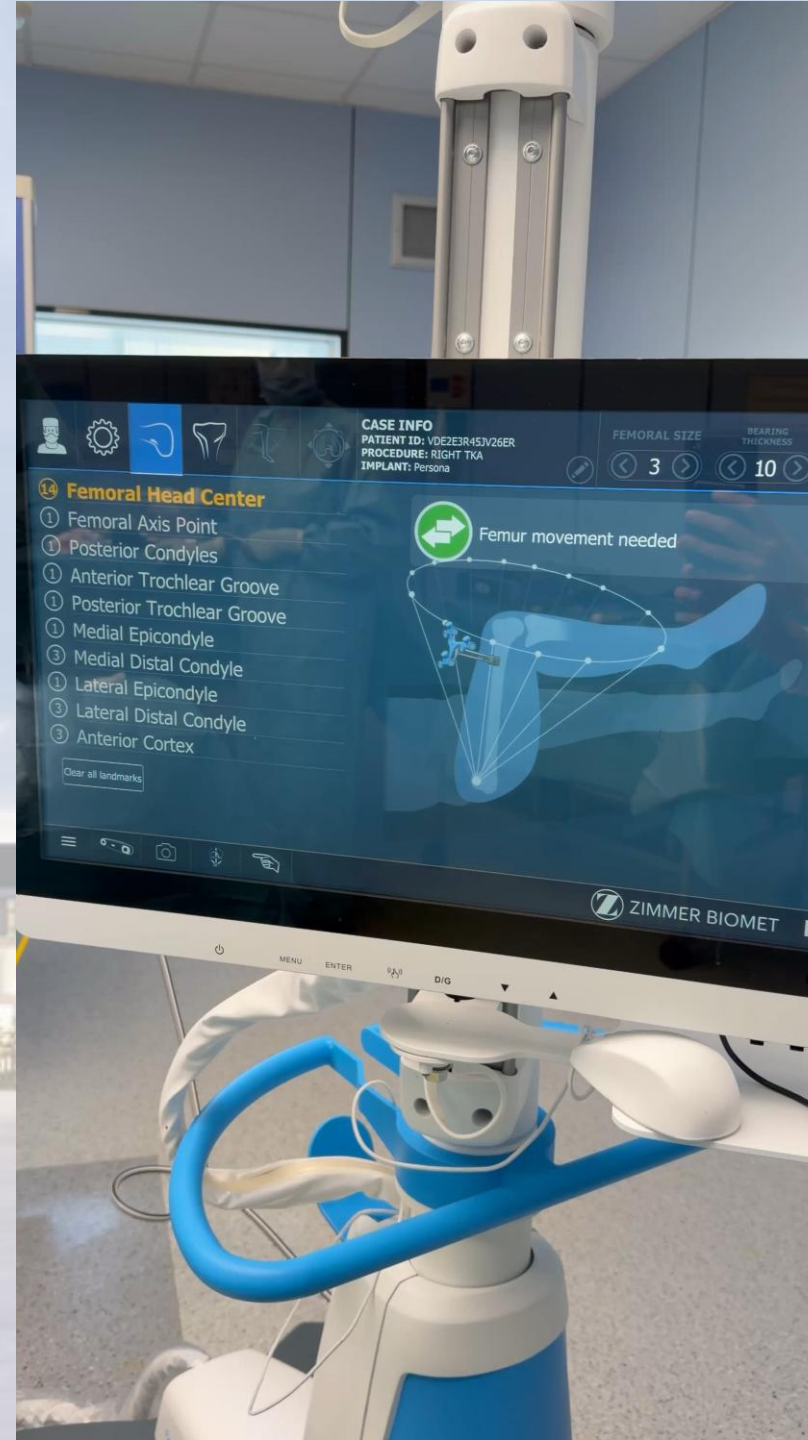
Workflow

- plaatsing trackers



Workflow

- registratie anatomische landmarks



Workflow

- chirurgisch plan



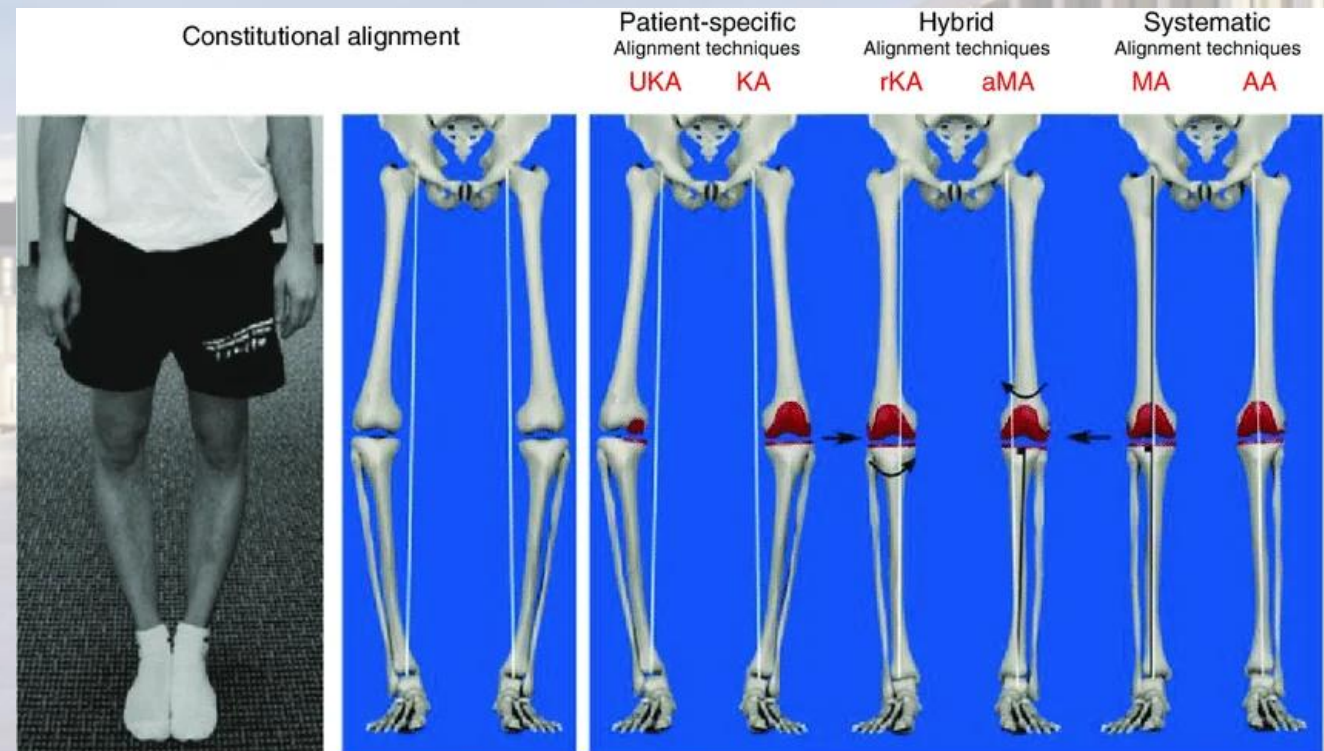
Workflow

- uitvoering plan



Voordelen

- nauwkeurige componentplaatsing
- reproduceerbaarheid
- minder outliers (laag volume)
- minder soft tissue trauma
- alignement filosofie



Nadelen

- learning curve
 - operatieduur
- duurder
 - aankoop
 - onderhoud
 - disposables
- technische storingen/afhankelijkheid
- beperkte keuze implantaat
- (nog) geen overtuigend bewijs van betere functionele resultaten op lange termijn



The background image shows a large, modern hospital courtyard with a paved ground and several small trees. The courtyard is surrounded by a multi-story building with a white facade and many windows. The sky is blue with some clouds.

Vragen?