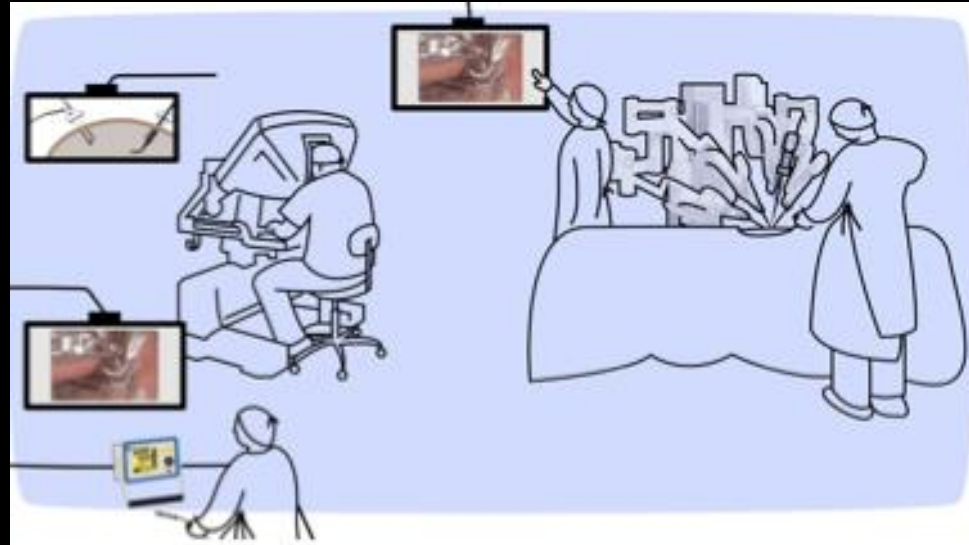


Ontwikkelingen bij keuzes voor robot geassisteerde prostatectomie en technische vooruitgang

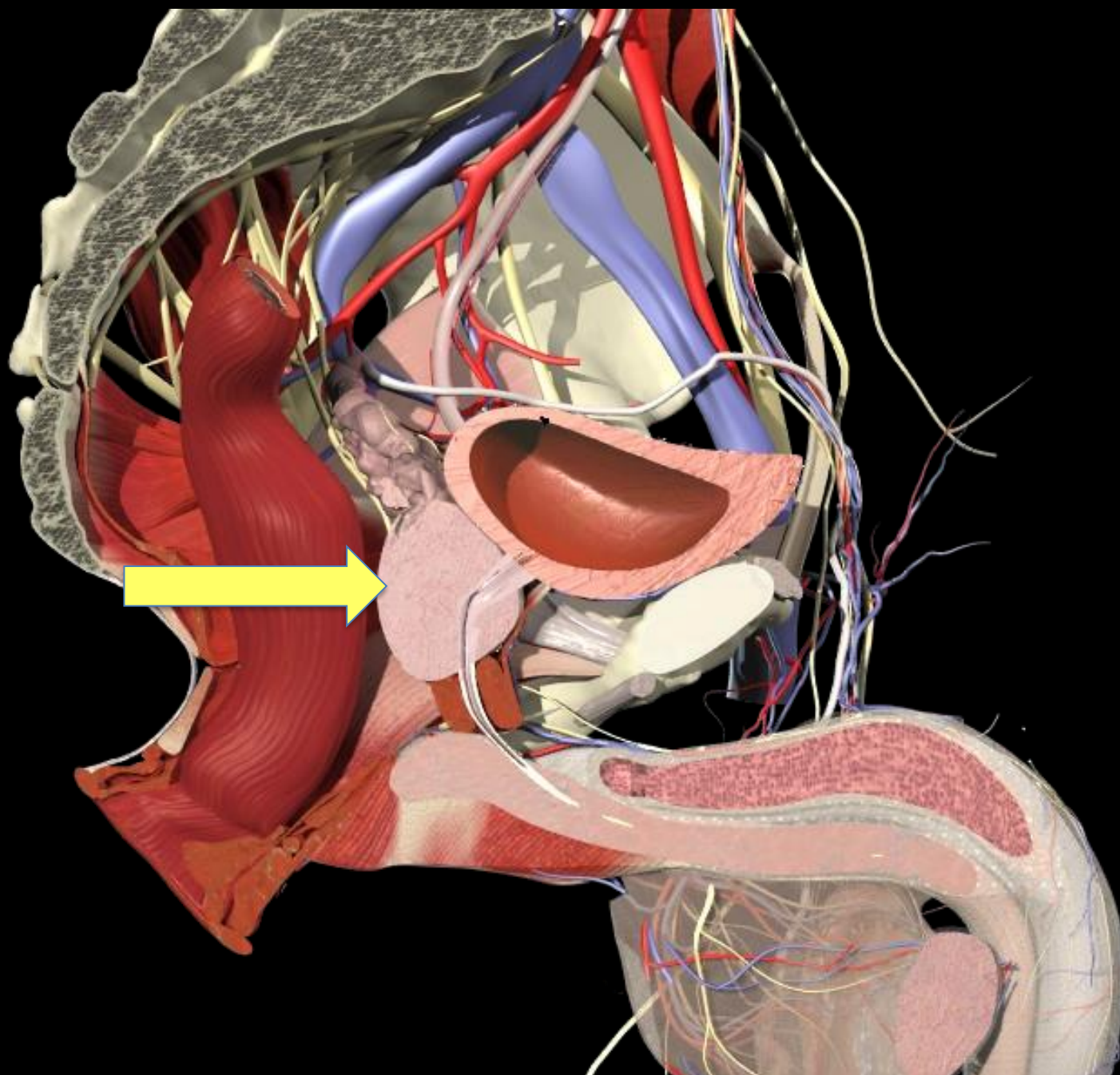


Pim van Leeuwen MD PhD
Urologist - the Netherlands Cancer Institute

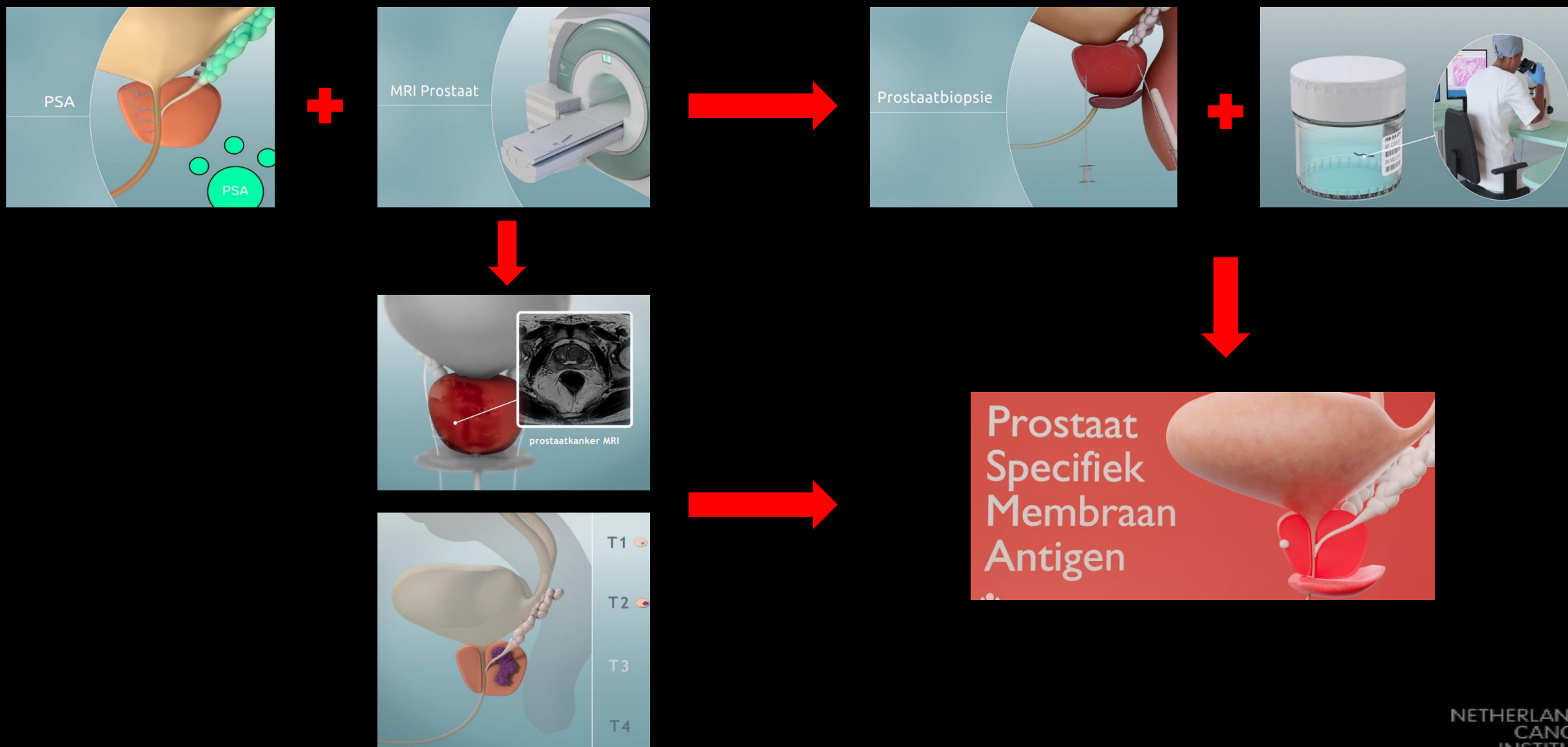
Masterclass Urologische Oncologie
27 mei 2025

Disclosures

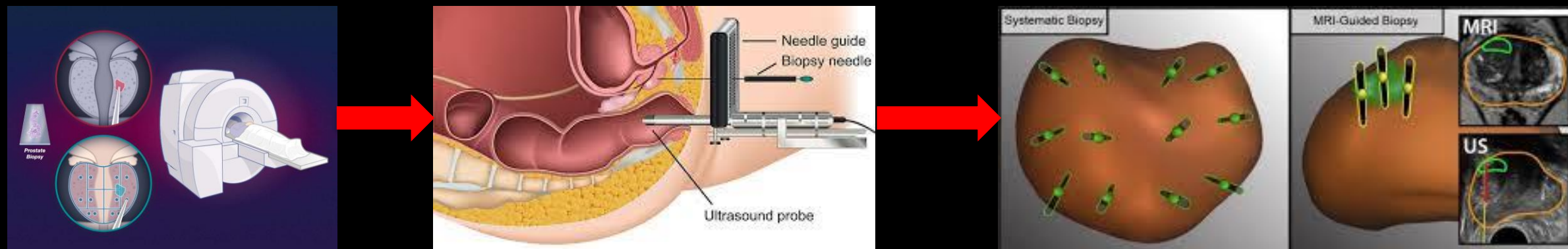
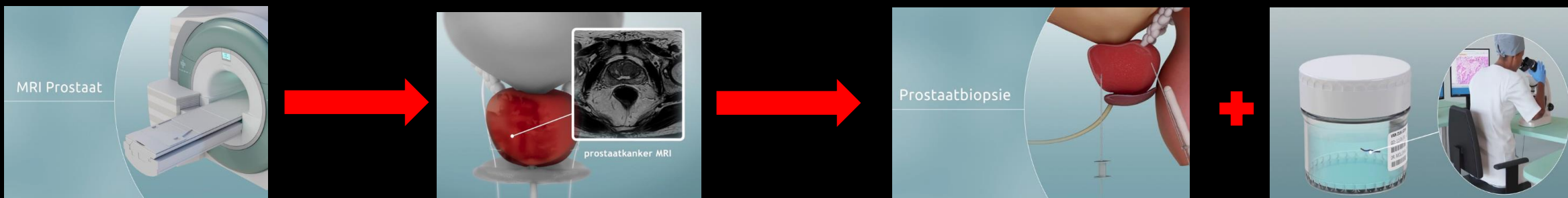
I have provided attended advisory boards, and/or provided lectures for: IPSEN, Recordati, Janssen for which AVL-NKI received honoraria

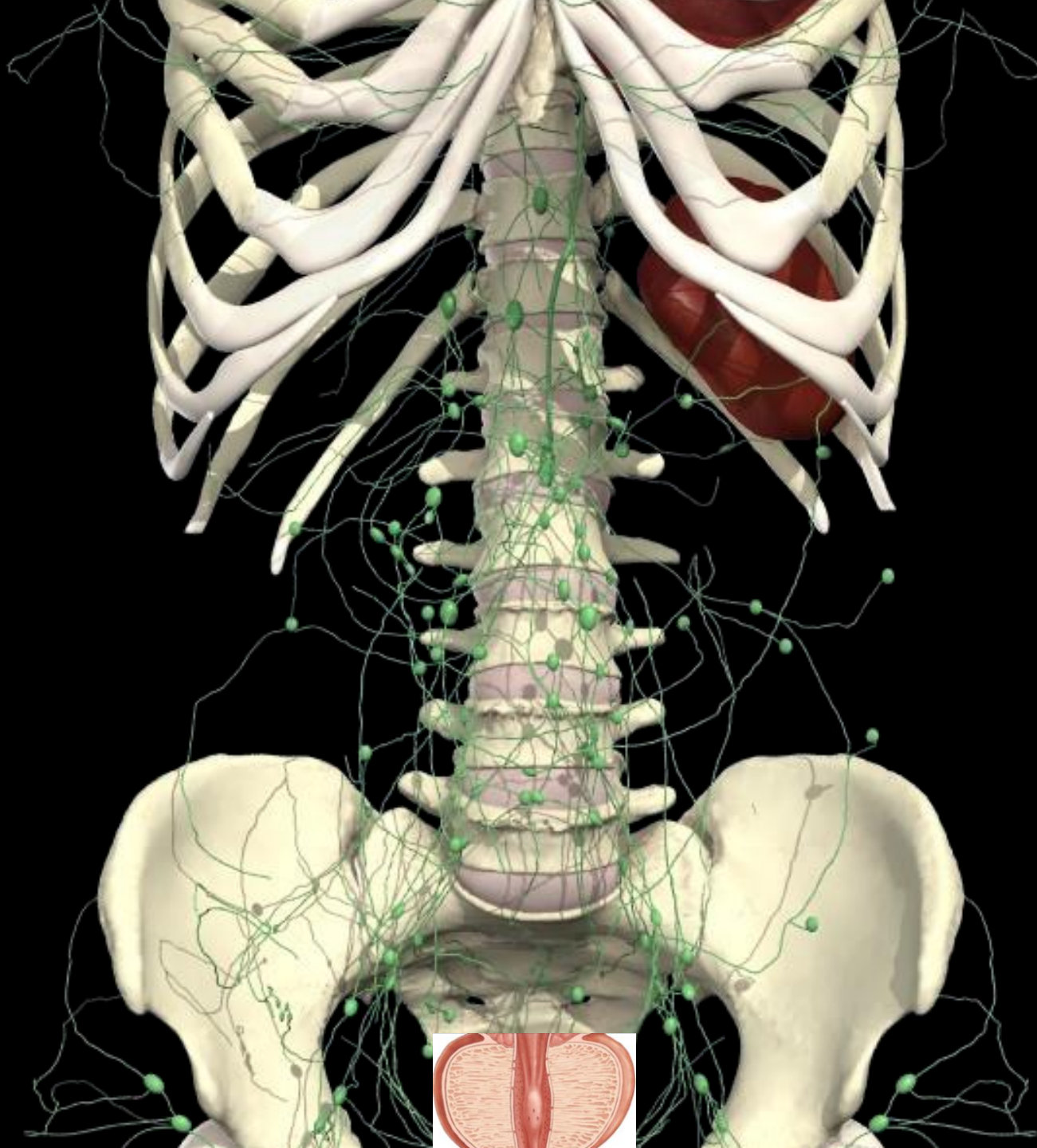


Diagnostiek Prostaatkanker



Diagnostiek Prostaatkanker





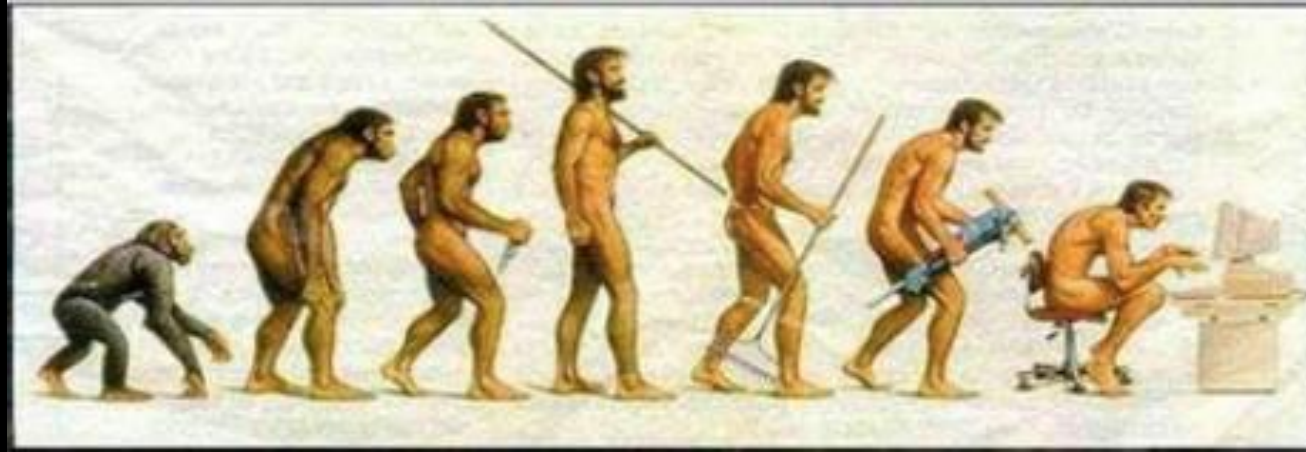
Prostaat

1. Prostaatweefsel
2. Prostaatkanker
3. Neurovasculaire bundel

Lymklieren

1. Voeren weefsel vocht af
2. Kanker uitzaaiingen

Geschiedenis Operatie

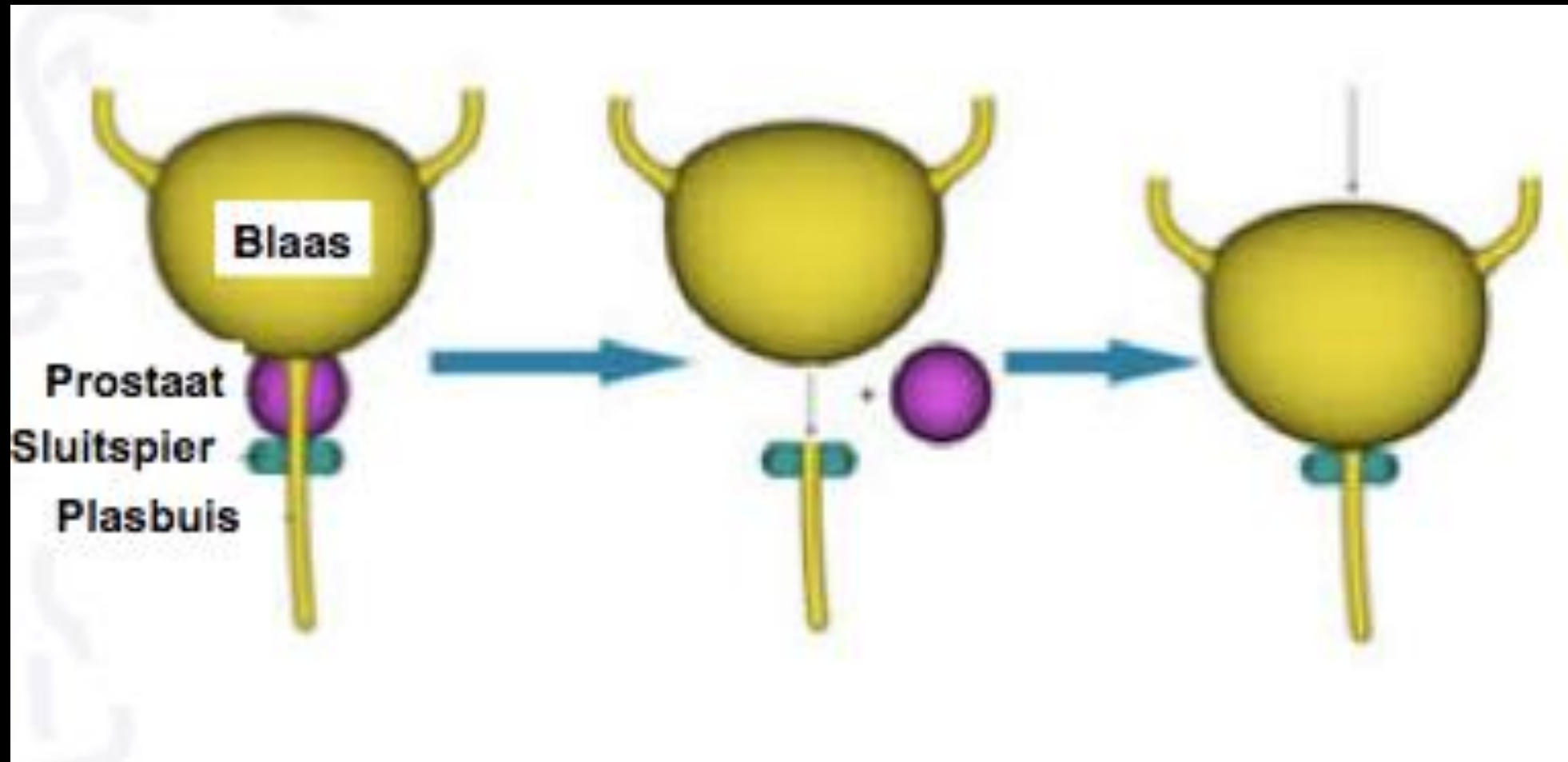


Waarom robot-chirurgie?

- Minimaal invasieve chirurgie beter voor de patiënten
- Nieuwe technologie
 - Informatiesysteem
 - Beeldvorming

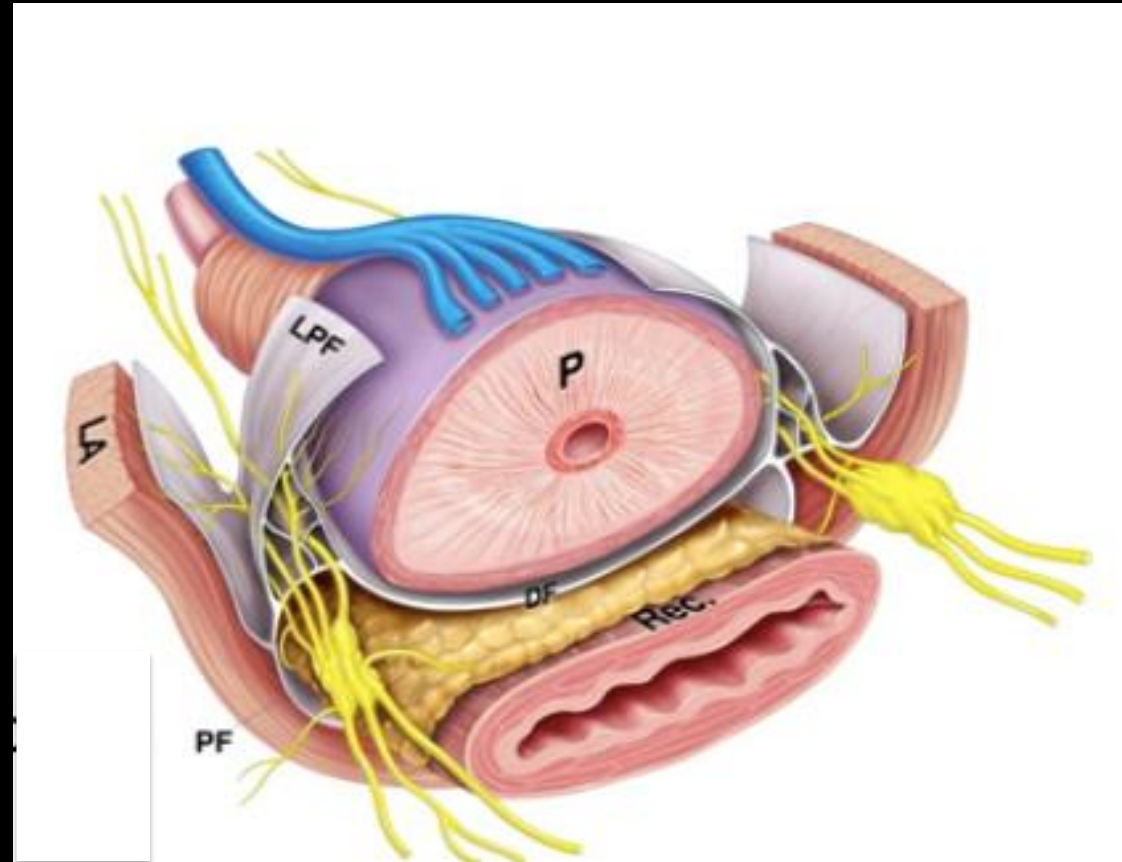


Radicale Prostatectomie (operatief verwijderen PC)



Het doel van een radicale prostatectomie

- Controle kanker
- Continentie urine
- Potentie



Ervaring chirurg is belangrijk!!

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

EAU
European Association of Urology

Platinum Priority – Prostate Cancer
Editorial by John W. Yaxley, Geoff Coughlin and Vipul Patel on pp. 760–761 of this issue

Robotic-assisted Versus Laparoscopic Surgery: Outcomes from the First Multicentre, Randomised, Patient-blinded Controlled Trial in Radical Prostatectomy (LAP-01)

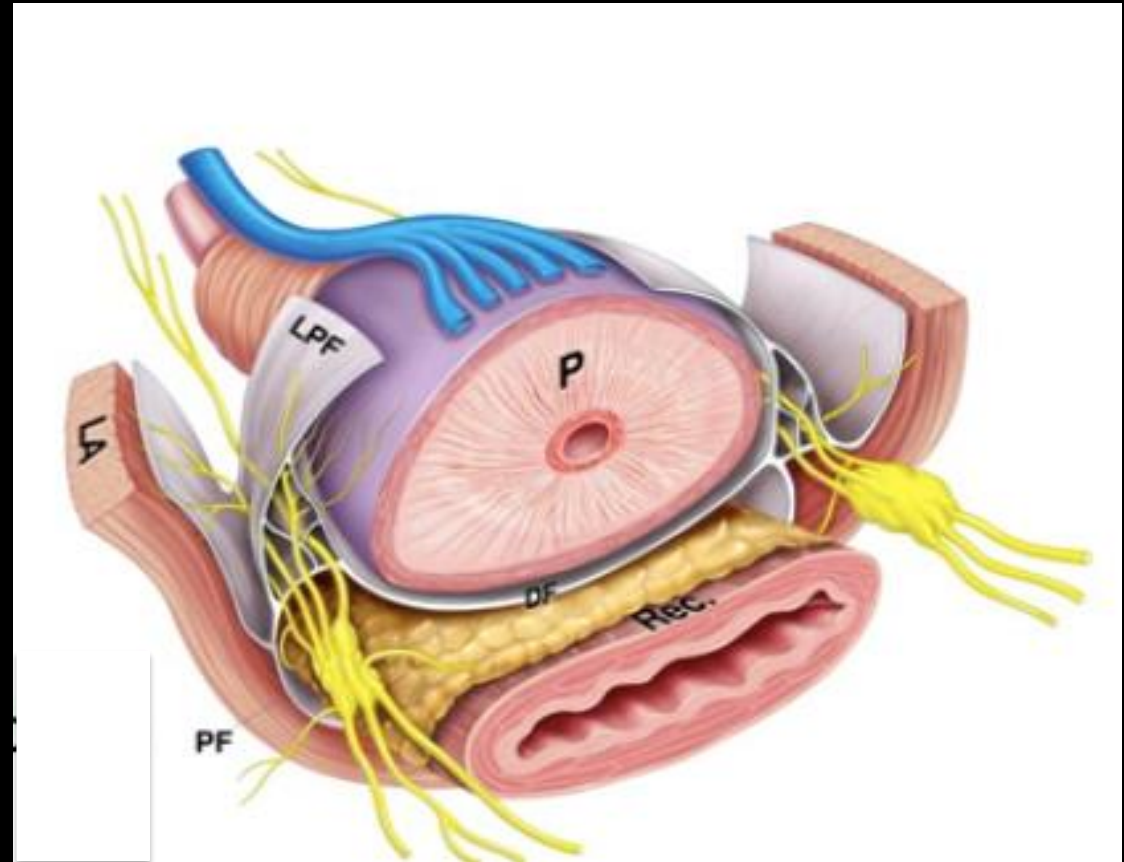
Jens-Uwe Stolzenburg^{a,*,}, Sigrun Holze^{a,†}, Petra Neuhaus^b, Iason Kyriazis^{a,c},
Hoang Minh Do^{a,d}, Anja Dietel^a, Michael C. Truss^e, Corinn I. Grzella^e, Dogu Teber^{f,g},
Markus Hohenfellner^f, Robert Rabenalt^{h,i}, Peter Albers^h, Meinhard Mende^{b,j}



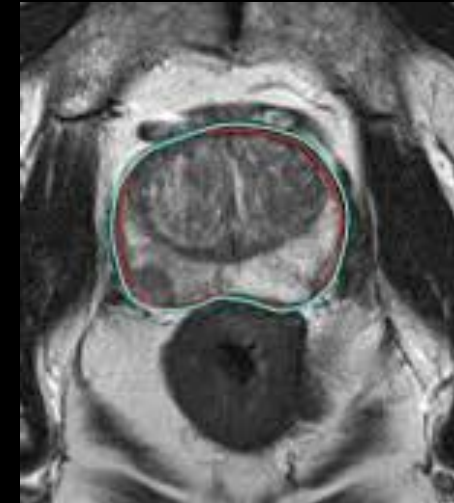
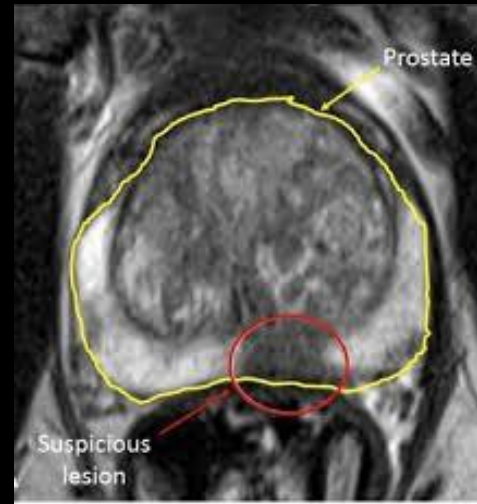
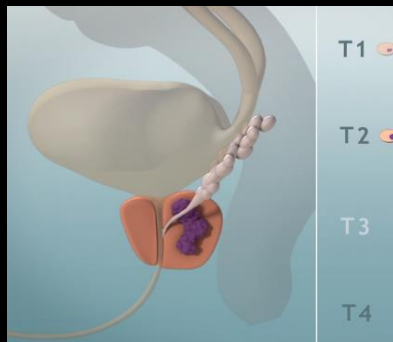
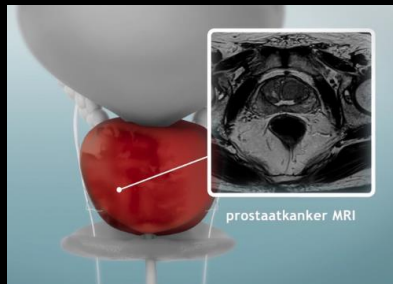
- Robot chirurgie:
 - Beter continentie
 - Beter potentie

Het doel van een radicale prostatectomie

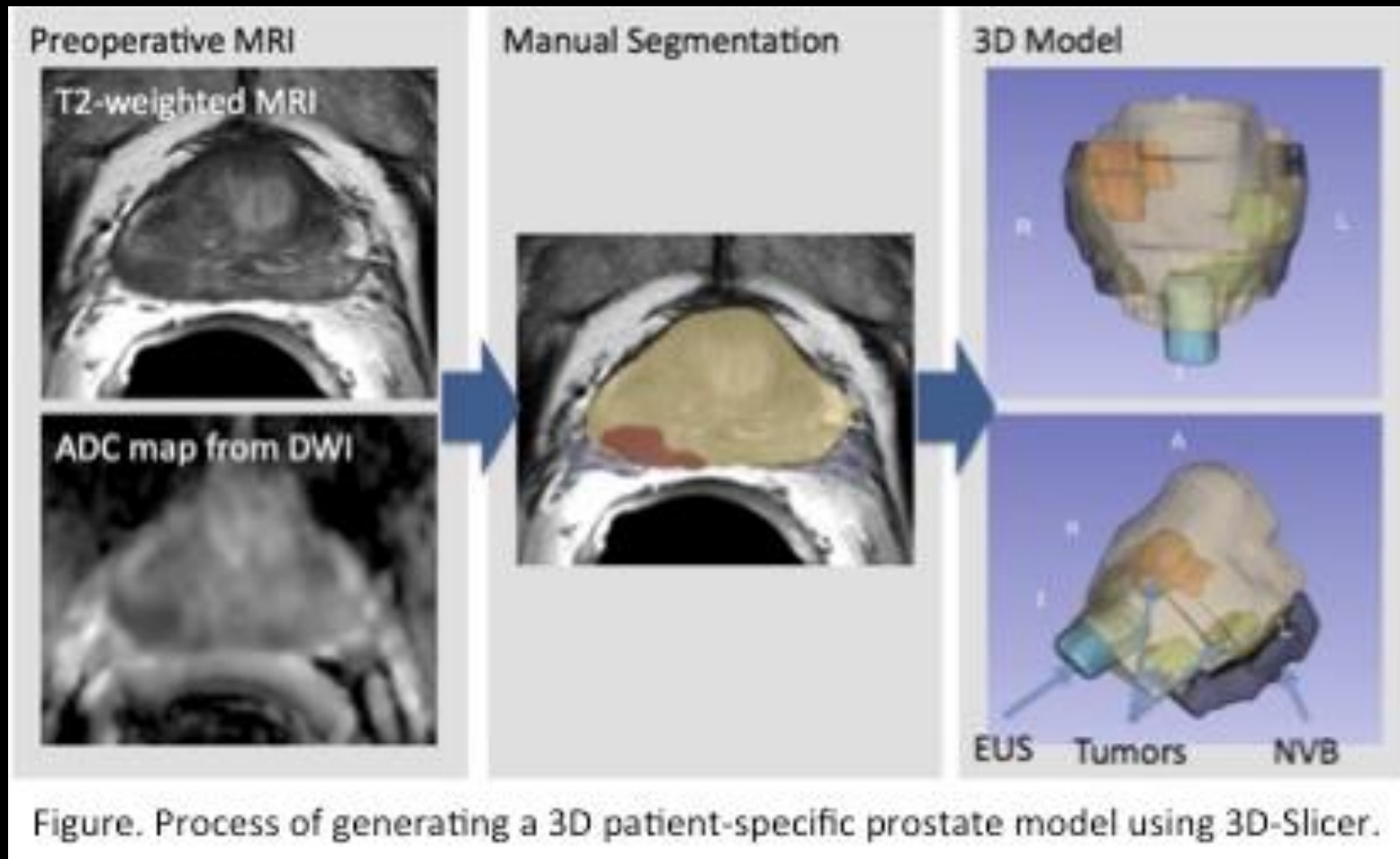
- Controle kanker
- Continentie urine
- Potentie
- **Zenuwsparing**
- **Plasbuissparing**
- **Blaassparing**



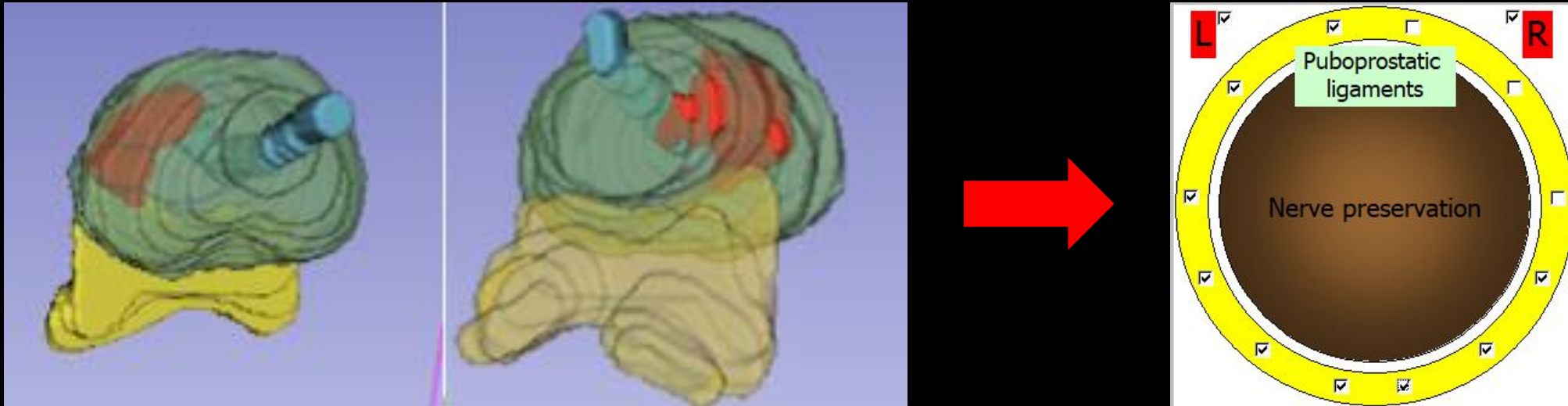
Zenuwsparing



3D model

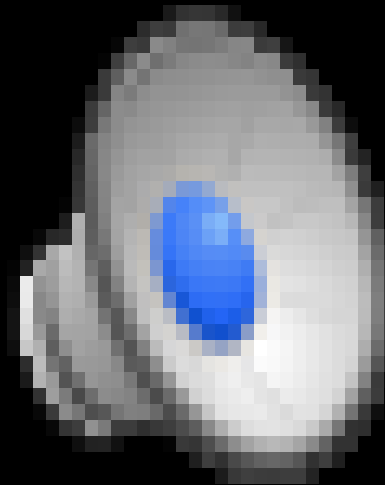
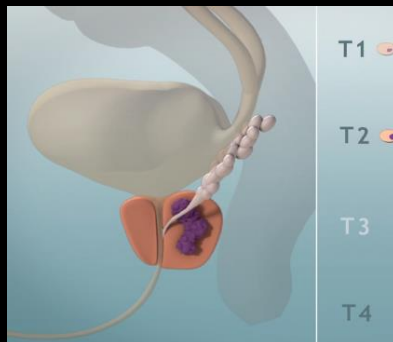
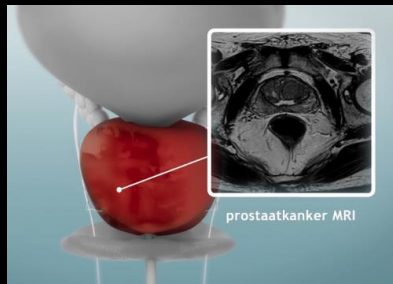


3D modellen

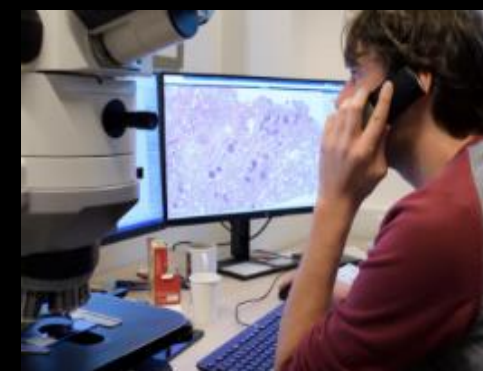
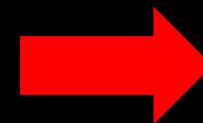
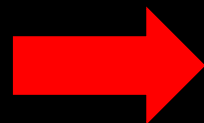
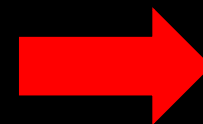
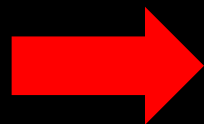
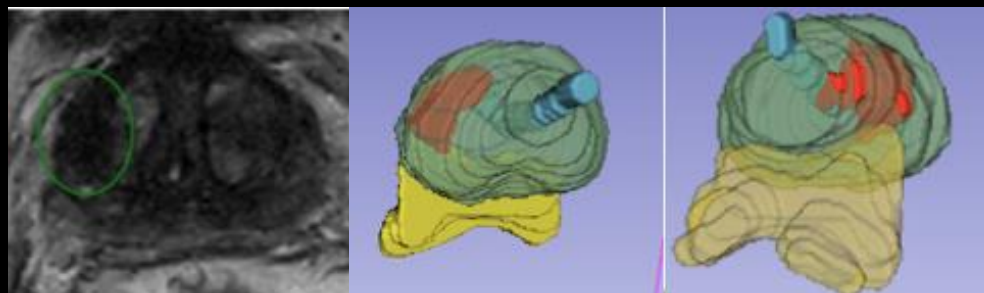


- 3D model leidt tot beleidswijziging zenuwsparing in 26% van operaties
- 3D model leidt tot betere voospelling van kapseldoorbraak (pT3a)

Zenuwsparing

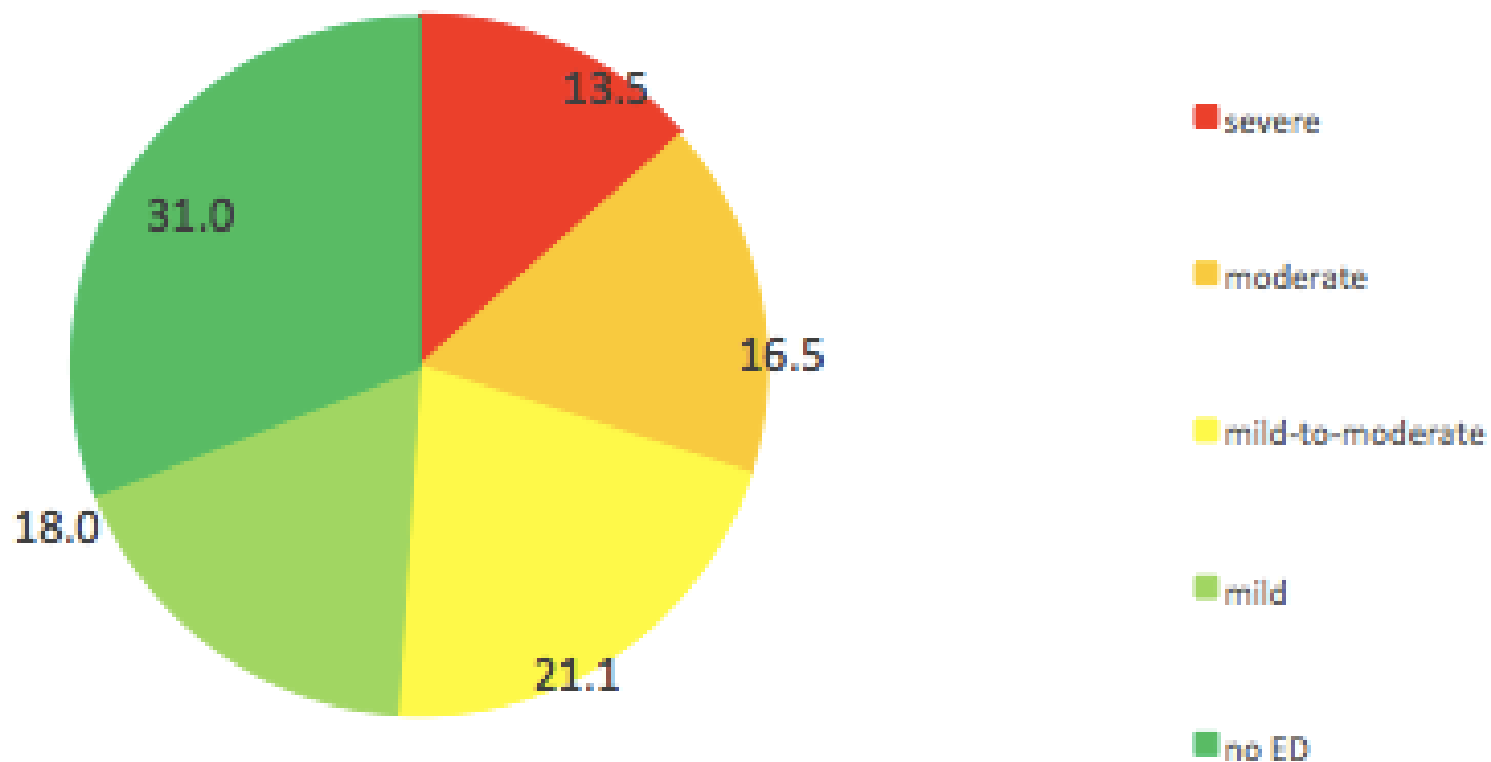


NeuroSafe

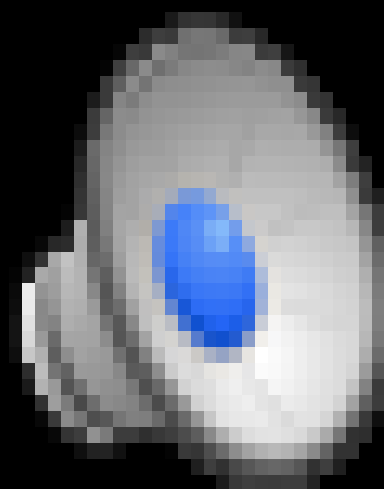
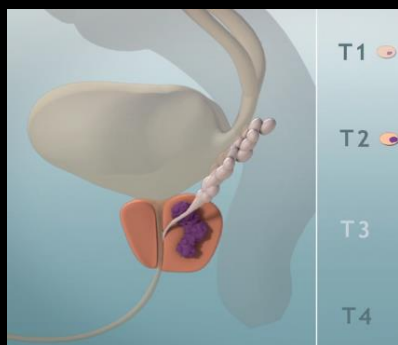


Persoonlijke Risico

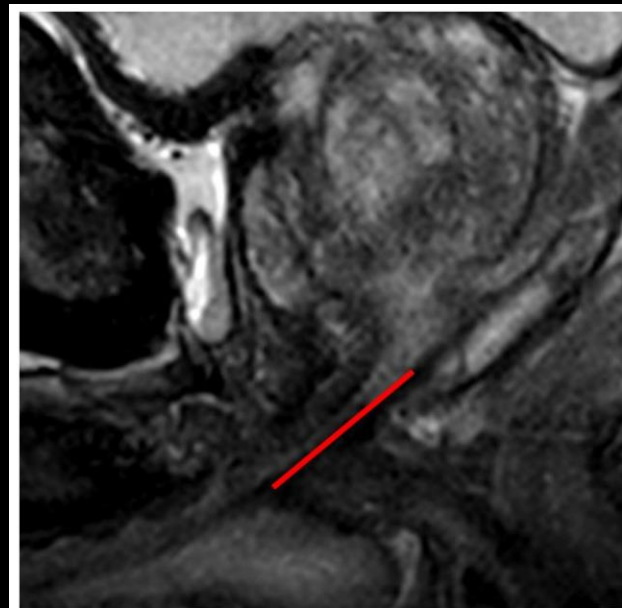
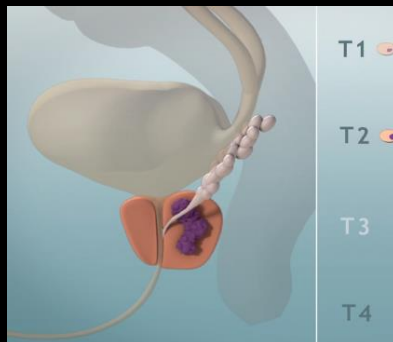
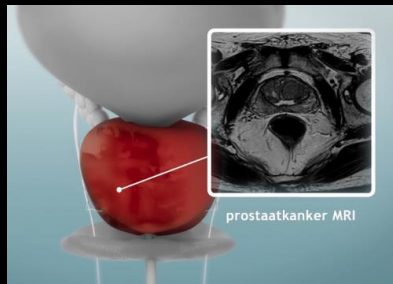
Kans en ernst van erectiele dysfunctie 12m na RALP



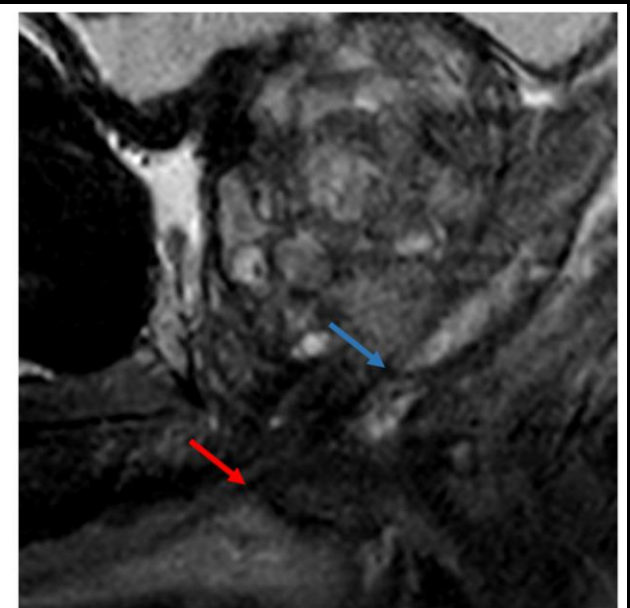
Blaassparing



Plasbuissparing

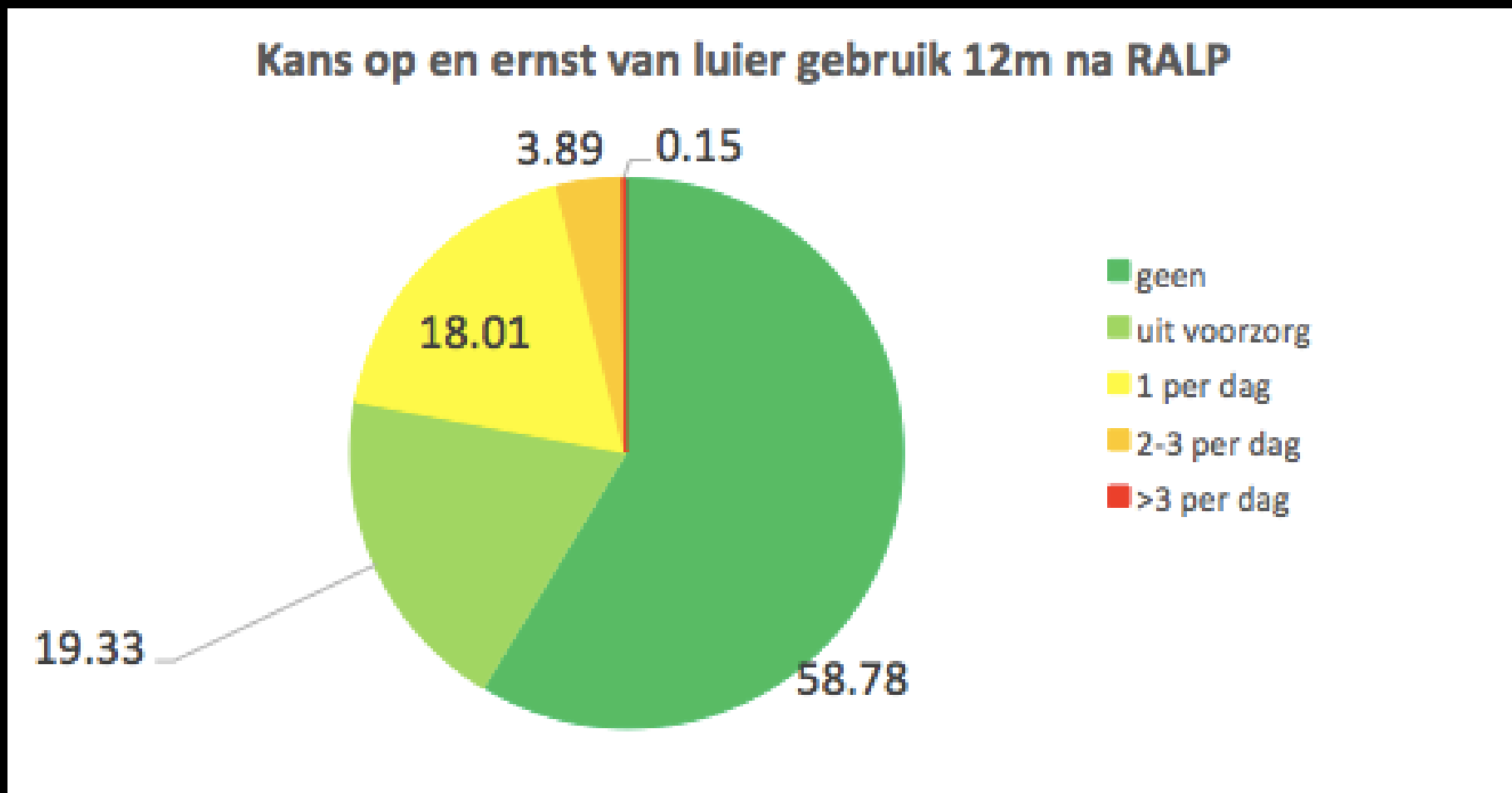


(a)



(b)

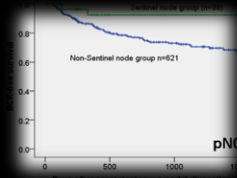
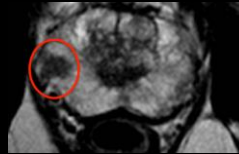
Persoonlijke Risico



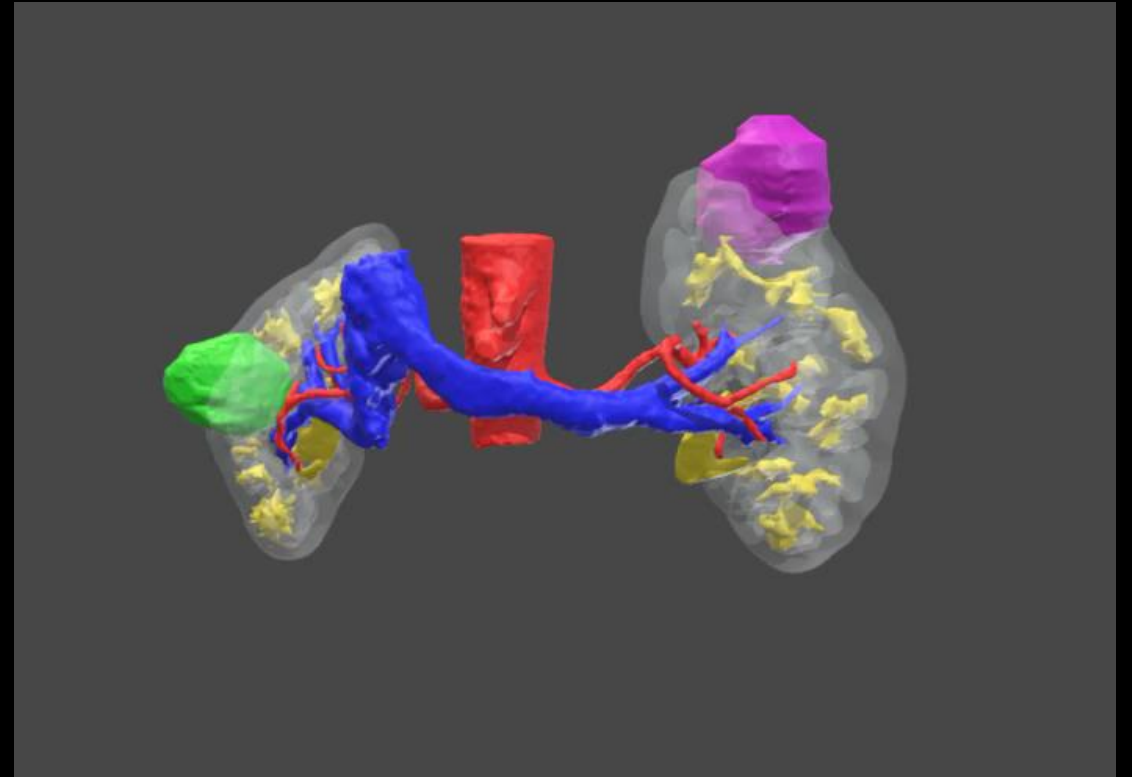
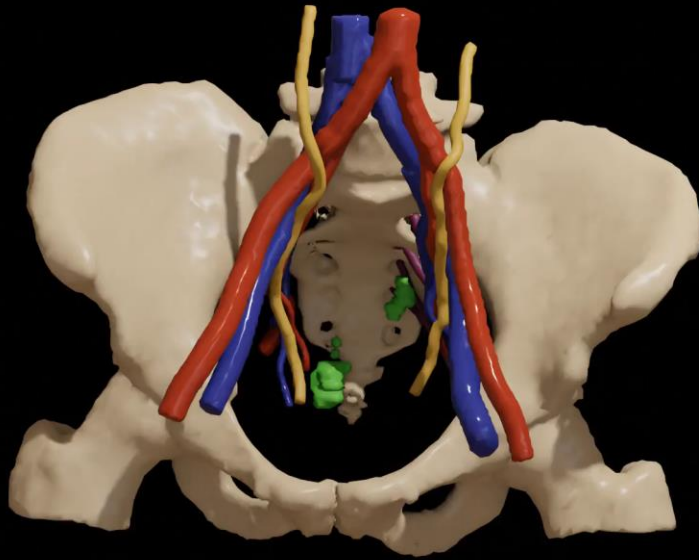
Zijn er ontwikkelingen?

Operatie

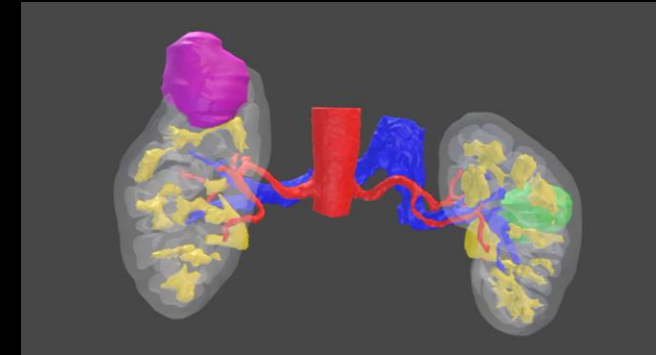
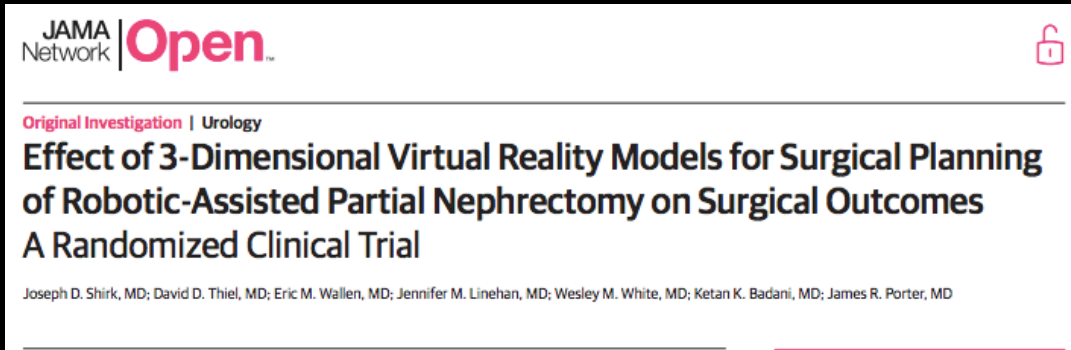
- Planning
- Chirurgie
- Uitkomst



3D reconstructie – 2D beeld



3D reconstructie - 2D beeld



Als de chirurg een 3-D model gebruikt voor chirurgie planning?

Minder:

- Tijd operatie
- Bloedverlies
- Duur opname

Shirk et al JAMA Network Open

Beeldgeleide Chirurgie

Vertaling van **pre**operatieve beeld in de **intra**operatieve beeld

nr. studie: 5N prostatect + ICG
n. serie: fusion
1-65 >



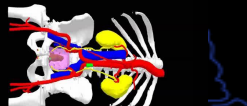
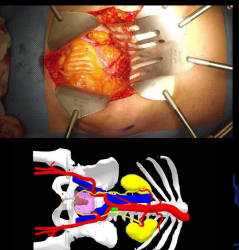
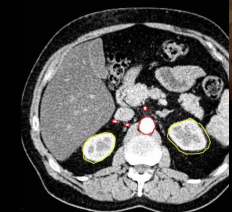
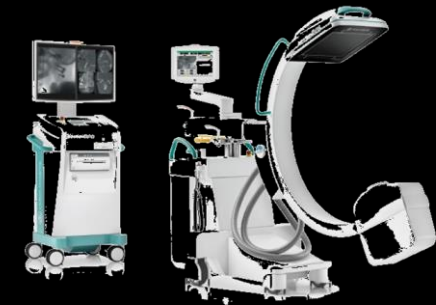
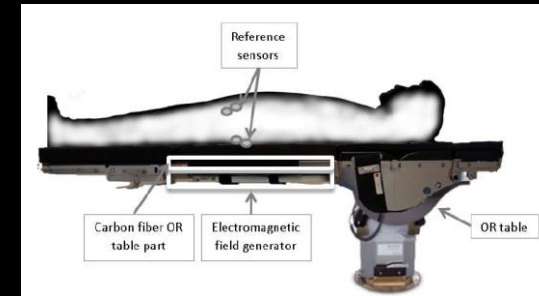
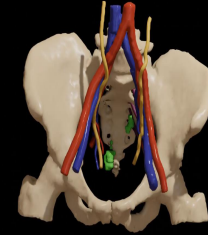
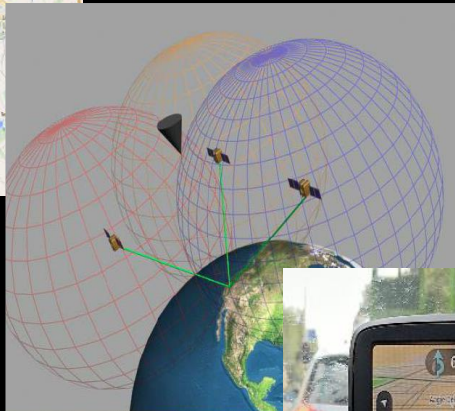
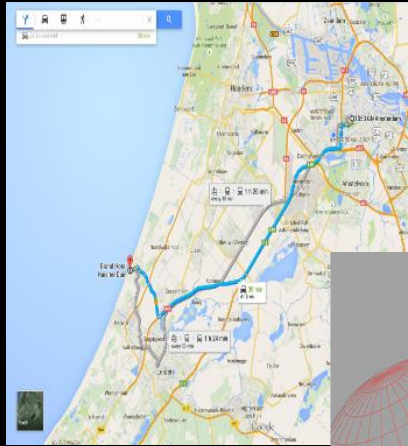
SC 500.174
117% P
SW 2.001

?



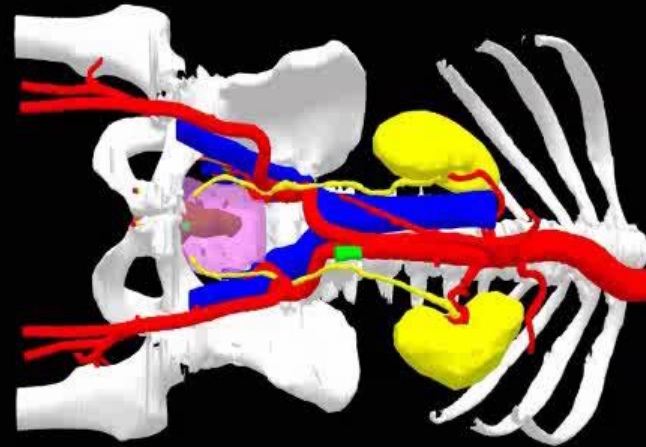
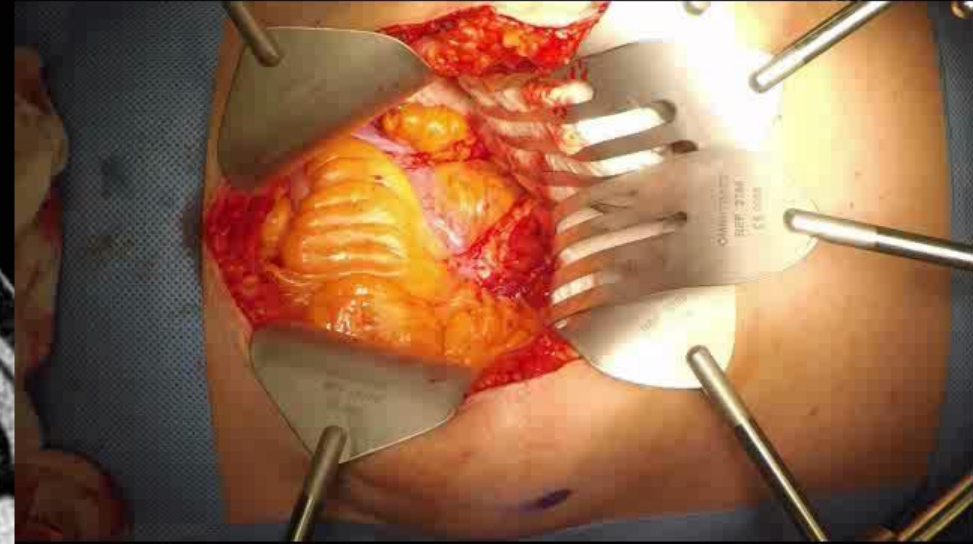
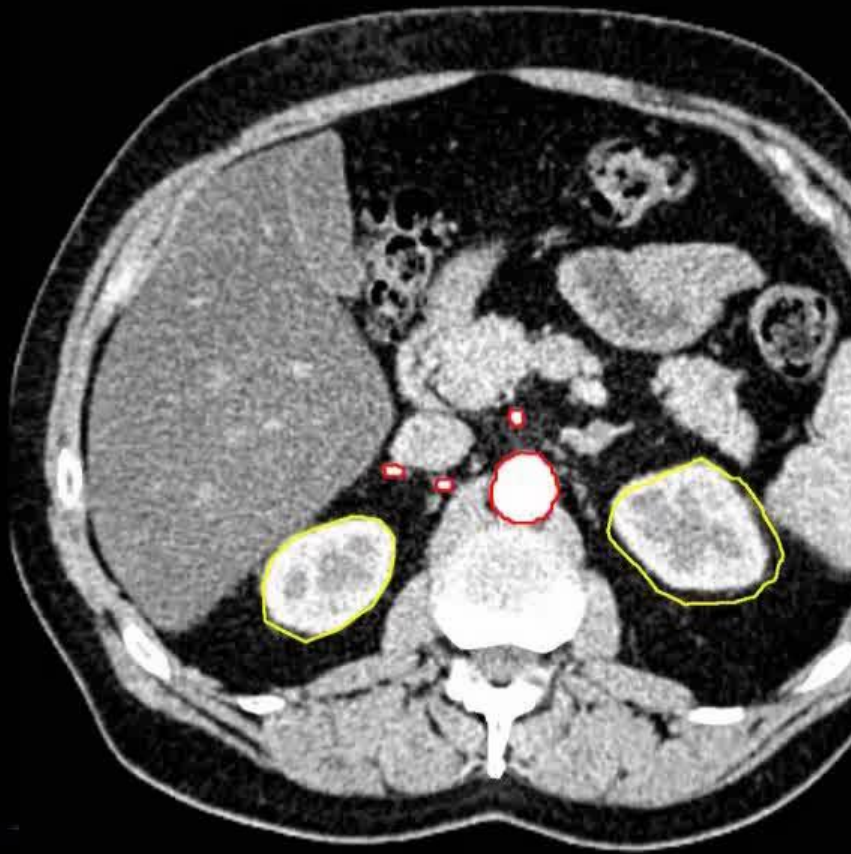
Lymph nodes

Intraoperative Navigatie



Nijkamp et al. 2019 J Surg Oncol

Intraoperative Navigation



2025: How Did Humans / Surgery Evolve?

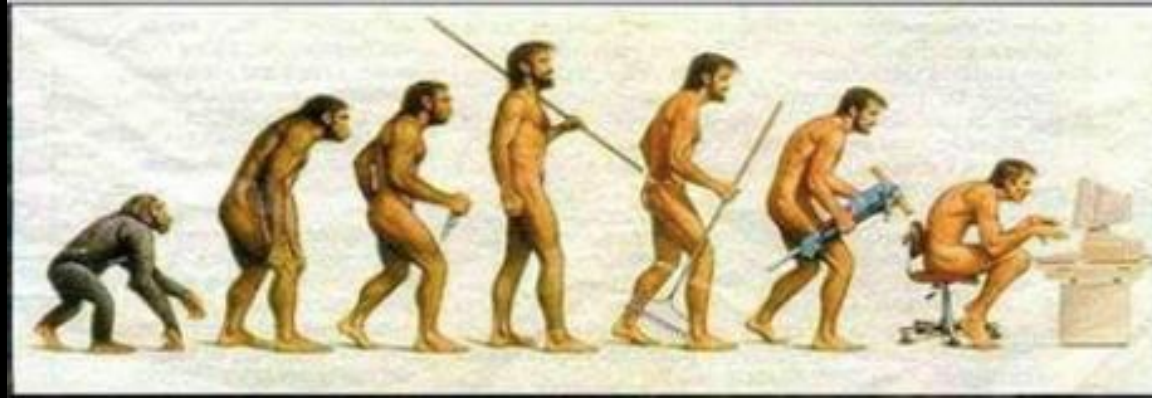
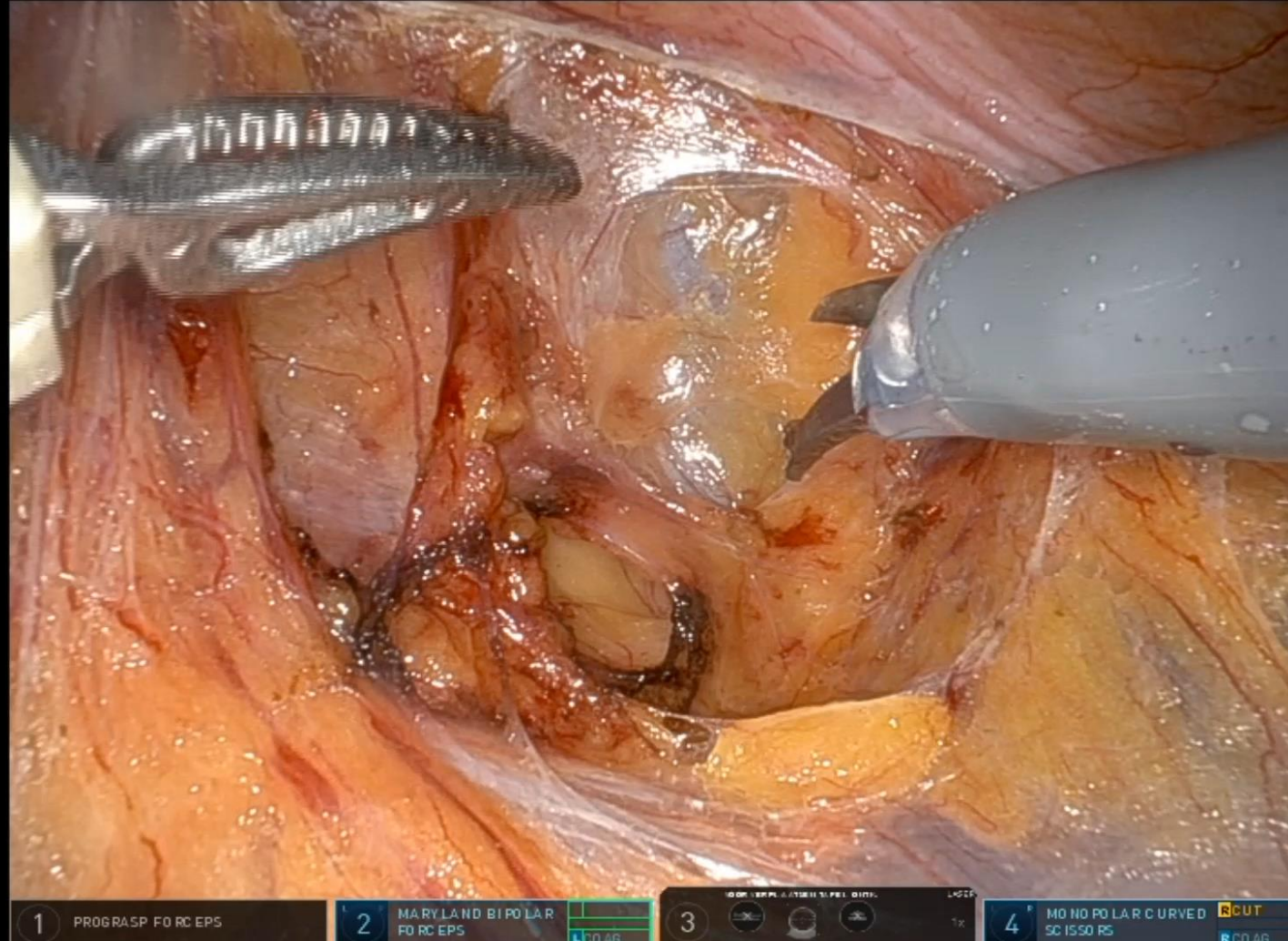


Image Guided Navigation during Robot Surgery



Beeldgeleide Chirurgie

Vertaling van **pre**operatieve beeld in de **intra**operatieve beeld



Lymph nodes

Zoeken ?



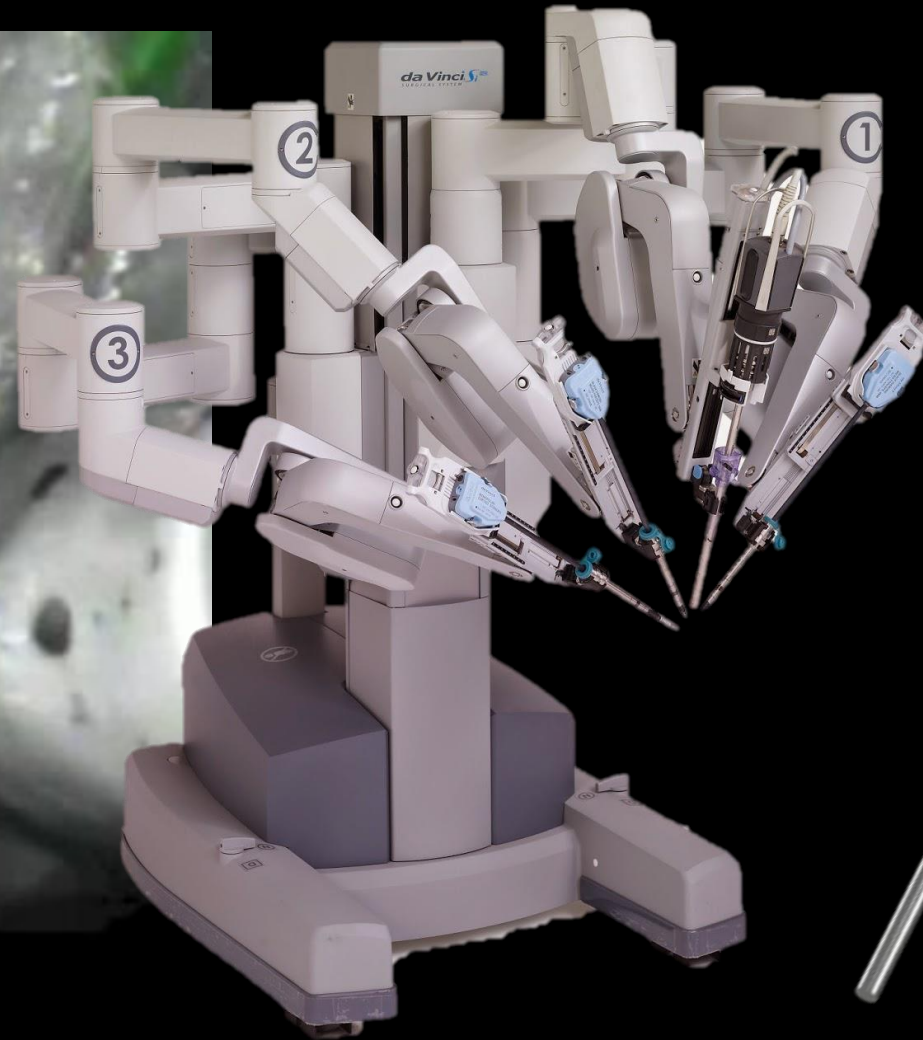
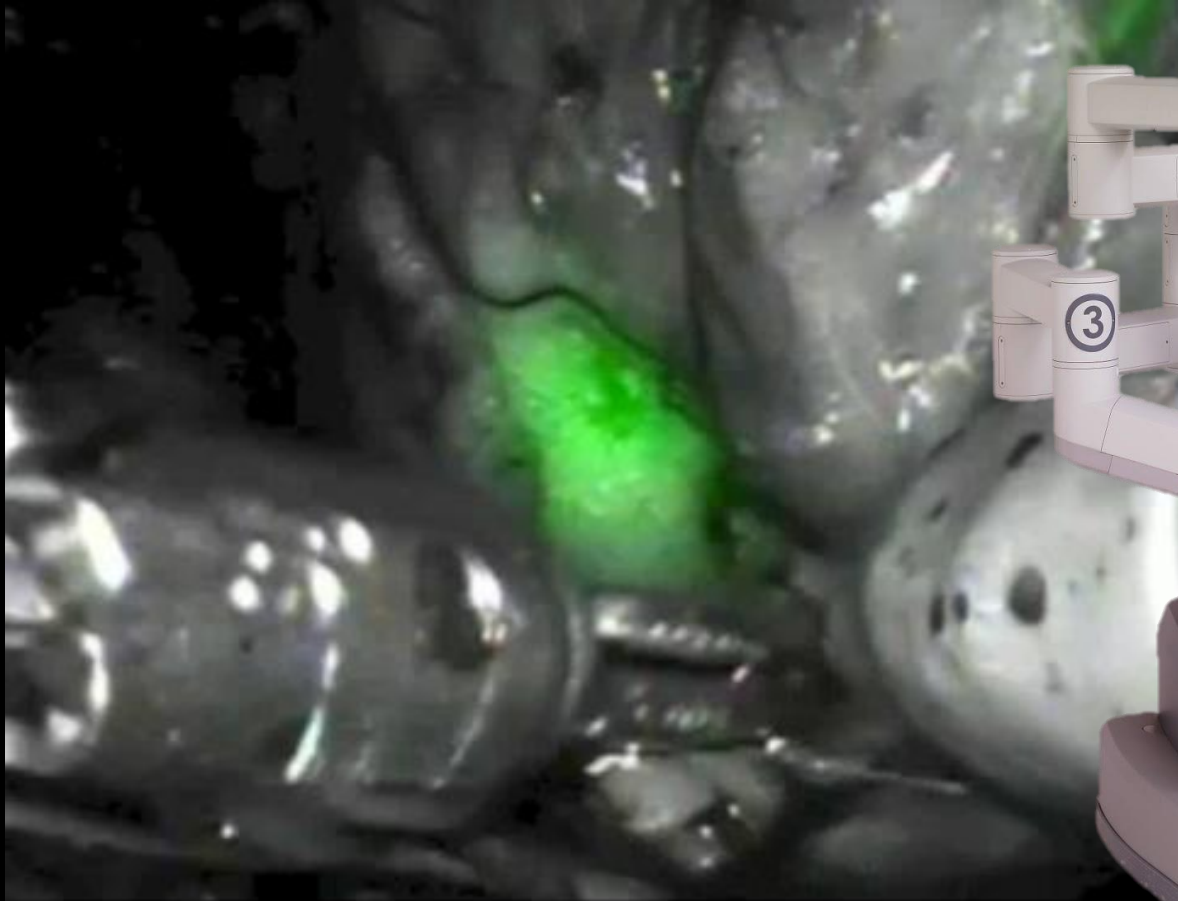
Vinden !



Fluorescentie



Operatie robot

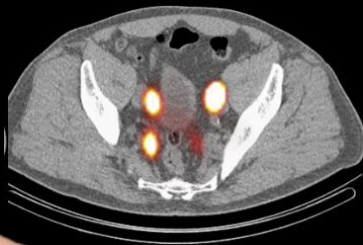


Hybriede kleurstof voor prostaatlymfklieren

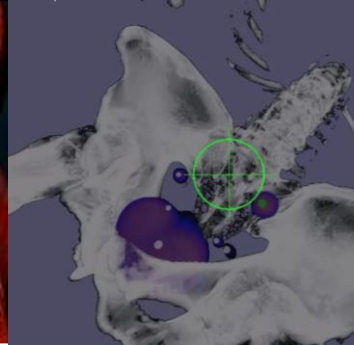
Niet Prostaatkanker Specifiek



Radioactief en fluorescent



SCAN



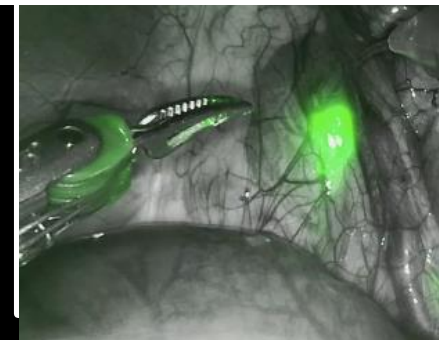
Navigeren



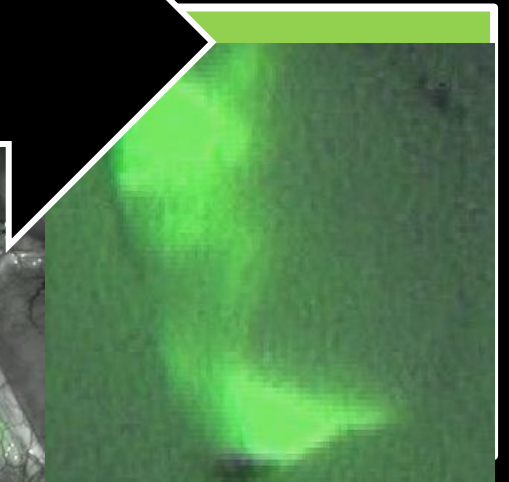
Opsporen
tijdens
operatie

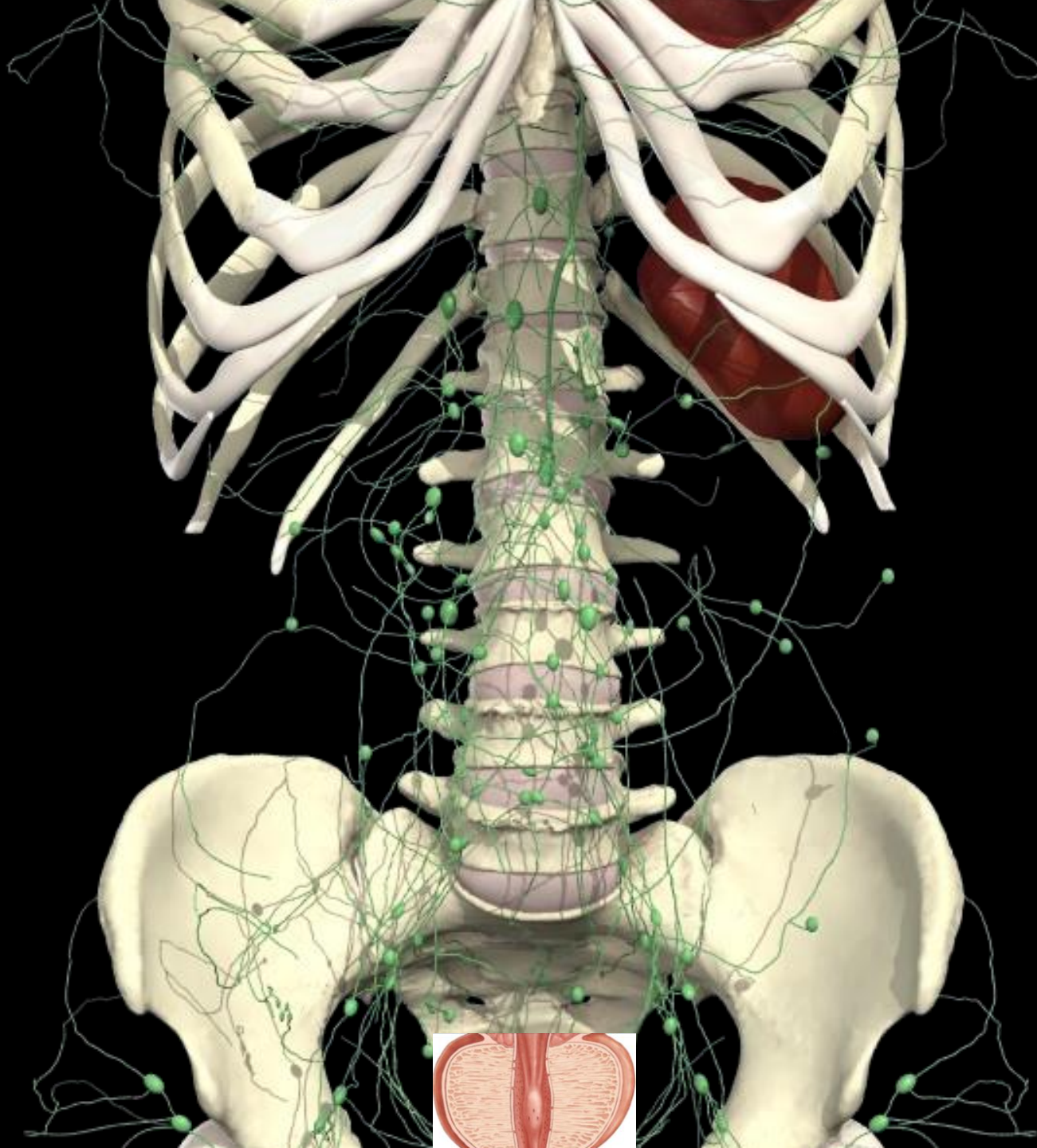


Injectie in de prostaat
(2 uur voor de operatie)



Fluorescentie





Prostaat

1. Prostaatweefsel
2. Prostaatkanker
3. Neurovasculaire bundel

Lymklieren

1. Voeren weefsel vocht af
2. Kanker uitzaaiingen

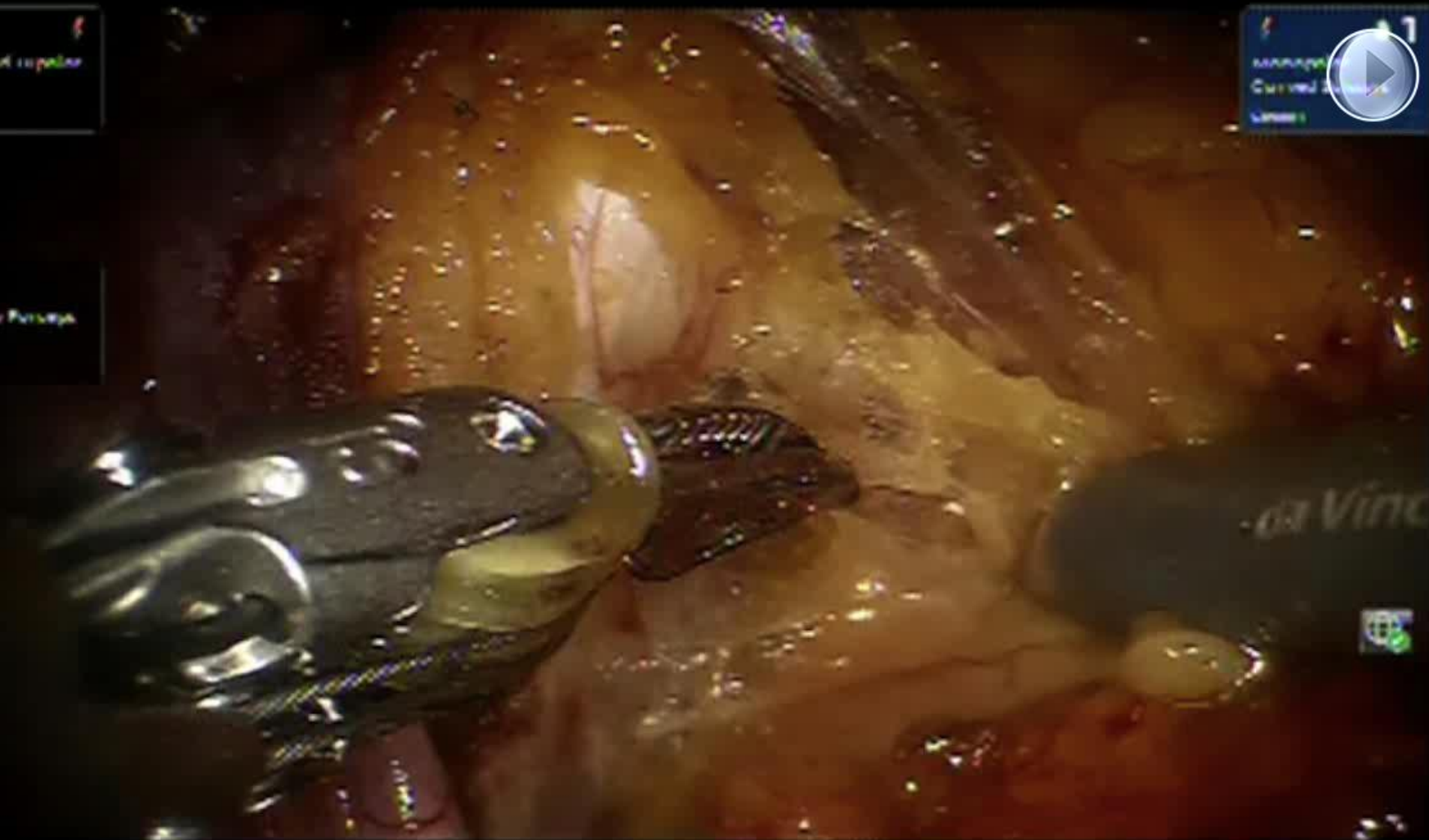
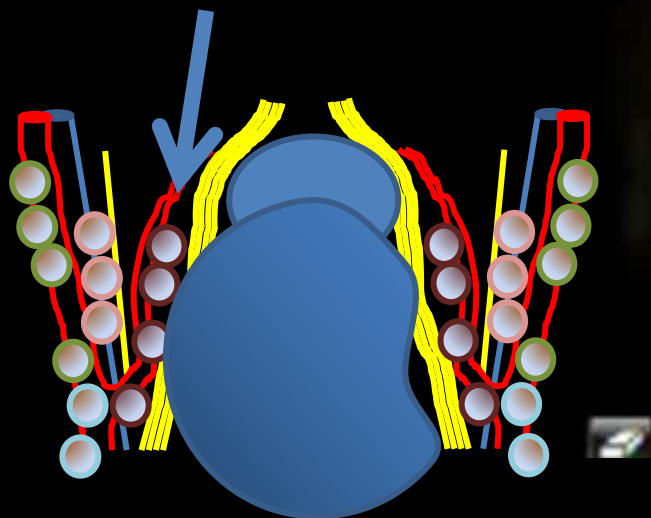
Injection



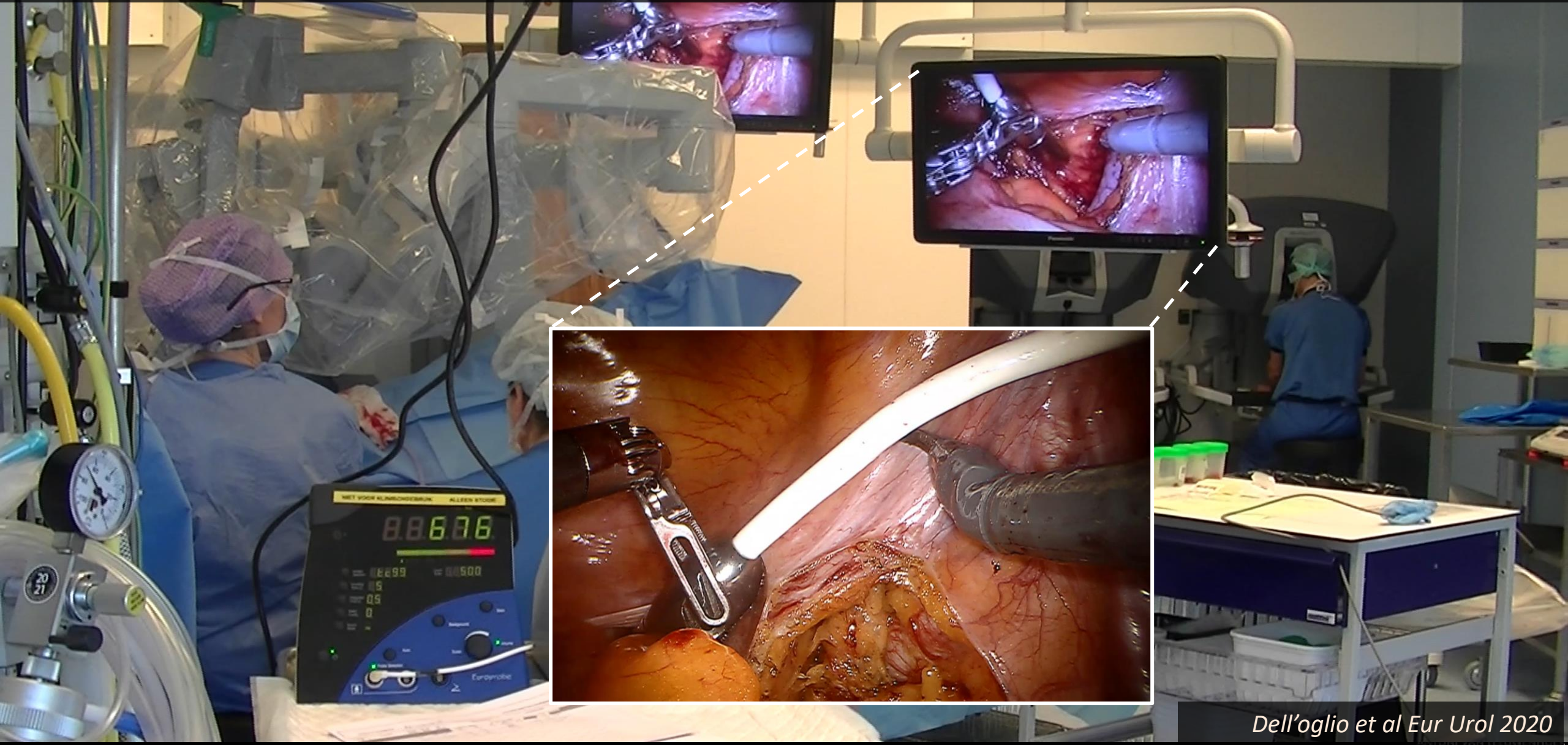


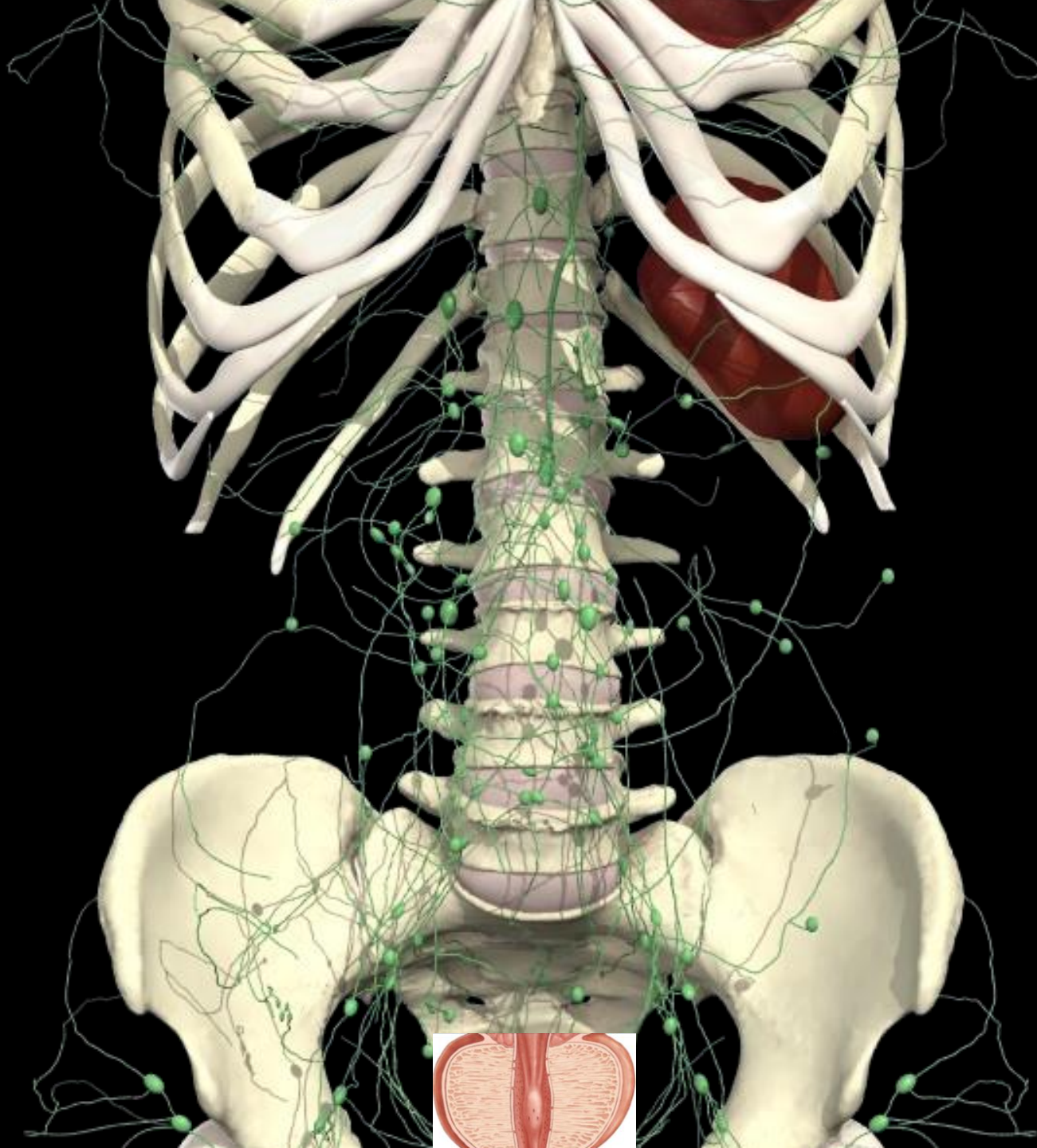
24
Karyland 10 palat
Puruya
Lamot

3
Puyguy Puruya
Puyd



With hybrid tracers radio- and fluorescence guided surgery complement each other





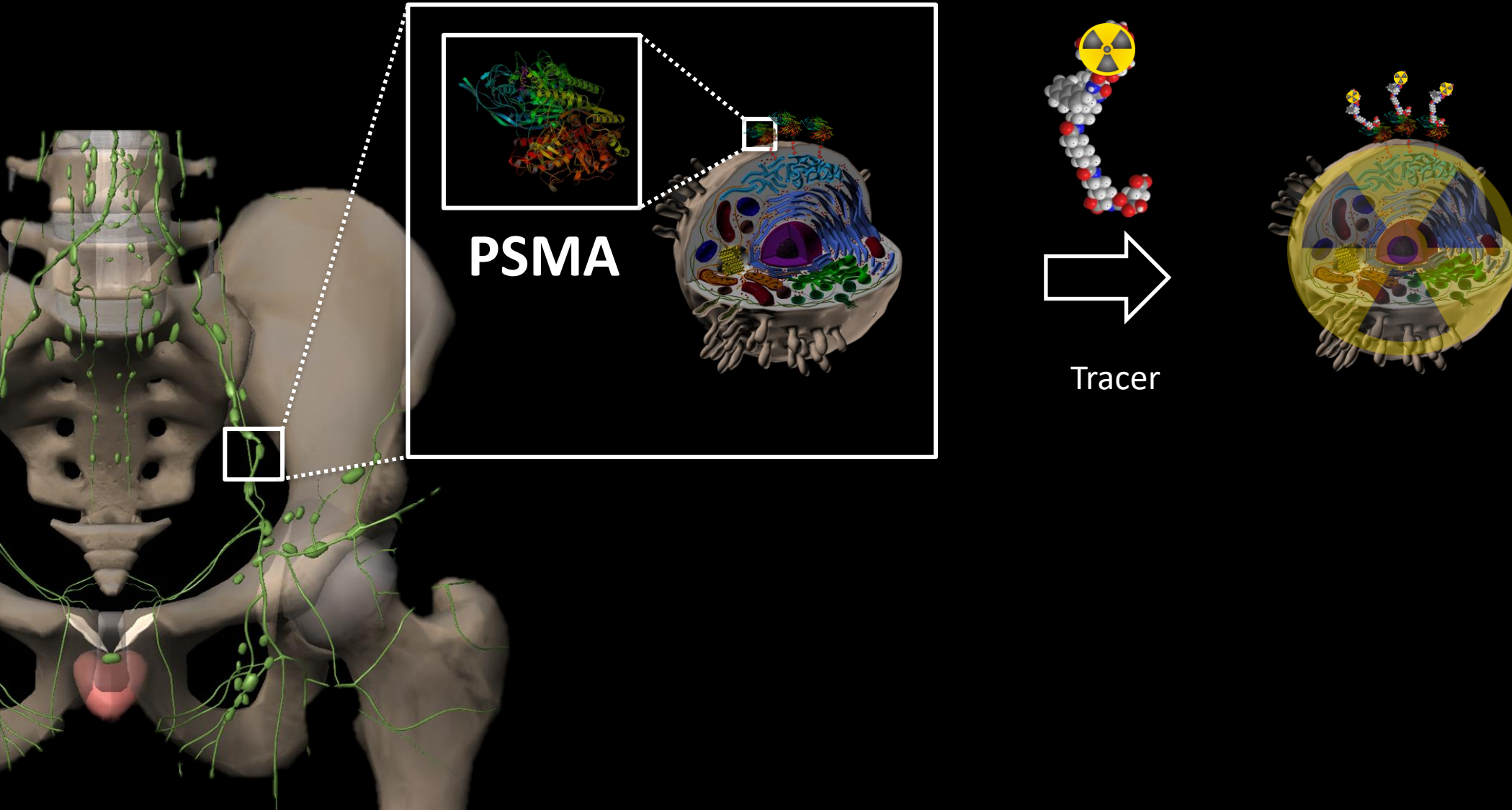
Prostaat

1. Prostaatweefsel
2. Prostaatkanker
3. Neurovasculaire bundel

Lymklieren

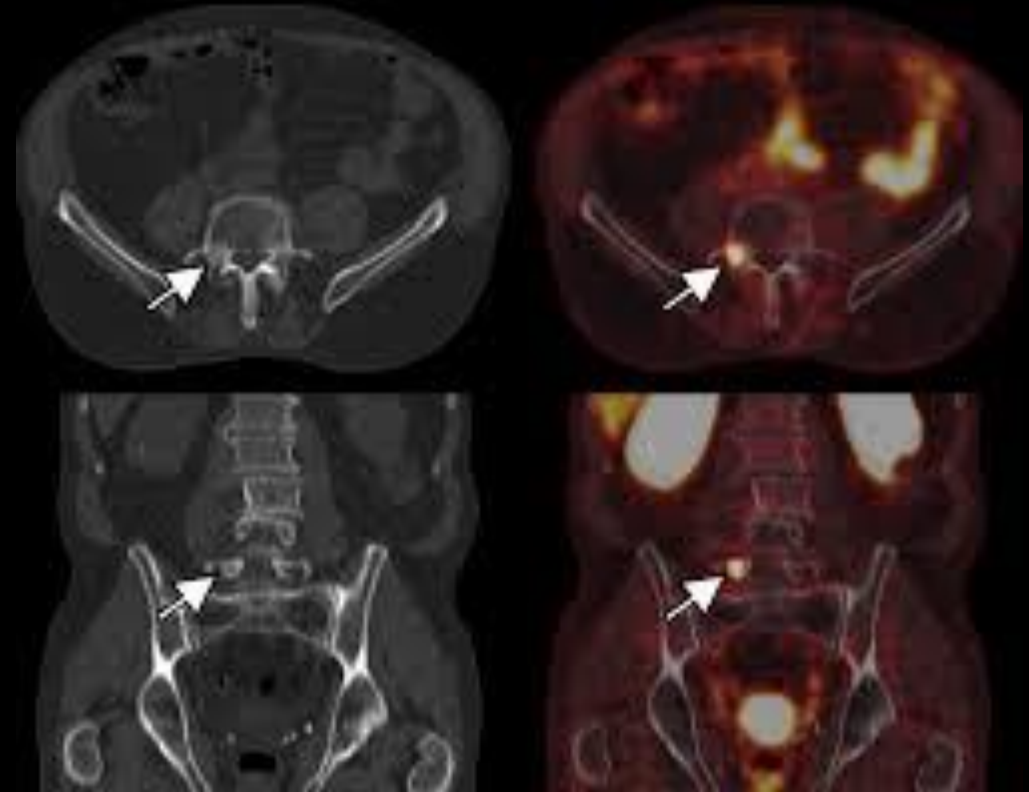
1. Voeren weefsel vocht af
2. Kanker uitzaaiingen

Prostate Specific Membrane Antigen (PSMA)

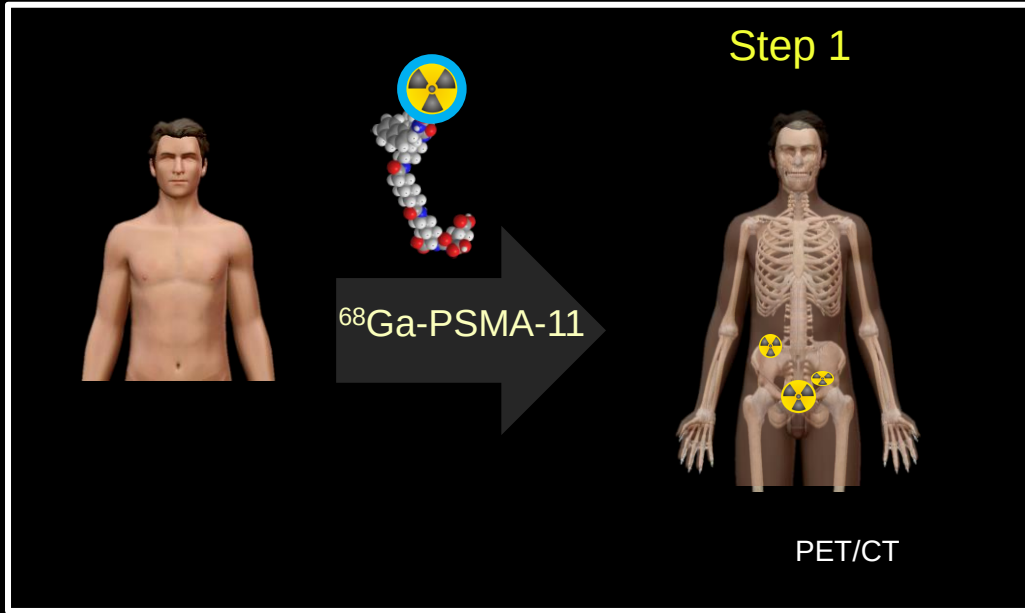


Prostaat Specifiek Antigeen Membraan

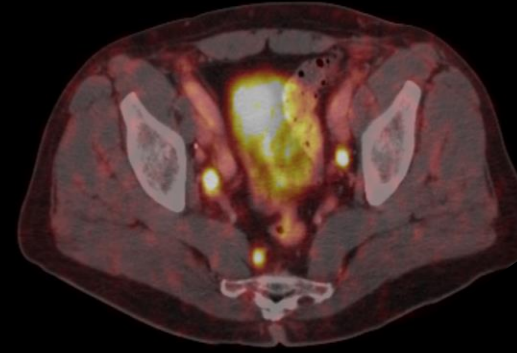
Prostaatkanker Specifiek



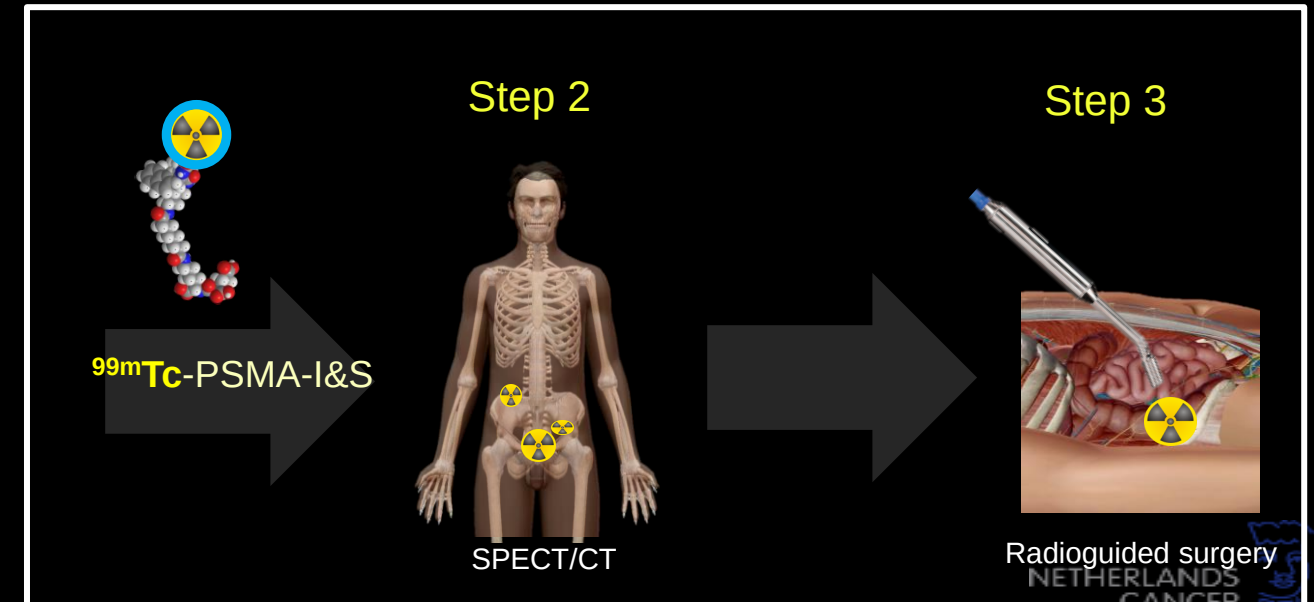
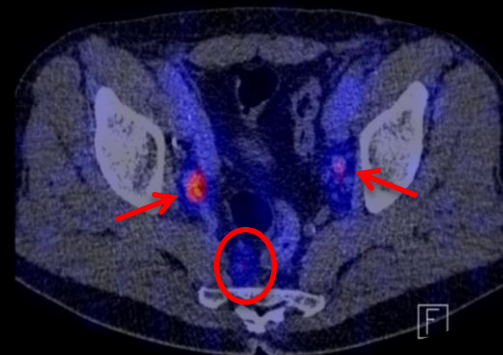
PSMA PET SCAN



SCAN



Operatie



Preoperative
PSMA PET/CT

Tracer
administration
and SPECT/CT

Placement of the
ports

Opening
peritoneum

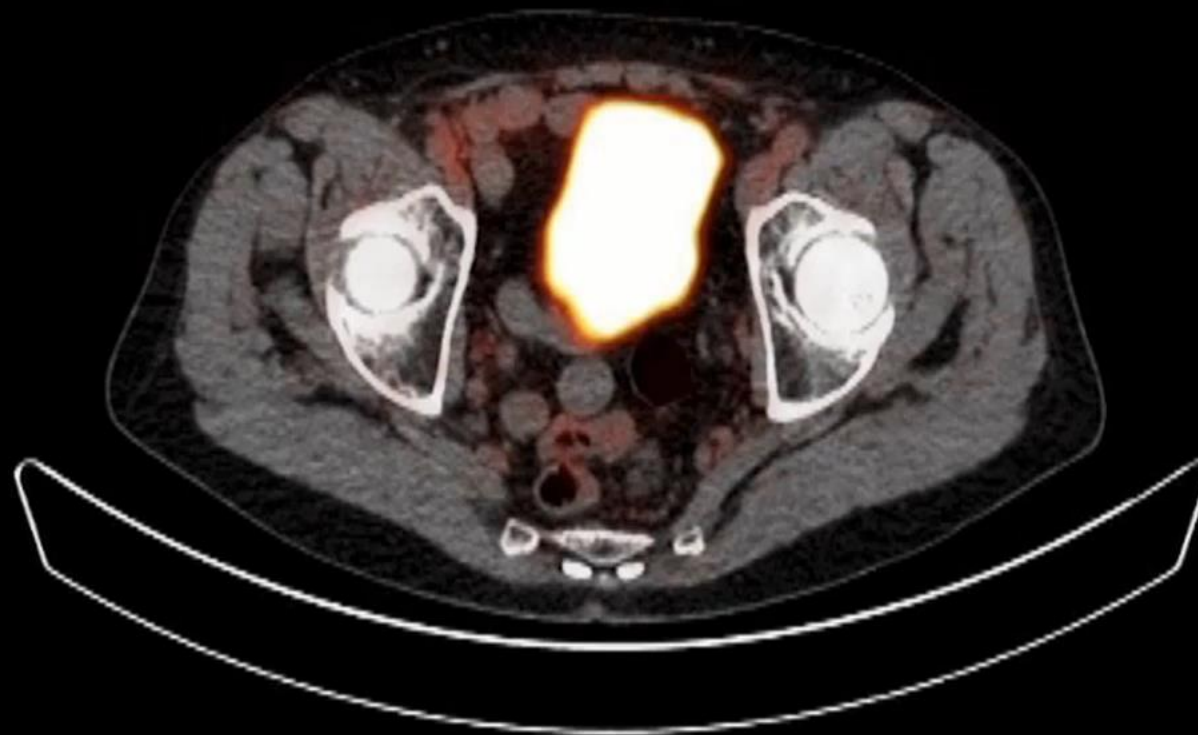
Insertion of the
DROP-IN probe

Radioactivity
measurement
anatomical
landmarks

Radioactivity
assessment
suspected
lesion(s)

Examination
surgical field

Ex vivo
radioactivity
validation

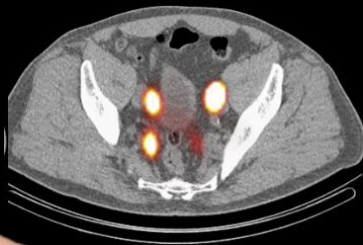


Work To Be Done

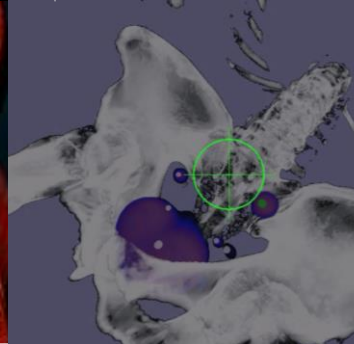
Hybride kleurstof specifiek voor Prostaatkanker



Radioactief en fluorescent



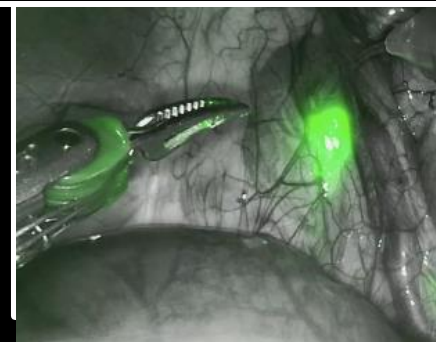
SCAN



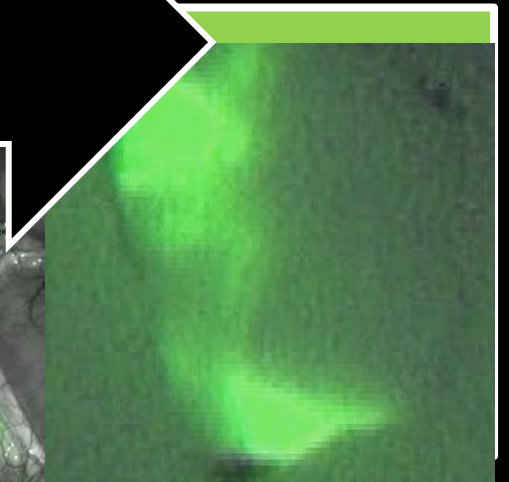
Navigeren



Opsporen
tijdens
operatie



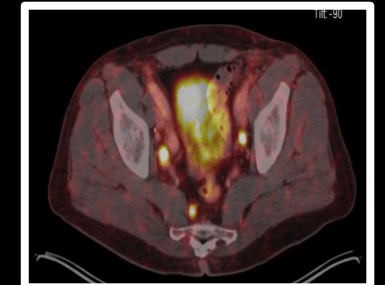
Fluorescentie



Injectie intraveneus
voor de operatie

Conclusies

1. Robot geassisteerde radicale prostatectomie veel uitgevoerd behandeling prostaatkanker
2. Betere uitkomsten door vaak uitvoeren en goed selecteren van patienten
3. Uitkomsten afhankelijk van operator en de persoonlijke kenmerken van de patient
4. Betere operatieve uitkomsten door intensieve samenwerking verschillende vakgebieden
5. Betere beeldvorming en beeldgeleide minimaal invasieve chirurgie hebben de toekomst



Acknowledgements

- AVL/NKI
 - Henk van der Poel
 - Hilda de Barros
 - Lotte Zuur
 - Anne-Claire Berrens
 - Ether Wit
 - Erik van Muilekom
 - Jolien van Kesteren
 - Corinne Tillier
 - Thierry Boellaard
 - Maarten Donswijk
 - Theo Ruers
 - Harald Groen
 - Laura Aguilera Saiz
- LUMC
 - Fijs van Leeuwen
 - Matthias van Oosterom
- St Vincent's Prostate Cancer Center
 - Phillip Stricker
 - Louise Emmett

Vragen



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