

A semi-transparent anatomical diagram of the male reproductive system is centered in the upper half of the image. It shows the testes, vas deferens, ureters, and the prostate gland. The diagram is rendered in shades of pink and red, with a soft, glowing effect.

PSMA: van target tot therapie in prostaatkanker

Dr. Jolien Verschueren

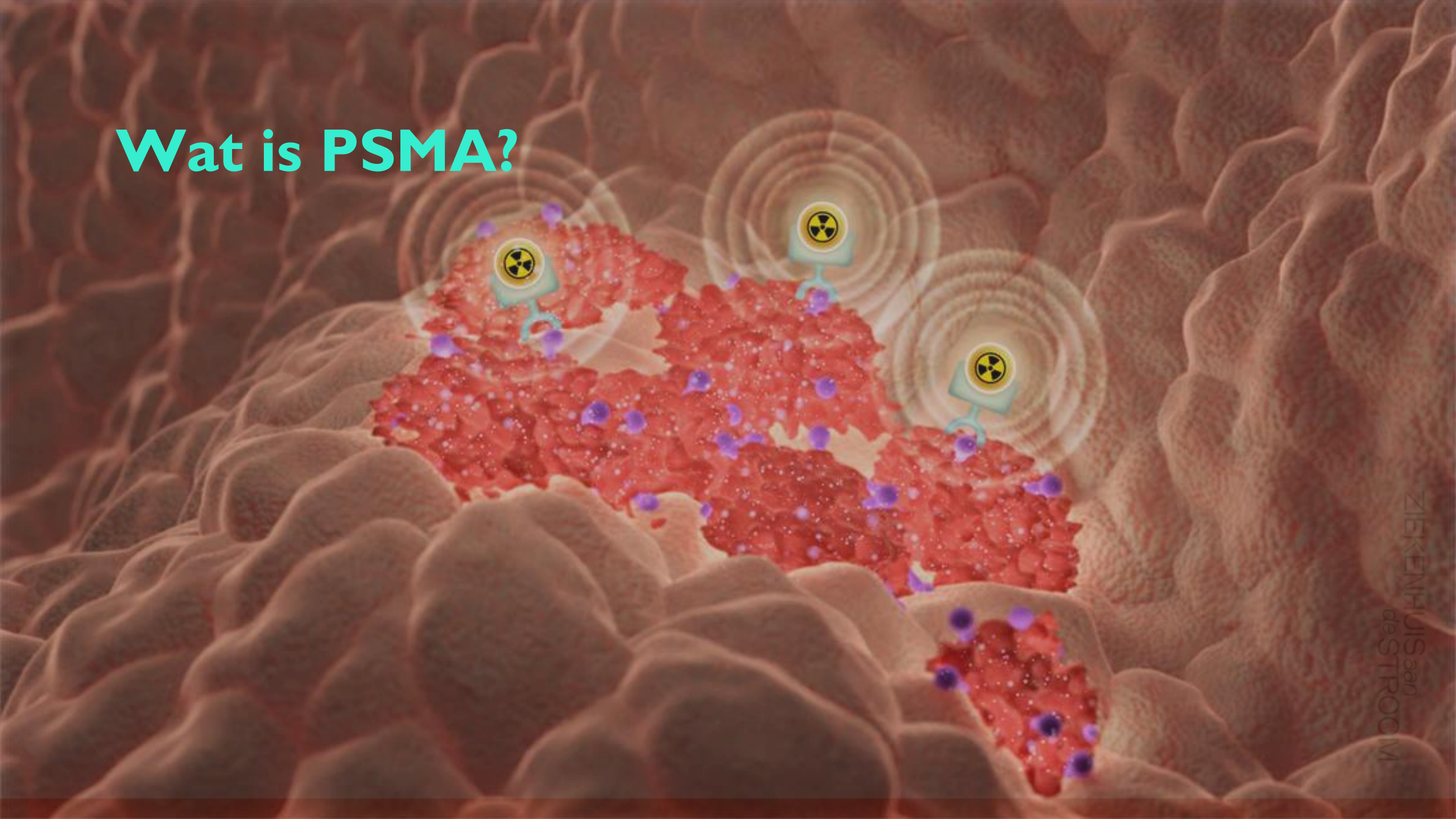
Nucleaire geneeskunde ZAS

Overzicht

- Wat is PSMA?
- PSMA – gerichte diagnostiek & therapie
- Radioprotectie



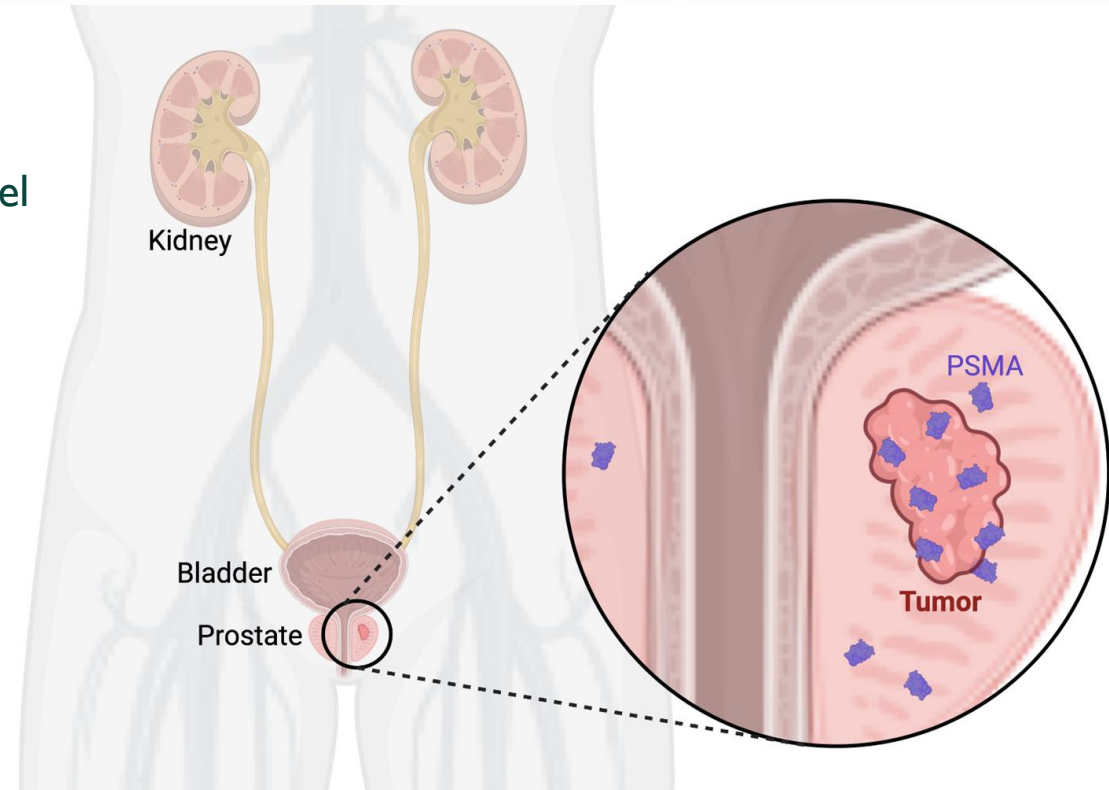
Wat is PSMA?



PSMA

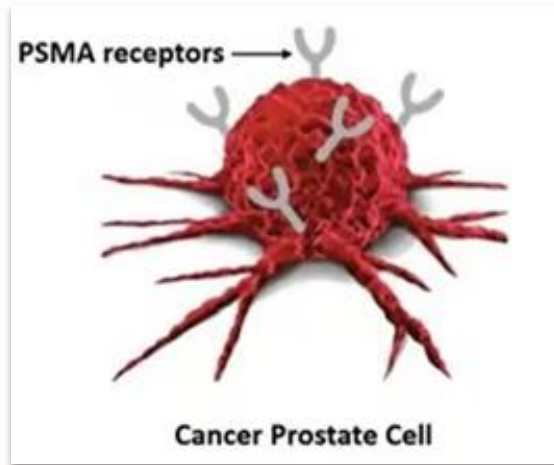
Prostaat Specifiek Membraan Antigen

- Transmembraaneiwit
- Zwakke expressie in normaal prostaatweefsel
- Verhoogde expressie in prostaatkankercellen (>80%)
- Excellent doelwit voor diagnose en therapie ('theranostics')



PSMA als doelwit voor theranostics

Eén doelwit (PSMA-receptor), twee toepassingen.

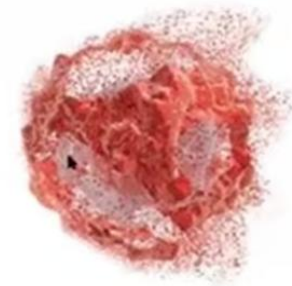


DIAGNOSE



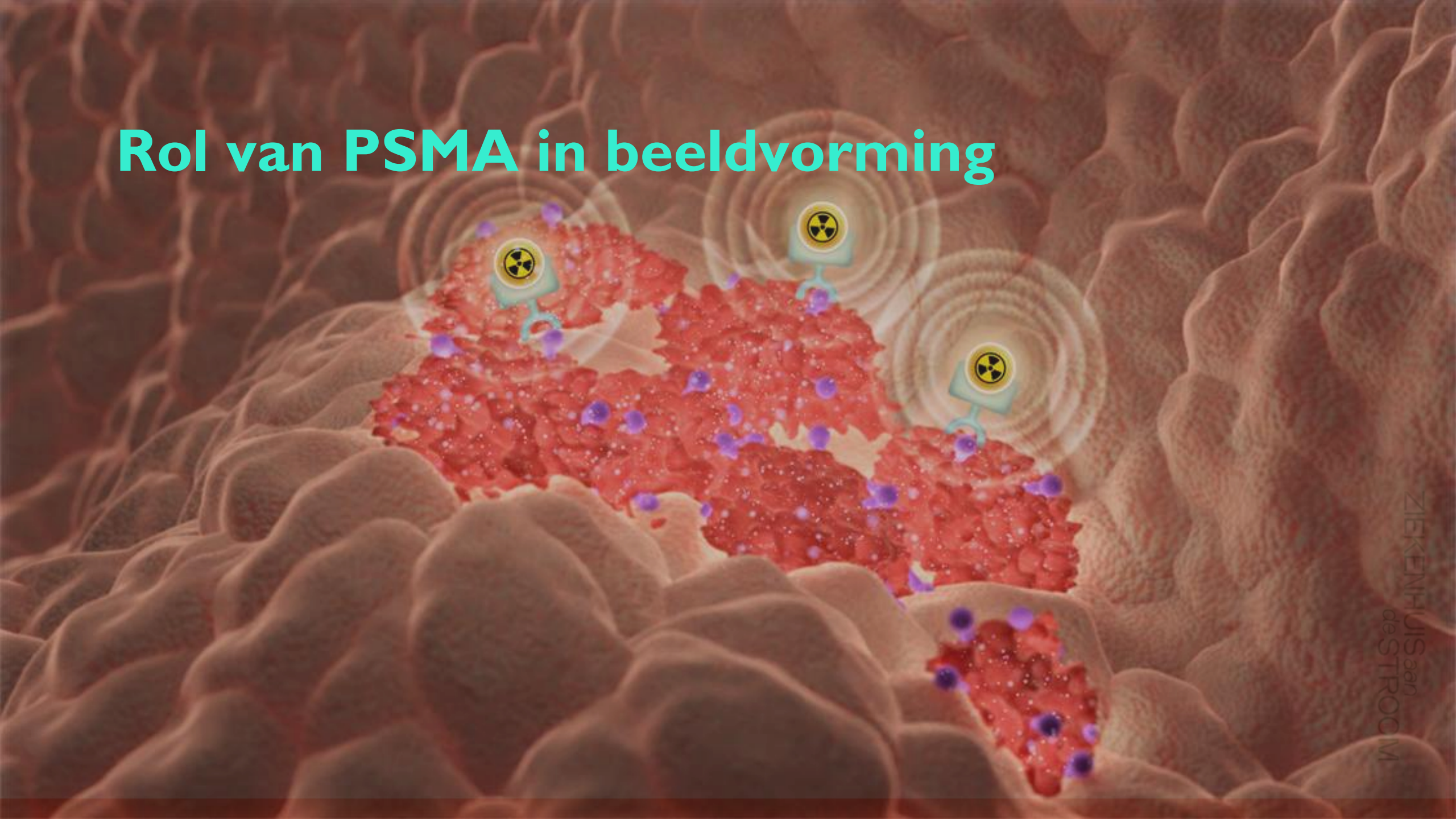
Accurate diagnosis by PSMA-PET

THERAPIE



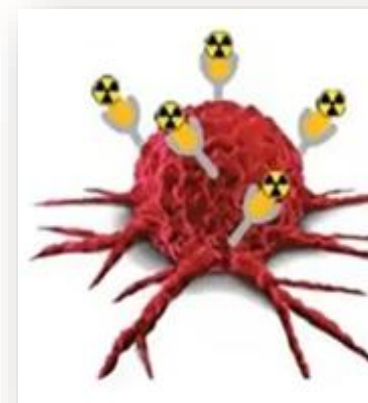
Cytotoxic cell death by ^{177}Lu -PSMA

Rol van PSMA in beeldvorming



PSMA PET: diagnostiek

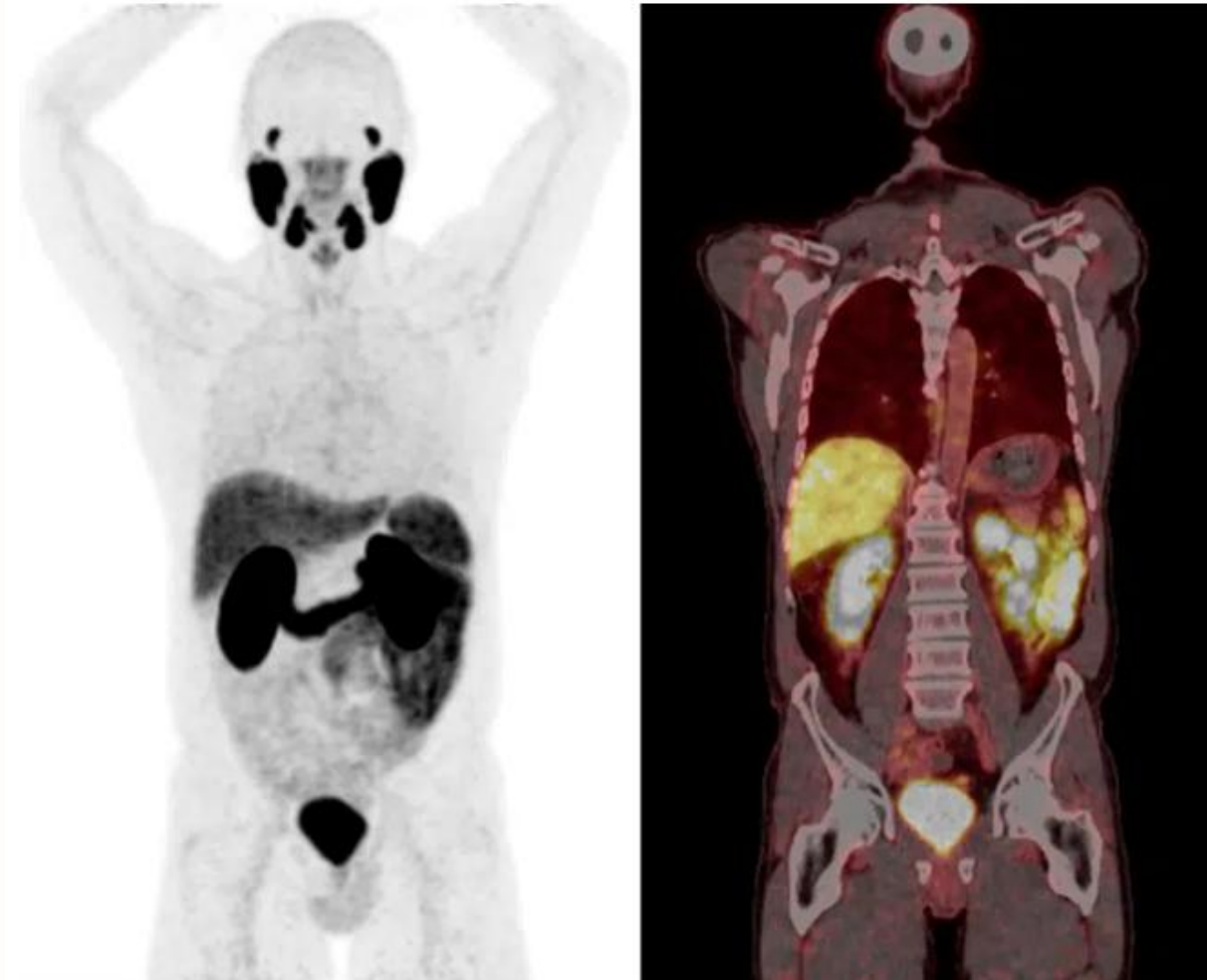
Radiofarmacon
IV injectie



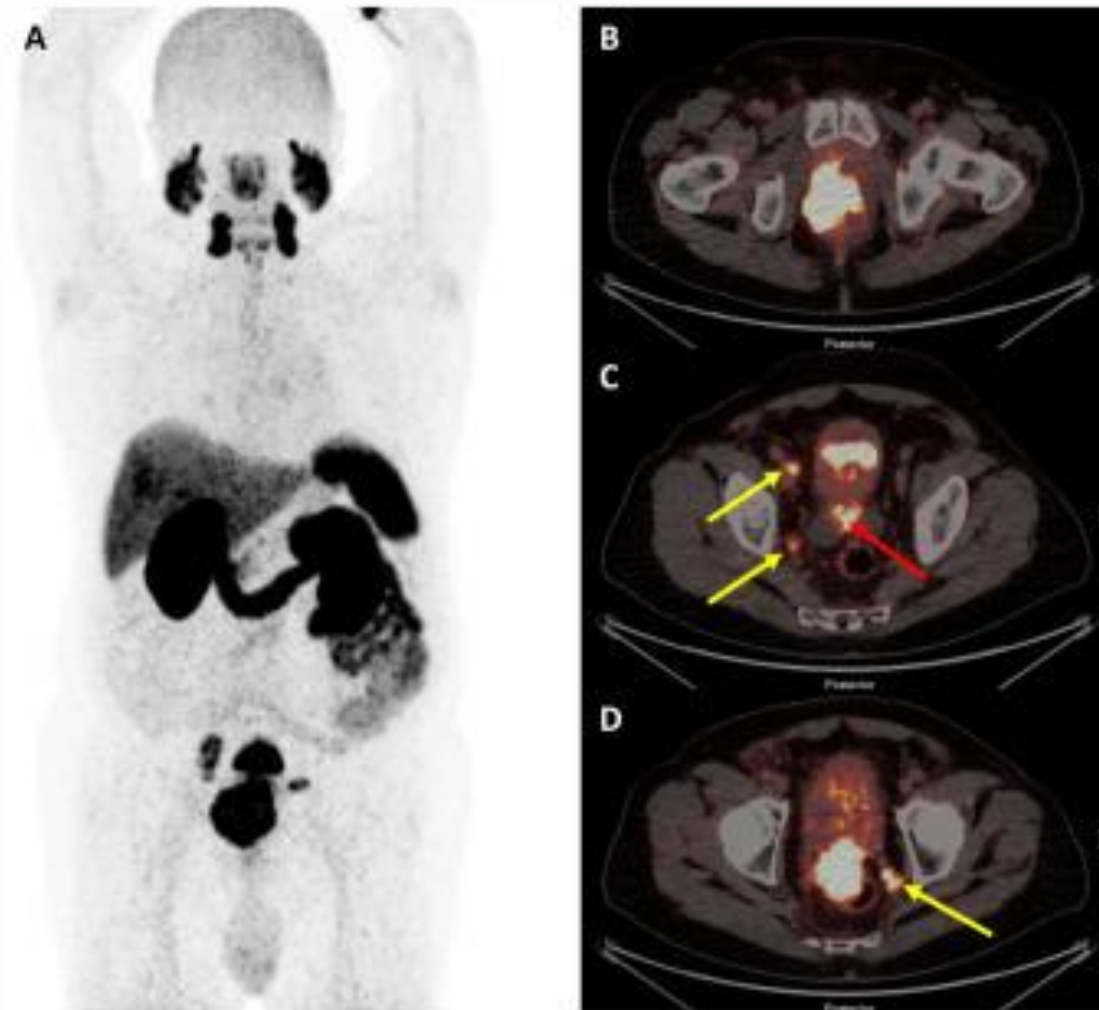
PET scan
Na (min) 60 min



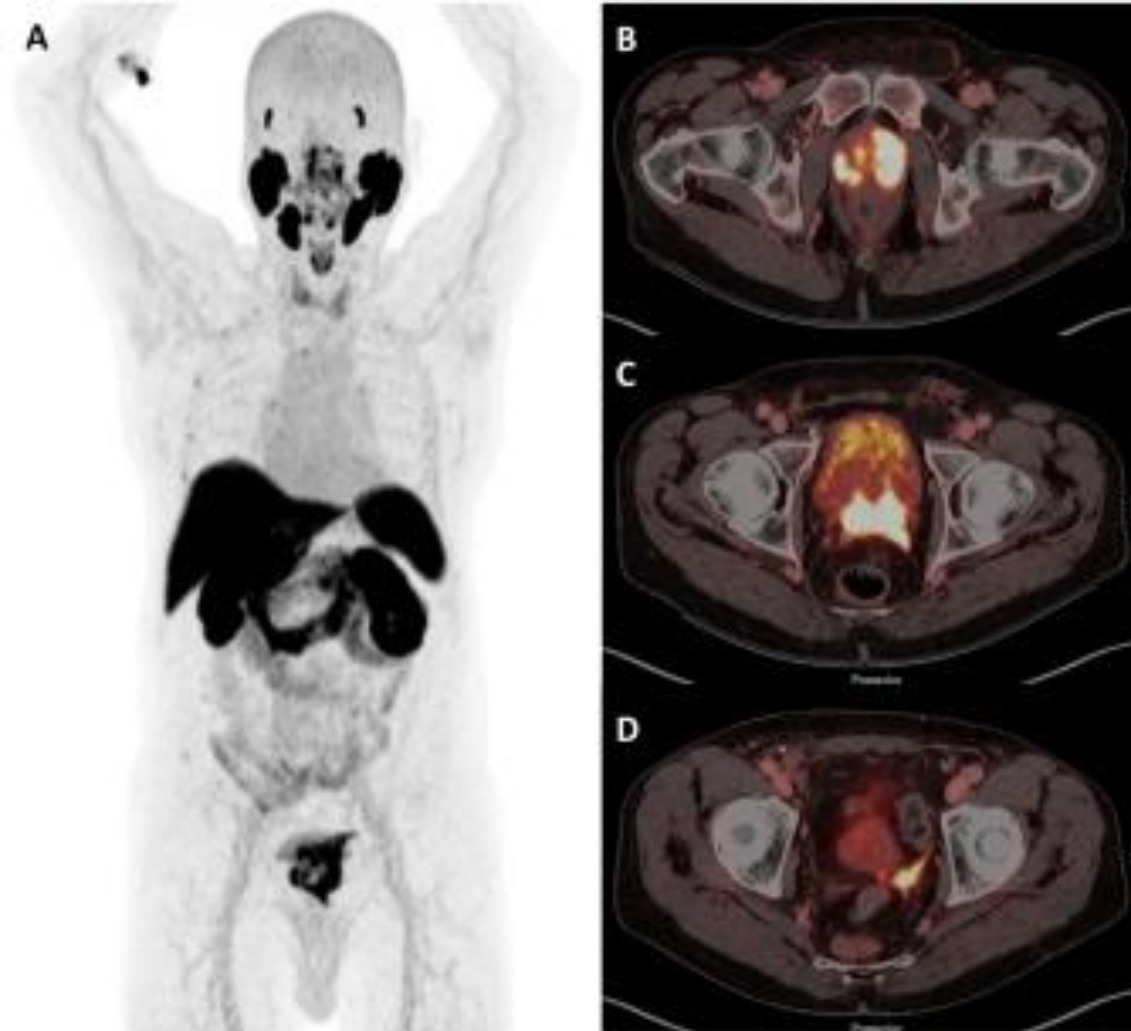
PSMA PET: normale verdeling



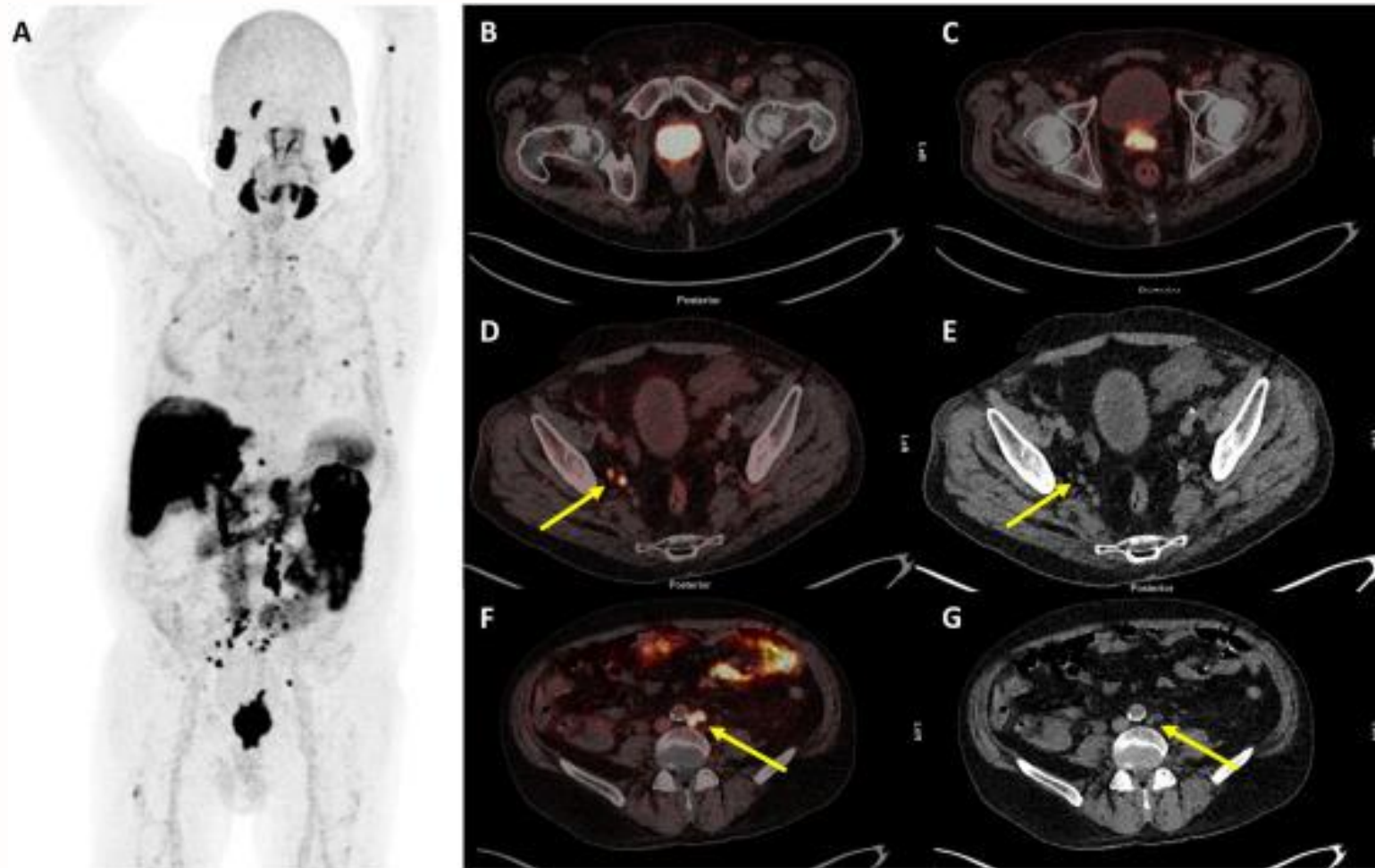
PSMA PET: voorbeelden



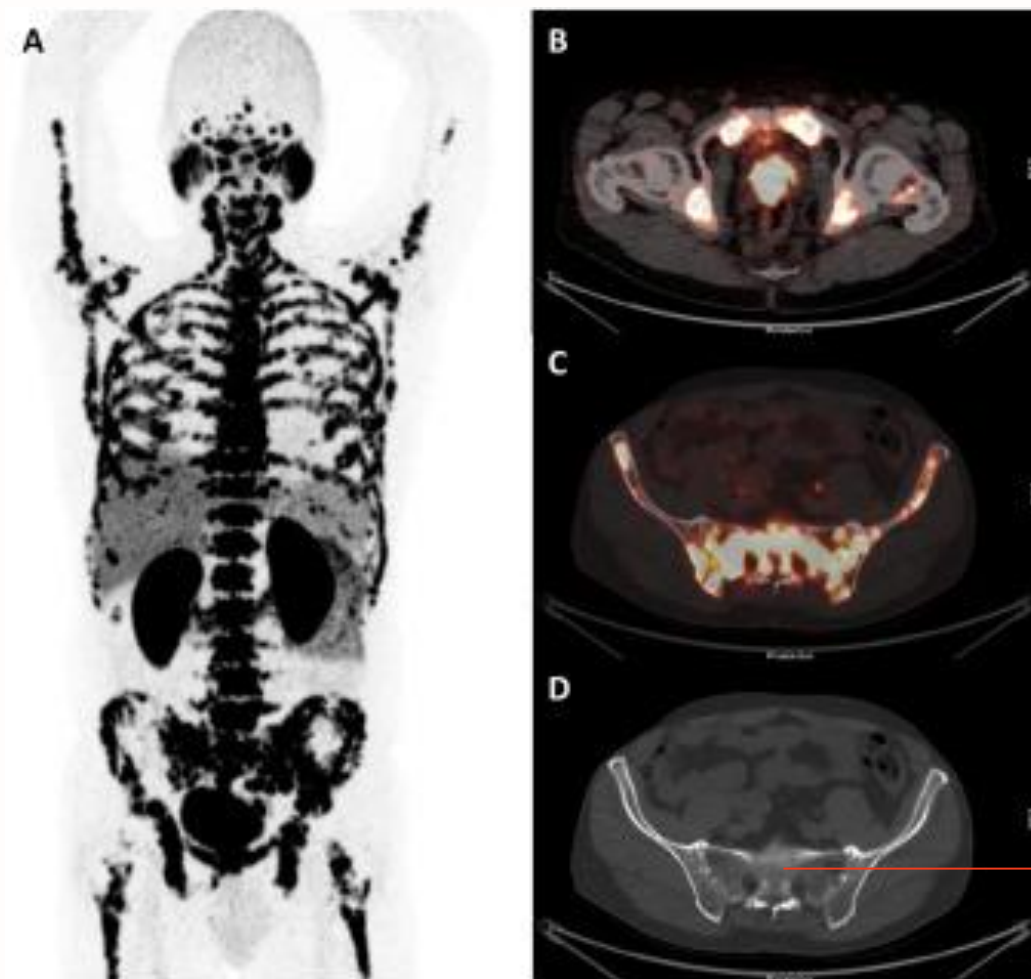
PSMA PET: voorbeelden



PSMA PET: voorbeelden



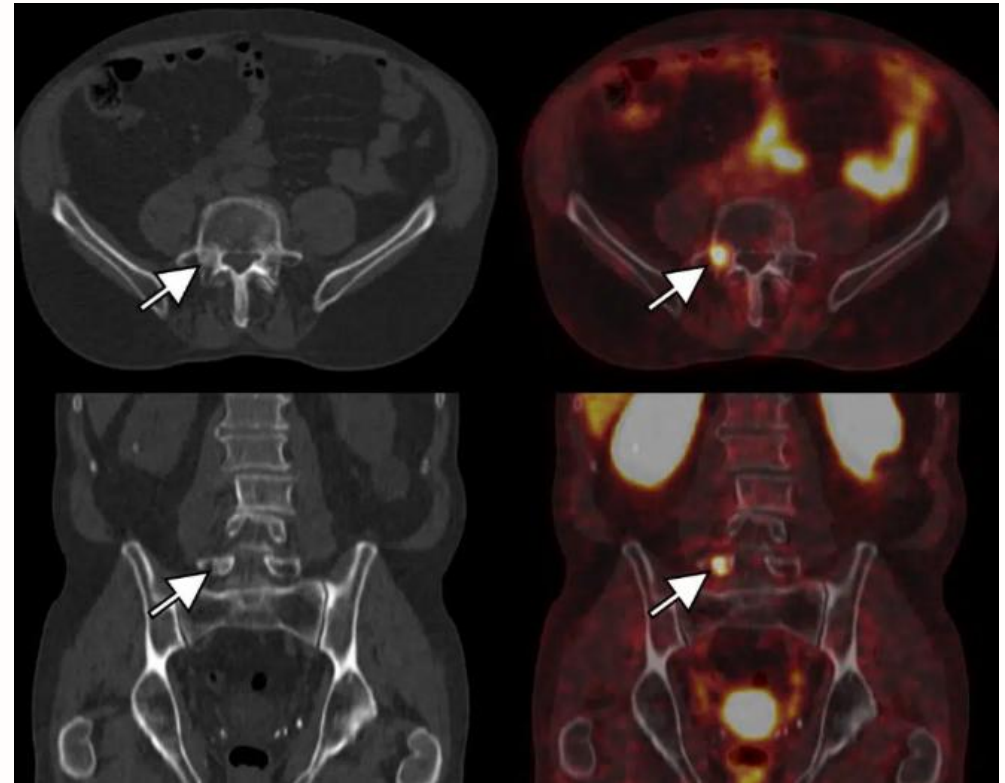
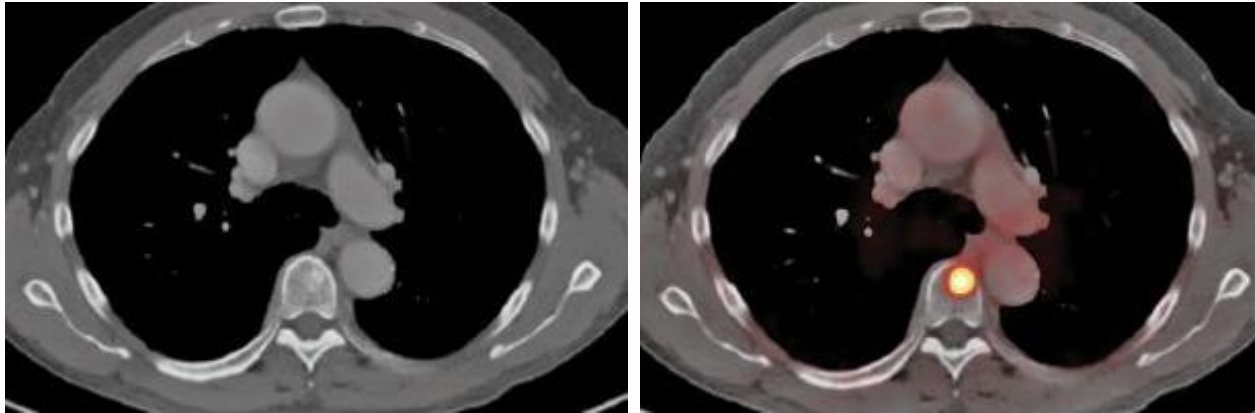
PSMA PET: voorbeelden



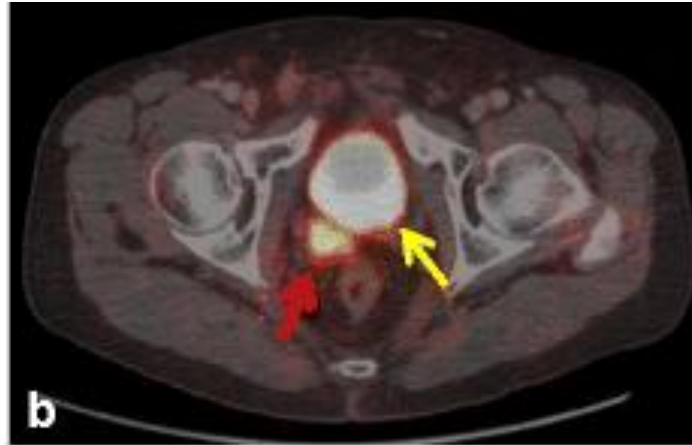
PSMA 'superscan'

Afwezigheid van
morfologische Δ

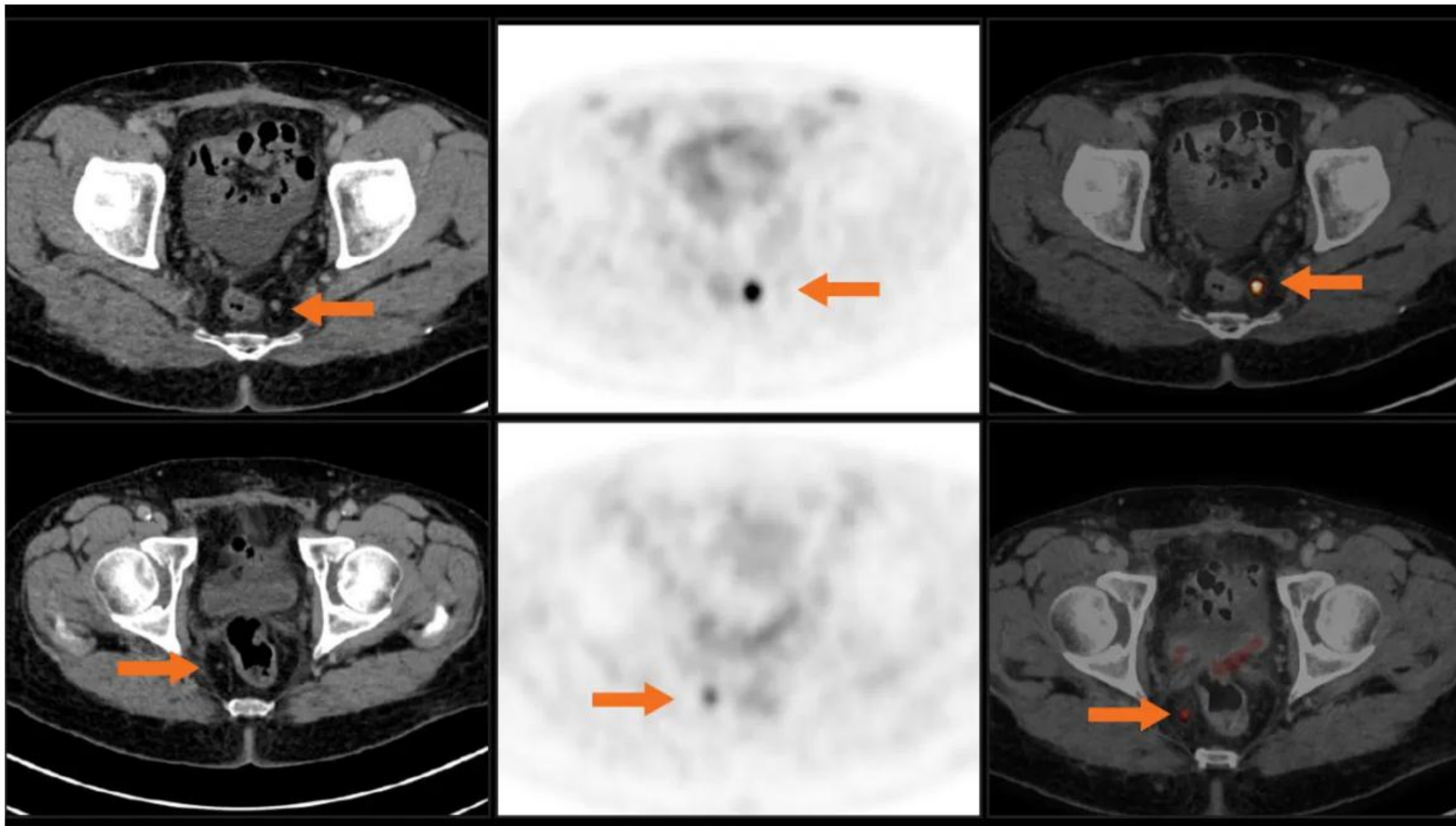
PSMA PET: voorbeelden



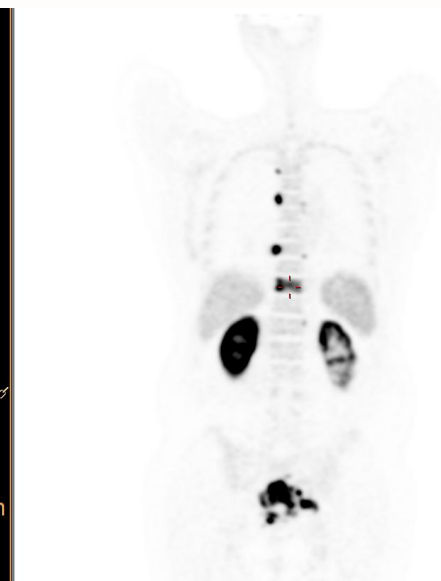
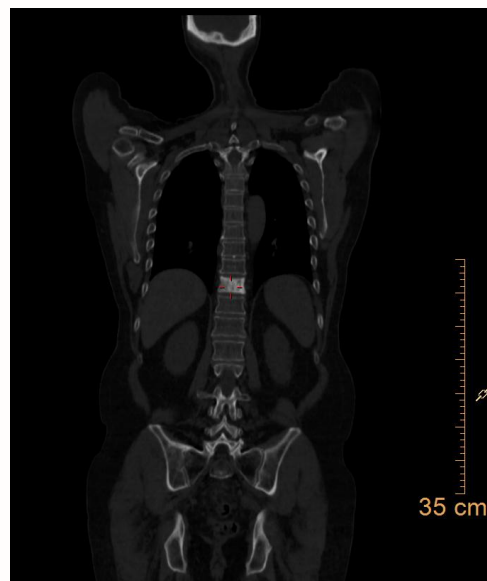
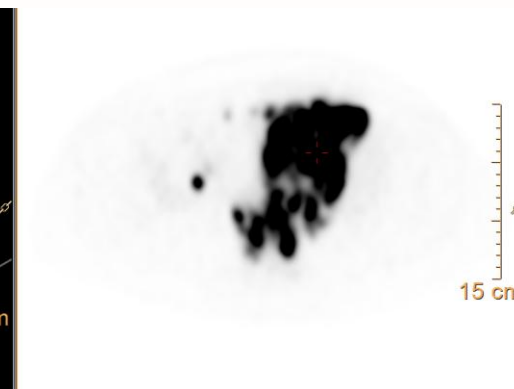
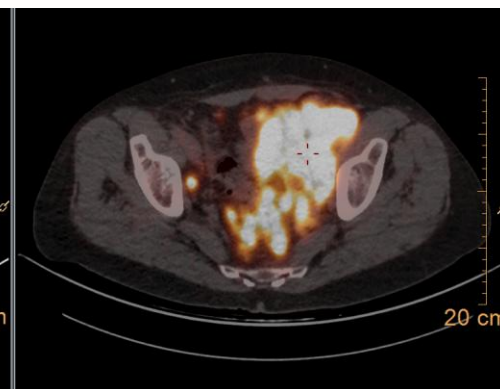
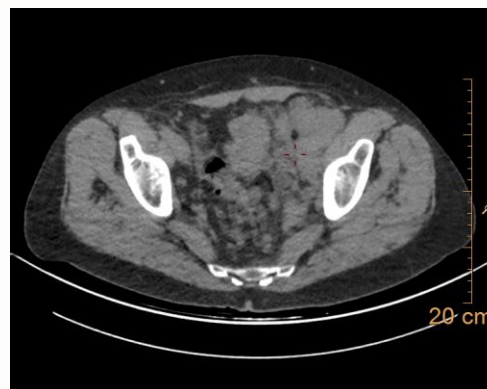
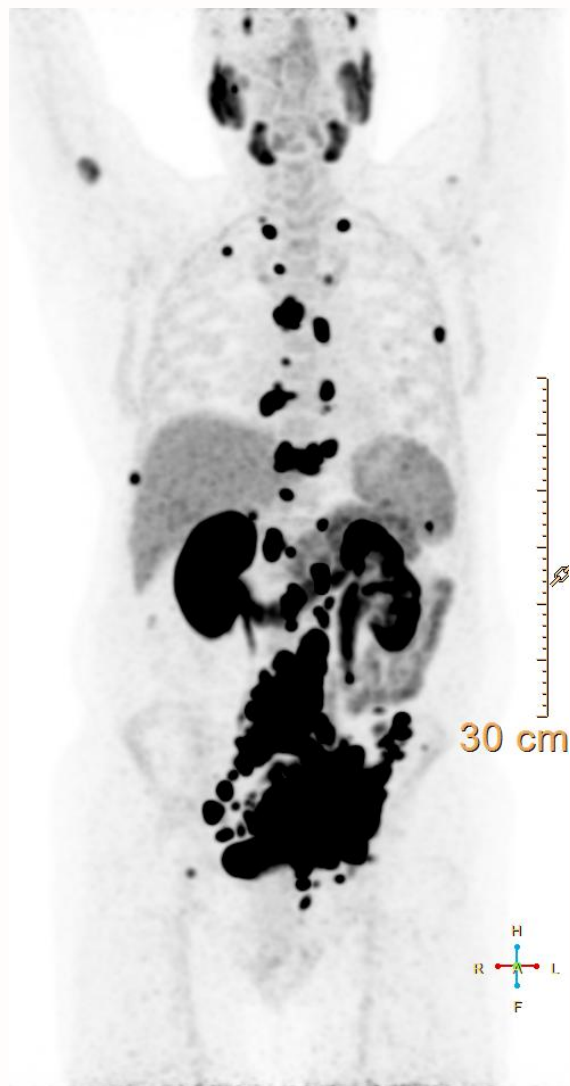
PSMA PET: voorbeelden



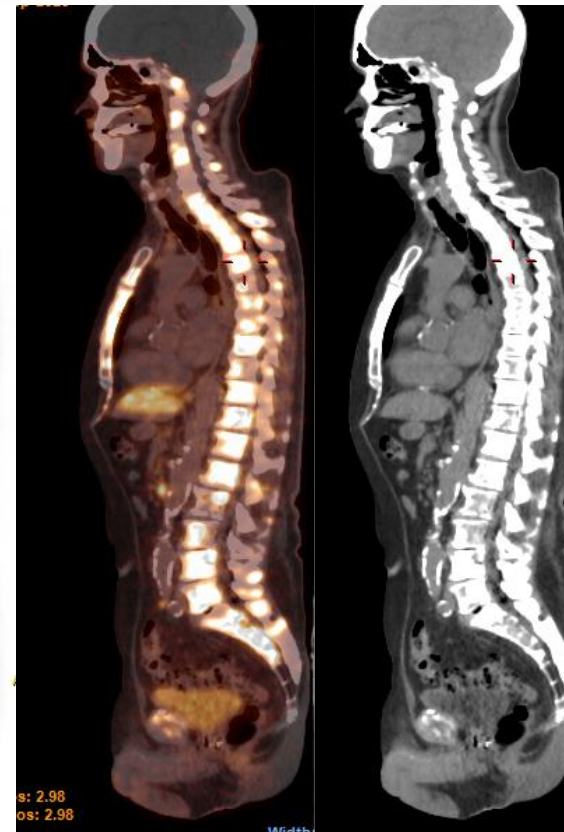
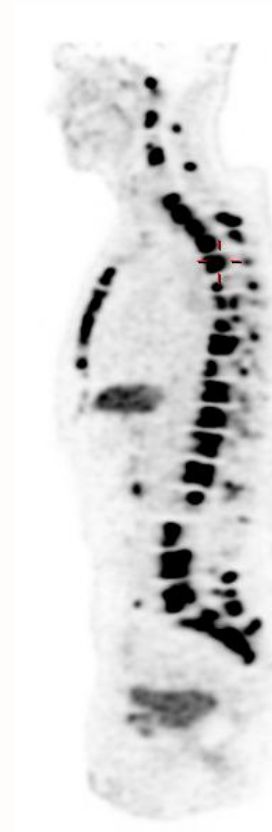
PSMA PET: voorbeelden



PSMA PET: kandidaat Lu-177 PSMA?



PSMA PET: kandidaat Lu-177 PSMA

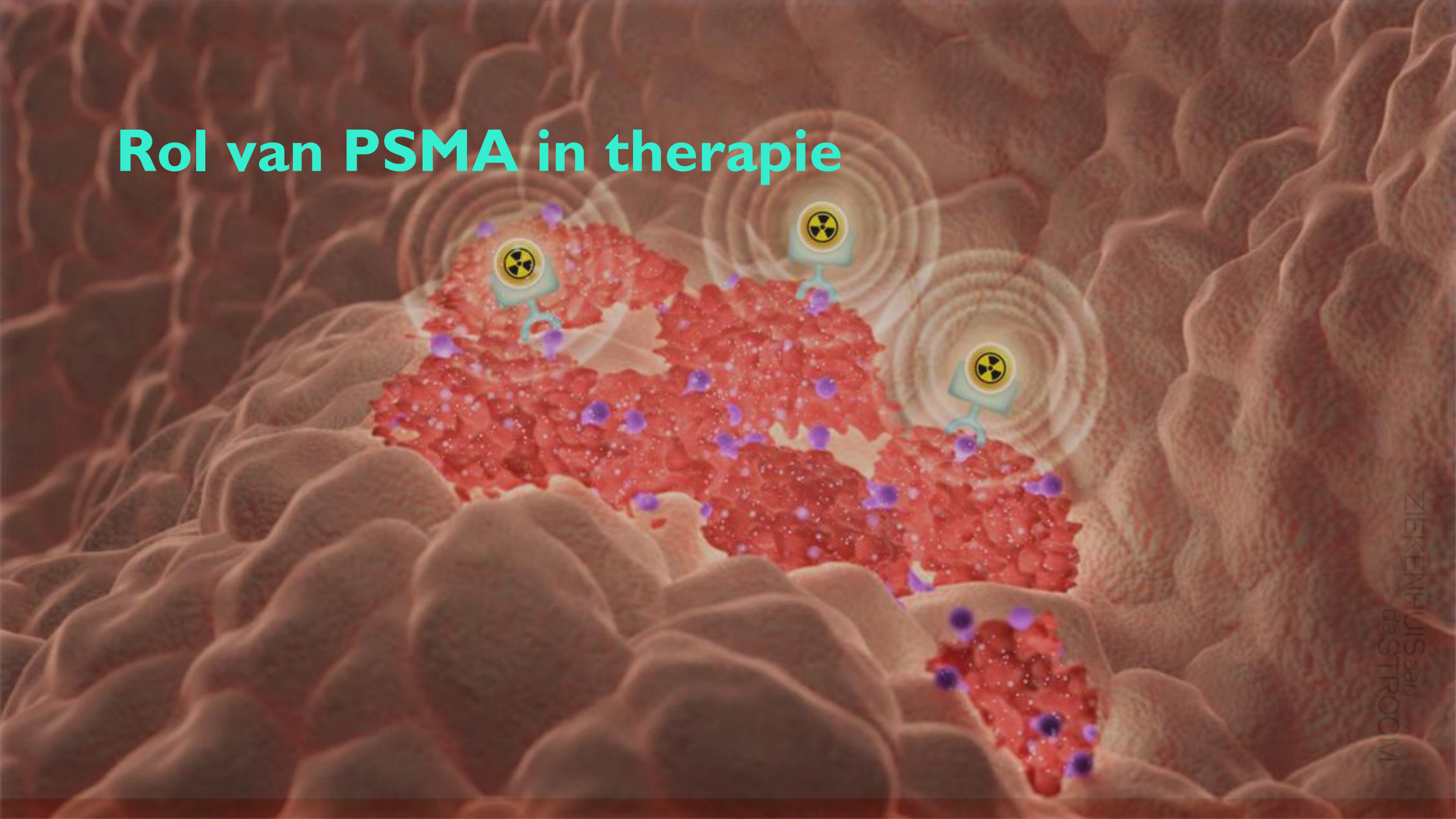


PSMA PET: voor wie?

- Primaire staging high-risk prostaatkanker
- Biochemisch herval (PSA > 0,2 ng/mL)
- mCRPC staging voor Lu-177 PSMA therapie



Rol van PSMA in therapie



Radioligandtherapie: ¹⁷⁷-Lutetium PSMA

Radiofarmacon

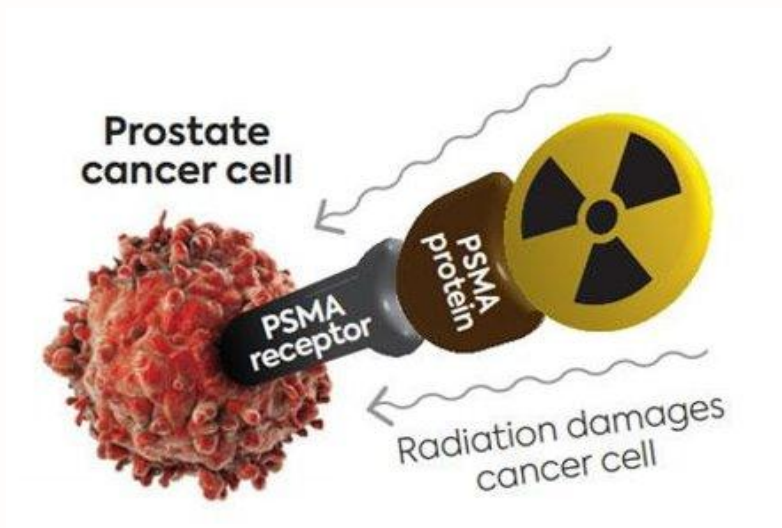
IV injectie



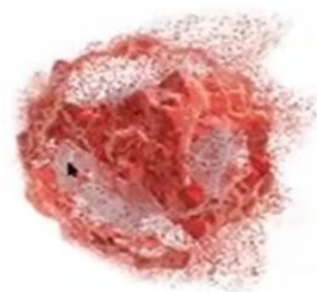
Lutetium-177 (of Actinium 225)



PSMA (ligand)

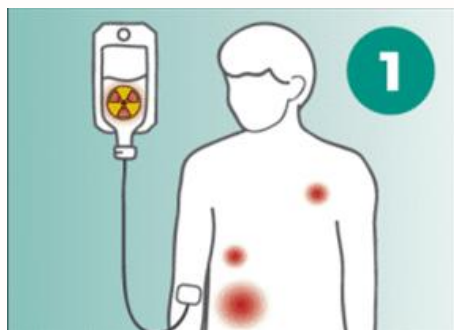


β -straling

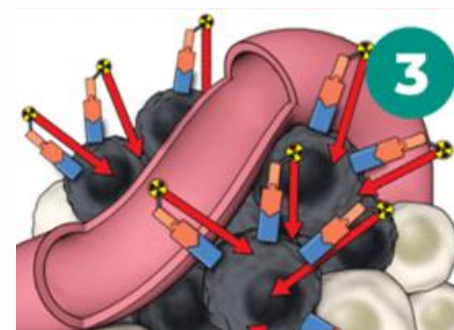
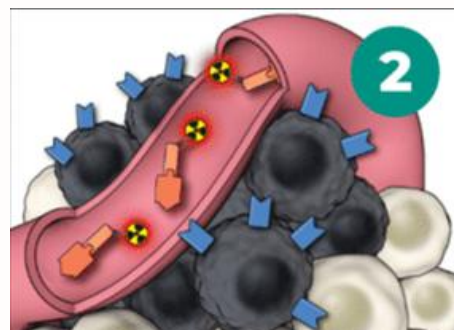


Celdood

¹⁷⁷-Lutetium PSMA: werkingsmechanisme



Intraveneuze injectie

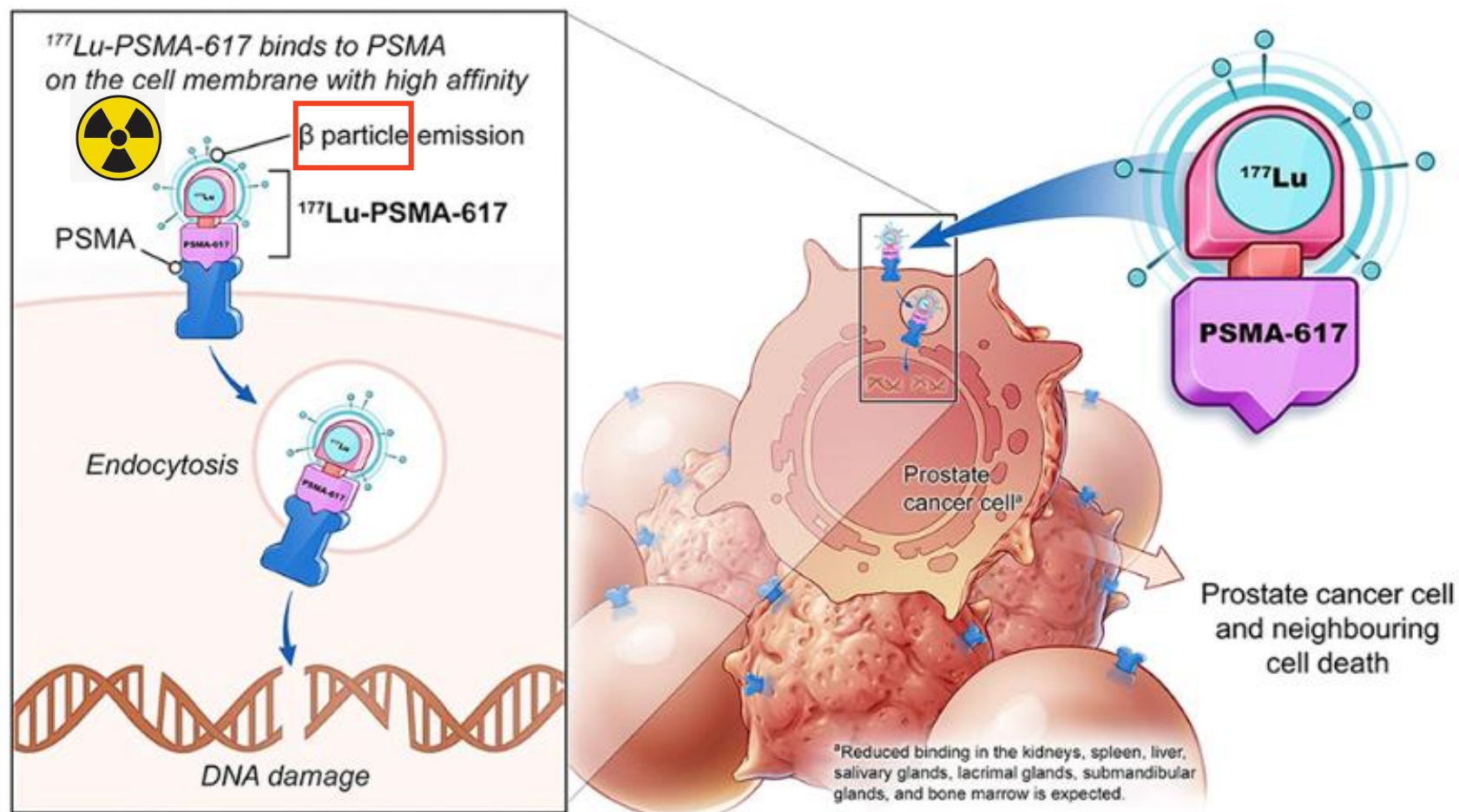


Specifieke binding aan PSMA receptoren, waarna 'interne' bestraling met β -



Prostaatkankercel apoptose

^{177}Lu -PSMA: op cellulair niveau



VISION trial

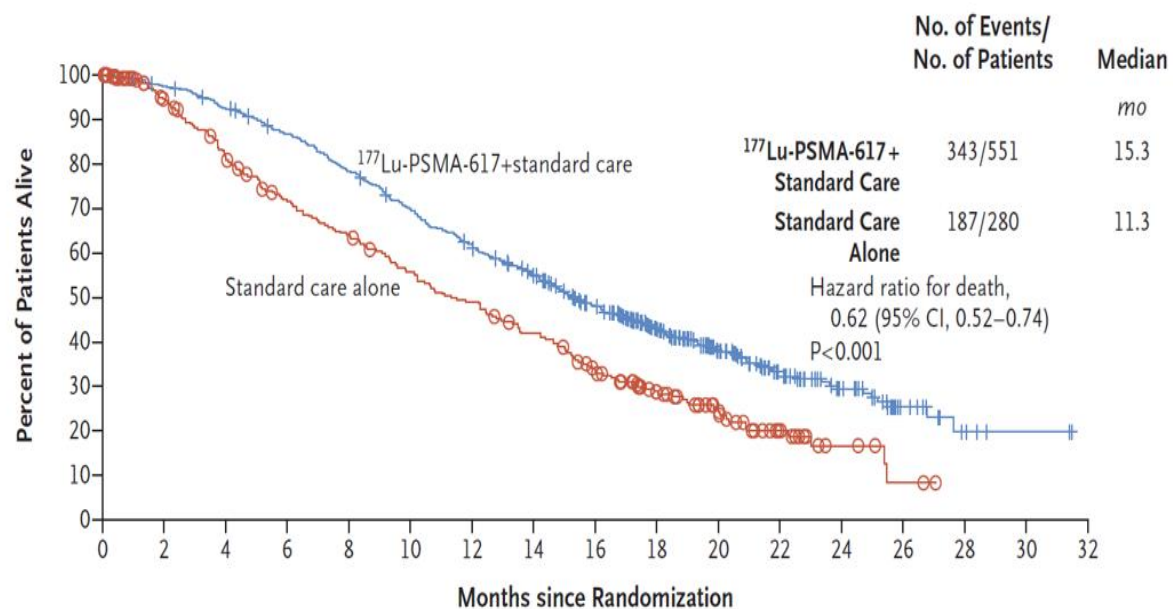
ORIGINAL ARTICLE

Lutetium-177-PSMA-617 for Metastatic Castration-Resistant Prostate Cancer

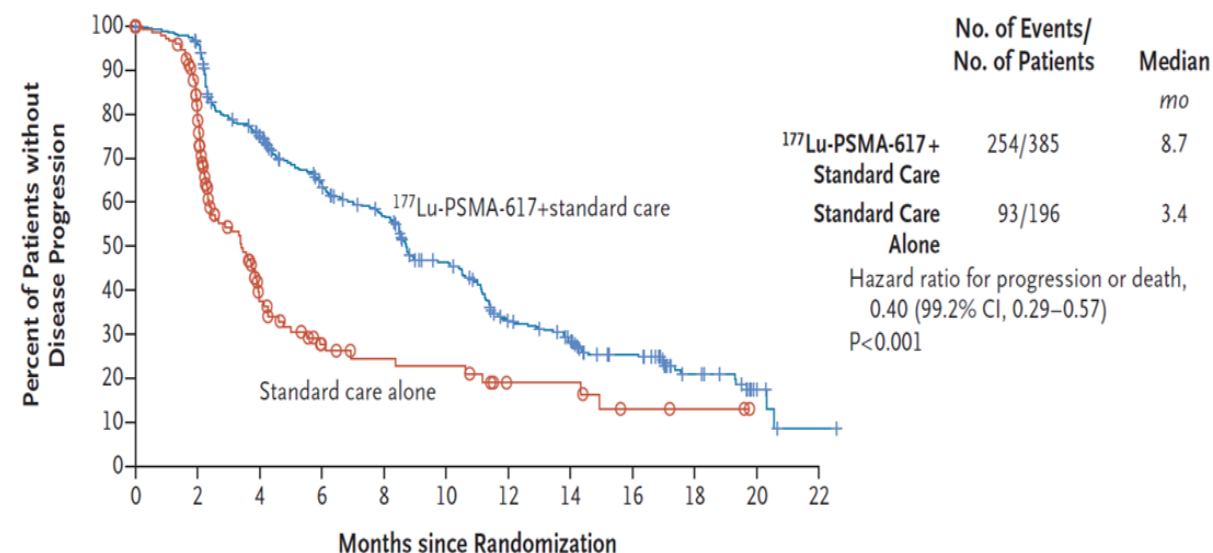


Sartor et al., NEJM 2021

VISION: primary endpoints



38% reduced risk of death



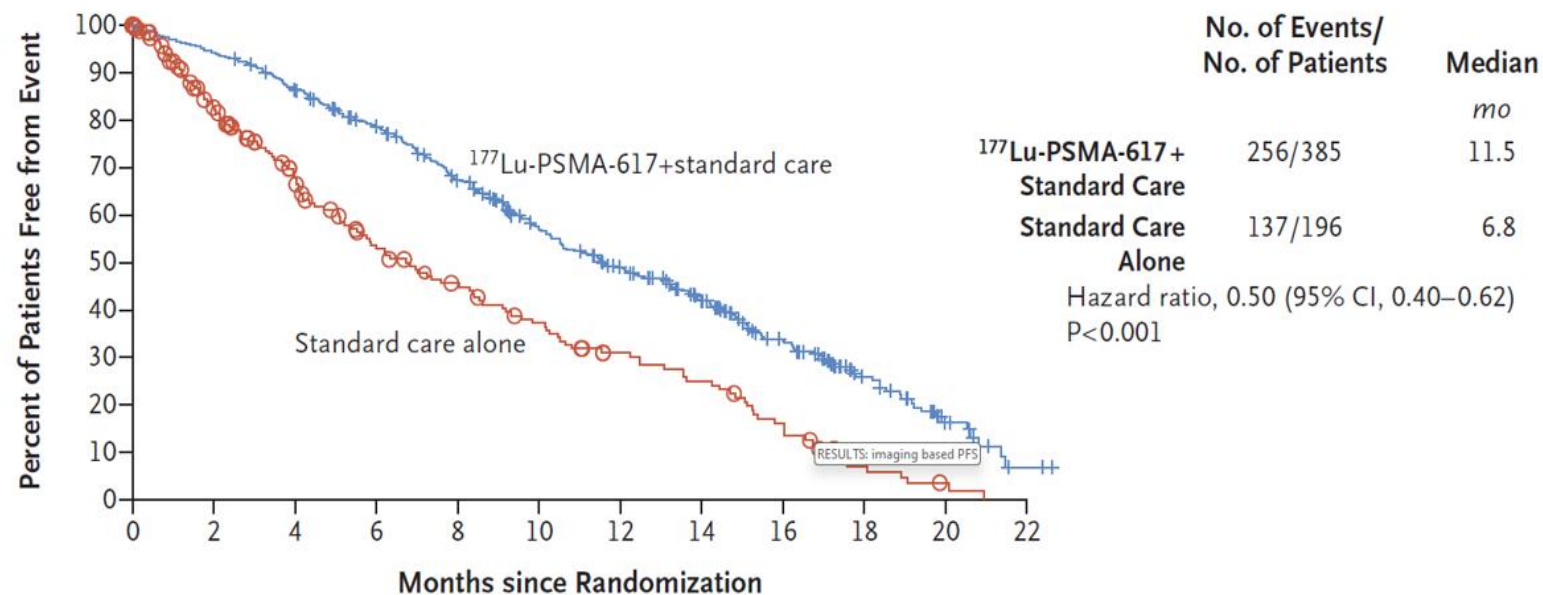
60% reduced risk of progression



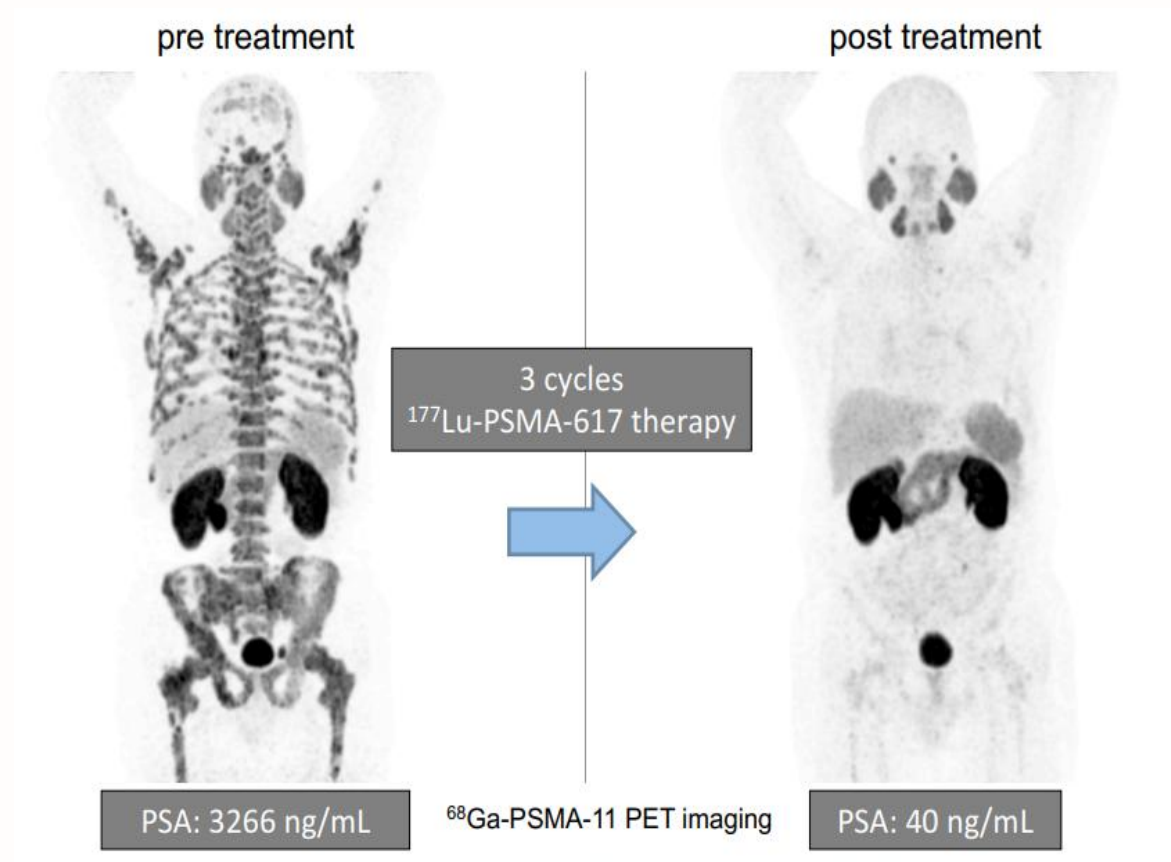
Sartor et al., NEJM 2021

VISION: secondary endpoint

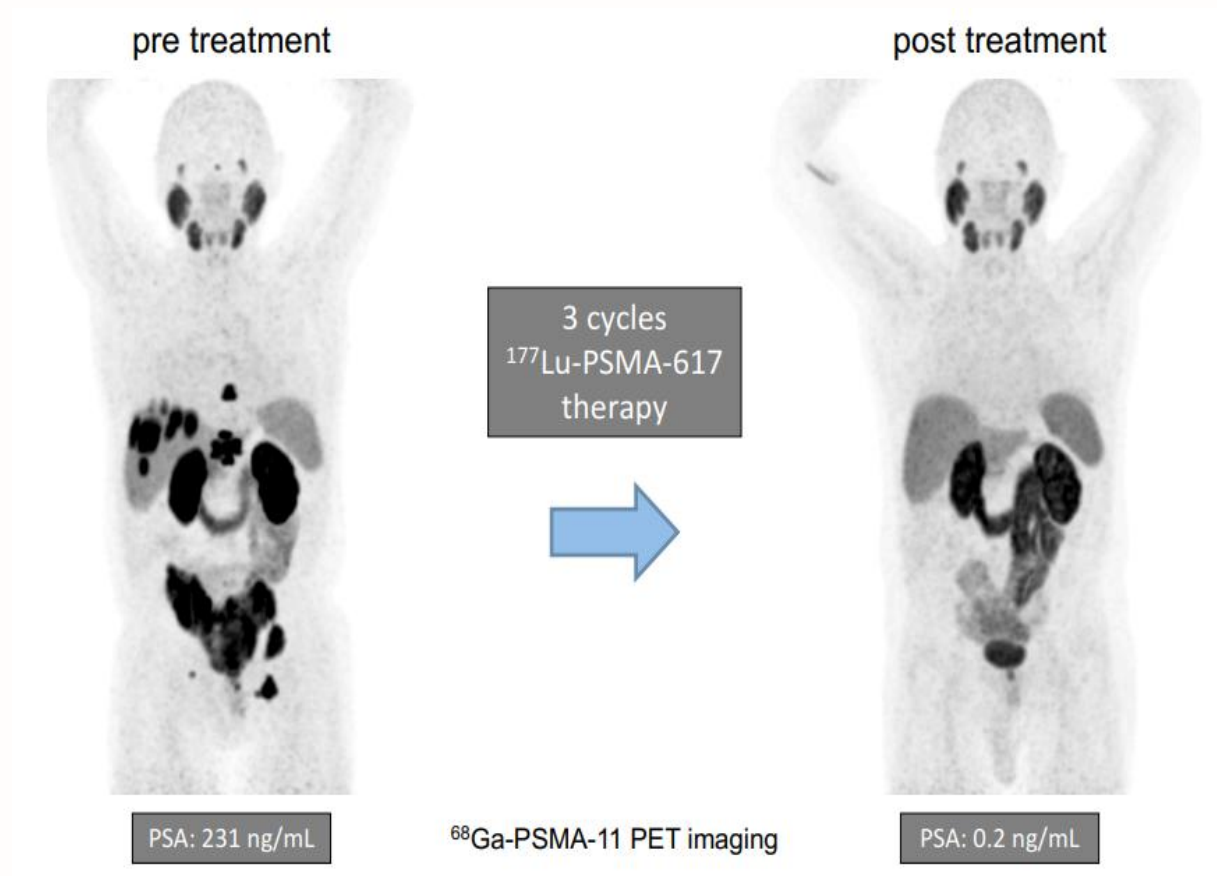
Time to First Symptomatic Skeletal Event



Resultaten in beeld



Resultaten in beeld



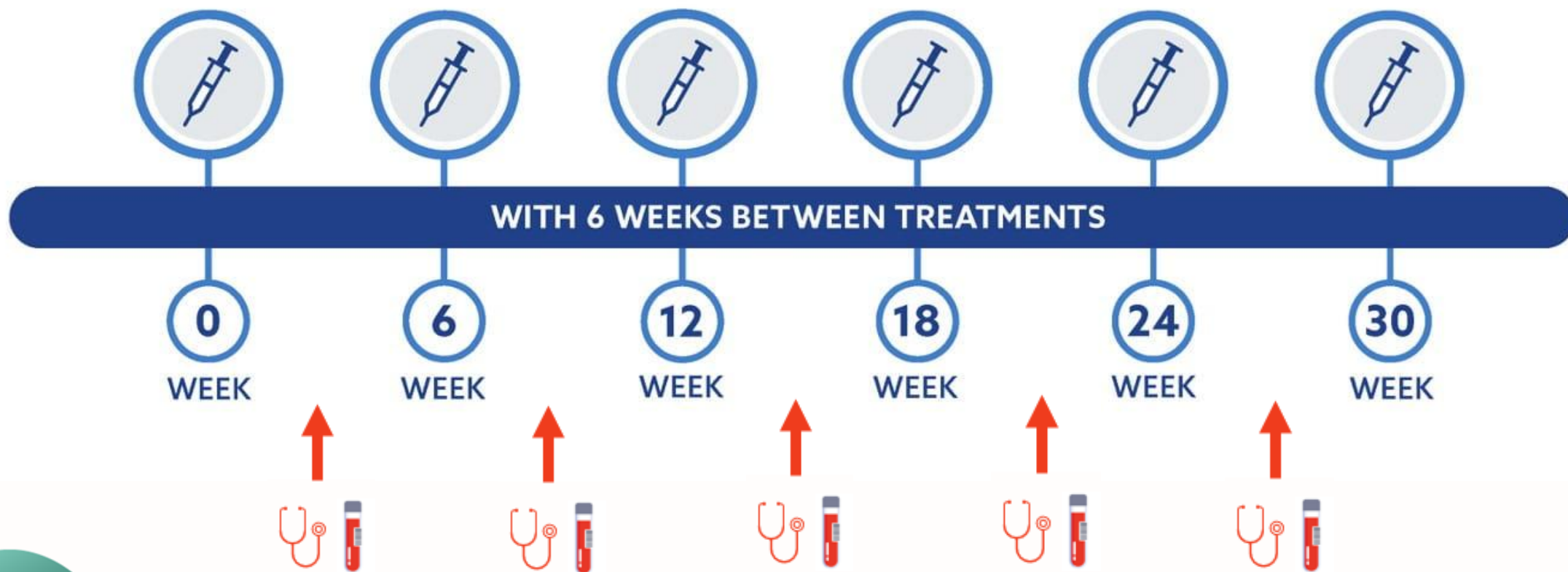
177-Lutetium PSMA: voor wie?



- ☐ Progressief mCRPC na standaard therapieën, inclusief taxaan-gebaseerde chemotherapie en een 2e generatie antiandrogeen therapie, tenzij de patiënt niet in aanmerking komt voor deze behandelingen of de patiënt deze geweigerd heeft
- ☐ PSMA+ letsels op PSMA PET/CT scan
- ☐ Levensverwachting van minimum 6 maanden
- ☐ ECOG 0-2
- ☐ Voldoende orgaanfunctie (lever, nier, beenmerg)



Administered for up to **6** treatments



^{177}Lu -PSMA therapie: nevenwerkingen

- Globaal goede tolerantie en laaggradige toxiciteit
- Target = **PSMA** (prostaat '*specifiek*' membraan antigen)
 - Tumorcellen zeer gericht behandelen zonder gezond weefsel aan te tasten => milde toxiciteit, goede tolerantie
 - Echter niet 100% specifiek...



¹⁷⁷Lu-PSMA therapie: nevenwerkingen

Potentiële bijwerkingen:

- Vermoeidheid (eerste 4 weken)
- Nausea (eerste 48u na behandeling) - preventief Ondansetron
- Xerostomie (droge mond): mild en transcient
- Hematotoxiciteit
- (droge ogen)
- (gewichtsverlies)

Lu-177 PSMA: take home messages

Wat?

Doelgerichte **precieze** bestraling van prostaatkankercellen met relatief sparen van gezond weefsel (→ goed tolerantie)

Wie?

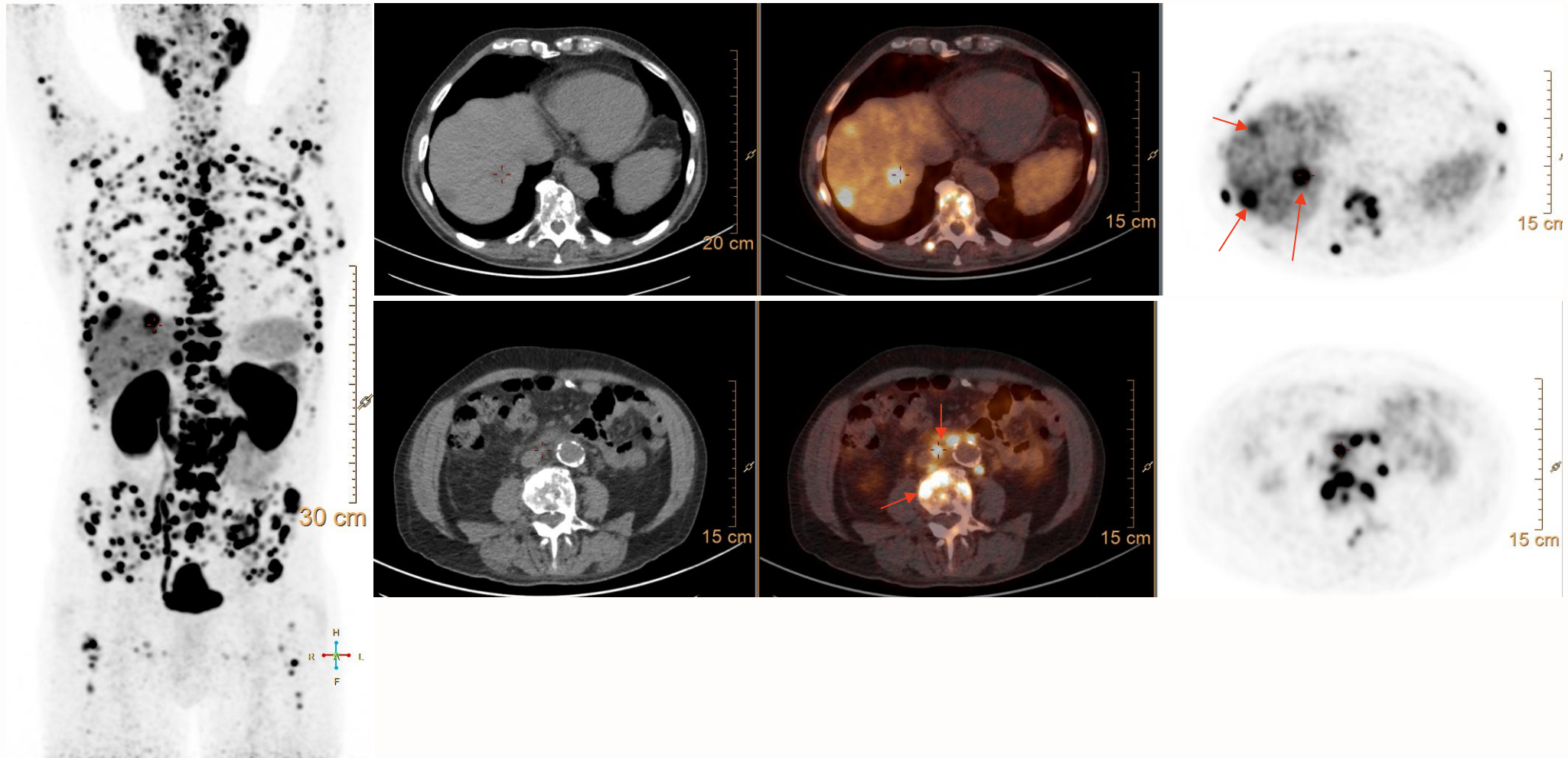
Patiënten met progressief gemetastaseerd castratie-resistent prostaatkanker (mCRPC)

Hoe?

Tot 6 kuren, om de 6-8 weken



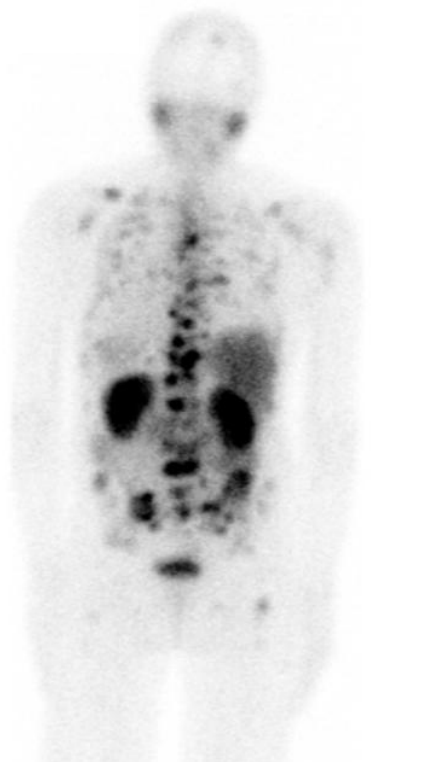
Casus X



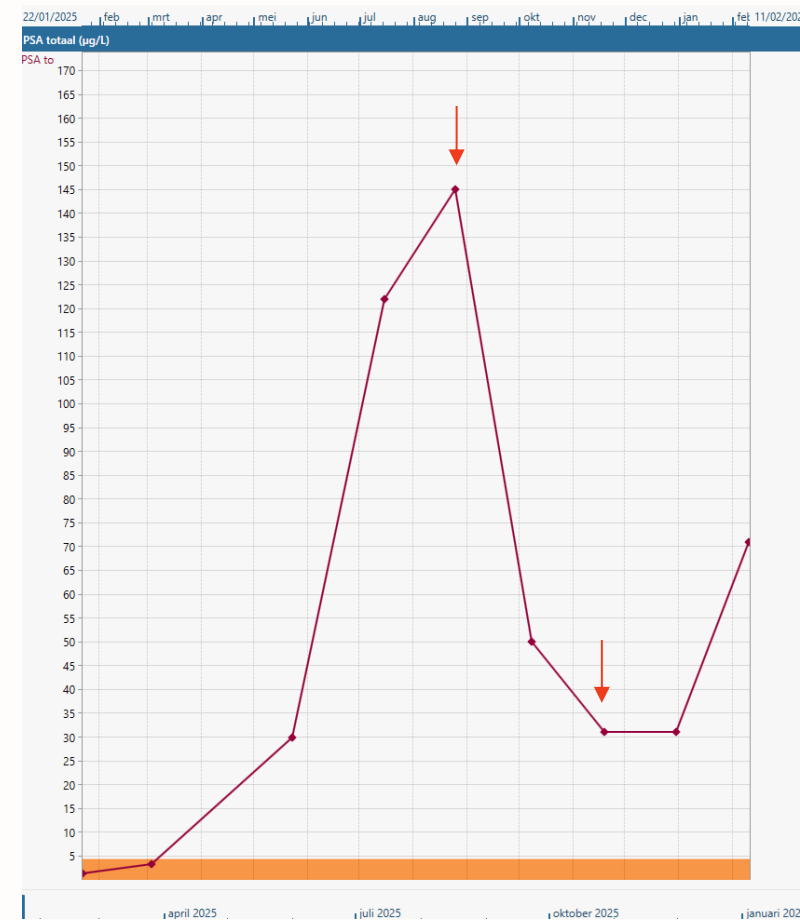
Therapierespons



Na 1e cyclus

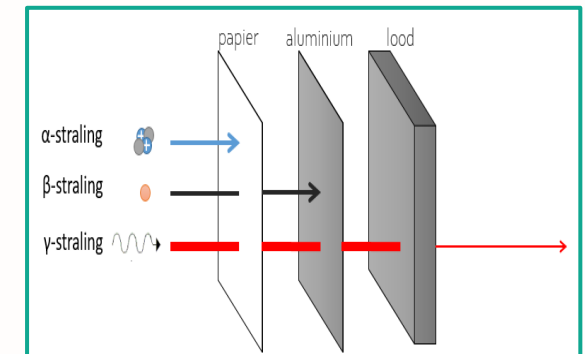
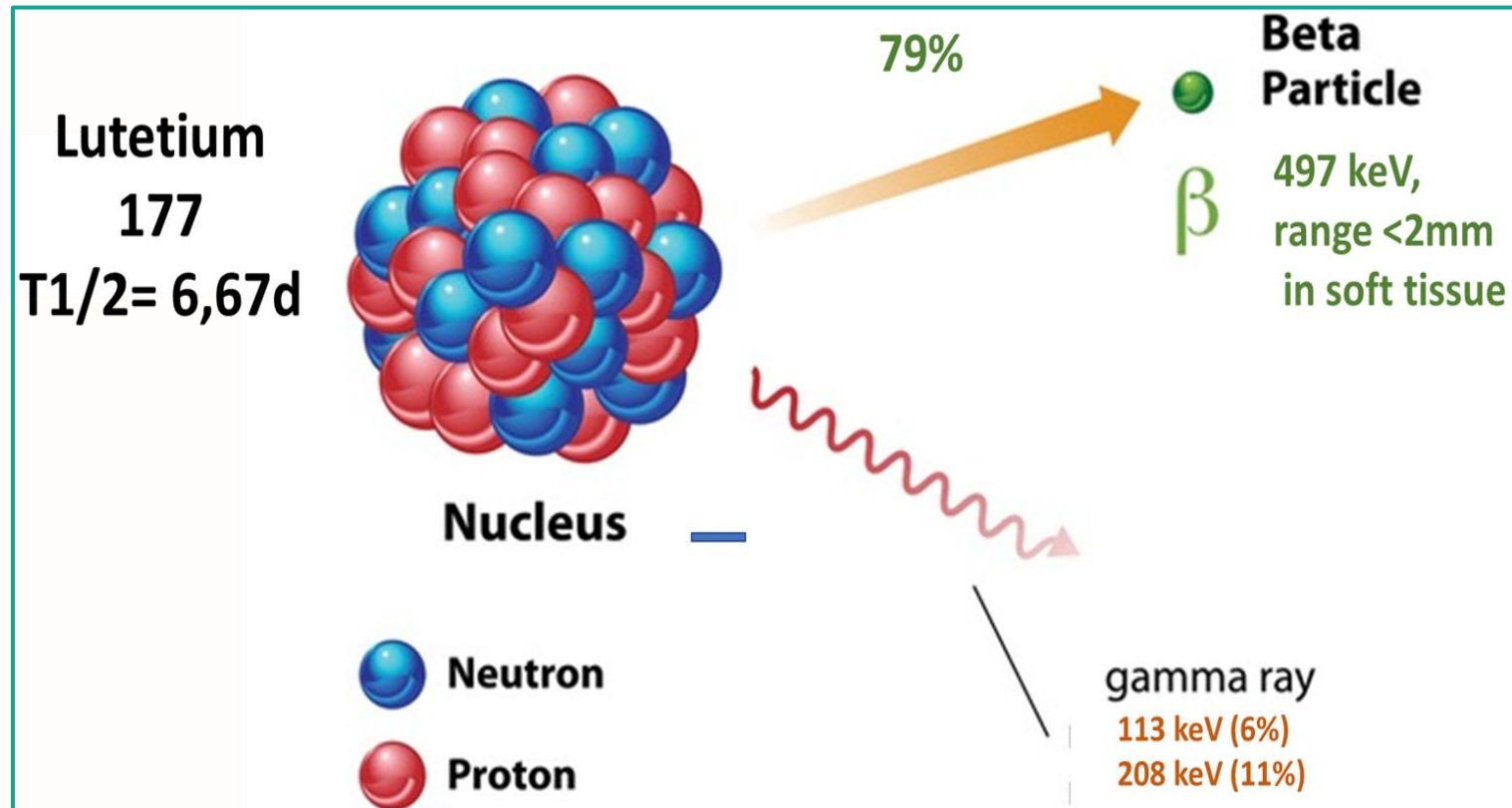


Na 3e cyclus



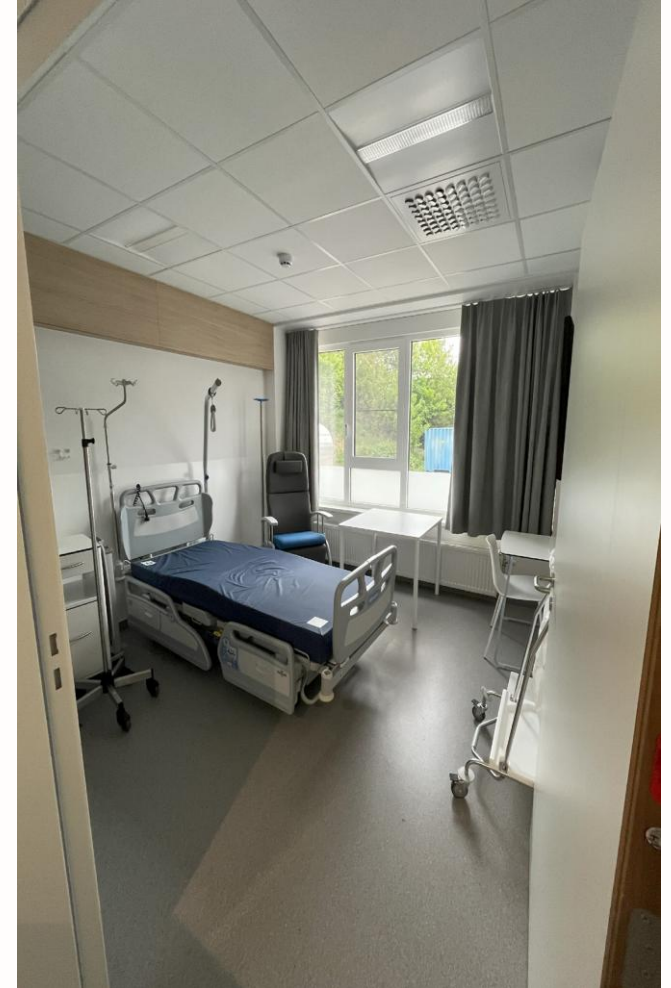
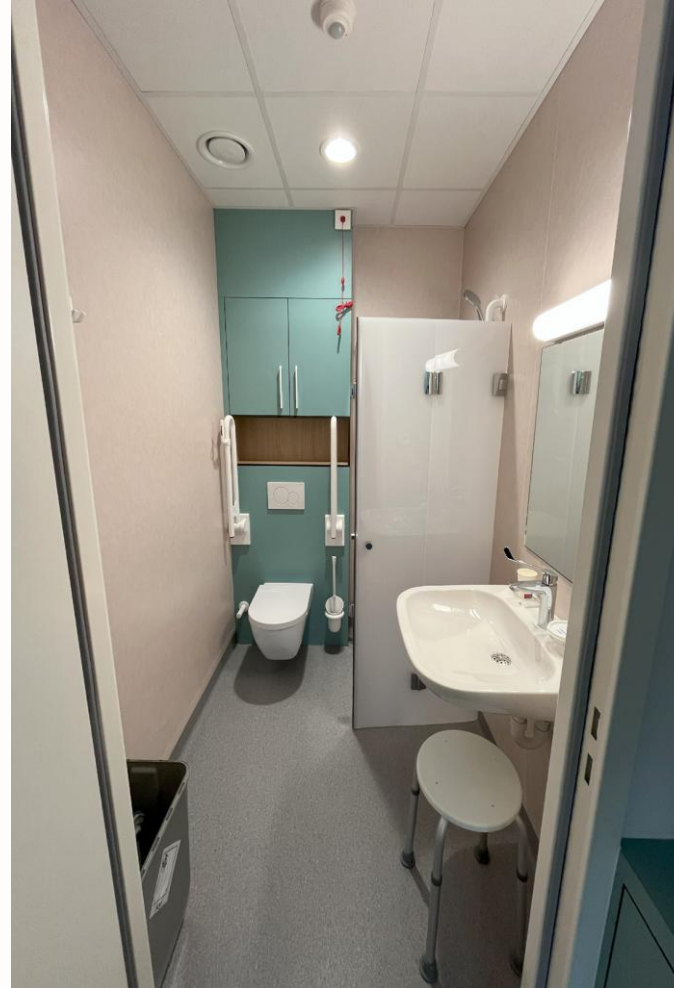


Radionuclide Lutetium-177



Therapiekamers

- 3 nieuwe kamers
- ZAS Augustinus, afdeling oncologie
- **1 overnachting (24 uur)** in 'metabole therapiekamer'
- Betonnen/loden muren
- geen bezoek, patiënt mag kamer niet verlaten



Septische putten

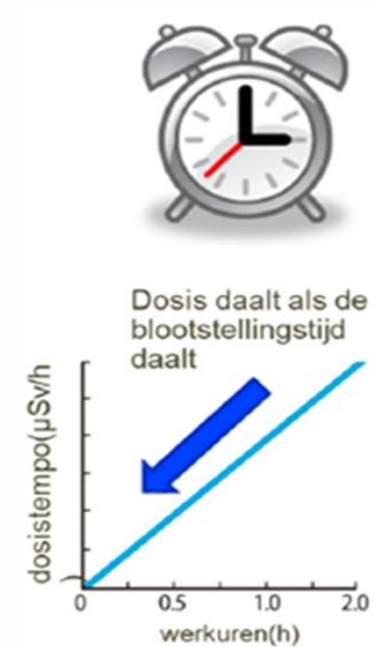
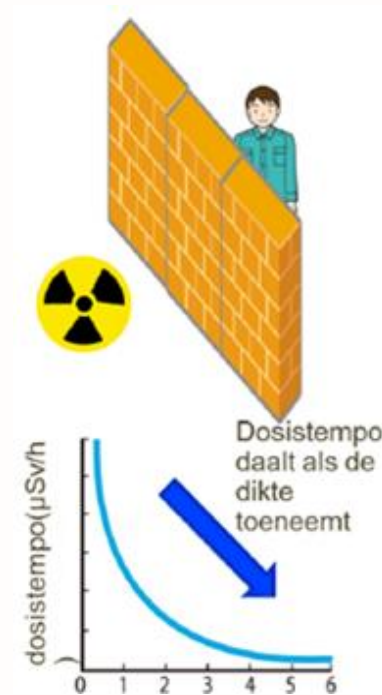
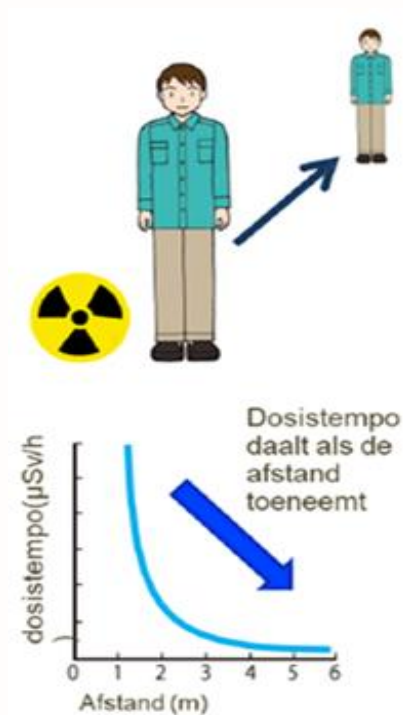
^{177}Lu -PSMA (unbounded)
snelle excretie via **urine**

radio-actieve urine eerste dagen!



Vuistregels radioprotectie ('ALARA')

(γ – component)





Na te leven leefregels: gedurende 3 dagen na de injectie





Ziekenhuis aan de Stroom
[ZAS] is het netwerk van
ZNA en GZA Ziekenhuizen

