

MSCV

Concepts of medical image post-processing

PRACTICAL

**Management and Post-Processing
of Prostate MRI.**

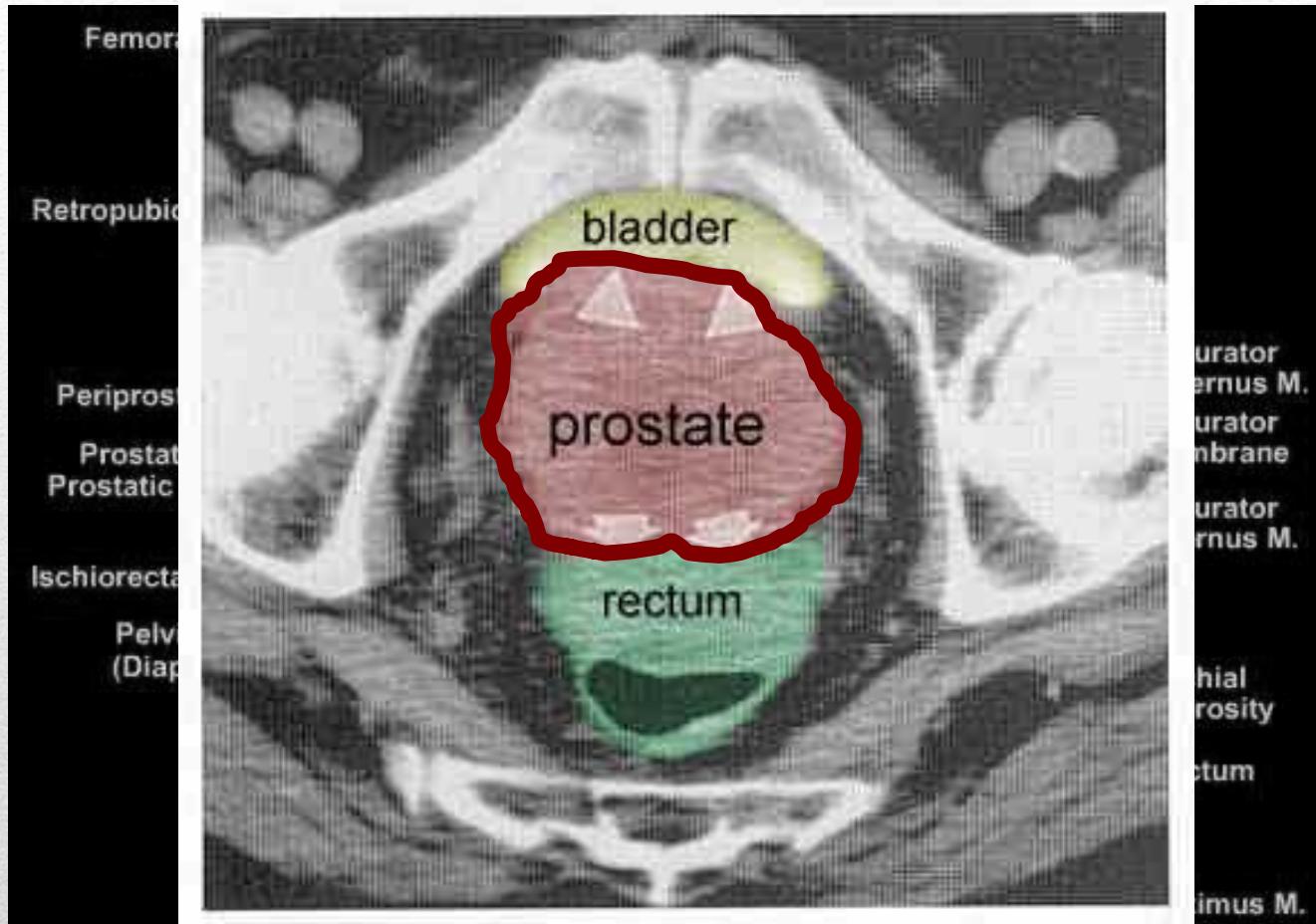
1

Prostate cancer → leading cause of cancer in males.

MRI sequence used for prostate cancer:

- **Anatomy Imaging** – *3D - T2 weighted imaging*
- **Diffusion Imaging** – *ADC (Apparent Diffusion Coefficient)*
- **Perfusion imaging** - *DCE (Dynamic Contrast Enhance)*
(observation from signal-intensity time curve)
- **Spectroscopy Imaging**

Prostate Cancer and Diagnosis

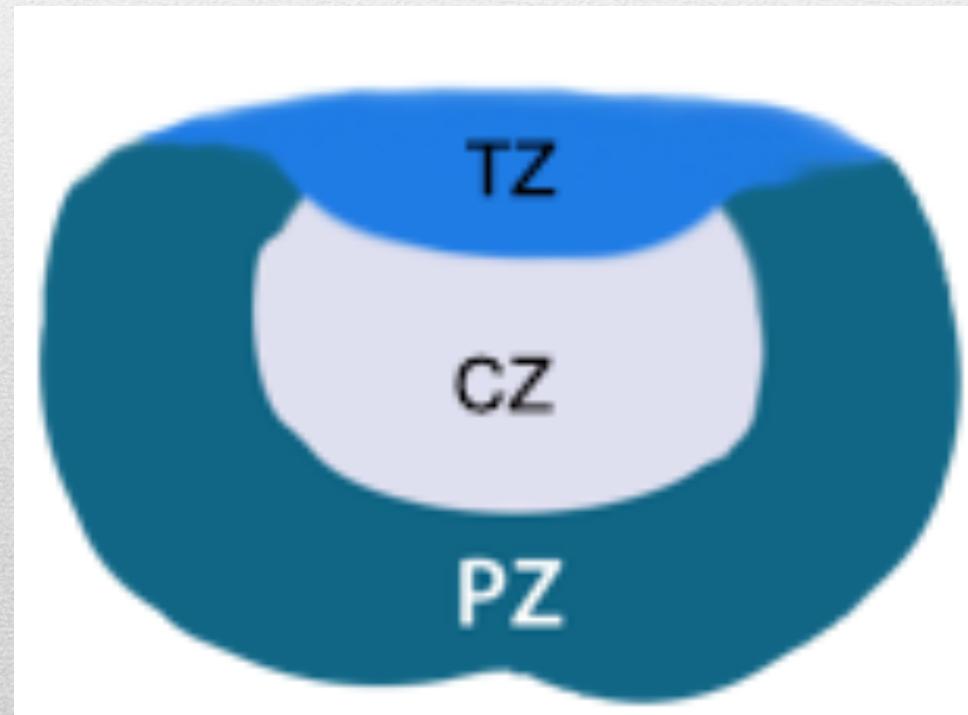


<http://mriprotocol.blogspot.com.es/2012/10/mri-anatomy-of-prostate.html>

3

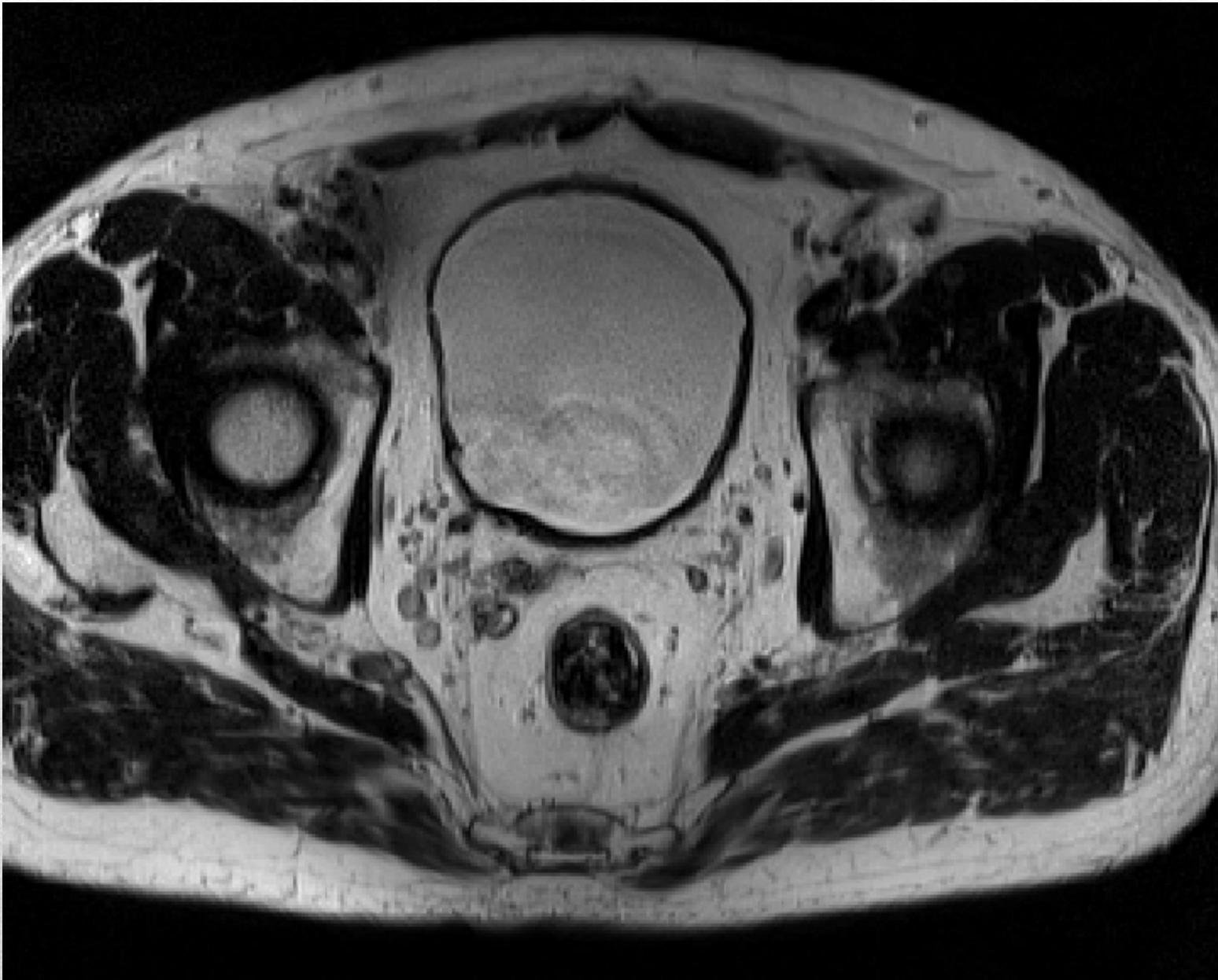
Anatomy of a normal prostate

- The **Peripheral zone (PZ)** shows hyperintensity
- The **Central zone (CZ)** and
- The **Transition zone (TZ)** are the constituent of the internal gland. Also, It presents an hypointense.



4

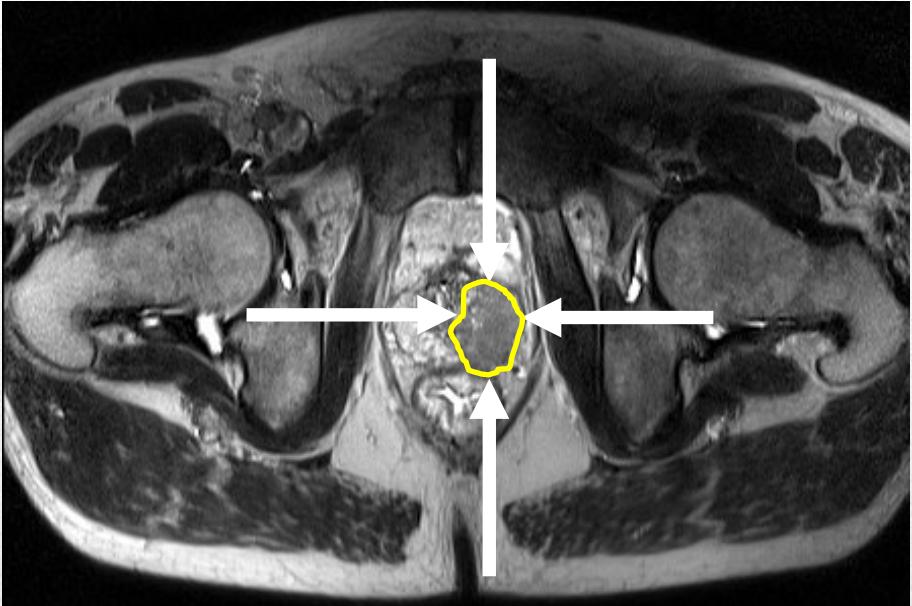
3DT2-weighted sequence



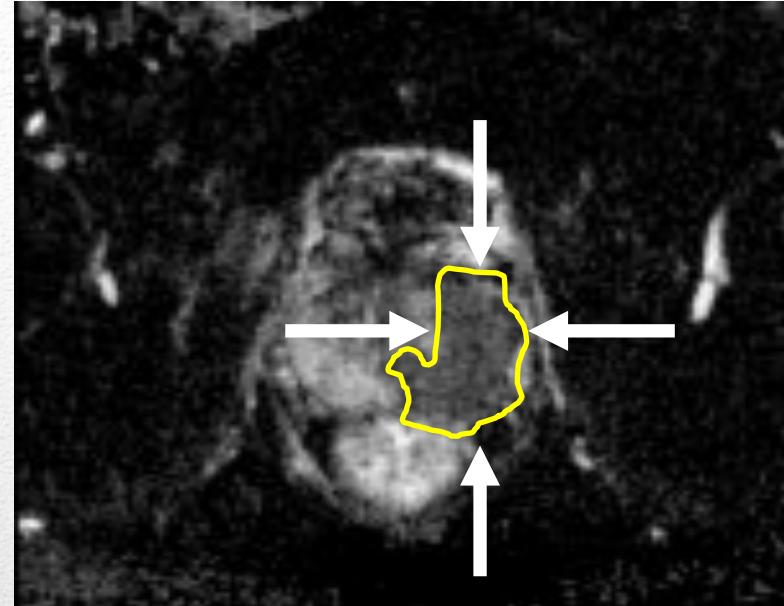
5

Trois exemples de cas pathologiques

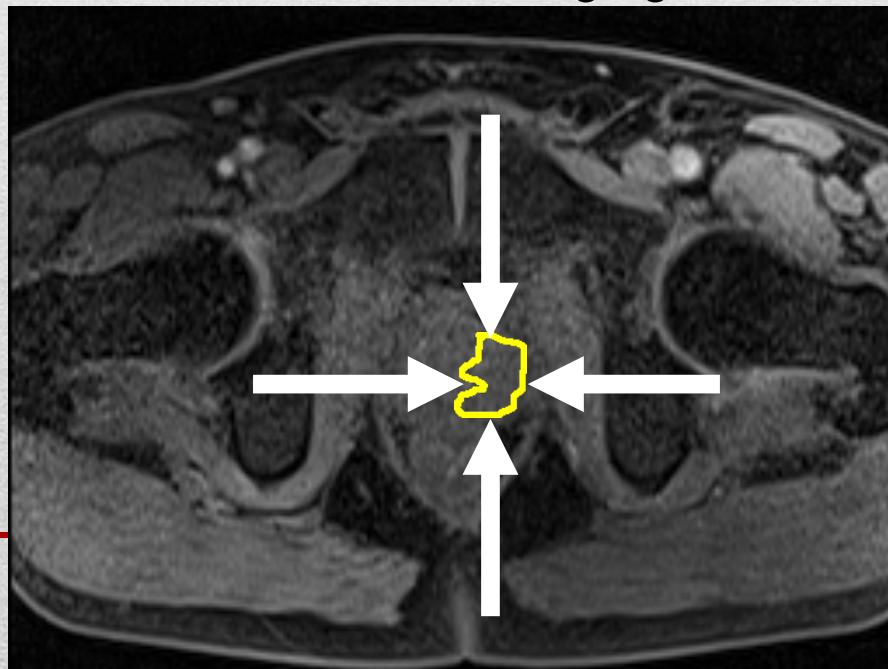
3D-T2 Anatomy Imaging



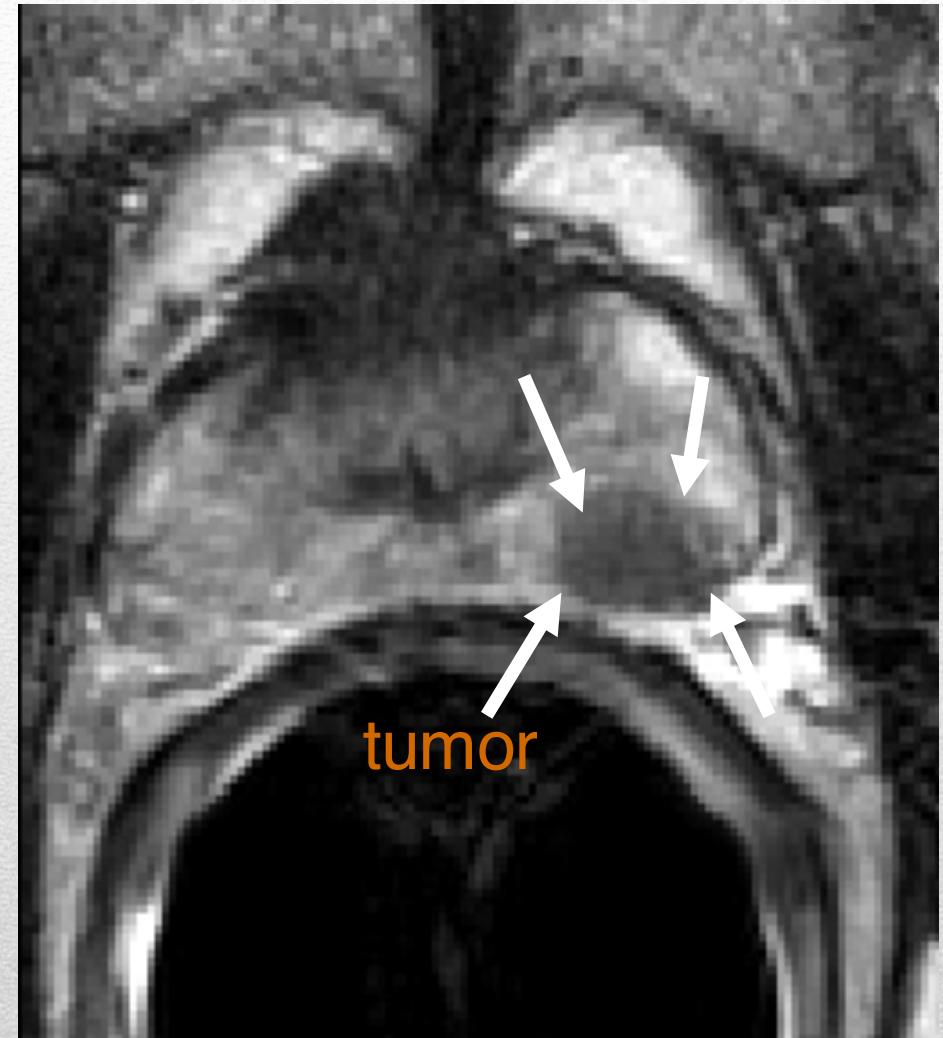
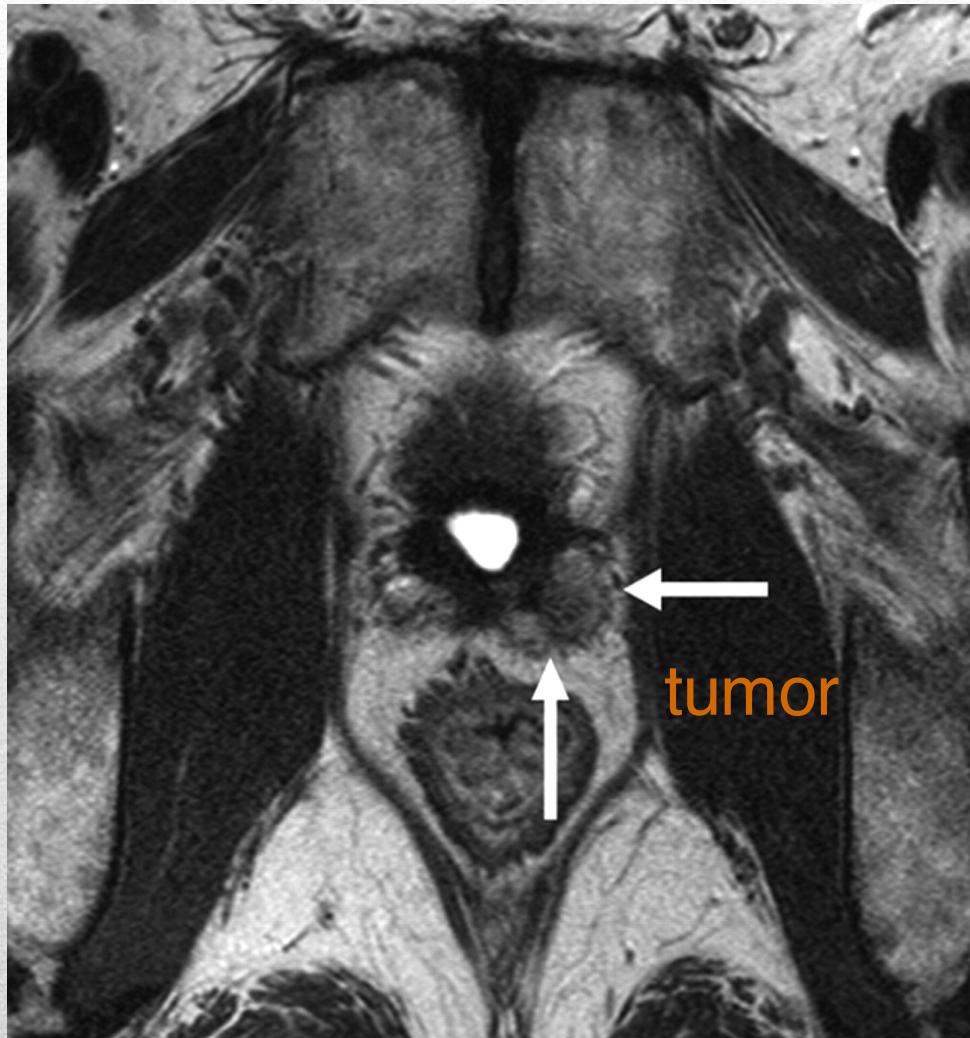
Diffusion Imaging



Perfusion Imaging



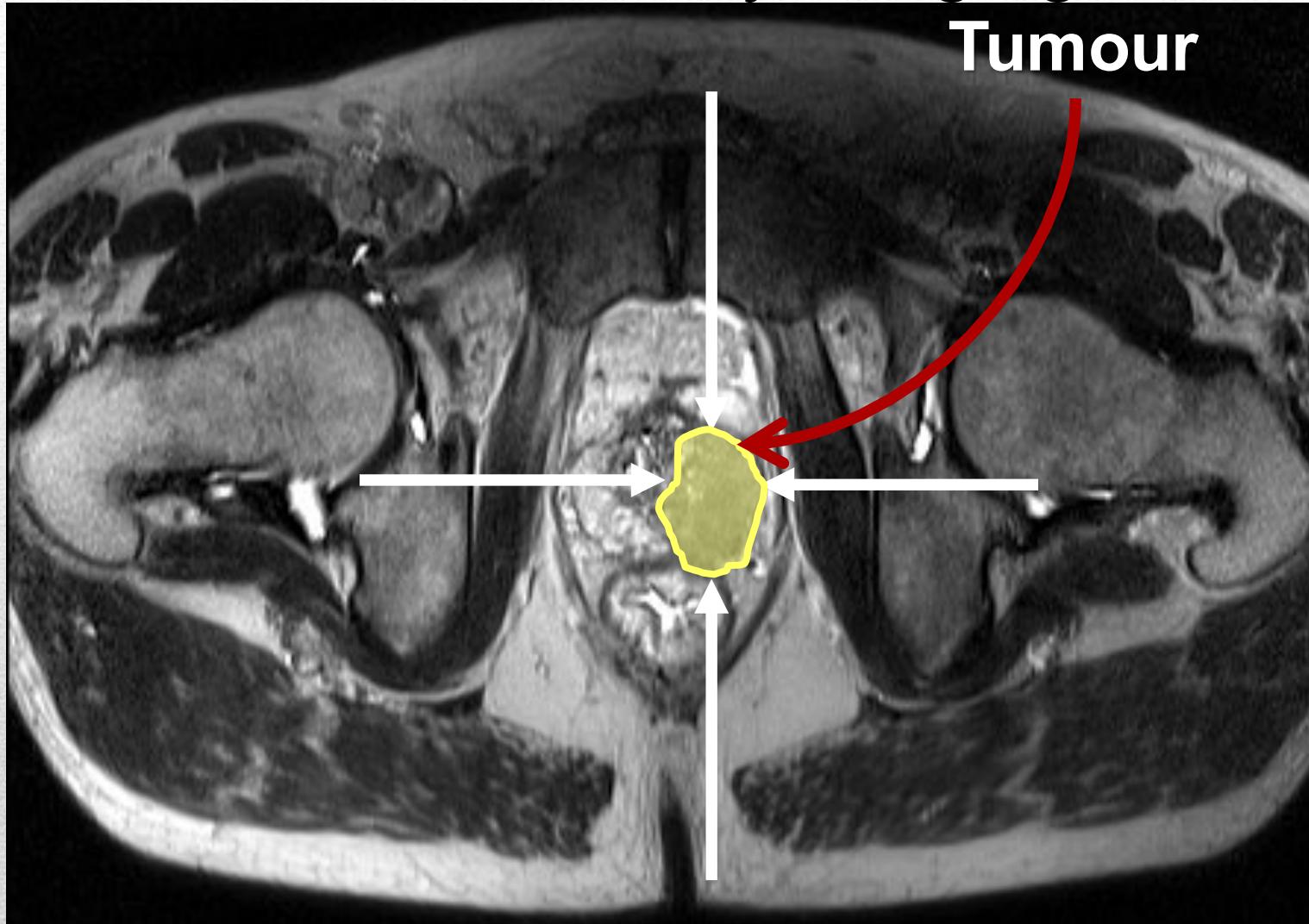
Examples of a Prostate Cancer Tumor



Kim C K et al. AJR 2010;194:1461-1469

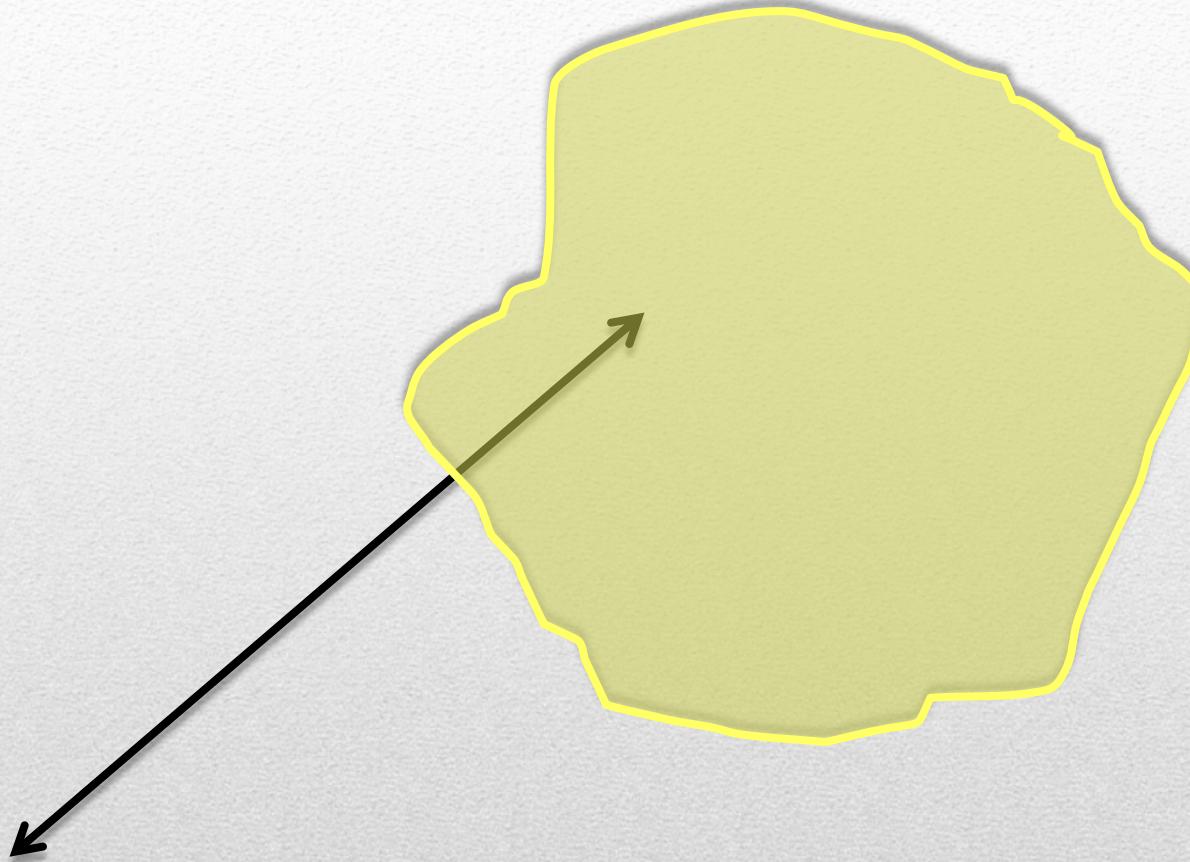
7

3D-T2 Anatomy Imaging



8

Calculation of the surface of the ROI prostate

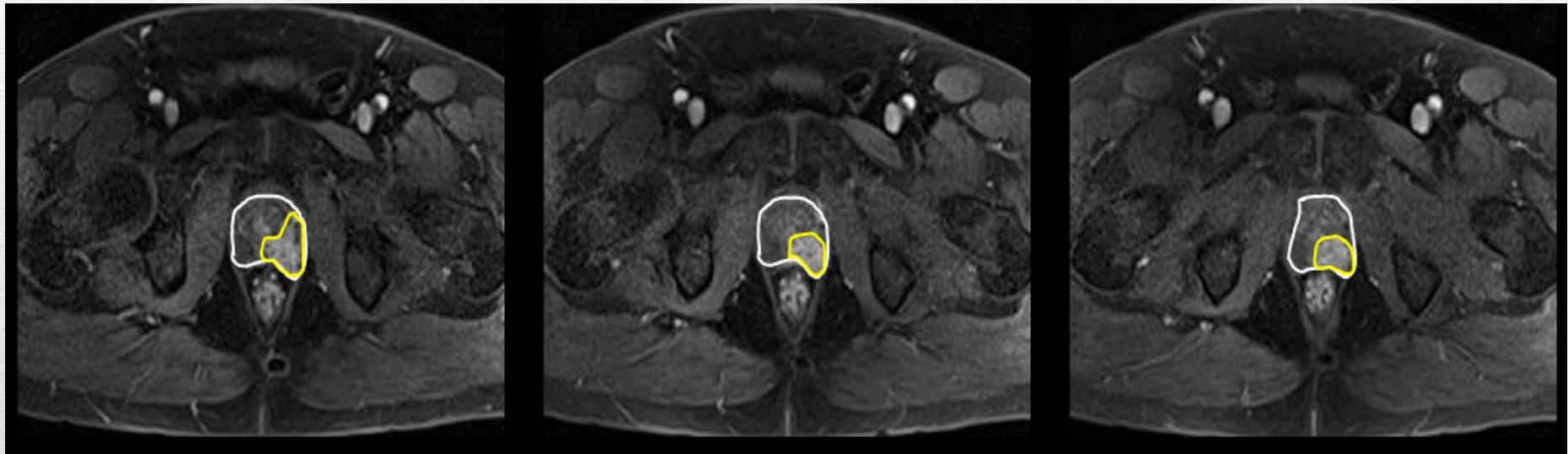


Volume = nombre de pixels X la résolution spatiale

9

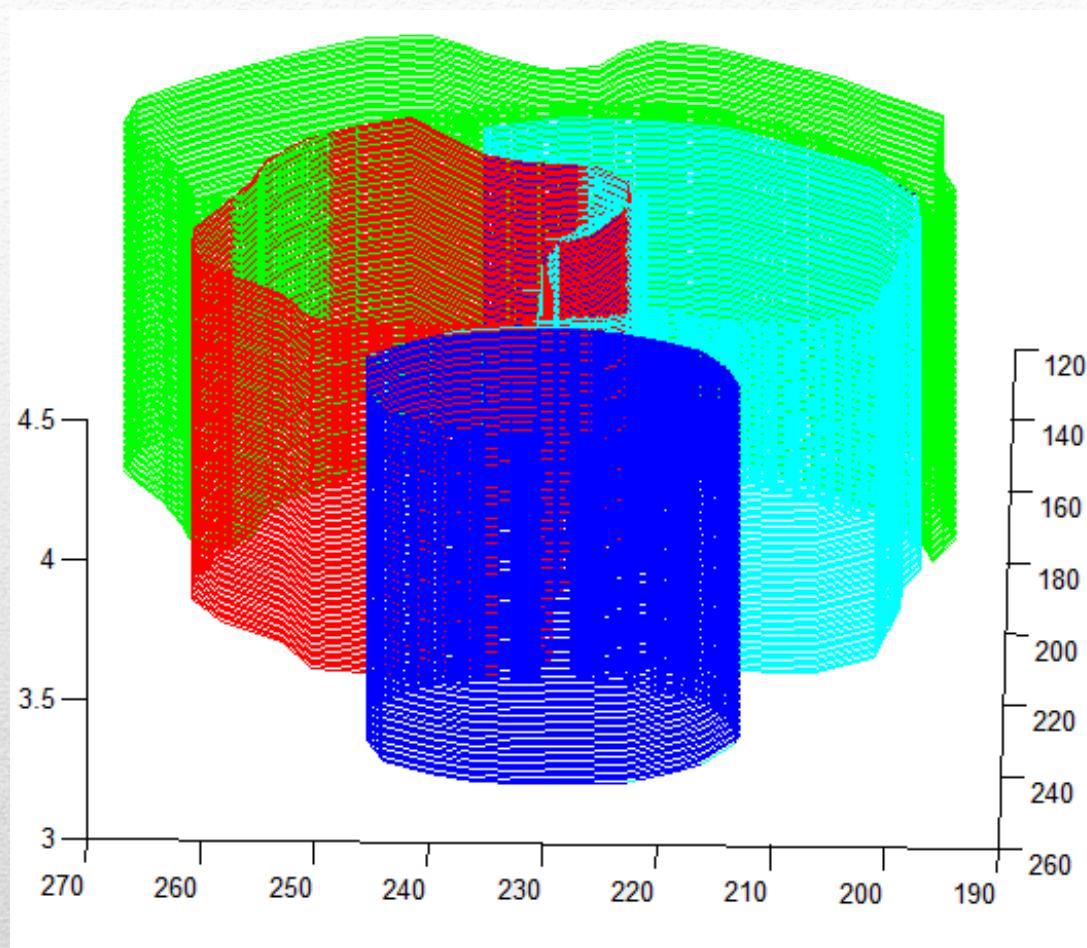
Examples of ROI corresponding to the prostate and to a tumor

Examples of anatomical images



10

Show the 3D model of the surface



Shows the cortical surface in 3D and image

Communications and Remote Sensing Laboratory, Université catholique de Louvain,
B-1348, Louvain-la-Neuve, Belgium.

11

1st stage

- GUI Interface
- Affichage des différentes images
- Gestion des données DICOM

$\approx 4\text{h}$

$\approx 6\text{h}$

$\approx 6\text{h}$

12

2nd Stage

- Segmentation of different zones:
TZ, PZ, CZ, and Tumour
- 3D Représentation for each zone

3rd Stage

- Calculate the surface and volume for each Region: TZ, PZ, CZ, and Tumour and report

- Make a ZIP file containing:
 - **Matlab code (GUI)**
 - **Report**
- Send to Christian.Mata-Miquel@u-bourgogne.fr
alain.lalande@u-bourgogne.fr
- **Group of 2 people**
- **Deadline 17/05/2017**