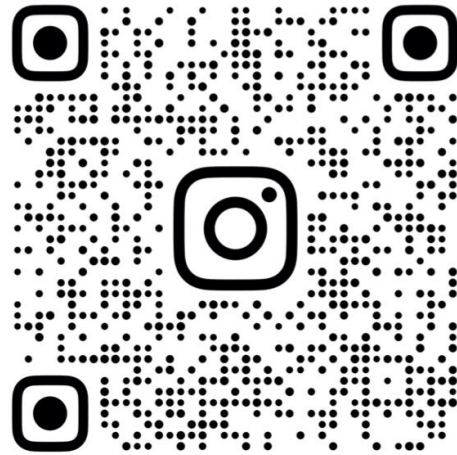
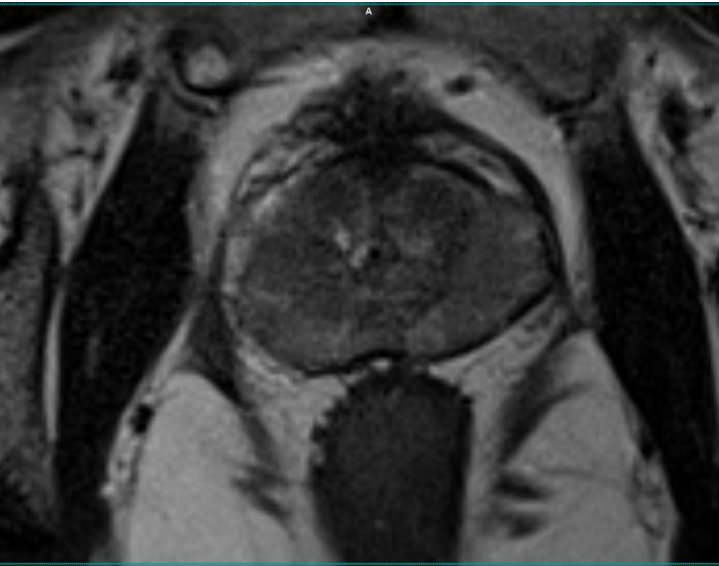


# karcinom prostaty

## časná detekce pomocí magnetické rezonance



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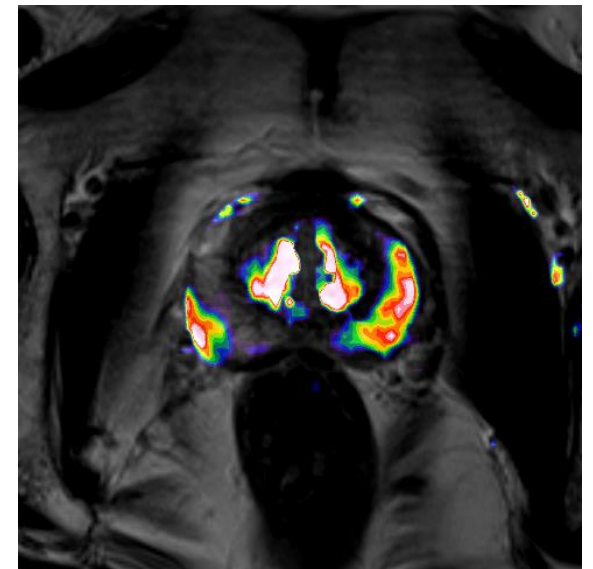
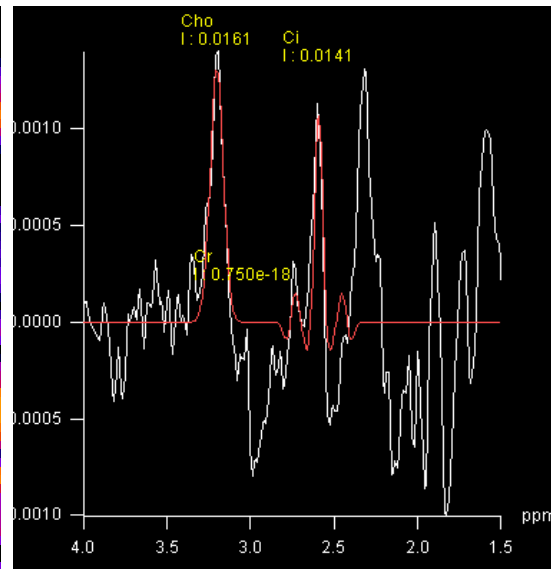
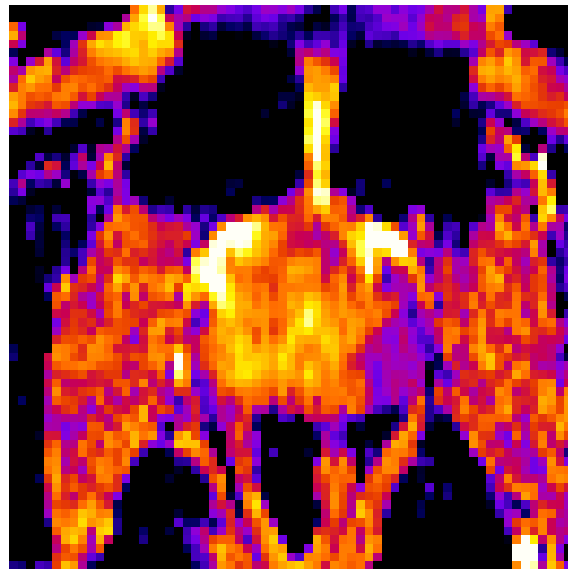
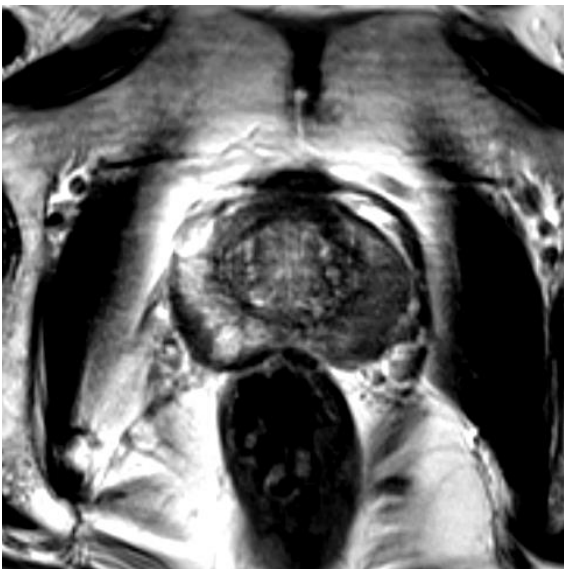
Jiří Ferda\*, \*\*

*Lékařská fakulta UK a Fakultní nemocnice v Plzni*

*Klinika zobrazovacích metod\*, Anatomický ústav\*\**

# Karcinom prostaty a MRI

- ◆ **Acinární karcinom prostaty a magnetická rezonance**
  - ◆ 2· to 1· nejčastější malignita v mužské populaci
  - ◆ malýCAP 1/3 m do 40ti let, 2/3 nad 70 let (\*)
  - ◆ detekce PSA, F/T ratio PSA, proPSA, TRUS guided nebo systemat. biopsie
- ◆ **Vysoký podíl TN – 2/3 (\*\*) a FN – 1/2 (\*\*) při provádění systematické biopsie při elevaci PSA**
- ◆ **Po roce 2010 – multiparametrický protokol MRI**



\*Schillaci O, Calabria F, Tavalozza M et al.: Influence of PSA, PSA velocity and PSA doubling time on contrast enhanced  $^{18}\text{F}$ -choline PET/CT detection rate in patients with rising PSA after radical prostatectomy. Eur J Nucl Med Mol Imaging 2012; 39:589-596

\*\*Roehl KA, Antenor JA, Catalona WJ. Serial biopsy results in prostate cancer screening study. J Urol 2012; 167: 2435-2439

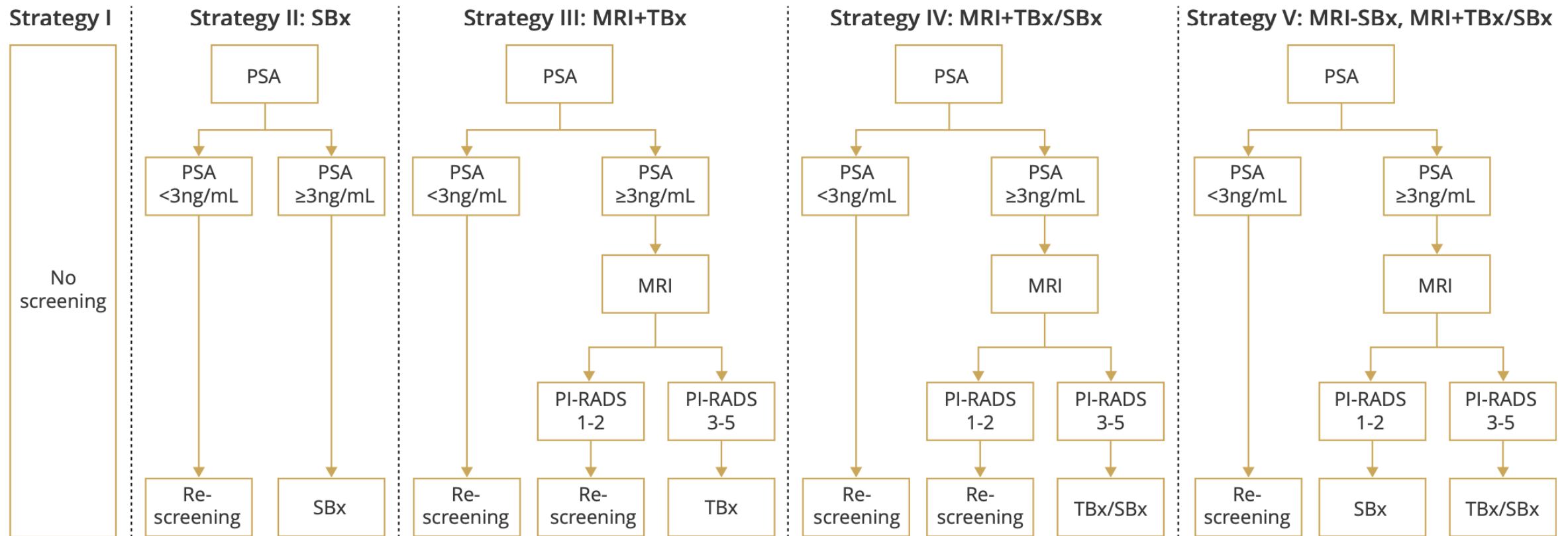
# Časná detekce CAP + screening s použitím MRI

> Value Health. 2021 Dec;24(12):1763-1772. doi: 10.1016/j.jval.2021.06.001. Epub 2021 Aug 6.

## Cost-Effectiveness of Magnetic Resonance Imaging in Prostate Cancer Screening: A Microsimulation Study

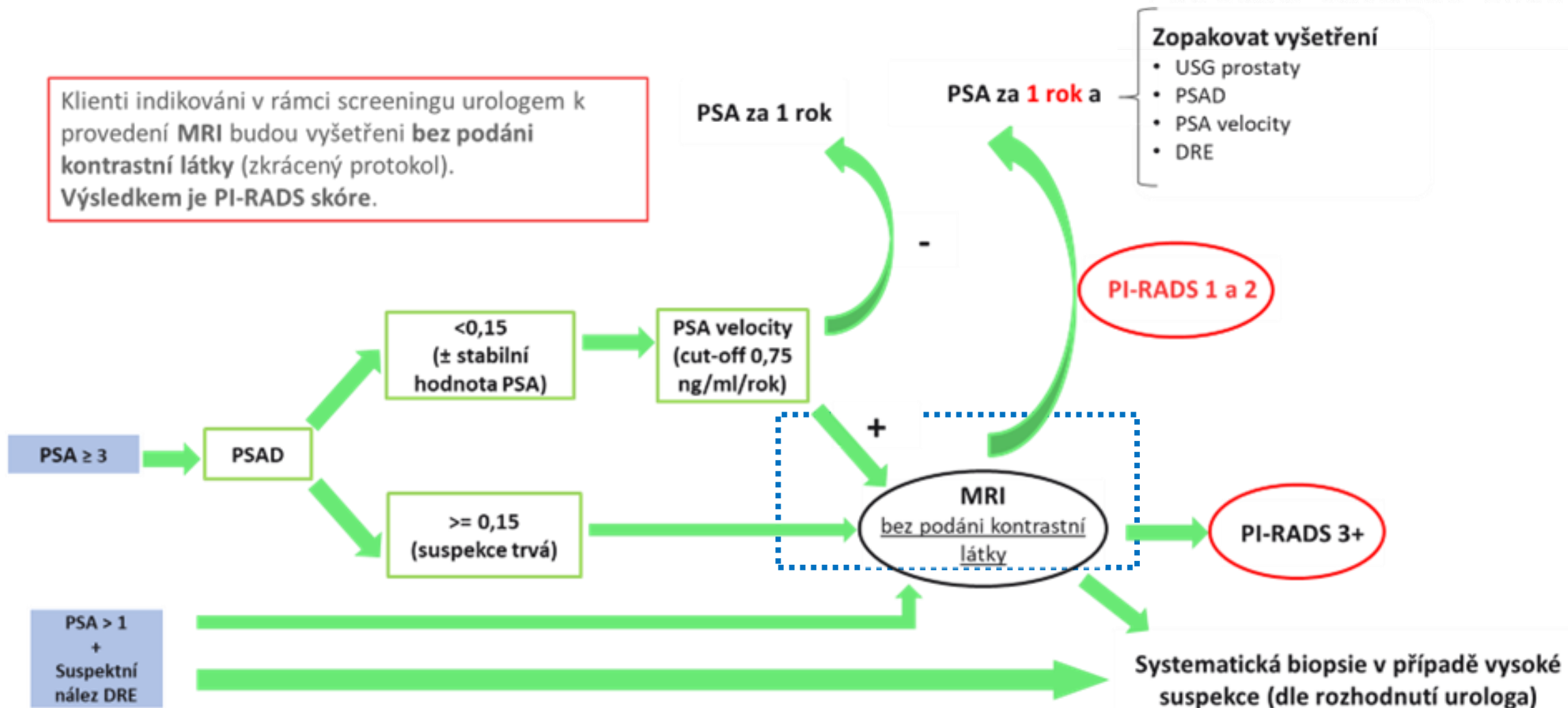
Shuang Hao<sup>1</sup>, Andreas Karlsson<sup>1</sup>, Emelie Heintz<sup>2</sup>, K Miriam Elfström<sup>3</sup>, Tobias Nordström<sup>4</sup>, Mark Clements<sup>5</sup>

**Figure 1.** Illustration of the 5 strategies.



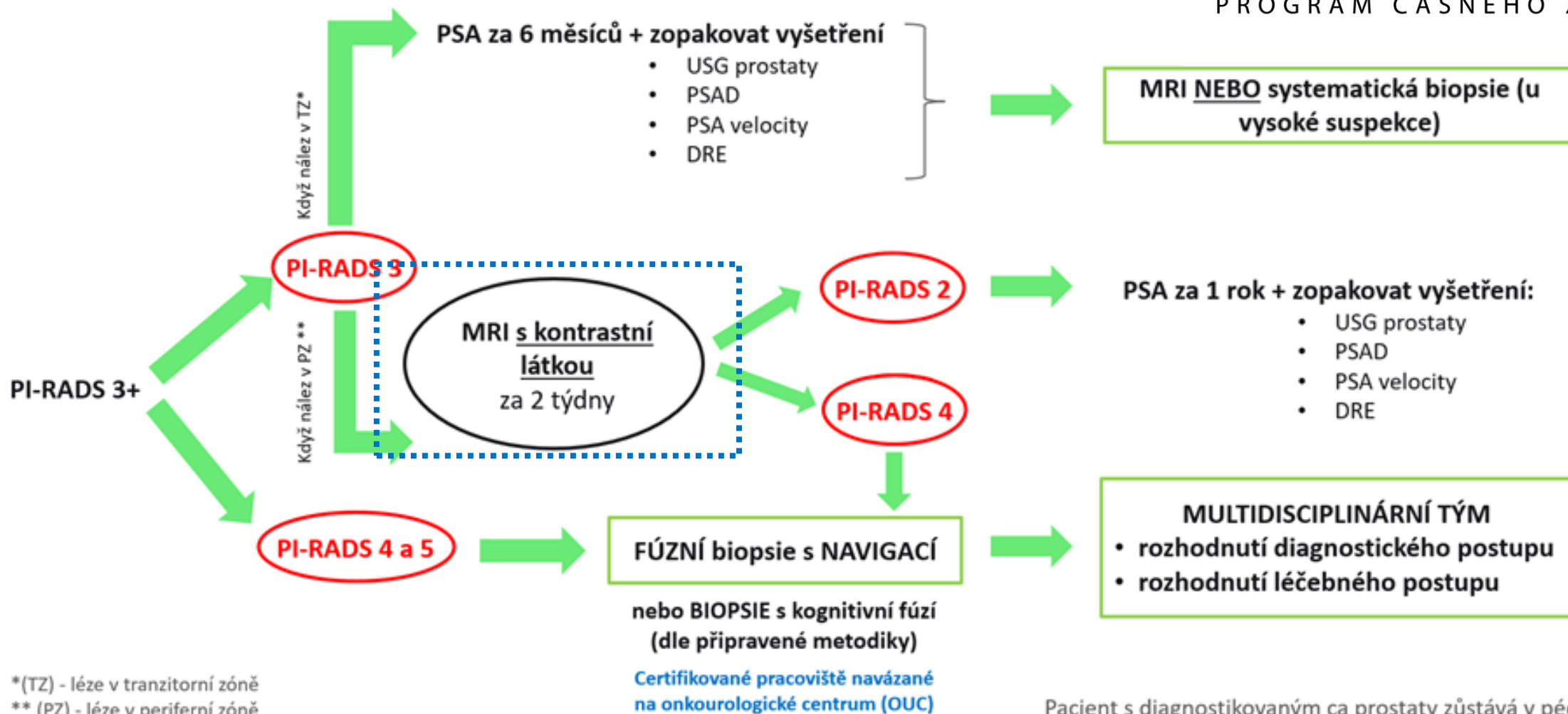
MRI indicates magnetic resonance imaging; PI-RADS, Prostate Imaging Reporting and Data System; PSA, prostate-specific antigen; SBx: systematic biopsy; Strategy I, no screening for prostate cancer; strategy II, quadrennial PSA screening using SBx alone; strategy III, quadrennial PSA screening using MRI, with TBx on positive MRI results; strategy IV, quadrennial PSA screening using MRI, with combined TBx/SBx on positive MRI results; strategy V, quadrennial PSA screening MRI, with SBx on negative MRI results and combined TBx/SBx on positive MRI results; TBx, targeted biopsy.

# Karcinom prostaty a MRI PSA 3,0+





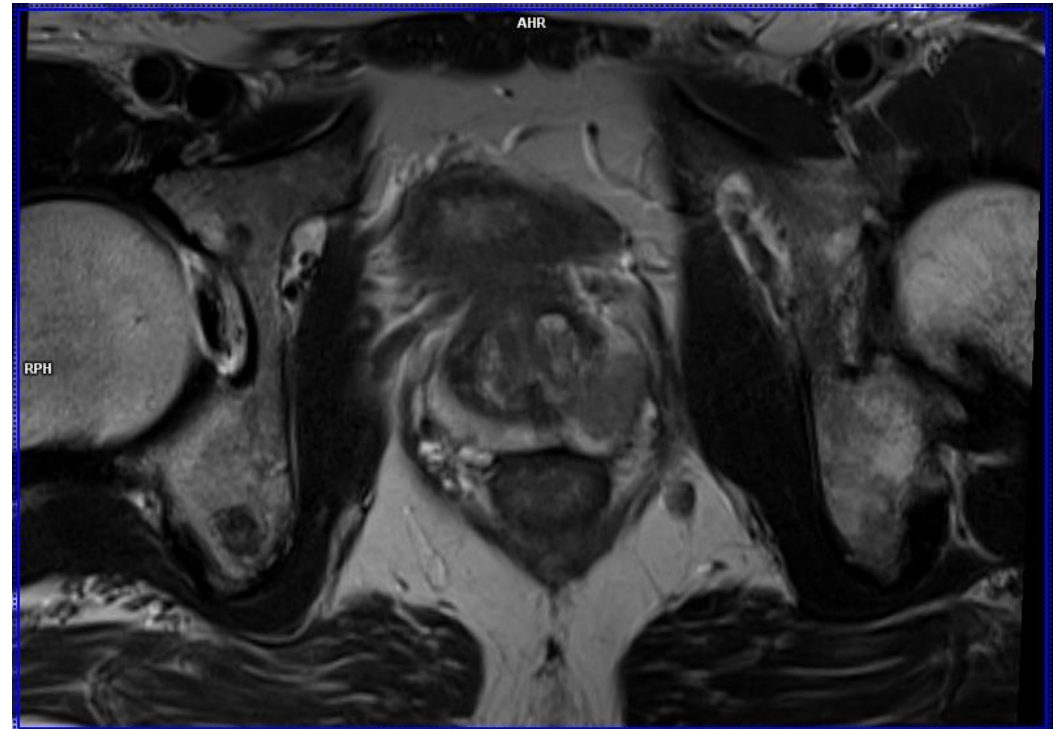
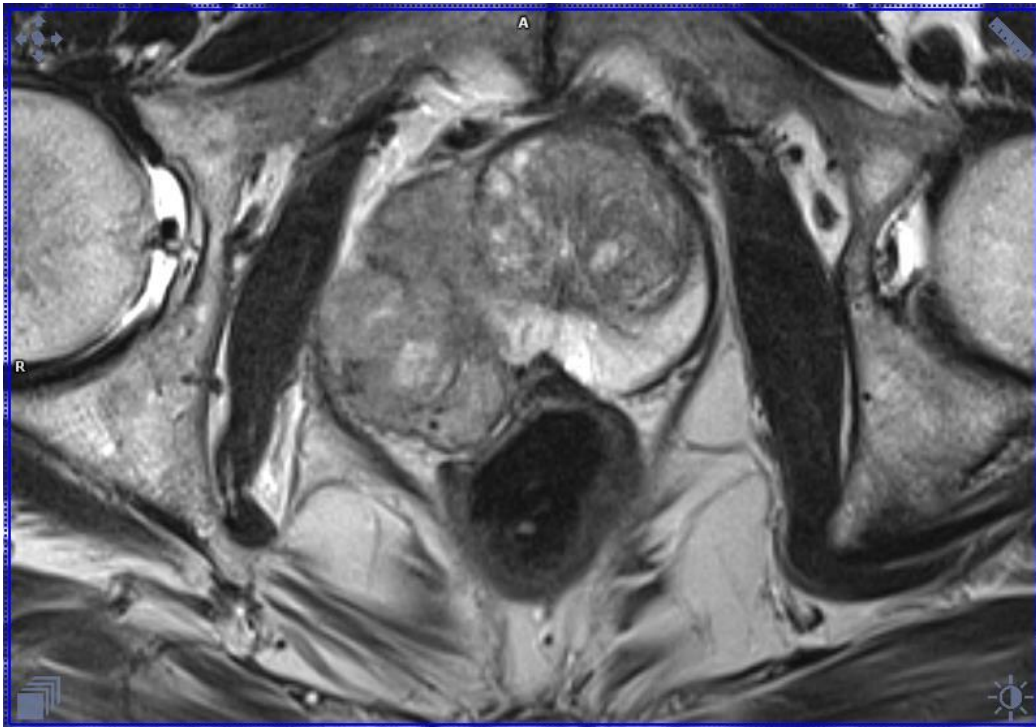
# Karcinom prostaty a MRI PSA 3,0+



# Diagnostické zobrazení karcinomu pomocí MRI

- ♦ Doba vyšetření 25 - 30 minut
- ♦ **Příprava – bez specifické přípravy**
- ♦ **CAVE! Kontraindikace**
- ♦ **feromagnetické cizí těleso, elektronické implantáty, kardiostimulátor/defibrilátor**

KARCINOM PROSTATY   
PROGRAM ČASNÉHO ZÁCHYTU



# PI-RADS

## PI-RADS<sup>®</sup>

### Prostate Imaging – Reporting and Data System

2019  
Version 2.1



#### 1. Magnetic Field Strength

The fundamental advantage of 3T compared with 1.5T lies in an increased signal-to-noise ratio (SNR), which theoretically increases linearly with the static magnetic field. This may be exploited to increase spatial resolution, temporal resolution, or both. Depending on the pulse sequence and specifics of implementation, power deposition, artifacts related to susceptibility, and signal heterogeneity could increase at 3T, and techniques that mitigate these concerns may result in some increase in imaging time and/or decrease in SNR. However, current state-of-the-art 3T MRI scanners can successfully address these issues, and most members of the PI-RADS Steering Committee agree that the advantages of 3T substantially outweigh these concerns.

#### 3. Computer-Aided Evaluation (CAE) Technology

Computer-aided evaluation (CAE) technology using specialized software or a dedicated workstation is not required for prostate mpMRI interpretation. However, CAE may improve workflow (display, analysis, interpretation, reporting, and communication), provide quantitative pharmacodynamic data, and enhance lesion detection and discrimination performance for some radiologists, especially those with less experience interpreting mpMRI exams. CAE can also facilitate integration of MRI data with some forms of MR targeted biopsy systems.

Credible satisfactory results have been obtained at both 1.5T and 3T without the use of an ERC. Taking these factors into consideration as well as the variability of MRI equipment available in clinical use, the PI-RADS Steering Committee recommends that supervising radiologists strive to optimize imaging protocols in order to obtain the best and most consistent image quality possible with the MRI scanner used. However, cost, availability, patient preference, and other considerations cannot be ignored.



# Biparametrický protokol zobrazení

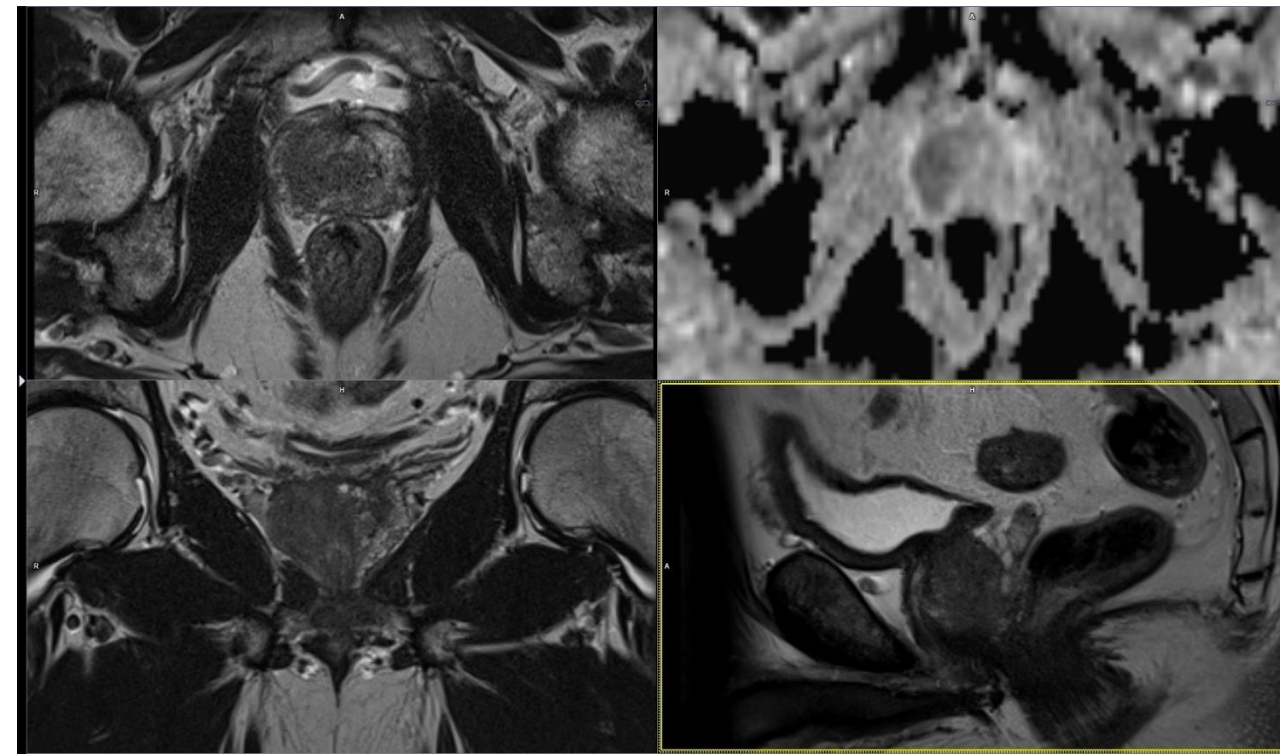
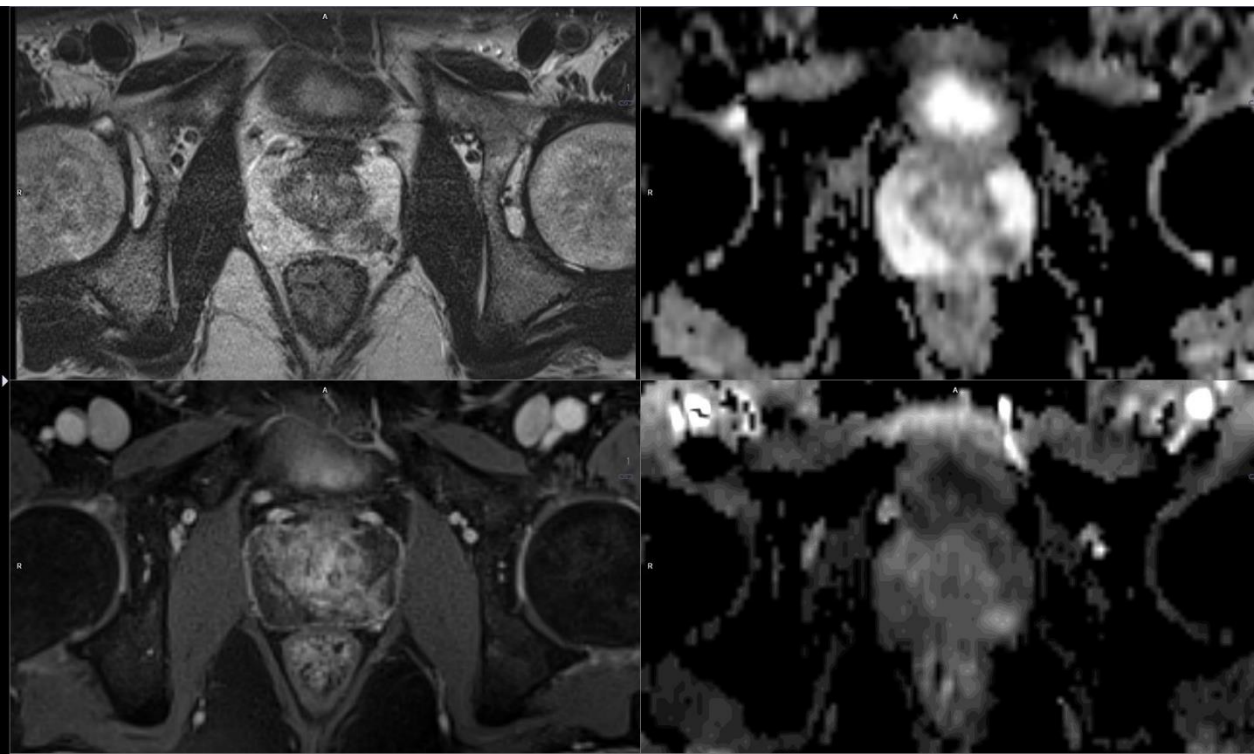
- T2
- DWI
- DCE
- score 1- 5

Peripheral zone

DWI	T2	DCE	score
1	Any*	Any	1
2	Any	Any	2
3	Any	-	3
4		+	4
4	Any	Any	4
5	Any	Any	5

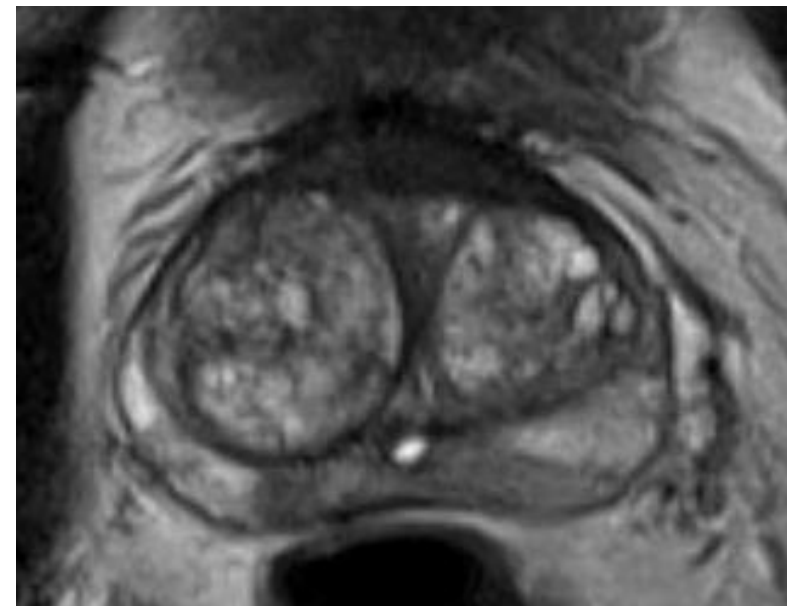
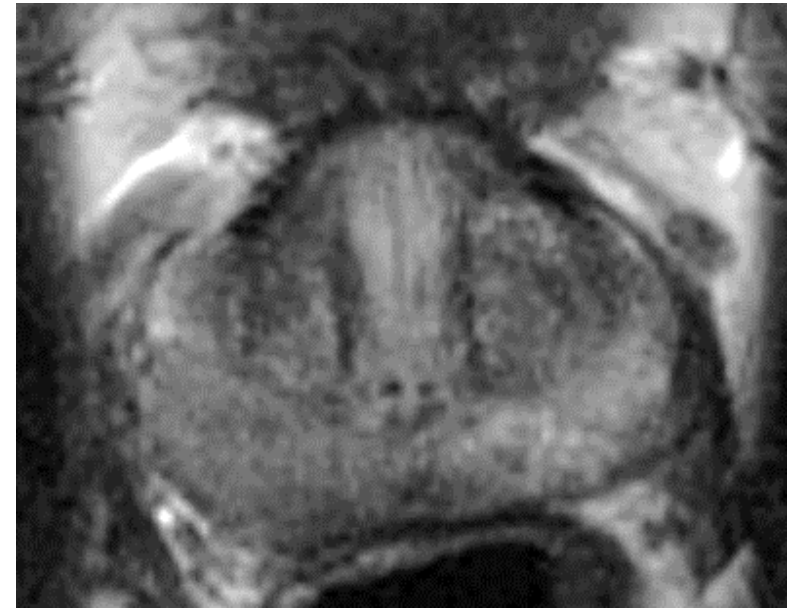
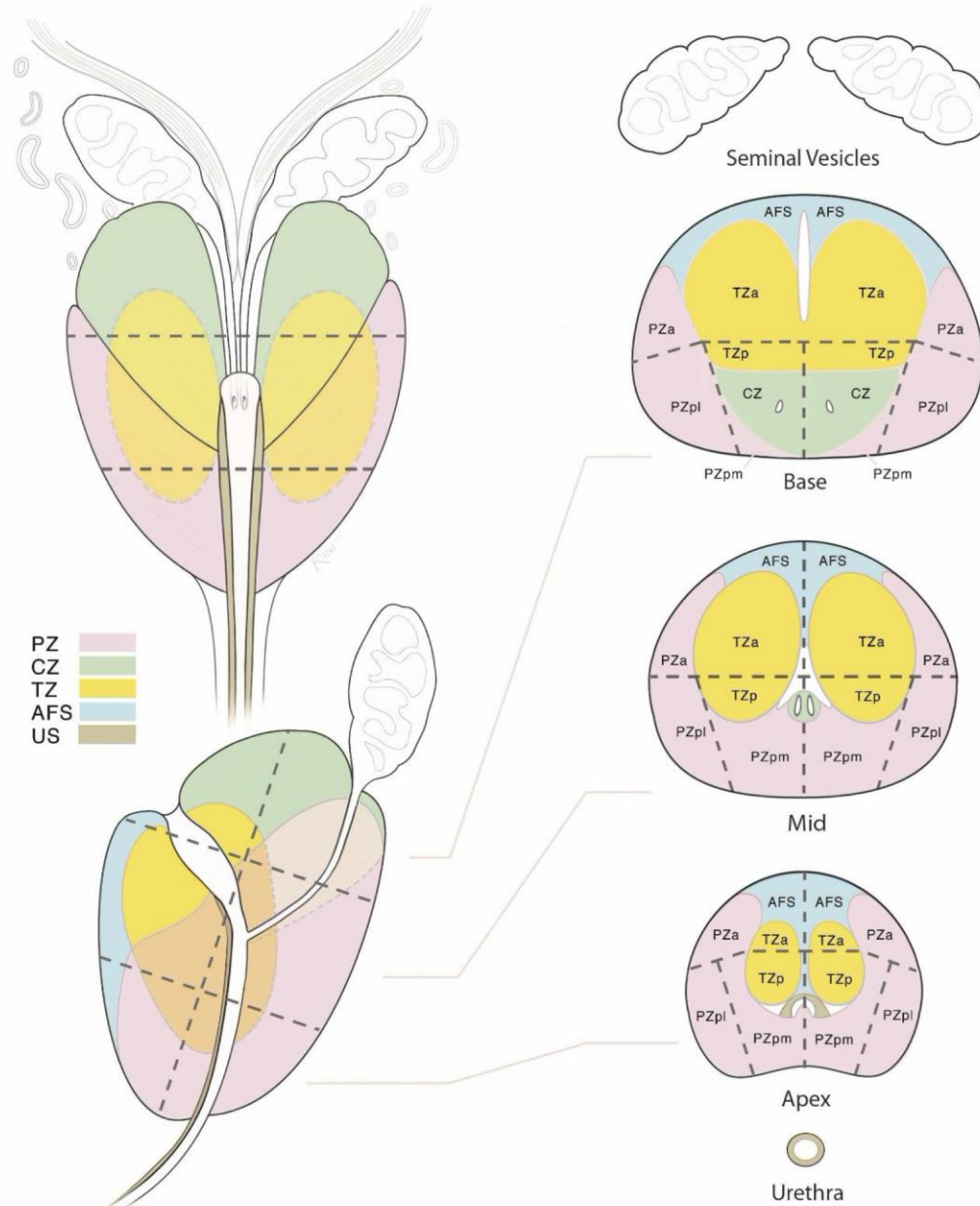
T2	DWI	DCE	score
1	Any*	Any	1
2	Any	Any	2
3	≤4	Any	3
4	5	Any	4
4	Any	Any	4
5	Any	Any	5

Transitional zone



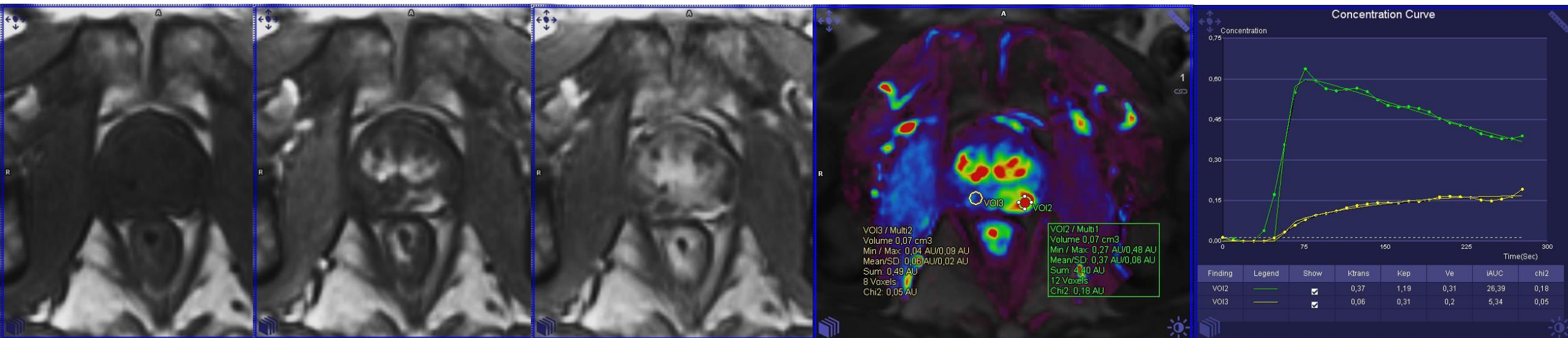


# Sektorová anatomie



# Kdy podat kontrastní látku

- Doporučená akvizice pouze při nálezů PIRADS skóre 3 v periferní zóně
- PI-RADS v 2.1 hodnocení postkontrastních obrazů
  - **Negativní nález:** žádné časné nebo postupné zvýšení intenzity odpovídající fokálnímu nálezů na T2 váženém obraze a/nebo DWI nebo fokální nasycení odpovídající lézi prokazující znaky benigní hyperplasii prostaty na T2 vážených obrazech
  - **Pozitivní nález:** ložisko časněji a nebo současně se sytí ve srovnání s okolními tkáněmi normální prostaty, odpovídá podezřelému nálezů na DWI ev. T2 vážených obrazech





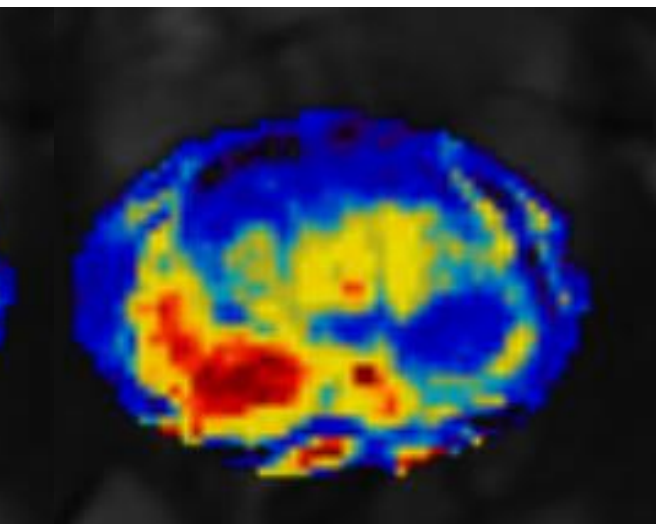
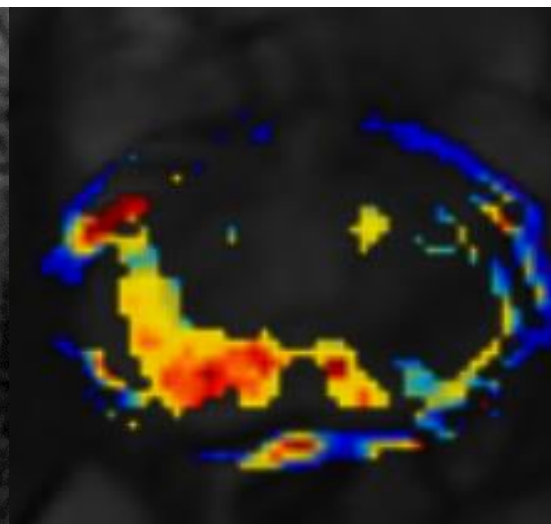
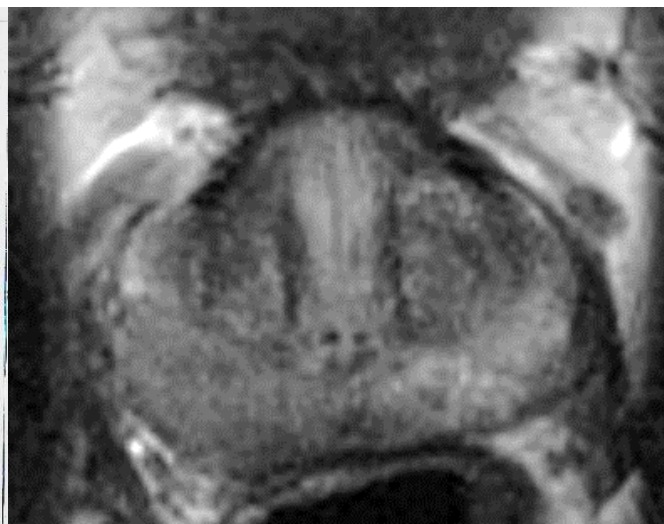
# Proč někdy postkontrastní zobrazení

- ♦ **Periferní zóna prostaty**

- ♦ Neovaskularizace
- ♦ Farmakokinetika v nádorové káni odlišná

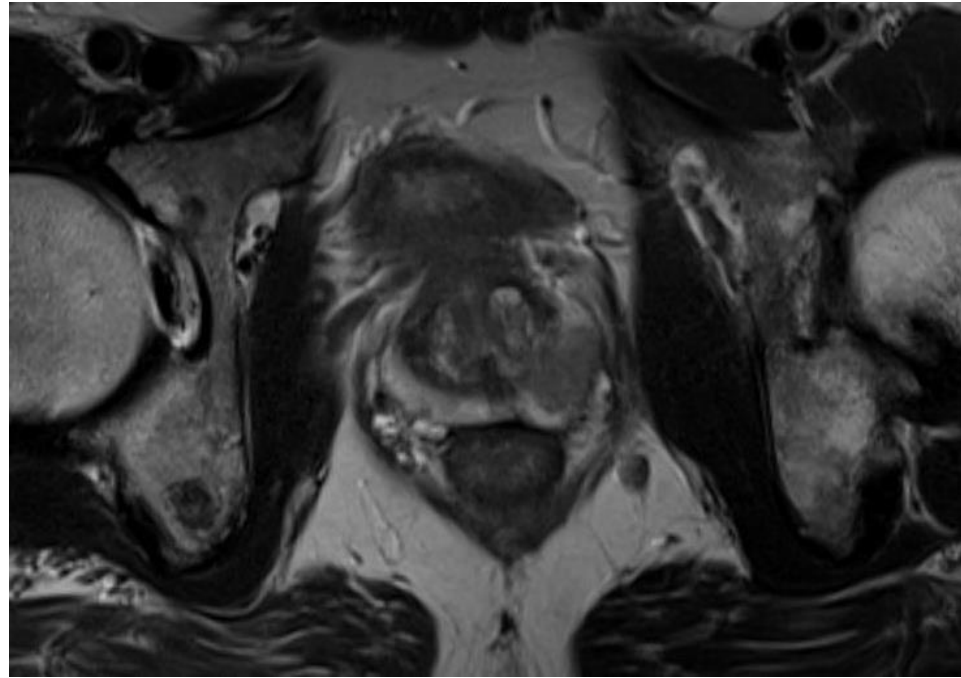
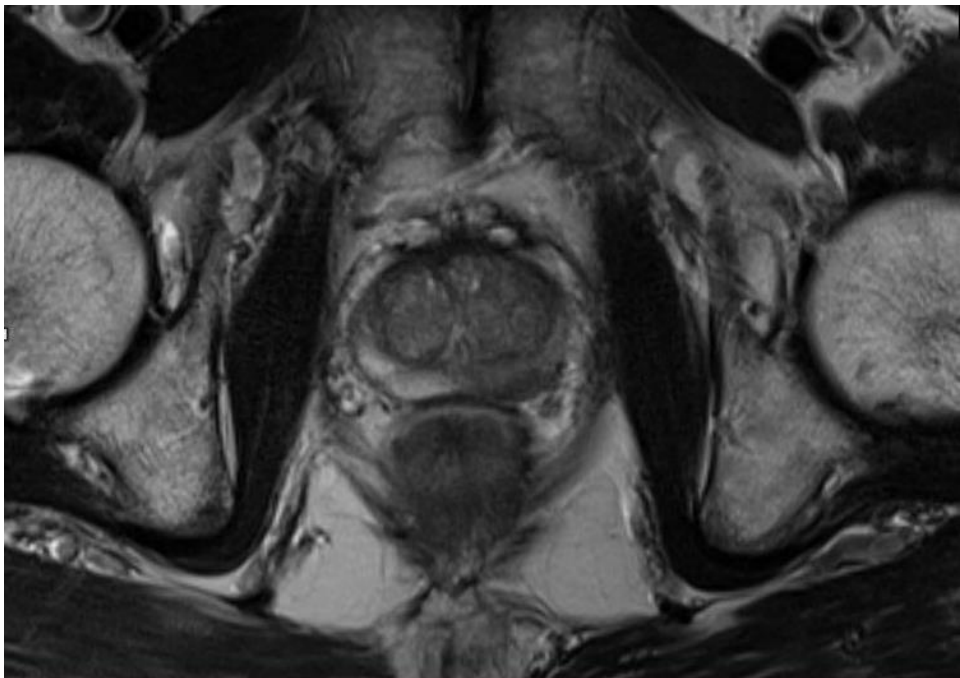
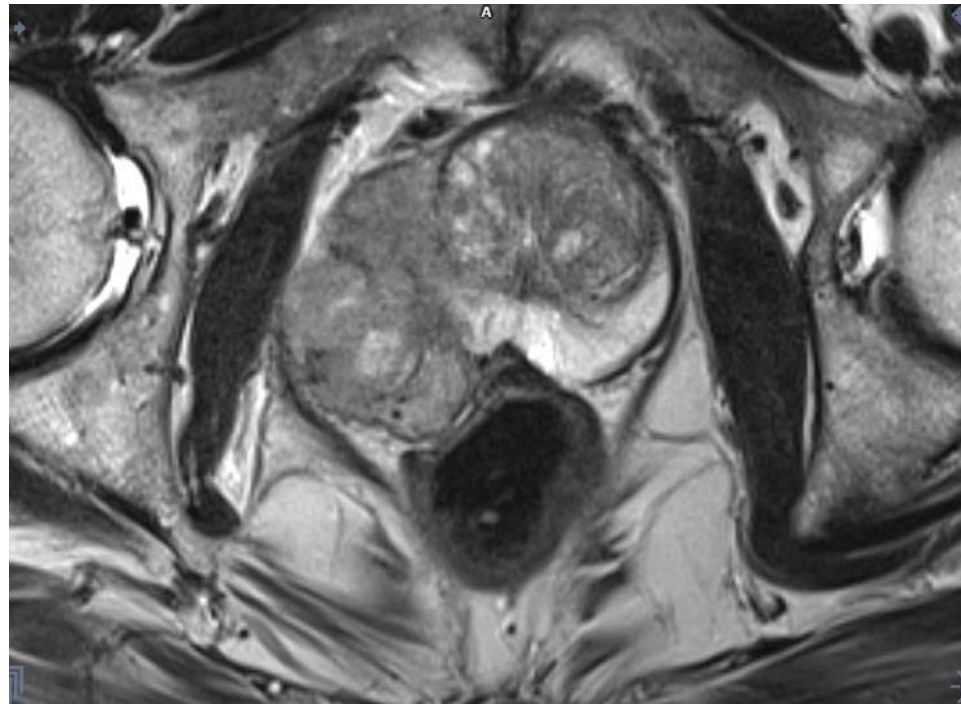
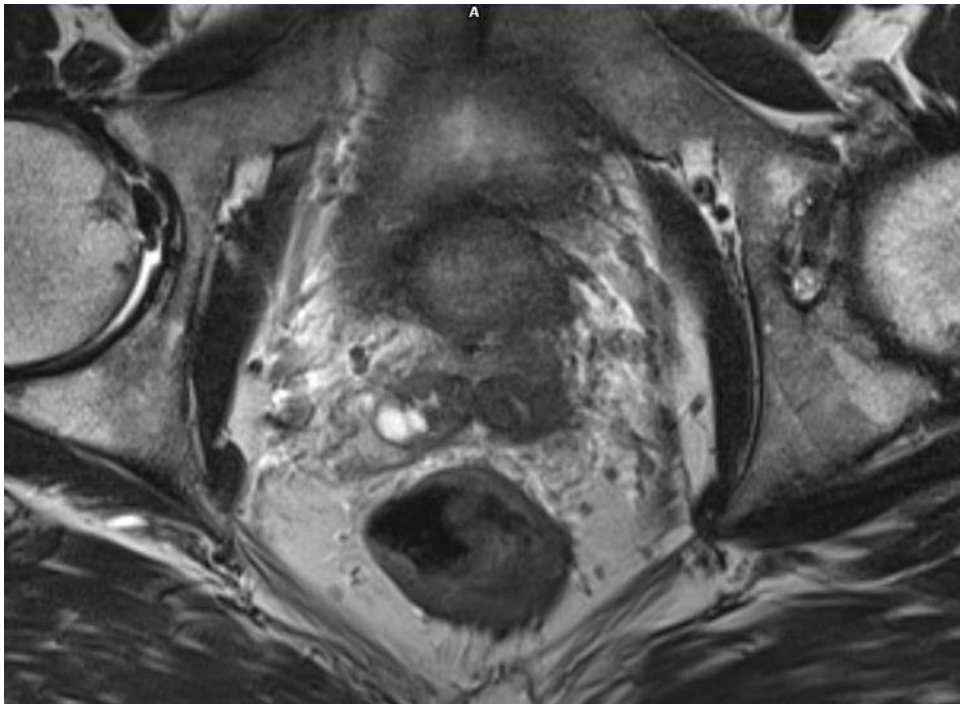
- ♦ **CAVE: kontraindikace podání gadoliniové k.I.**

- ♦ **chronické renální selhání, kreatinin nad 300  $\mu\text{mol/l}$**



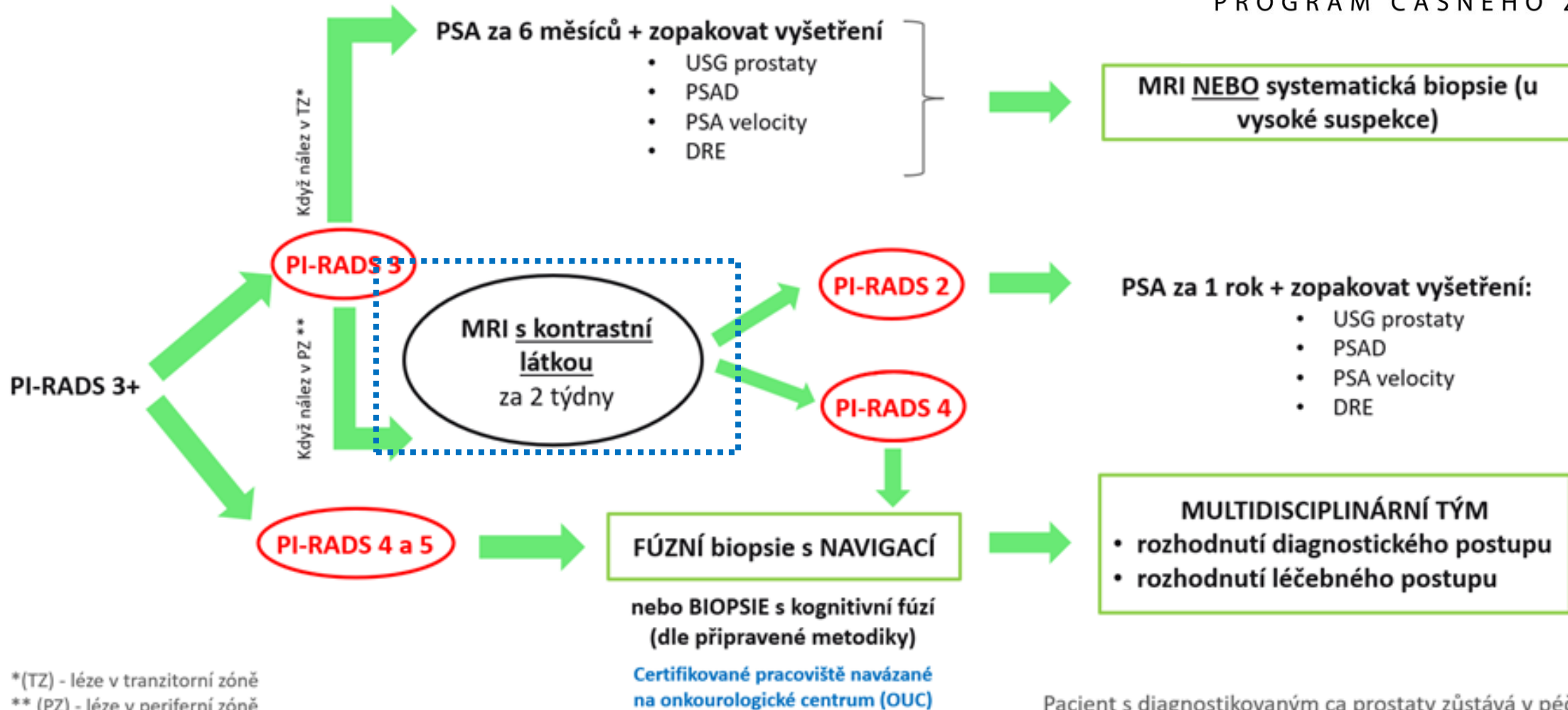
\*Schillaci O , Calabria F, Tavolozza M et al.: Influence of PSA, PSA velocity and PSA doubling time on contrast enhanced  $^{18}\text{F}$ -choline PET/CT detection rate in patients with rising PSA after radical prostatectomy. Eur J Nucl Med Mol Imaging 2012; 39:589-596

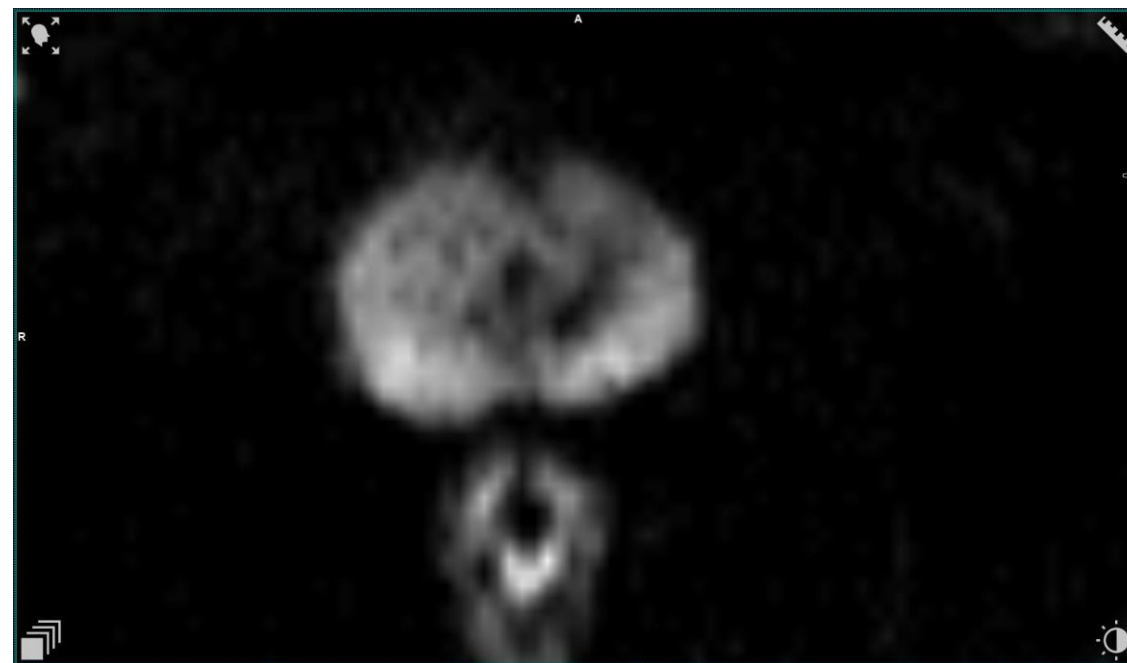
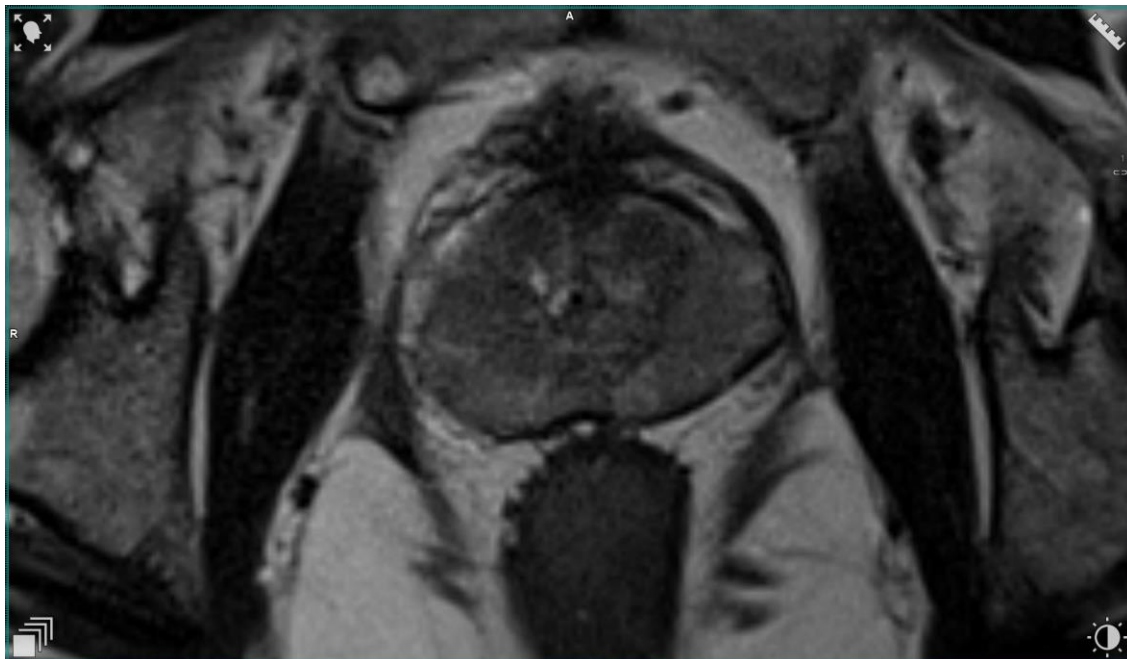
\*\*Roehl KA, Antenor JA, Catalona WJ. Serial biopsy results in prostate cancer screening study. J Urol 2012; 167: 2435-2439





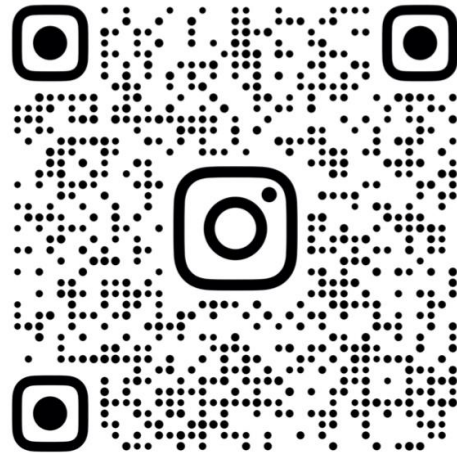
# Karcinom prostaty a MRI PSA 3,0+





# karcinom prostaty

## časná detekce pomocí magnetické rezonance



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