

Did You Know? Prostate Cancer

Take-home message

- Very often prostate cancer progresses without symptoms, in some cases it can lead to urinary disorders.
- It is important to carry out the detection of this cancer by the rectal touch from 50 years or from 40 years if the genetic factors were highlighted.
- The blood Prostate Specific Antigen (PSA) is a complementary examination to detect a large number of new cancers.

Prostate cancer develops as **small nodules** or **protuberances** on the surface of the prostate. This cancer is **the most common cancer in men**. With more than 71,000 new cases per year, prostate cancer is the first cancer in men in France.

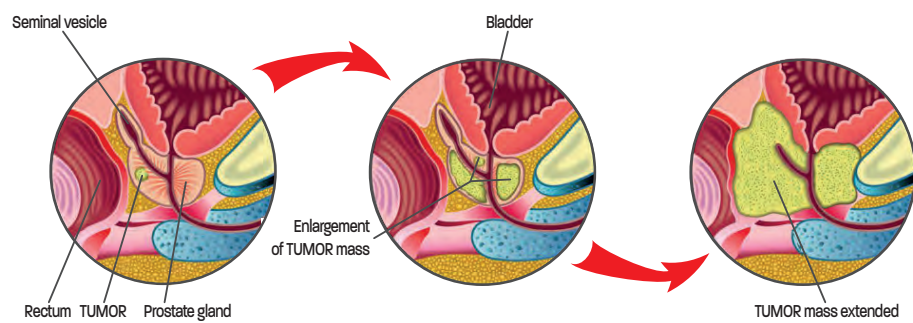
Most men with prostate cancer are older than 45 years. This type of cancer frequency **increases with age**. The number of new annual cases is estimated at about 36.5 per 100,000 men worldwide. **Adenocarcinoma** is the most common form of prostate cancer. It accounts for about 95% of cases. The average age at diagnosis is 70 years.

The **main risks** of prostate cancer are **aging, family history, a high-fat diet and alcohol**. The evolution of the disease depends on the stage of the disease at the time of diagnosis.

Symptoms

- The appearance of blood in the urine or in the sperm and difficulty urinating.
- On an advanced stage, cancer can be responsible for pain in the anus and rectum.
- Risk of metastases in the bones and invasion of the bone marrow.

PROSTATE CANCER



Possible treatments (in case of localized cancer)

- Radical prostatectomy: by a conventional opening or by laparoscopy (minimally invasive surgical technique with endoscope camera introduced in the surgical area).
- External or internal radiotherapy intended to destroy cancer cells.
- Brachytherapy: a form of radiotherapy which consists of implanting tiny radioactive sources directly into the prostatic tissue.

In Olea Sphere® ?



MRI is necessary for the **pre-operative** assessment of prostate cancer.

The MRI Protocol is made of 3 sequences: one **T2** weighted sequence, one diffusion weighted sequence (**DW**) and sometimes one dynamic contrast enhanced sequence after gadolinium injection (**DCE**).

«Prostate» application makes it possible to access to **morphological information** and **parametric maps** such as ADC (Apparent Diffusion Coefficient). On malignant prostate lesions, ADC values are lower than in healthy tissue.

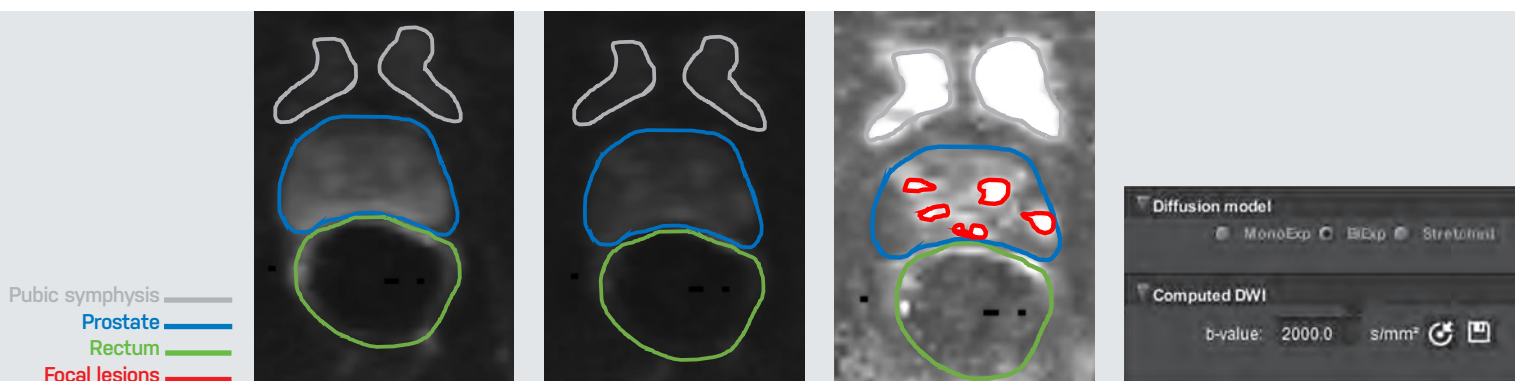
Thanks to «IVIM» plugin, diffusion images can be computed for high **b values (electronic b values*)**.

Cancerous sites are more easily detected on non-acquired series: they **appear clearly in hypersignal** at **b = 2000 s/mm²** (see picture 1).

*The maximum b value should be limited to avoid the Kurtosis effect



Thanks to Perfusion module, the detection of **increased micro-vascularization of cancerous tissues will be possible**. Benignant tissue could also be differentiated from cancerous tissue using Kurtosis imaging (K).



Picture 1: From left to right: Diffusion images acquired with b=500 s/mm², b=1000 s/mm² and computed with b=2000 s/mm².

Sources: http://www.doctissimo.fr/html/dossiers/cancer_prostate/4915-cancer-prostate-chiffres.htm ■ http://www.maxisciences.com/cancer-de-la-prostate/cancer-de-la-prostate-symptomes-et-traitements_art29311.html ■ <http://www.cancer.ca/fr-ca/cancer-information/cancer-type/prostate/risks?region=qc> ■ <http://www.e-cancer.fr/Patients-et-proches/Les-cancers/Cancer-de-la-prostate/Anatomie-de-la-prostate> ■ http://www.passeportsante.net/fr/Maux/Problemes/Fiche.aspx?doc=cancer_prostate_pm ■ http://www.doctissimo.fr/html/sante/encyclopedie/sa_513_cancer_prostate.htm ■ <http://www.passeportsante.net/fr/Maux/Problemes/Fiche.aspx?doc=cancer-prostate-pm-symptomes-du-cancer-de-la-prostate> ■ <http://www.topsante.com/medecine/cancers/cancer-de-la-prostate/prevenir/cancer-de-la-prostate-un-depistage-plus-precis-614586> ■ <http://www.sante.fr/cancer-prostate-en-video/video/586> ■ http://www.sciencesetavenir.fr/sante/cancer/l-alcool-facteur-de-risque-du-cancer-de-la-prostate_109284 ■ <http://www.erasme.uilb.ac.be/page.aspx?id=14440> ■ Tanimoto A, Nakashima I, Kohno H et al. Prostate cancer screening: the clinical value of diffusion-weighted imaging and dynamic MRI imaging in combination with T2-weighted imaging. J Magn Reson Imaging 2007;25:146-52 ■ Klass N.A, Nagel et al. Differentiation of Prostatitis and Prostate Cancer by Using Diffusion-weighted MRI Imaging and MR-guided Biopsy at 3T. April 2013, Volume 267, Issue 1 ■ Meier-Schroers M, Kukuk G, Wolter K et al. Differentiation of prostatitis and prostate cancer using the Prostate Imaging-Reporting and Data System (PI-RADS). July 2016 Volume 85, Issue 7 Pages 1304-1311 ■ Cornud F, Lecouvet F, Portalez D. Impact de l'IRM sur la prise en charge d'un cancer de prostate. Progrès en Urologie-FMC Vol.20-Mars 2010-No1 ■ Case report Olea Medical : Prostate_MRI-targeted_TRUS-guided_biopsy.pdf