

One-stop diagnosis of prostate cancer

New MRI techniques: quick, accurate and less hassle



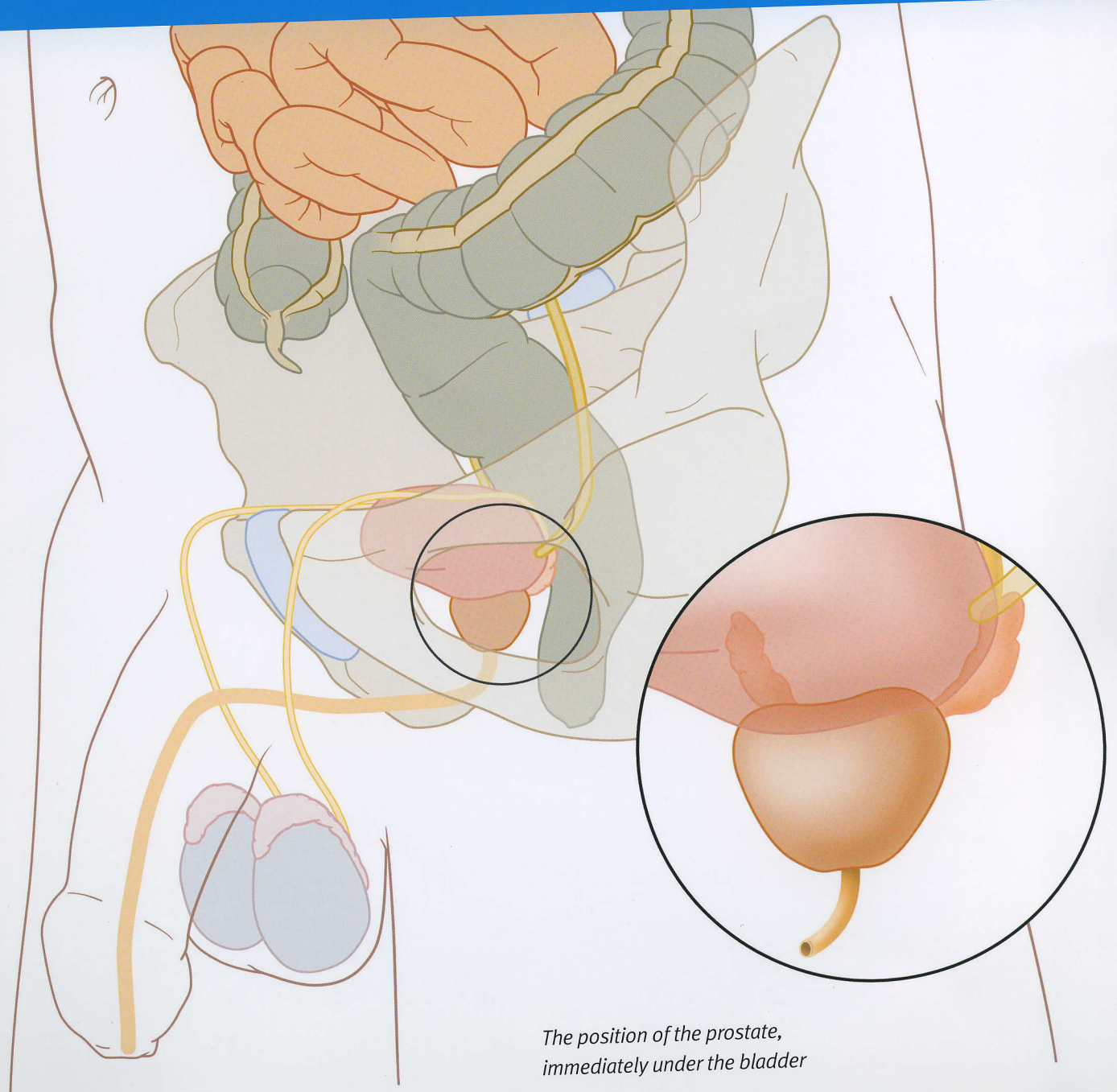
detection
localisation
agression
treatment

PROSTATE MR
CENTER OF EXCELLENCE

Prostate MR Center of Excellence
uses:

3 Tesla MRI-scanner
(Siemens Magnetom Skyra 3T)

- state-of-the-art technologie
- prostate in 3D colour images
- crystal clear down to the molecular level
- insight in cell density and circulation
- location and aggressiveness of cancer can be accurately determined



*The position of the prostate,
immediately under the bladder*

One in six men develop prostate cancer at some point in life

No less than one in six men develop prostate cancer at some point in life. There is no preventative screening and if it is suspected, the patient may have to undergo a range of very different, and often painful, detection methods and treatments.

The consequences of prostate cancer are anything but mild. Of the 10,000 odd men diagnosed in the Netherlands each year, about 2500 die of the consequences. Of the men who survive, a considerable proportion suffer from permanent incontinence and impotence.

Yet there is a ray of hope. Radboud University Nijmegen Medical Centre is the world leader in new MRI techniques that can quickly confirm or dismiss a suspicion of prostate cancer as well as accurately determining the aggressiveness and spread of the disease. This makes a rapid individualised treatment possible and this increases the patient's chances of survival.

However, these new MRI techniques are still not widely used.

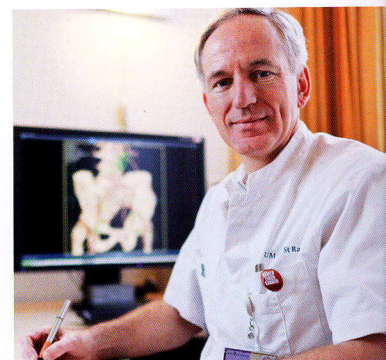
Ignorance, legislation and cost accounting mean that a return trip to our medical centre in Nijmegen is not the first option in the case of suspected prostate cancer. And this despite the fact that a growing international group of patients thinks nothing of taking a long flight to make use of our expertise and facilities.

From an economic viewpoint the new MRI techniques are also favourable: they clearly lower the costs of diagnosis and treatment throughout the entire course of care. So looking beyond the initial costs is definitely worthwhile!

Barriers can be overcome. I hope that we – government, health insurers, specialists, GPs and patients – will increasingly be able to work together to give men with a suspected prostate cancer the benefits of a modern MRI scan.

Yes we scan!

Jelle Barentsz



Prof. Jelle Barentsz is Professor of Radiology and research leader of the Department of Radiology of Radboud University Nijmegen Medical Centre. He gained his degree in medicine cum laude from Utrecht University in 1980 and gained his doctorate in 1990 for his research on MRI of the bladder. As an internationally recognised expert and renowned speaker he has been awarded many international prizes. On top of these he received the 'Koningin Wilhelmina Research' Prize in 2008: an award of 2 million euros for his research into using MRI for the diagnosis and treatment of prostate cancer.

Radboud University Nijmegen Medical Centre

Top clinical, multidisciplinary care for prostate cancer

At Radboud University Nijmegen Medical Centre all of the relevant specialisms and departments work together on the diagnosis and treatment of prostate cancer.

MRI screening for actual and suspected prostate cancer takes place at the Prostate MR Center of Excellence, part of the Department of Radiology. Each year hundreds of patients from across the world come for an MRI diagnosis to Nijmegen because the new techniques are currently only used here.

RUCO expertise centre

If prostate cancer is diagnosed then a treatment plan is compiled in close collaboration with the Radboud University Centre for Oncology (RUCO). All oncological expertise has been concentrated in this specialist centre.

Multidisciplinary team

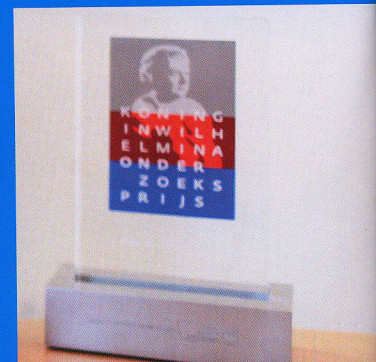
During the diagnosis and treatment of prostate cancer the patient can count on top clinical care by a multidisciplinary team:

- urologist
- radiotherapist
- radiologist
- pathologist
- medical oncologist
- sexuologist
- oncological nurse

Research prizes

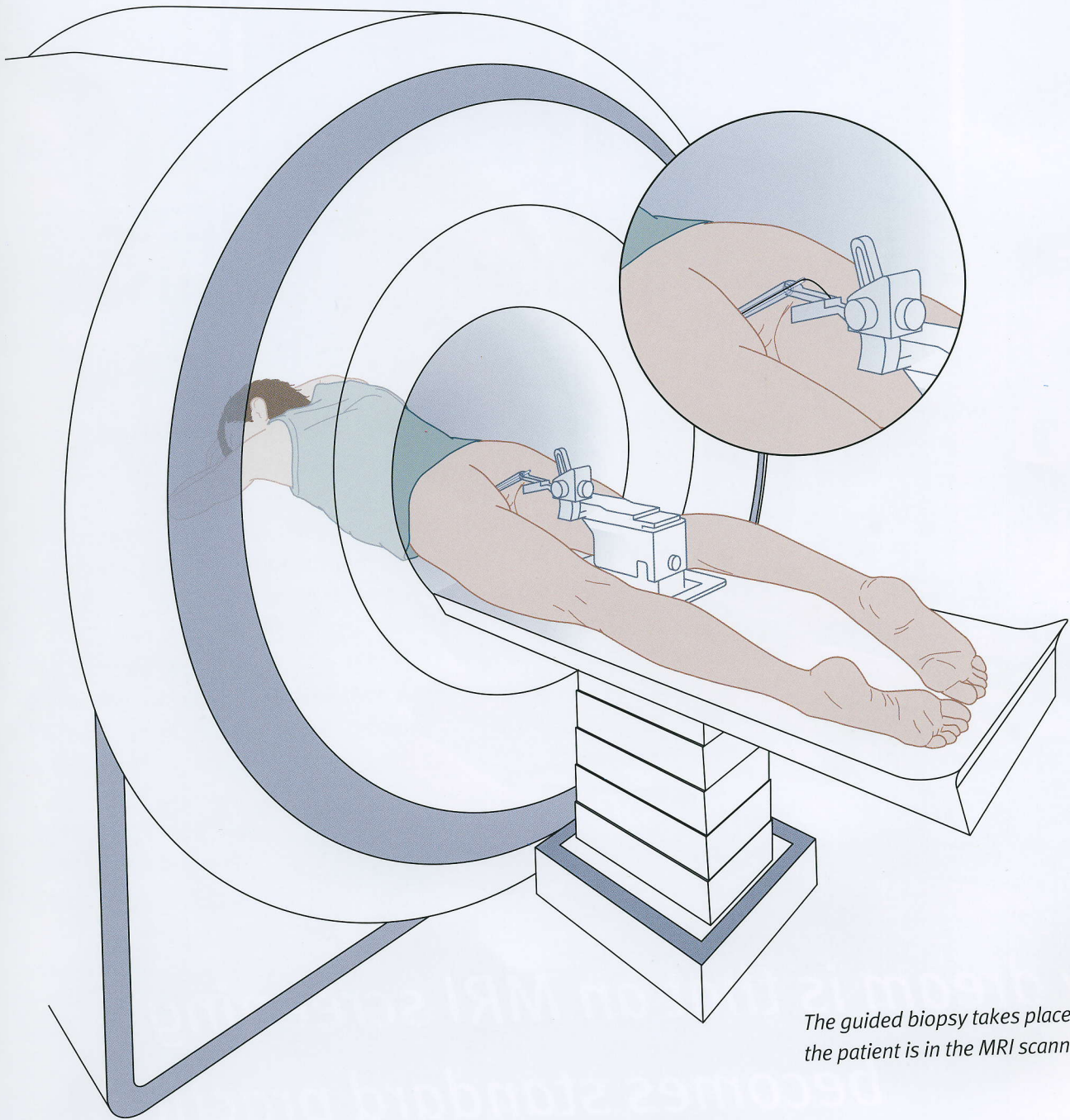
The research into MRI screening for actual or suspected prostate cancer by the Prostate MR Center of Excellence is led by Prof. Jelle Barentsz. This research has been awarded various prestigious prizes including:

- SCBTMR Lauterbur Award (1999, 2010)
- Koningin Wilhelmina Research Prize (2008)
- SCBTR Cum Laude Award (2004, 2008)
- 6 first prizes Society of Uroradiology:
1994, 1998, 2001, 2002, 2006, 2007





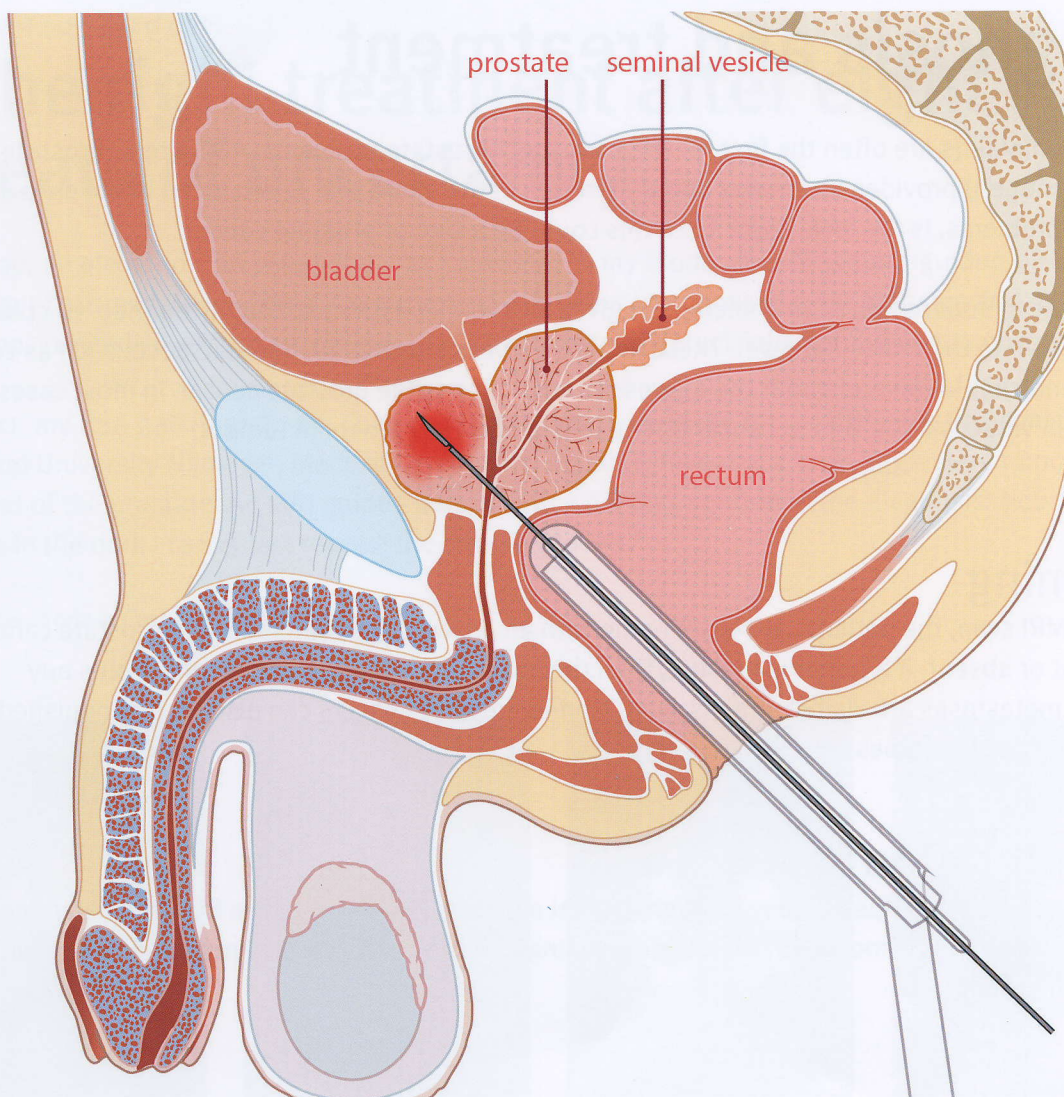
“My dream is that an MRI screening becomes standard practice if somebody comes to their GP with an elevated PSA level.”



The guided biopsy takes place while the patient is in the MRI scanner.

Benefits of scanning

- Early detection of the aggressive prostate cancer
- Precise determination of the malignancy
- The correct treatment choice because the spread and aggressivity of the tumour can be accurately established
- No surgical interventions are necessary to detect lymph-node metastases
- No unnecessary hormone treatments to treat metastases (side effects include forgetfulness and loss of energy)



During the MRI-guided biopsy the worst part of the tumour can be specifically targeted.

Grants needed for further cancer research

The research prizes and grants from the Dutch Cancer Society (www.kwfkankerbestrijding.nl) are vital for further research into the use of MRI for diagnostics and the treatment of prostate cancer, for example. Such research really improves the prospects of cancer patients and it also reduces the risk of cancer.



Diagnosis and treatment

Urinary complaints are often the first reason to suspect prostate problems. A PSA test (Prostate Specific Antigen) provides an answer about a protein in the blood that is produced in the case of prostate problems. Is the level high? Then this could be a sign of prostate cancer.

In that case a modern MRI scan immediately gives an overall picture with highly defined 3D colour images down to the molecular level. These images provide information about aspects such as cell density and circulation and about the aggressiveness of possible prostate cancer. In most cases, a high PSA value is not a sign of cancer but an inflammation or a benign tumour.

Scanning

After an MRI scan, the patient can return home with an answer. The scan reveals if prostate cancer is present or absent. If a tumor is present, then the nature and location of the cancer plus any possible metastases are visible straightaway. Non-aggressive cancers can also be distinguished from the aggressive types.

Interpretation

With a so-called MR-guided biopsy through a rectal approach, a core of tissue from the most aggressive part of the tumour is removed for histologic examination. The biopsy is performed while the patient is in the MRI scanner.

Treatment

In a short period of time, all of the characteristics of the prostate cancer can be assessed and a specific treatment plan compiled. Thanks to the more rapid diagnosis, the chance of metastases is reduced. Removal of the prostate is necessary less often, which means the chances of impotence or incontinence is less.

Follow-up treatments can include:

- A wait and see approach (annual MRI)
- Focal treatment during which the tumour is 'burned away' using an MRI-guided laser or ultrasound (without an operation or radiation therapy)
- Targeted radiation therapy, hormonal therapy and/or chemotherapy
- Removal of the prostate using the DaVinci operation robot (the fine mechanics reduce the risk of incontinence and/or impotence).

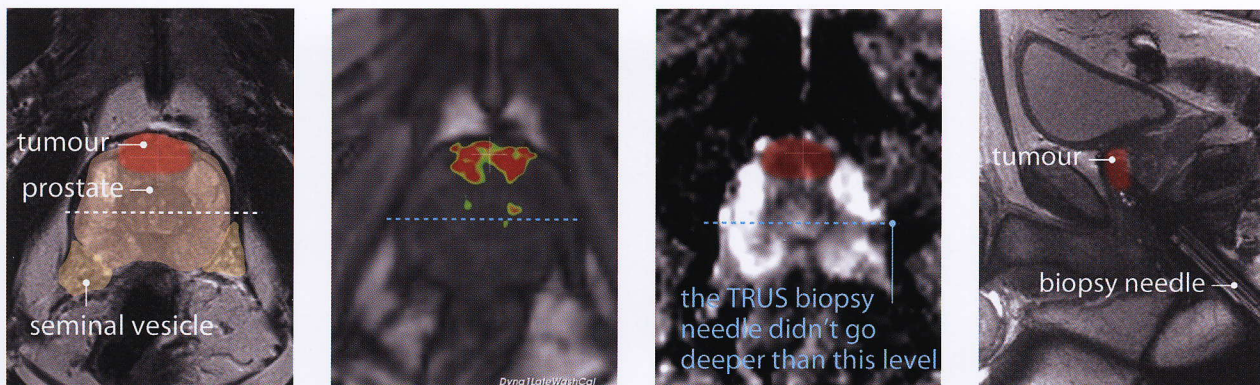
A patient now aged 62*:

“The right treatment after eight years of uncertainty”

“In 2009, an elevated PSA value of 9 was measured in my blood. An ultrasound-guided biopsy was taken but that revealed nothing. Over the next few years I underwent more biopsies and on each occasion, 12 needles were used. No less than 96 needles were stuck into me! But no tumour was found.”

“In 2011, my PSA had risen to 28. Then it was decided to send me for an MRI investigation at Radboud University Nijmegen Medical Centre. This instantly revealed a large aggressive tumour at the front of the prostate. An MRI guided biopsy with 2 needles confirmed the diagnosis. Now after 8 years in the dark I can at last receive the right treatment.”

** This case is one of Prof. Jelle Barentsz's patients.*

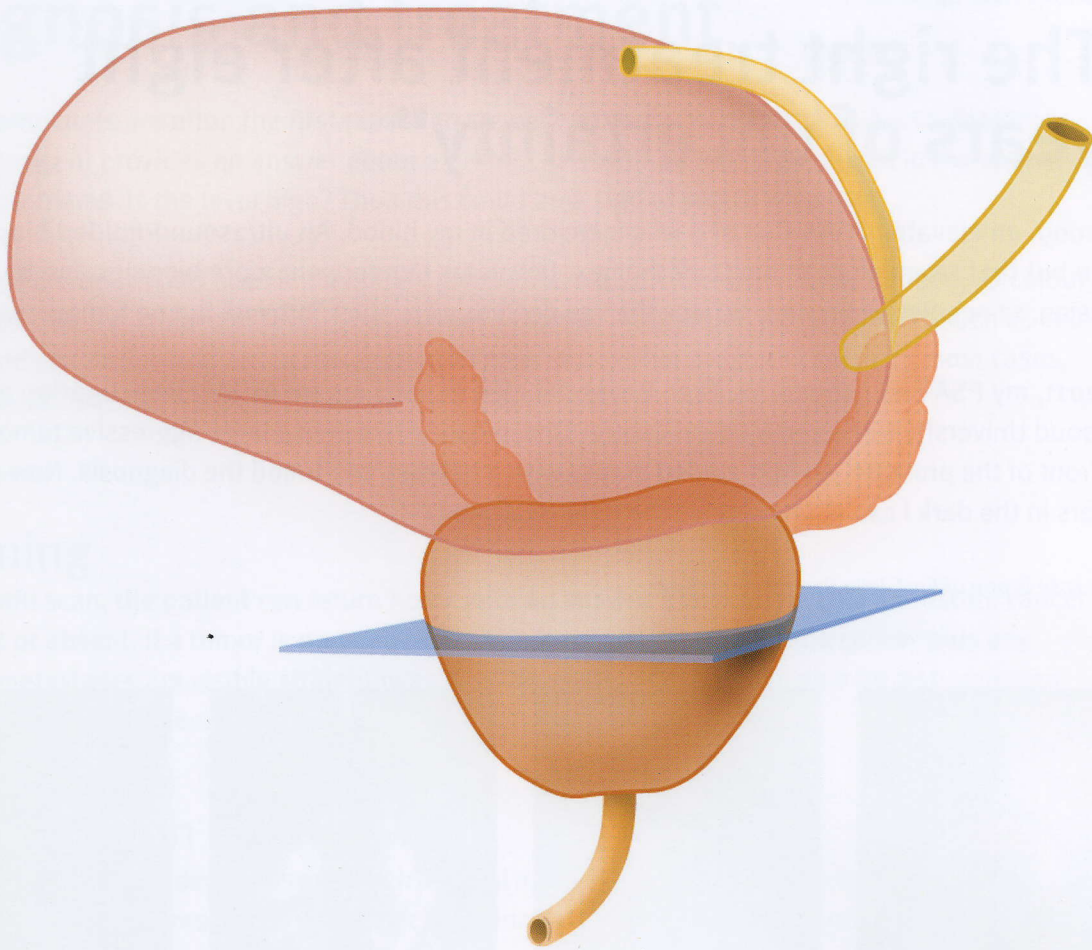


“No less than 96 needles were stuck into me!”

Make men aware of their prostate

Blue Ribbon (www.blueribbon.nl) wants to make men aware of their prostate and to dispel the taboos about this by raising awareness of prostate cancer among the general public, the media and politicians. Blue Ribbon is an initiative from the Prostate Cancer Foundation Contact (Stichting Contactgroep Prostaat-kanker) and its activities are supported by the Dutch Cancer Society and the Dutch Association of Urology.





***Ultrasound biopsies
underestimate the true nature
of aggressive prostate cancers
46% of cases;
MRI is 95% accurate***

Disadvantages of the current diagnostics

Many painful tests are often needed to establish a diagnosis at present. The results are mostly inaccurate. The result: a lack of clarity, stress and physical inconvenience for the patient.

1. Rectal examination

During a rectal examination the physician feels with his fingers if tumours are present on the prostate.

Disadvantages: *The examination is unpleasant for the patient. It is also highly inaccurate: 70% of the cancers cannot be felt. The finger only reaches one side of the prostate and often misses the seminal vesicles.*

2. Ultrasound biopsies

With the help of ultrasonography, 12 needles are used to take samples from the prostate. Is tumour tissue found? Then treatment is the next step. If nothing is found then the biopsy is frequently repeated.

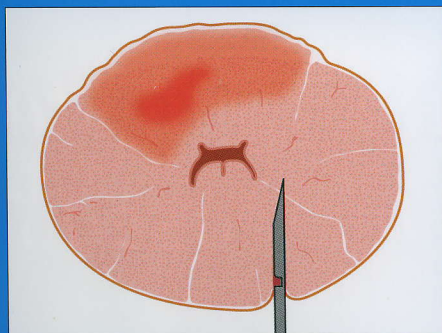
Disadvantages: *This examination is very burdensome and painful for the patient. The method is also not targeted and therefore inaccurate: the tumour is often missed. In retrospect many tissue samples prove to be unnecessary (no prostate cancer). The tissue becomes damaged, certainly in the case of repeated biopsies.*

3. Conventional MRI

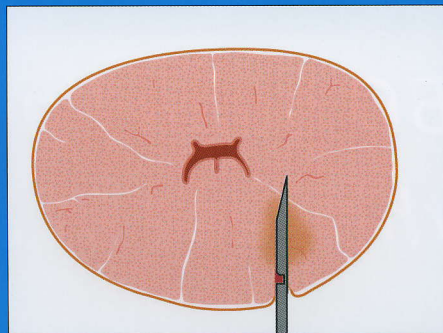
For conventional MRI a two-dimensional image is made in black and white. On such images the tumour can be observed as a vague, grey mark. If the tumour is localised then an operation or radiotherapy is usually the next step.

Disadvantages: *The image does not provide an accurate location of the tumour and does not make all metastases visible. Moreover, it cannot be seen if the tumour is benign or malignant.*

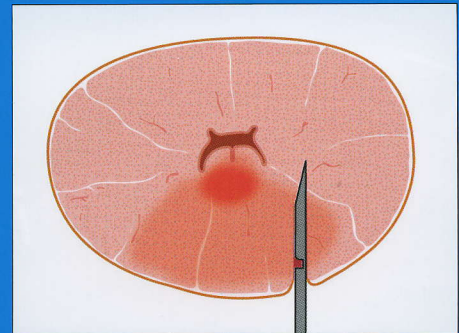
The images below show a cross section of the prostate



Needle penetrates next to the tumour or does not reach it



Wrong (non-aggressive) tumour is biopsied

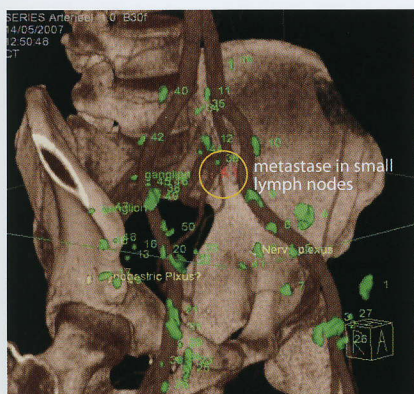


Wrong part of the tumour is biopsied

A patient now aged 65*:

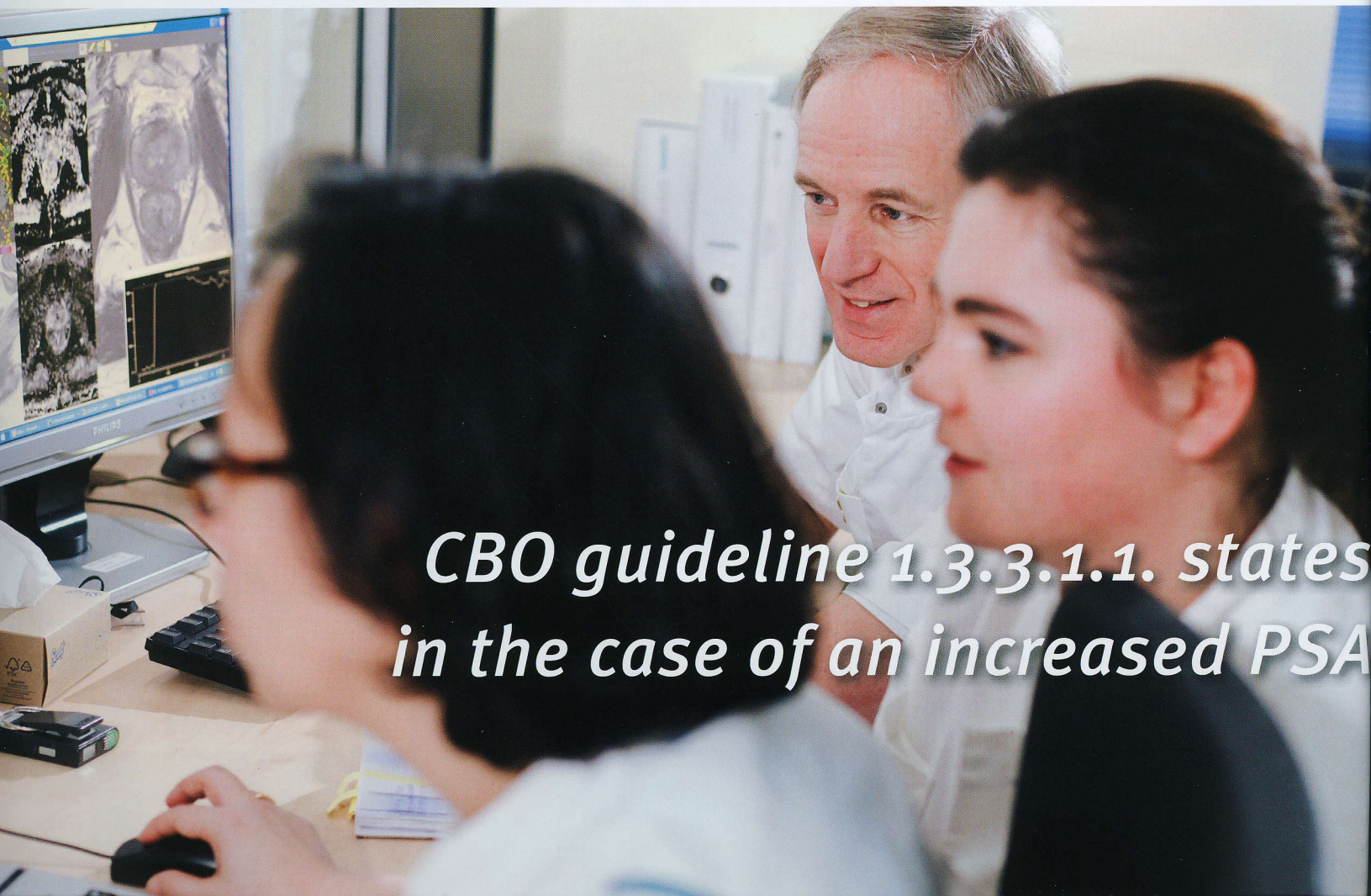
“MRI revealed the true cause of my PSA rise.”

“In 2004, I received brachy-radiotherapy for prostate cancer. The results seemed to be good. Nevertheless my PSA level still rose again in 2007. The physicians suspected a local recurrence and therefore considered complete removal of my prostate. Just to be sure I first of all let an MRI scan be performed at Radboud University Nijmegen Medical Centre.”



“During the MRI scan an experimental iron contrast medium was used with very precise results. This scan revealed the real cause of my PSA elevation: a small number of metastases in my lymph nodes. I underwent temporary hormone treatment and selective radiotherapy of the nodes. I no longer take any hormones and my PSA level is normal again.”

**This case is one of Prof. Jelle Barentsz's patients.*



***CBO guideline 1.3.3.1.1. states
in the case of an increased PSA***

Facts and figures

- 64% of men with an increased PSA do not have prostate cancer. MRI provides immediate clarity.
- In 90% of cases, MRI detects the tumour at exactly the right location.
- In men who have already undergone a negative ultrasound-guided biopsy twice, cancer was subsequently diagnosed in one go with MRI in 59% of cases.
- 50% of the tumours that are found with a biopsy are non-aggressive and do not need treatment. However, in these cases unnecessary operations are often performed.
- Ultrasound biopsies underestimate the true nature of aggressive prostate cancers in 46% of cases; MRI is 95% accurate.
- CBO guideline 1.3.3.1.1. states that modern MRI is the best option in the case of an increased PSA and a previous negative TRUS biopsy. Many medical professionals are not yet aware of this and therefore rely on the known – conventional – detection methods.
- Point 1.3.3.1.2. of the CBO guideline states that an MRI must be made prior to treatment for prostate cancer.
- Point 1.3.2 states that the CT scan is not recommended for the diagnostics and local tumour and lymph node staging of the prostate carcinoma.
- MRI reduces the number of biopsies.

*that modern MRI is the best option
after a previous negative TRUST-guided biopsy*

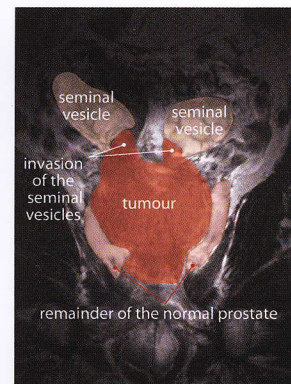
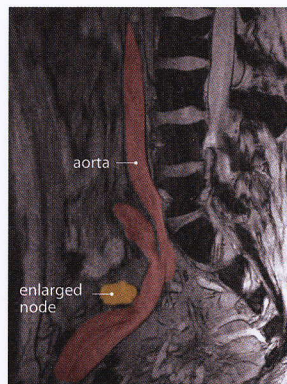
Een nu 54-jarige patiënt*:

“On the basis of the scan my operation was cancelled.”

“In 2005, a PSA value of 6 was measured in my blood. When the ultrasound guided biopsy subsequently revealed prostate cancer a prostate operation was planned immediately. However, I still let an MRI scan be performed at Radboud University Nijmegen Medical Centre before the operation.”

“The MRI scan revealed a large aggressive cancer on 90% of my prostate with infiltration of the seminal vesicles. An abnormal node with metastases could also be seen. Based on this scan it was decided to cancel the operation. I received a hormone treatment instead. I now feel relatively fit and have a PSA value of 0. Without the MRI scan I would have undergone an unnecessary operation.”

* This case is one of Prof. Jelle Barentsz's patients.



“50% of the tumours that are found with a biopsy are

non-aggressive and do not need treatment.

However, in these cases unnecessary operations are often performed.”

Finally

My dream is that MRI screening will become standard practice if somebody comes to the GP with an elevated PSA. And that operations will then become unnecessary thanks to timely treatment with laser or ultrasound.

With a new type of contrast fluid the patient can also be diagnosed more effectively. In a recent experimental phase the use of this fluid led to strikingly positive results. The international interest was overwhelming. I sincerely hope that this contrast fluid will shortly be available for use in the Netherlands.

Furthermore promising developments are taking place in the combination of techniques such as MRI, MRS, CT scans and PET scans. Increasing benefits can be obtained from such approaches.

Or even better still: a general screening for men above a certain age. If this is done for breast cancer (1 in 7 women), then why isn't done for prostate cancer (1 in 6 men). Why don't we have a 'mannography' yet? Why don't we all pin a blue ribbon to our lapels?

A major step forwards in this direction is the rapid diagnosis route that is already taking place in our Prostate MR Center of Excellence in Nijmegen on a limited scale. In a single day, the patient is scanned and he receives the diagnosis and treatment plan within 48 hours. That's how it ought to be: if prostate cancer is suspected, then a valid diagnosis should be made in one go and the patient should have a clear perspective straightaway.

If you still have doubts about the financial feasibility of all of this, then please come and calculate the costs of the total care package with me. Because with the use of our modern MRI techniques, these costs are definitely lower.

Jelle Barentsz



Information for care providers

Further information about the latest MRI techniques or the possibilities and progress of the research can be obtained from the Prostate MR Center of Excellence.

Postal address:

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Secretariaat Prostate MR Center of Excellence
Afdeling Radiologie
Huispost 667
Postbus 9101
6500 HB Nijmegen
The Netherlands

e-mail: s.estourgie@rad.umcn.nl
telephone: +31 24 361 9196

Visitor's address

Geert Groteplein-Zuid 10
6525 GA Nijmegen
The Netherlands

Would you like further information about prostate cancer and its treatment?

Then please contact your physician or click on www.umcn.nl/mrcenter

How can you apply for a prostate MRI?

www.umcn.nl/mrcenter › 'MR Prostaat aanvragen'

PROSTATE MR CENTER OF EXCELLENCE

is part of the Department of Radiology of Radboud University Nijmegen Medical Centre and is part of the multidisciplinary expertise centre of the RUCO.



Credits:

coordination and editing: Product Group Communication Radboud University Nijmegen Medical Centre
design: Puntkomma, Nijmegen
photography: Paul Lagro, Oosterbeek
text: De Huurwoordenaar, Arnhem
illustrations: Maartje Kunen, 's-Hertogenbosch
translation: Radboud in'to Languages, Nijmegen
printing: Mediacenter, Rotterdam