

# Prostate Health Index *phi*

The latest advance in Prostate Health Testing



The Prostate Health Index (*phi*) is now available through Melbourne Pathology. This test has significantly improved accuracy in prostate cancer risk prediction over currently available tests. (Catalona et al, Journal of Urology 2011, see references)

## What is the basis of the *phi* test?

A marker for prostate cancer has been identified – truncated proPSA (p2PSA). This molecule circulates as part of the Free PSA fraction, and is present as a higher proportion of the Free PSA fraction in patients with prostate cancer. A greater specificity for cancer detection was found when proPSA was combined with Free PSA and Total PSA, as a calculation known as the Prostate Health Index (*phi*).

### When is it indicated?

phi is likely to be most useful in men where the Total PSA result is mildly elevated (2 – 10 µg/L). Determining the cancer risk in this range can be difficult, with up to 25% of new prostate cancer patients having a relatively normal PSA (< 4 µg/L); on the other hand, 60 – 70% of men with a PSA value > 4 µg/L have a benign biopsy result. Because of this uncertainty, a prostate biopsy is often considered to clarify the diagnosis.

## Advantages of the $\phi$

- *phi* can assist patients and doctors to make a decision about proceeding with a prostate biopsy.
- *phi* is minimally influenced by the age of an individual.

It is envisaged that this test may assist in reducing the number of unnecessary biopsies in patients with a mildly elevated Total PSA result (2 – 10 µg/L).

The role of *phi* in other clinical situations, such as follow-up of radical prostatectomy, has not yet been established.

- **The original test**  
**PSA**  
**55% diagnostic accuracy**

The PSA test is a good starting point, but an elevated result does not differentiate between benign prostate enlargement and prostate cancer.

- **A better test**  
Free/Total PSA Ratio  
*65% diagnostic accuracy*

The ratio of Free to Total PSA is lower in cancer than in benign prostate disease, so this test can be a more accurate detector of cancer, but is still a suboptimal test.

- **The next generation test**  
Prostate Health Index  
*75% diagnostic accuracy*

A better indicator of whether a patient should proceed to biopsy.


*phi* and Prostate Cancer – (% probability of positive biopsy)  
(for Total PSA of 2 – 10 µg/L)

Low (8.7%)   Moderate (20.6%)   High (43.8%)

## What to request?

Prostate health index or  $\phi_i$ .

*phi* cannot be bulk billed as there is no Medicare rebate. The patient will receive an account for \$95\*.

 <b>PATHOLOGY</b>		REFERRAL	
<b>Patient</b> <div style="border: 1px solid black; padding: 2px; margin-top: 5px;"> <b>Mr Citizen John</b> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>           Title _____ Surname _____            Address _____  <b>123 Main Street</b>  <b>Melbourne VIC 3000</b> </div> <div>           Given Name _____            Hs/UR No. _____         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>           Date of Birth _____ Sex _____            12/03/1963    M         </div> <div>           Telephone No. _____            _____         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>           Medication No. _____            _____         </div> <div>           Accident to _____            _____         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>           Plan _____ WC _____ SAC _____            HSD _____ wk _____ Oth _____         </div> <div>           Card No. _____            _____         </div> </div>		<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;"> <b>Doctor</b>            Gp/EC/Code _____            Gp's Ref No. _____            Address _____            _____            _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           Provider No. _____            _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           Copy to: Dr Name and Address _____            _____            _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           Copy 2 Refs _____            1. _____            2. _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           Loc Code _____ Hosp Code _____ Ward _____            _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           Ref _____ PC _____ HC _____ NU _____ DE _____ M _____ IP _____ CP _____ IN _____ PR _____ RD _____            _____         </div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">           SD _____ RSK _____            _____         </div>	
<b>Clinical Notes</b> (including relevant medications) <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <b>Recent PSA 1.2</b> </div>		<b>Tests Requested</b> <div style="display: flex; justify-content: space-between; align-items: center; margin-bottom: 5px;"> <div>           Urgent <input type="checkbox"/> Tel. <input type="checkbox"/> Fax <input type="checkbox"/> By _____            Action No. _____         </div> <div>           Containers Collected _____            _____         </div> </div> <div style="border: 1px solid black; padding: 20px; text-align: center; margin-top: 10px;"> <div style="background-color: yellow; display: inline-block; padding: 10px 20px;">phi</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div>           X _____            Doctor's Signature         </div> <div>           _____            Requested Date         </div> </div>	
<div style="display: flex;"> <div style="flex: 1; padding-right: 10px;"> <b>Service Cytology</b>  <input type="checkbox"/> Prostate/Small  <input type="checkbox"/> Menstrual  <input type="checkbox"/> Post Menopausal  <input type="checkbox"/> Pregnancy  <input type="checkbox"/> L.M.F.  <input type="checkbox"/> Post Partum  <input type="checkbox"/> Combination  <input type="checkbox"/> Hormonal Therapy         </div> <div style="flex: 1;"> <b>Patient Status at Date of Service or Specimen Collection</b>  <input type="checkbox"/> Private patient in a private hospital or approved hospital facility  <input type="checkbox"/> Hospital patient in a recognised hospital  <input type="checkbox"/> Private patient in a recognised hospital  <input type="checkbox"/> Outpatient patient of a recognised hospital  <div style="display: flex; justify-content: space-between;"> <span>Yes</span> <span>No</span> </div> </div> </div>		<div style="display: flex; justify-content: space-between; align-items: center; margin-bottom: 5px;"> <div>           Signed _____            Person Identifying patient         </div> <div>           Specimen Date _____            _____         </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div>           _____            Specimen Time         </div> <div>           _____            Specimen Time         </div> </div>	

# Prostate Health Index *phi*

The latest advance in Prostate Health Testing

## Patient Management

The question about the adoption of widespread screening for prostate cancer is currently the topic of debate, as is the best management protocol for dealing with patients with mild PSA elevations. Other factors, such as patient age and co-morbidities, are very relevant in the approach to each case.

The use of PSA medians for risk stratification was recognised in the changes made to the Medicare Benefits Schedule in May, 2009 (see cost information to the right).

As the *phi* test is most useful where the Total PSA result is above the median (2 – 10 µg/L), it may help determine, with more confidence, whether the elevated PSA is more likely to be associated with prostate cancer than due to non-cancerous changes, potentially avoiding unnecessary biopsy.

The flowchart shows one possible approach. Earlier referral to a urologist may be desirable for patients with specific symptoms or concerns including a rapidly rising PSA.

## How much does prostate testing cost?

Prostate Specific Antigen (PSA): Total

- Medicare rebate is available under the following conditions:  
Monitoring of previously diagnosed prostatic disease – unrestricted
- 1 PSA test per year for all other men.

Prostate Specific Antigen (PSA): Free/Total Ratio

Medicare rebate is available under the following conditions:

Follow-up of a PSA result that:

1. lies at or above the age-related median, but below the age-related, method-specific 97.5% reference limit – 1 test per 12 month period, or
2. lies at or above the age-related, method-specific 97.5% reference limit, but below a value of 10 µg/L – 4 tests per 12 month period.

Prostate Health Index (*phi*)

*phi* tests cannot be bulk billed as Medicare Australia does not provide a rebate for *phi*. Patients will receive an account. The fee for *phi* is \$95\* and patients will not be able to claim a Medicare rebate for this service.



**Associate Professor Ken Sikaris**  
BSc(Hons), MBBS, FRCPA, FAACB, FFSc  
Chemical Pathology

A University of Melbourne graduate, Dr Sikaris trained at the Royal Melbourne, Queen Victoria, Prince Henry's and Heidelberg Repatriation Hospitals. He obtained fellowships from the Royal College of Pathologists of Australasia (RCPA) and the Australasian Association of Clinical Biochemists (AACB) in 1992 and 1997 respectively.

A/Prof Sikaris was appointed Director of Chemical Pathology at St Vincent's Hospital in 1993 and Medical Director of Dorevitch Pathology in 1998 before starting at Melbourne Pathology in 2003. He specialises in Prostate Specific Antigen, cholesterol and quality assurance and is Chair of the RCPAQAP Key Incident Monitoring Program for Australasia.

A NATA-accredited laboratory assessor, he is also founding Fellow of the RCPA Faculty of Science where he is Principal Examiner in Chemical Pathology.

A/Prof Sikaris is a Principal Fellow of the Department of Pathology at Melbourne University and lectures to undergraduates, GPs and a variety of specialist groups across Australia and overseas.

A/Prof Sikaris is also Director of Clinical Support Services for Sonic Healthcare.

For further information, please contact A/Prof Ken Sikaris on 9287 7847.

## References

Australian Institute of Health and Welfare (AIHW) 2010. ACIM (Australian Cancer Incidence and Mortality) Books. AIHW: Canberra (2007 data). Prevalence of Prostate Cancer among Men with a Prostate-Specific Antigen Level  $\leq 4.0$  ng per Milliliter. Thompson IM et al. N Engl J Med 2004;350:2239–46. Baseline prostate-specific antigen compared with median prostate-specific antigen for age group as predictor of prostate cancer risk in men younger than 60 years old. Loeb S et al. Urology 2006;67:316–320. Long-term prediction of prostate cancer up to 25 years before diagnosis of prostate cancer using prostate kallikreins measured at age 44 to 50 years. Lilja H et al. J Clin Oncol 2007;25:431–6. A multicenter study of [-2]pro-prostate specific antigen combined with prostate specific antigen and free prostate specific antigen for prostate cancer detection in the 2.0 to 10.0 ng/ml prostate specific antigen range. Catalona WJ et al. J Urol 2011 May;185(5):1650–5. Epub 2011 Mar 17. Free prostate-specific antigen test utilization. Consistency with guidelines. Jackson BR et al. J Gen Intern Med. 2005 September; 20(9): 859–861.

\*Correct at the time of printing.

Fees are subject to change without notice.