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Introducing the new Multiplex Faecal PCR in the algorithm for diagnosis of enteric pathogens causing gastroenteritis

Dr Renu Vohra MBBS MD FRCPA

Diarrhoeal disease is a leading cause of morbidity and mortality worldwide, both in developing and developed regions of the world. Both enteric protozoa and enteric bacteria continue to be the most commonly encountered pathogens causing diarrhoea.

Diagnostic microbiology laboratories rely on conventional methods of microscopy and culture for detection of enteric protozoa and bacteria.

QML Pathology processes tens of thousands of faecal samples per year for gastrointestinal pathogens and performs conventional diagnostic methods like culture and microscopy for their detection. However, culture and microscopic methods require significant skill, labour and time, which can delay epidemiological investigation or treatment.

Conventional culture has been the 'gold standard' method for the detection of bacterial enteric pathogens even though studies have repeatedly noted poor yield and high cost.



Conventional methods

The microscopic techniques employed require technical skill and expertise. It is also labor intensive and time consuming.

Conventional culture has been the 'gold standard' method for the detection of bacterial enteric pathogens even though studies have repeatedly noted poor yield and high cost.

Culture and identification is performed for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, *Aeromonas*, *Plesiomonas* and *Vibrio*. These procedures include enrichment steps, use of selective culture media, biochemical identification, serotyping, and resistance profiling. Final results are obtained after 3 to 4 days, making these procedures laborious and time-consuming.

Many bacteria are inherently difficult to grow (affected by prior antibiotics) and may attain a so-called viable but non culturable state (*Campylobacter jejuni*). This complication combined with the limited viability of *Shigella* outside the human body may compromise the sensitivity of culture.

The advantages, however, of these methods include identification to the species or serovar level, the facilitation of outbreak management, and the generation of an antimicrobial susceptibility profile.

Faeces PCR

Molecular methods provide a means for sensitive and rapid detection of enteric pathogens. A number of molecular diagnostic assays on faecal specimens have recently emerged for enteric pathogens, including several Multiplex PCR approaches using real-time cyclers, gel electrophoresis or hybridisation-based detection.

QML Pathology evaluated TIB Molbiol (light mix) Multiplex Real-Time PCR that detects *Cryptosporidium sp*, *Giardia sp*, *Dientamoeba sp*, *Blastocystis sp*, *E.histolytica*, *Salmonella sp*, *Campylobacter sp*, *Shigella sp*, *Y.enterocolitica* and *Aeromonas sp* simultaneously in two detection wells and compared it with conventional methods.

These 10 pathogens combined account for greater than 95% of all faecal pathogens detected in clinical samples at QML Pathology.

The initial evaluation of the PCR showed **superior sensitivity (100%) and specificity (100%)** for both enteric protozoa and enteric bacteria with reduced turnaround time.

Since the integration of the Multiplex PCR in the routine algorithm at QML Pathology for stool examination, more than 4,500 stool specimens have been analysed by both conventional methods and PCR.

Findings of the Multiplex PCR compared to conventional techniques since implementation:

1. IMPROVED DETECTION RATES

Significant increased detection rates of both enteric protozoa and enteric bacteria by Multiplex PCR:

- (a) Enteric protozoa - the detection rate was 33% by Multiplex PCR compared to 6% by microscopy.
- (b) Enteric bacteria - the detection rate was 11% by Multiplex PCR compared to 5% by culture.

Detection rates were significantly more for *Blastocystis sp* and *Dientamoeba sp* by Multiplex PCR:

- (a) *Blastocystis sp* - the detection rate was found to be 15% by PCR compared to 4% by microscopy.
- (b) *Dientamoeba sp* - detection rate was found to be 14% by PCR compared to 0.2% by microscopy.

The detection rate of *Aeromonas sp* was found to be 2% compared to 0.1% by culture.

2. IMPROVED SENSITIVITY AND SPECIFICITY

Sensitivity and specificity for detection of both enteric protozoa and bacteria were 100% respectively when compared to conventional techniques.

3. DETECTION OF MULTIPLE PATHOGENS

2% of specimens had more than one enteric protozoa detected by PCR compared to 0.3% by microscopy.

General comments from customers since implementation

Customers have been very appreciative of the reduced turnaround time for the results. Early institution of therapy in patients has led to improved patient outcomes.

Role of microscopy and culture

Although Multiplex PCR has shown to be superior to both microscopy and culture, QML Pathology still recommends requesting both microscopy and culture. This is because Multiplex PCR only detects 10 faecal pathogens (namely *Cryptosporidium sp*, *Giardia sp*, *Dientamoeba sp*, *Blastocystis sp*, *E.histolytica*, *Salmonella sp*, *Campylobacter sp*, *Shigella sp*, *Y.enterocolitica* and *Aeromonas sp*).

Therefore, MCS is required for the detection of infection by other parasites and enteric bacteria that are not covered by PCR. Furthermore, culture of bacterial pathogens aids in identification to the species or serovar level, as well as the generation of an antimicrobial susceptibility profile.

Frequently asked questions since implementation of the PCR

DO INCREASED DETECTION RATES OF *BLASTOCYSTIS* SPECIES AND *DIENTAMOEBIA* SPECIES REPRESENT FALSE POSITIVES BY PCR?

The increase in detection rates is due to enhanced sensitivity (100%) of the PCR compared to the conventional methods. In the study conducted at QML Pathology, all specimens positive by PCR for *Blastocystis* sp and *Dientamoeba* sp were confirmed positive by an alternate PCR (i.e., by a different PCR method using different genetic target). The specificity of the PCR was 100%, therefore, indicating that these are true positives.

CAN THE PCR DIFFERENTIATE BETWEEN PATHOGENIC AND NON PATHOGENIC STRAINS OF *BLASTOCYSTIS* SPECIES?

The PCR cannot differentiate between pathogenic and nonpathogenic strains of *Blastocystis* sp, hence, a comment is inserted with a positive result which states "The role of *Blastocystis* in causing diarrhoea is controversial. If symptoms persist after exclusion of other causes, a trial of metronidazole may be indicated."

DOES FAECAL PCR INCLUDE NOROVIRUS?

The PCR targets 10 pathogens including enteric bacteria and enteric protozoa. It currently does not have any targets for enteric viruses.

HOW FRESH DOES A FAECES SAMPLE NEED TO BE?

Stability studies from the Multiplex PCR trial showed that faeces at room temperature for 4 days did not affect the rate of detection of the pathogens.

CAN PCR DETECT ASYMPTOMATIC CARRIAGE OF *GIARDIA*?

Yes it can.

IS REPEAT PCR REQUIRED FOR TESTING CLEARANCE?

If patient is asymptomatic repeat testing to demonstrate clearance is not recommended, unless the patient is a food handler and works in the food industry.

THE MICROSCOPY IS REPORTED AS CYSTS OF *E.HISTOLYTICA* /*E.DISPAR* BUT THE PCR IS NEGATIVE. DOES MY PATIENT HAVE *E.HISTOLYTICA* INFECTION?

The microscopy cannot differentiate between the pathogenic *E.histolytica* from non pathogenic *E.dispar* morphologically. However, the PCR can differentiate between *E.histolytica* and *E.dispar*. Therefore, if the PCR is negative for *E.histolytica* then your patient does not have *E.histolytica* infection.

DO YOU PERFORM CULTURE IF ONLY PCR IS REQUESTED?

No, we cannot perform culture if it is not requested.

HOW DO I INTERPRET PCR RESULTS?

A positive PCR result means the DNA of the specified pathogen was found within the provided sample type. However, PCR cannot differentiate between live and dead organisms.

A negative PCR result can mean:

- no infection
- the sample provided is free of the pathogen(s) requested
- the pathogen(s) may be present, but at a quantity below our assays' detection limit.

CAN I USE A RECTAL SWAB FOR PCR TEST?

The validation of the PCR was carried out on faecal specimens, however, given the sensitivity of the PCR, rectal swabs could be used as alternate specimen. However, QML Pathology does not encourage the use of rectal swabs for Multiplex PCR for faecal pathogens.

WILL THE PCR DETECT ENTERIC PATHOGENS IF THE PATIENT IS ON TREATMENT?

While antibiotics or other various treatments will not inhibit the PCR process, it is possible that treatment may diminish the presence of the pathogen(s) beyond the detection limit of PCR.

DO I STILL NEED TO REQUEST FOR MCS?

Yes, for detection of infection by other parasites and enteric bacteria that is not covered by PCR. Culture of bacterial pathogens aids in identification to the species or serovar level and the generation of an antimicrobial susceptibility profile.

Pathologist Profile

Dr Renu Vohra MBBS MD FRCPA

PATHOLOGIST IN CHARGE: MICROBIOLOGY & IMMUNOLOGY

Phone: (07) 3121 4436

Email: Renu.Vohra@qml.com.au

1994: Obtained an MD in Microbiology, University of Delhi, India.

1997: Commenced training as a Pathologist in Australia.

2000: Obtained fellowship of the Royal College of Pathologists.

1999 - 2002: Worked in private pathology in QLD, progressing from a Registrar position to a Consultant in Microbiology.

Also worked as Clinical Microbiologist with the Queensland Health Pathology Service.

2004: Joined QML Pathology's Microbiology Department.

Special Interests: Bacteriology and molecular microbiology.



Estimated Glomerular Filtration Rate Revisited

Dr Charles Appleton MBBS (Qld) FRCPA

Changes to PIP Diabetes Incentive – eGFR now required annually

Diabetes is the leading cause of chronic kidney disease with approximately 30% of people with type 1 and 40% with type 2 diabetes developing the disease. It is well-recognised that early diagnosis gives a patient the best chance of avoiding progression to end-stage renal disease, dialysis and associated conditions.

From 1 October 2013, a kidney function test has been added to the minimum requirements for eligible patients' annual diabetes cycle of care under the PIP Diabetes Incentive. This test is an annual measurement of a patient's estimated Glomerular Filtration Rate (eGFR). At QML Pathology, the eGFR is reported as part of the E/LFT test. The Pathology 'Best Practice' Guidelines for Diabetes Management are included below for your reference.

	Adult Type 2 Diabetes	Adult Type 1 Diabetes	Adult Aboriginal & Torres Strait Islander	Children	Adolescents
HbA1c	3-6 months if insulin treated. 6-12 months if no insulin.	3-6 months	3 monthly	3 monthly	3 monthly
Albuminuria	At diagnosis, then 12 monthly if normal. 3-6 monthly if proteinuria.	5 years post diagnosis, then 12 monthly.	At diagnosis, then 12 monthly if normal. 3-6 monthly if proteinuria.	5 years post diagnosis or at onset of puberty, then 12 monthly.	2 years post diagnosis or at onset of puberty, then 12 monthly.
Lipid Studies	1-2 years if normal. 3-6 months if abnormal (fasting).	1-2 years if normal. 3-6 months if abnormal or treated abnormal (fasting).	1-2 years if normal. 3-6 months if abnormal or treated abnormal (fasting).	2 years	2 years
eGFR (part of E/LFT)	12 monthly	12 monthly	12 monthly	12 monthly	12 monthly

TABLE 1: PATHOLOGY 'BEST PRACTICE' GUIDELINES FOR DIABETES MANAGEMENT

Estimated Glomerular Filtration Rate Revisited

It has been almost 10 years since The Australasian Creatinine Consensus Group published recommendations for all Australian laboratories to routinely calculate and report the eGFR on all adult patients.

This was in response to rising concerns that many older patients whose renal function was declining but whose muscle mass was also falling were being overlooked. The decline in creatinine production which related to the muscle mass was tending to mask the renal impairment until quite severe renal impairment had developed. This was particularly a concern with the large group of patients with diabetes mellitus.

Meas. GFR Stage	N	CKD Stage based on aMDRD				
		1	2	3	4	5
1	482	67%	33%	1%	0%	0%
2	576	16%	64%	21%	0%	0%
3	597	1%	12%	78%	10%	0%
4	312	0%	0%	17%	79%	4%
5	128	0%	0%	3%	32%	65%

TABLE 2: CKD STAGE BASED ON aMDRD

Froissart et al *J Am Soc Nephrol* 16(3):763-73, 2005

After consideration of many formulae (which to be useful had to be based only on parameters to which the laboratories already had access – it was not helpful for instance to require measurement, recording and accurate transcription of body weight and height, or to require assay of additional parameters such as cystatin, or collection of an additional urine sample), the '186' MDRD formula was recommended. In Table 2 we see the formula's success in prediction of degree of renal impairment from essentially normal to end-stage disease.

The recommended formula has been refined twice since to further improve prediction; however, the formula has limitations.

The Cockcroft-Gault formula has traditionally been used for guiding drug dosages and there is a large amount of clinical experience with this. The eGFR, however, is widely available and provides a valid estimate of the renal function. The units of eGFR are mL/min/1.73 m² whereas the units of drug clearance are mL/min. To avoid overdosing small patients or underdosing large patients, dosage may require adjustment for patient size.

In chronic kidney disease, factors other than renal drug clearance play a role on pharmacokinetics. Thus, the eGFR cannot displace the need for therapeutic drug monitoring.

eGFR is not useful for predicting renal dysfunction in patients under the age of 18 years and validation studies of eGFR in pregnancy have yet to be performed.

The use of eGFR in other than Caucasian populations has been explored and although the formula has not been validated in Aboriginal and Torres Strait Islander patients, it appears clinically appropriate to use it prudently in these populations.

Finally, eGFR tells only part of the story with respect to renal disease. For complete risk stratification of patients with chronic kidney disease, both the eGFR and the urinary albumin should be assessed.

References

1. Johnson, DW et al. Chronic kidney disease and automatic reporting of estimated glomerular filtration rate: new developments and revised recommendations. *Med J Aust.* 197(4):222-223
2. Linacre S. Australian social trends: diabetes mellitus. Australian Bureau of Statistics. Commonwealth of Australia. 2007
3. Shaw J, Tanamas S, editors. Diabetes: the silent pandemic and its impact on Australia. Baker IDI Heart and Diabetes Institute with input from Diabetes Australia and Juvenile Diabetes Research Foundation (JDRF). 2012

Pathologist Profile

Dr Charles Appleton MMBS (Qld) FRCPA
PATHOLOGIST IN CHARGE: BIOCHEMISTRY

Phone: (07) 3121 4512
Email: Charles.Appleton@qml.com.au

Dr Charles Appleton graduated from the University of Queensland in 1977 (MBBS), before starting work as a resident medical officer at the Royal Brisbane Hospital in 1978. In 1980, Dr Appleton became a registrar in pathology at RBH, before moving into the role of acting Assistant Chemical Pathologist.

Dr Appleton joined QML Pathology in 1985 as Chemical Pathologist, and was subsequently appointed Partner in Charge of Biochemistry.

For part of this time, he worked as Visiting Chemical Pathologist at the Repatriation General Hospital, Greenslopes. In 2003, ownership of QML Pathology changed and his position title was revised to Pathologist in Charge of Biochemistry.

Dr Appleton's special interests include use of computers in pathology result interpretation and reporting, legal aspects of drug testing, inborn errors of metabolism and calcium metabolism.

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iGeneScreen™

QML Pathology is pleased to offer iGeneScreen at the reduced price of **\$850***.

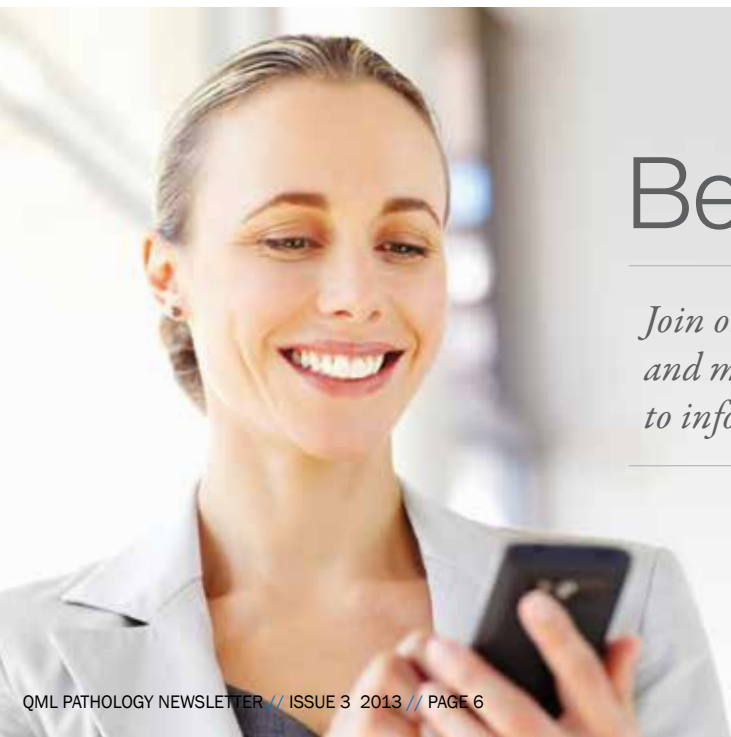
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* Prices are correct at time of printing may be subject to change without notice. No Medicare rebate available.


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Reminder:
The new audit triennium
starts 1 January 2014!

OK

WEDNESDAY

1

January

Relax, you're re-enrolled!

**The 2014 - 2016 Audit Triennium
starts on the first of January.**

**Enrolled in the Surgical Skin Audit
or the Cytology Pap Smear Audit?**

Registrations have been automatically
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continue submitting your samples
using the audit request forms.

**For enquiries, change of details,
or to register, please call us
on (07) 3121 4565.**

QML Pathology.
LAB NUMBER & IMAGE/FAX

PATIENT LAST NAME GIVEN NAMES

PATIENT ADDRESS

TESTS REQUESTED

LAB NO. & IM

CLINICAL NOTES

☐ SELF DETERMINE
☐ STANDARD



Introducing Dr Sally Appleton

After graduating with her Bachelor of Medicine and Bachelor of Surgery in 2004 at the University of Qld, Sally continued her studies completing her Fellowship in Microbiology in 2012.

Dr Sally Appleton has held a number of Microbiology Registrar positions in leading Queensland hospitals and since obtaining her fellowship has held the position of Senior Fellow in Microbiology with Queensland Health.

In addition to her full time duties, Dr Appleton has held a casual tenure since 2006 with the QML Pathology Warfarin Department continuing a long family association with QML Pathology.

Phone: (07) 3121 4074

Email: Sally.Appleton@qml.com.au



Introducing Dr Susan Boyd

After graduating Veterinary Science at the University of Queensland, Susan spent several years in small animal practice in Australia and the UK, during which time she achieved Membership of the Australian and New Zealand College of Veterinary Scientists in Small Animal Medicine and completed the Royal College of Veterinary Surgeons Certificate of Small Animal Medicine. In 2002, Susan commenced a residency in clinical pathology at The Royal Veterinary College, UK, which was followed by a temporary lectureship there. She is a diplomat of the American College of Veterinary Pathologists in Clinical Pathology.

With over 10 years experience in diagnostic clinical pathology, Susan enjoys all facets of clinical pathology, with a particular interest in haematology, including haematology of exotic species, and cytology including bone marrow disease.

Phone: (07) 3121 4343

Email: Susan.Boyd@qml.com.au

ZOSTAVAX®

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ZOSTAVAX is a single dose vaccine indicated for the prevention of:

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Fax: (07) 3121 4944
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1. Harpaz et.al. MMRW 2008 Jun 6; 57(RR-5):1-30

Collection Centre Updates

NEW COLLECTION CENTRES

ANDERGROVE.....(07) 4942 4634

68 Celeber Drive

Opening Hours:

Mon – Fri: 7.00am – 12.00pm

BRISBANE.....(07) 3229 0687

Anzac Square Arcade

Shop 10, Cnr Adelaide & Edward Streets

Opening Hours:

Mon – Fri: 8.00am – 12.00pm

12.30pm – 4.00pm

BUNDABERG (REOPEN)(07) 4151 3743

Shop MM3, Hinkler Shopping Mall

16 Maryborough Street

Opening Hours:

Mon – Fri: 8.00am – 12.30pm

1.00pm – 4.00pm

Sat: 8.30am – 11.30am

BROWNS PLAINS.....(07) 3121 4444

Shop 33, Grand Plaza Shopping Centre

27-49 Browns Plains Road

Opening Hours:

Mon – Fri: 8.30am – 2.00pm

CAIRNS.....(07) 4038 3410

Shop 61, Smithfield Shopping Centre

Cnr Captain Cook & Kennedy Highways

Opening Hours:

Mon – Fri: 8.00am – 1.00pm

1.30pm – 4.00pm

CAIRNS.....(07) 4036 4693

Shop 21, Surgery 4

Mt Sheridan Plaza, 106 Barnard Drive

Opening Hours:

Mon – Fri: 8.30am – 12.30pm

GLADSTONE.....(07) 4972 7041

Suite 22, Night Owl Shopping Centre

Cnr Dawson Highway and Park Street

Opening Hours:

Mon – Fri: 8.30am – 12.30pm

1.00pm – 4.30pm

MAROOCHYDORE.....(07) 5452 7460

Unit 1, 24 Denna Street

Opening Hours:

Mon – Fri: 7.00am – 12.30pm

1.00pm – 3.00pm

Sat: 8.00am – 12.00pm

PIALBA.....(07) 4194 2528

Primary Care Medical Centre

55 Torquay Road

Opening Hours:

Mon – Fri: 8.30am – 12.30pm

1.00pm – 3.30pm

REEDY CREEK.....(07) 5592 4897

Reedy Creek Village Shopping Centre

Cnr Old Coach Rd & Kingsmore Blvd

Opening Hours:

Mon – Fri: 8.00am – 1.00pm

RICHLANDS.....(07) 3372 2866

Shop 8, Richlands Plaza

551 Archerfield Road

Opening Hours:

Mon – Fri: 8.00am – 12.00pm

STRATHPINE.....(07) 3889 6533

Shop 12, 328 Gympie Road

Opening Hours:

Mon – Fri: 7.00am – 11.30am

12.00pm – 3.00pm

SURFERS PARADISE.....(07) 5592 4933

Chevron Renaissance Medical Centre

45 Elkhorn Avenue

Opening Hours:

Mon – Fri: 7.30am – 12.30pm

1.00pm – 3.30pm

TERRANORA.....(07) 5590 5088

Terranora Medical Centre

Terranora Shopping Village

2-14 Henry Lawson Drive

Opening Hours:

Mon – Fri: 8.15am – 1.15pm

TWEED HEADS(07) 5599 5537

1/80-82 Keith Compton Drive

Opening Hours:

Mon – Fri: 8.00am – 11.00am

WOODRIDGE.....(07) 3299 1385

Shop 10, 91-99 Ewing Road

Opening Hours:

Mon – Fri: 7.30am – 12.30pm

TOOWOOMBA.....(07) 4613 6346

7 Springs Medical Centre

881 Ruthven Street

Opening Hours:

Mon – Fri: 7.00am – 6.00pm

Sat: 8.00am – 12.00pm

NOW OPEN SATURDAY

HERVEY BAY.....(07) 4124 8645

14 Luizzi Street

Opening Hours:

Mon – Fri: 8.00am – 1.00pm

Sat: 8.00am – 11.00am

NORTH MACKAY(07) 4942 7833

Shop 4A

Mt Pleasant Shopping Centre

Grandview Drive

Opening Hours:

Mon – Fri: 8.00am – 12.00pm

1.00pm – 4.30pm

Sat: 8.00am – 12.00pm

RELOCATED

PACIFIC PINES(07) 5573 4751

Pacific Health Centre

Shop 6A, 19 Pitcairn Way

Opening Hours:

Mon – Fri: 8.00am – 1.00pm

1.30pm – 4.00pm

Haemochromatosis (HFE) Gene Mutation

The 'Patient Eligibility for Medicare Rebate: Haemochromatosis (HFE) Gene Mutation' form is designed to make it easier for doctors and patients for determining eligibility for Medicare rebate. For a copy of this form, please contact your local MLO or the Marketing Department on (07) 3121 4506.

Patient Eligibility for Medicare Rebate: Haemochromatosis (HFE) Gene Mutation QML Pathology

Attention Patient:
1) Please ask your Doctor to complete this form.
2) Please return this completed form to the QML Pathology Clinic you attended.

Haemochromatosis Testing
Haemochromatosis is a hereditary condition. The patient is advised to fill in the following questions carefully.
If the answers to ALL questions are YES, then the patient will qualify for a Medicare rebate.

1. Does the patient have a personal history of at least two elevated ferritin QML test results (ferritin > 1000 µg/L)? ☐ YES ☐ NO

2. Does the patient have a personal history of haemochromatosis? ☐ YES ☐ NO

3. Does the patient's immediate family member have haemochromatosis? Please specify relationship: ☐ Brother ☐ Sister ☐ Son ☐ Daughter ☐ Grandson ☐ Granddaughter ☐ Other ☐ YES ☐ NO

4. Does the patient's immediate family member have a haemochromatosis mutation? Please specify relationship: ☐ Brother ☐ Sister ☐ Son ☐ Daughter ☐ Grandson ☐ Granddaughter ☐ Other ☐ YES ☐ NO

5. Does the patient's immediate family member have a haemochromatosis mutation? ☐ YES ☐ NO

For a complete listing of QML Pathology collection centres, please visit our website: www.qml.com.au.

Doctor's Noticeboard



DR DEEPAK ARUMUGAM

*Cardiologist,
Heart Care Partners*

Dr Arumugam

completed an Honours degree in Neuroscience at Monash University, Melbourne before moving to Brisbane and completing medical training at the University of Qld. He trained in cardiology at The Prince Charles, Royal Brisbane and Women's and Gold Coast Hospitals.

He pursued subspecialty training in cardiac electrophysiology, predominantly device implantation (pacemakers and implantable defibrillators) and cardiac catheter ablation at the Royal Brisbane and Women's Hospital. He then gained further experience including complex ablation (atrial fibrillation and ventricular tachycardia) over a two year fellowship at one of the largest ablation centres in North America at the Royal Jubilee Hospital, Canada.

Dr Arumugam can be contacted at Mater Private Hospital, Brisbane on:
P: (07) 3360 7100.



ABBY BARRETT, APD BExSc MNutDiet is now situated with Dr Mohamed Khafaji at Pindara Specialist Suites.

Patients do not need a referral for a consultation. At this time, appointments are available on Tuesdays between 10.00am and 6.00pm.

For further information on dietetic services, or to make a booking, please phone the number below.

Please note: Pensioner discounts apply, and persons with a DVA Gold Card and those eligible for a chronic disease Management plan will be bulk billed.

Pindara Specialist Suites, Suite 310
29 Carrara Street, Benowa QLD 4217

P: (07) 5527 8270

abby@goldcoastrenalandhypertension.com.au

ASS. PROF GEOFFREY M BOYCE, Neurologist, wishes to advise continued practice in neurology at 23 Dalley Street, Lismore NSW 2480. Dr Boyce has a regular neurology newsletter which may be accessed at his website below.

P: (02) 6621 8245

F: (02) 6621 8237

E: admin@nrneurol.com.au

W: www.nrneurol.com.au



DR JULIE JOYNER

MBBS (1st Hons)
The University of Qld
FRACP PhD

Endocrinologist and
Internal Medicine

Specialist (General Physician) with 17 years consultant experience.

Dr Joyner wishes to advise her colleagues that she has moved to:

Rooms Bayside, Suites 7&8, Level One
The Hub, 2 Loraine Street (Cnr Rickey Street) Capalaba QLD4157

P: (07) 3198 4700

F: (07) 3245 7530

E: admin@roomsbayside.com



DR DENNIS HARTIG

MBBS (Qld)
FRACS(Ortho)
BA(Hons) MA

Dr Hartig is a specialist spine

surgeon practicing at St Andrew's War Memorial Hospital in Brisbane. He is a graduate of the University of Qld and obtained his FRACS in Orthopaedic Surgery in Queensland in 2010.

His first fellowship year was completed in paediatric and adult spine surgery at the Royal Brisbane Hospital and the Royal Children's Hospital. His second fellowship year was completed through the Combined Neurosurgical and Orthopaedic Spine Programme at Vancouver General Hospital and the University of British Columbia, Canada.

St Andrew's Specialist Suites
6th Floor, 457 Wickham Terrace
Brisbane QLD 4001

P: (07) 3831 6202

F: (07) 3831 9717



DR MICHAEL OTTLEY
BSc (Hons) MBChB
(Hons) FRACS (Orth)

*Consultant
Orthopaedic Surgeon*

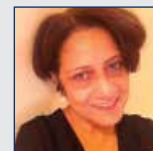
Dr Ottley is commencing private practice work with specialisation in hip and knee surgery after working in the field of Orthopaedic surgery in Queensland for over 10 years. Particular interests are total hip replacement and revision hip replacement; partial, total and revision knee replacement, arthroscopic surgery of the hip and knee, knee ligament reconstruction and sports injuries of the hip and knee.

For all appointments please contact:

P: (07) 3831 6202

F: (07) 3831 9717

Brisbane Hip and Knee Clinic
St Andrew's Specialist Centre
St Andrew's War Memorial Hospital
Level 6, Suite 6.1, 457 Wickham Tce
Spring Hill QLD 4000



DR LATA SHARMA
MD FRANZCOG

*Gynaecology &
Reproductive Medicine*

Dr Sharma has over 25 years experience in obstetrics and gynaecology having worked in district and tertiary hospitals, both overseas and in Australia. Dr Sharma obtained her specialist training (FRANZCOG) in Australia. In addition to being a full time clinician, Dr Sharma has been actively involved in teaching and training IMGs, GP Diploma Obstetrics Trainees and RANZCOG Specialist Trainees.

For appointments, please call the consulting suites or email sharmasmedical@yahoo.com.

Brisbane Private Hospital
259 Wickham Terrace, Brisbane
P: (07) 3834 6620
F: (07) 3831 4900

Peninsula Private Hospital
Cnr George & Florence Sts, Kippa-Ring
P: (07) 3284 2702
F: (07) 3283 1871

North Lakes Day Hospital
7 Endeavour Boulevard, North Lakes
P: (07) 3833 6765
F: (07) 3491 3614


DR RYAN SOMMERVILLE

completed his medical training in Brisbane and is a Queensland trained ENT, Head and

Neck Surgeon who has been providing specialist ENT services to the north side of Brisbane and the Sunshine Coast since 2009.

Dr Sommerville is a consultant of the Royal Brisbane and Women's Hospital Head and Neck Cancer multi-disciplinary clinic, and operates and consults at both the RBW and Logan Hospitals. He teaches medical students, residents, ENT trainees and also is on the teaching faculty for local and international advanced skull base courses for ENT surgeons and neurosurgeons.

Dr Sommerville consults privately at Wickham Terrace, North Lakes, Burpengary, Wellers Hill and Caboolture Private Hospital. He has also recently started operating at Caboolture Private Hospital in addition to doing complicated private cases in Brisbane central at Brisbane Private and St Andrew's War Memorial Hospitals.

Dr Sommerville is interested in adult and paediatric ENT, sinus surgery, ear surgery and head and neck cancer.

His main rooms are located at Wickham House, Level 1, 155-157 Wickham Tce, Spring Hill QLD 4000.

P: (07) 3831 1448

E: admin@entsbc.com.au

W: www.entsbc.com.au



IAN WILSON, is an experienced child psychiatrist. He recently returned to Queensland and has begun working at The

Toowong Specialists Group in Brisbane.

Ian has been in private practice for a total of almost 20 years and has held senior positions in public sector mental health services, where he worked with multi-disciplinary teams.

For many years, he has actively participated in professional development as a member of the RANZCP (Queensland) Branch Executive Committee and the Faculty of Child Psychiatry, as well as by training and mentoring medical students and registrar trainees.

Level 3, 54 Jephson Street
PO Box 680
Toowong QLD 4066

P: (07) 3371 5558

F: (07) 3112 4242

W: www.apsychiatrist.com.au

FEMALE GPs VR FULL TIME & PART TIME – CALOUNDRA SUNSHINE COAST

Non-corporate/family owned well-established and accredited.

We have a team of male and female doctors with a large growing database.

No after hours. All full time doctors have their own dedicated consulting room.

Our female doctors are in demand; we offer Mirena/IUD, women's health etc.

Full time nursing and admin support, all computerised.

Large well-equipped treatment room and CDM clinic.

Mixed billing, accredited travel clinic.

Onsite pathology, chemist, allied health.

Located only 5 mins to new SC University Hospital precinct, close to beach and only 1 hr north of Brisbane. Great schools and university close by.

Remuneration negotiable.

All enquiries will be treated confidentially.

Contact the Practice Manager on (07) 5491 9044 or email currimundi@cmcnet.com.au.

VACANCIES
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A VR, GP is required for a Scarborough beachfront, non-corporate practice 30 minutes from Brisbane's CBD.

The accredited practice has private billing facilities, modern equipment and has staffing of nine doctors and registered nursing support.

The medical centre has a computerised skin cancer clinic, ultrasound machine and operating microscope. Allied health staff are also on site. A candidate who is fluent in English, Afrikaans, Dutch, German or French languages would be an advantage.

C: Angela De-Gaetano
Practice Manager

A: Majellan Medical Centre
107 Landsborough Avenue
Scarborough QLD 4020

P: (07) 3880 1444

F: (07) 3880 1067

NARANGBA FAMILY MEDICAL PRACTICE

A part time position (with a view to full time if required) is available for a VR Family Doctor at the Narangba Family Medical Practice, as one of our doctors (Dr Orr) is leaving to specialise.

We are a three doctor, fully computerised, non-bulk-billing practice established since 1986 in an outer, semi-rural northern suburb of Brisbane. The ideal candidate would be of an age where taking over the whole practice eventually would be a distinct possibility.

C: Dr Peter C. Stephenson

M: 0403 151 602

A: Main Shopping Centre
30 Main Street, Narangba QLD 4504
(beside Narangba Pharmacy, opposite Narangba Railway Station)

P: PO Box 3 Narangba QLD 4504

W: www.narangba-medical.com.au

The Doctor's Noticeboard is a free service for medical practitioners.

If you wish to place a notice, please email details to info@qml.com.au.



Infectious Diseases Report

GEOGRAPHIC DISTRIBUTION - JULY 2013

ORGANISM	Regions (as per key below)															TOTAL			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	JUL	JUN	MAY	APR
Adenovirus (not typed)		6	4				14		9		35	4	1	2	1	76	40	44	31
Adenovirus (typing pending)	1	1	2				1		2		3	2	1			13	17	21	12
Barmah Forest virus	6	8	6	5			4		12	9	15	15	1	3	3	87	102	166	159
Bordetella pertussis	5	9	8	2	1		9		24	3	29	18	7	5	7	127	91	110	82
Brucella species											1	1	2			4	4	5	7
Campylobacter jejuni							1									1	0	1	0
Chlamydia pneumoniae																0	0	0	0
Chlamydia trachomatis, not typed	65	105	42	32	1		85	2	55	34	144	49	24	49	20	707	623	796	743
Coxiella burnetii	2	1									1	1	4			9	13	12	8
Cryptococcus species																0	1	5	4
Cytomegalovirus (CMV)	2	8	2	6			3		7		13	5		2	2	50	44	53	71
Entamoeba histolytica																0	0	0	0
Enterovirus - not typed																0	0	0	2
Epstein-Barr virus (EBV)	6	25	14	7	1		20		20	7	36	16	4	7	6	169	156	225	175
Flavivirus unspesified	5	7	1				2				5	4	1	1		26	23	43	33
Hepatitis A virus																0	2	1	3
Hepatitis B virus	16	7	5				13	1	3	3	59	4	2	4	2	119	102	89	115
Hepatitis C virus	15	55	15	5	1	1	38		32	10	86	17	9	11	11	306	253	359	340
Hepatitis D virus			1													1	0	0	0
Hepatitis E virus																0	0	0	0
Herpes simplex Type 1	16	57	28	8		1	56		23	11	91	22	11	11	8	343	290	333	309
Herpes simplex Type 2	8	47	6	8	2		26		17	6	49	13	3	9	5	199	175	176	160
Herpes simplex virus - not typed																0	0	0	0
HIV-1		3	1						1		2					7	10	4	12
HTLV-1											1					1	0	0	0
Human Metapneumovirus	1	10	13	2		4	29		25	7	38	8	3	1		141	80	63	50
Influenza A virus	3	6	5	2		1	27	2	13	6	22	17	3	13		120	43	48	52
Influenza B virus	1	11	7	1			14		4	1	15	1		1	1	57	17	22	21
Legionella pneumophila (all serogroups)		6	2			1		1	6		1					17	7	2	3
Legionella species		2	1				3			2	4	3	1	1		17	14	8	6
Leptospira species	2															2	9	10	4
Measles virus																0	1	0	0
Mumps virus																0	0	1	1
Mycoplasma pneumoniae	22	136	67	12	2	2	117	1	109	41	256	92	39	17	10	923	738	803	640
Neisseria gonorrhoeae	4	15	3	2			8		10	3	15	4	4	2		70	46	57	58
Parainfluenza virus		9	4	1		2	8		14	3	17	7	3	5		73	65	46	33
Parvovirus		4					2				7	1				14	6	8	5
Pneumocystis carinii																0	0	0	2
Respiratory Syncytial virus	2	15	19		3	3	21		26	8	47	22	10	7	2	185	184	255	272
Rhinovirus (all types)	3	41	25	7	1	3	34		43	12	68	35	6	13	3	294	279	326	190
Rickettsia - Spotted Fever Group	1	1								1			1			4	8	2	5
Ross River virus	1	1	1	4			2		8	8	6	9	2	1	3	46	75	114	135
Rubella virus																0	1	0	0
Salmonella paratyphi A																0	0	0	0
Salmonella paratyphi B																0	0	0	0
Salmonella typhi																0	0	0	2
Streptococcus Group A	3	12	5		2		16	1	5	4	15	6	5		2	76	57	79	72
Toxoplasma gondii			1													1	0	0	0
Treponema pallidum	21	13	8	2	3		45	2	14	9	53	6	6	14	2	198	135	203	162
Trichomonas vaginalis	13	2	1		1		2	1	2		2		1	5		30	20	36	23
Varicella Zoster virus	15	47	14	5			49		28	5	79	27	5	9	4	287	221	222	235
Yersinia enterocolitica																0	0	0	0
TOTAL	239	670	311	111	18	18	649	11	512	193	1215	409	159	193	92	4800	3952	4748	4237

REGIONS:

1 Cairns

2 Gold Coast/Northern Rivers

3 Ipswich

4 Mackay

5 Mount Isa

6 New England

7 North Brisbane Suburbs

8 Northern Territory

9 Redcliffe

10 Rockhampton

11 South Brisbane Suburbs

12 Sunshine Coast

13 Toowoomba

14 Townsville

15 Wide Bay/Burnett

FURTHER HISTORICAL CLINICAL DATA CAN BE OBTAINED BY CONTACTING MARKETING ON INFO@QML.COM.AU.