

QML PATHOLOGY

newsletter October 09

>>Genital Herpes

Dr Renu Vohra MBBS MD FRCPA

Pathologist in Charge - Immunology & Microbiology

Genital herpes is one of the most common sexually transmitted infections in Australia. It can be due to either HSV-1 or HSV-2.

- HSV-2 is responsible for the majority of recurrent genital herpes and is the primary cause of genital ulcer disease (GUD) worldwide.
- Genital herpes simplex virus (HSV) infection is a recurrent, lifelong disease with no cure.

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Epidemiology

HSV-1

- HSV-1 mainly causes oral infections and is usually acquired in childhood.
- Up to 80% of Australian adults are HSV-1 seropositive and the prevalence increases by age.
- In the past decade an increase in incidence of HSV-1 genital herpes has been seen, especially in the younger population.
- In a study, conducted in Melbourne, the proportion of first episode genital herpes due to HSV-1 increased from 15.8% to 34.9% between 1980 and 2003.
- QML Pathology data from November 2006 to October 2007 revealed that 42% of all the genital specimens tested by PCR were positive for HSV-1, 50% for HSV-2 and 8% for VZV (Figure 1).

HSV-2

- Presence of HSV-2 suggests genital HSV-2 infection.
- HSV-2 seroprevalence varies from 11-65% in Australian based studies.
- 80% of infections remain undiagnosed.
- HSV-2 infection has been linked to three times higher risk of acquiring HIV.
- The strongest predictor for genital HSV infection is a person's number of lifetime sex partners.

Risk factors for genital herpes infection are:

1. Advent of sexual activity at or before 17 years of age
2. History of sexually transmitted infections
3. History of undiagnosed genital lesions or discharge
4. Human immunodeficiency virus infection
5. Multiple life sex partners
6. Partner diagnosed with genital HSV infection.

Transmission

HSV is acquired through close contact with an infected person who is shedding the virus in oral or genital secretions.

Clinical Features

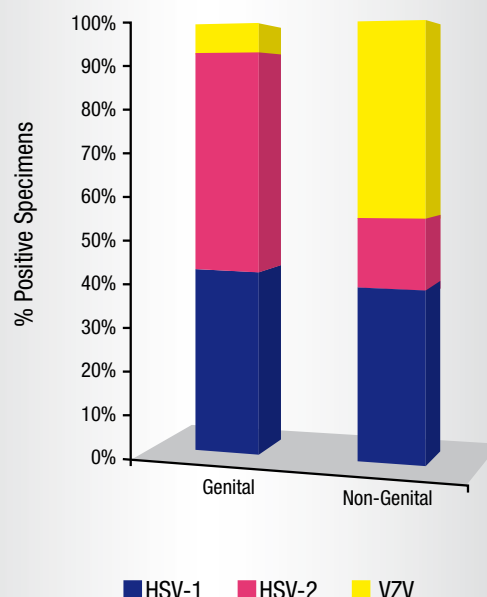
- Only about 20% of patients with HSV-2 will give a history consistent with genital herpes.
- Asymptomatic infection occurs in up to 60% of cases.
- In about 20% the infection remains undiagnosed due to unrecognised symptoms.
- Primary genital herpes infection with HSV is followed by a latency period in which the virus remains latent in the sensory sacral ganglia.

- Reactivation of genital herpes can be symptomatic or asymptomatic.
- 70% of transmission occurs in periods of symptomatic shedding.

Symptoms of 'classic' outbreaks of primary genital HSV infection

- Begins with a prodrome lasting 2-24 hours that is characterised by localised or regional pain, tingling and burning. Patients may also have constitutional symptoms like fever, headache, malaise and inguinal lymphadenopathy.
- As the disease progresses, papules and vesicles develop on an erythematous base, and erosions appear over hours to days. These lesions usually crust and then re-epithelialize and heal without scarring.
- The cervix and urethra are involved in more than 80% of women with first episode infections.
- First episode genital herpes among patients who have prior exposure to HSV-1 infection have less frequent systemic symptoms and more rapid healing.

Figure 1: Summary of Percent Positive HSV/VZV PCR on Genital Specimens Nov 2006 - Oct 2007



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Facts about genital herpes

1. Only 10-25% of people who are HSV-2 seropositive report a history of genital herpes, which suggests that most infected people have unrecognised symptomatic or completely asymptomatic infections, and therefore, most people are undiagnosed.
2. Almost all HSV seropositive people (98%) reactivate subclinically.
3. Transmission can occur from such reactivation.
4. HSV-2 seropositivity is a risk factor for increased acquisition of HIV. Two fold-four fold increased risk of transmission has been demonstrated in various studies.

Characteristics of first episode genital herpes

- First episode infections have more numerous and scattered vesicles and more systemic symptoms.
- Approximately 80% of primarily infected people develop constitutional symptoms.
- The primary infection lasts two to six weeks and can be extremely painful, containing large quantities of infectious HSV particles.
- The clinical course of first time episode genital herpes is similar for both HSV-1 and HSV-2.

Recurrent outbreaks

- Recurrent HSV outbreaks are usually milder than the initial episode - there are typically fewer grouped lesions, and viral shedding occurs at a lower concentration and for a shorter duration (i.e. about three days).
- Recurrence rates for HSV-1 and HSV 2 vary (Table 1 below).

Table 1: Recurrence rates of genital herpes due to HSV-1 and HSV-2

HSV-1

Recurrent outbreaks occur in 50% of patients with HSV-1, and the median time to the first recurrence is one year following primary infection.

HSV-2

The median rate of recurrence is about 4-5 times per year, and the median time to first recurrence is 50 days.

Approximately 90% of patients with initial infection with HSV-2 have at least one recurrence during the first year.

Recurrences may become less frequent over time, usually about 3-5 years after acquisition.

Atypical presentation of genital herpes

- Genital herpes may not produce the classic symptoms mentioned.
- However, on further questioning the patient will recall a discrete recurrent itch or an irritating red spot that comes and goes or a crack that opens up occasionally.

Diagnosis

1. Viral culture

Viral culture is an insensitive test for detection of HSV from genital ulcers but is highly specific for differentiating between HSV-1 and HSV-2.

2. Serology

- There is a need to differentiate between HSV-1 and HSV-2 as the two viruses differ in terms of epidemiology, clinical implication and outcome.
- HSV antibodies form during the first few weeks after infection.
- Because HSV-2 infection is almost exclusively sexually acquired, HSV-2 antibodies are consistent with an anogenital infection.
- HSV-1 antibodies may be present in anogenital and orolabial infections; they cannot be used to differentiate between infections.

Time frame for developing antibodies

- The time required for the development of IgG antibodies following HSV infection varies from 21 to over 42 days, with most individuals having detectable IgG 21-28 days after exposure to the infection.
- IgM antibodies are usually detectable 9 -10 days after exposure, and may remain detectable for up to 6 weeks in a minority of individuals. IgM antibodies may be detectable during recurrences of the infection.

Type of serological tests

A. Type specific serology

- Enzyme linked immunoassays (ELISA) based on type specific antigen are able to differentiate between HSV-1 and HSV-2.
- Even though type specific serology have high sensitivity and specificity, the positive predictive value is poor in low prevalence population, therefore, there will be a high rate of false positives in this population.
- Type specific serology should be used if other methods of diagnosis like PCR are not available or negative.

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B. Western blot assay

- This is regarded as the gold standard serological test, but is labour intensive and expensive.

Significance of HSV serology results

HSV-2

- If positive for HSV-2 antibody: potential for transmission to the partner. Antiviral therapy for asymptomatic carriers is not indicated.
- If negative for HSV-2 antibody: results indicate that the patient is at risk of acquiring the infection. This risk cannot be completely eliminated (although condoms provide some protection to women).

HSV-1

- If patient tests positive for HSV-1 they could potentially infect a partner with HSV-1 by performing orogenital sex if their partner is negative for HSV-1.
- If patient tests negative for HSV-1 then they are at risk of acquiring HSV-1 genital herpes through receptive oral sex.

Limitations of serology

- Type specific serological tests may give rise to both false negative and false positive results.
- Pre-test probability should be assessed in asymptomatic patients from low prevalence population.
- While HSV-2 serology is synonymous with genital herpes, HSV-1 is not specific to an anatomic location. No test can distinguish between antibodies elicited by oral vs. genital HSV-1.
- IgM tests cannot distinguish between new from established symptomatic episodes.

- Tests are more accurate in patients with clinical history of lesions. Therefore a patient with clinical history of genital lesions and positive HSV-2 antibody is likely to be true positive.
- Pre-test counselling is important to advise the patient about the positive and negative aspect of serological testing.

As both HSV-1 and HSV-2 cause lifelong infections with intermittent reactivations, application of serological testing is complicated. For accurate interpretation of serology results a detailed sexual history and the type of test used is required.

3. Direct virus detection

A. PCR

- PCR testing for HSV DNA has greater sensitivity than traditional viral culture (sensitivity of more than 95%, compared with 75% for culture).
- QML Pathology offers a multiplex PCR for the detection of HSV-1, HSV-2 and VZV.
- The increased sensitivity for PCR is due to its ability to detect non-viable viral DNA following an acute episode.
- The turnaround time for a PCR is 24 hours.
- A Dacron swab/flocked swab is preferred over other swabs for collection of specimens from the vesicles. The swabs can be sent either in viral transport medium (green top swab) or dry to the laboratory.

B. Immunofluorescence (DFA, IFA)

- These tests have poor sensitivity and are labour intensive, requiring skill in interpretation. These tests are not performed at QML Pathology.

Ctd.>



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After graduating with her MBBS and MD from the University of Delhi, India in 1994, Dr Vohra commenced training as a Pathologist. After obtaining her Fellowship of the Royal College of Pathologists of Australasia in 2000,

Dr Vohra practiced in private pathology in Queensland. During this time she progressed from a Registrar position to a Consultant in Microbiology, and more recently was a Clinical Microbiologist with the Queensland Health Pathology Service. Dr Vohra joined QML Pathology's Microbiology Department in 2004.

Associations

Australian Society of Microbiology
American Society of Microbiology
Royal College of Pathologists of Australasia
Australian Society of Infectious Diseases
Australian Society of Antimicrobials

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Treatment

Effective oral medications are available for the treatment of genital herpes (Table 3).

These agents offer clinical benefit but do not cure the disease.

These drugs can be used for episodic treatment or long-term suppressive therapy.

Table 3: Treatment of genital herpes

	Side effects	Indication	Oral dose
Acyclovir	Nausea, vomiting, headache, diarrhoea, vertigo, myalgia, rash	Initial infection	400mg orally three times daily for 5 days (preferred in pregnancy*)
		Recurrences	400mg orally three times daily for 5 days (preferred in pregnancy*)
		Suppressive therapy	200mg orally twice daily for 6 months (preferred in pregnancy* - dose increased to 400mg orally twice daily for suppression in late pregnancy)
Famciclovir	Nausea, vomiting, headache, fatigue, paresthesias, pruritus	Initial infection	125mg orally twice daily for 5 days
		Recurrences	125mg orally twice daily for 5 days or 1g orally twice a day for 1 day or 500mg orally twice daily for 7 days (immunocompromised patient)
		Suppressive therapy	250mg orally twice a day
Valaciclovir	Nausea, vomiting, headache, dizziness	Initial infection	500mg orally twice daily for 5 days
		Recurrences	500mg orally twice daily for 3 days
		Suppressive therapy	500mg orally daily for 6 months (if less than 10 recurrences per year while not taking suppressive therapy) or 1g orally daily for 6 months (if recurrences more than 10 per year while not taking suppressive therapy) or 500mg orally twice daily for 6 months (immunocompromised patient).

*seek specialist advice.

References

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- HSV type specific serology in sexual health clinics: use, benefits, and who gets tested. Sex. Transm. Infect. 2004; 80:113-117
- Therapeutic guidelines 2006, Version 13.

Infectious Diseases Report - Geographic Distribution - September 2009

ORGANISM	Regions (as per key below)															Total			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sep	Aug	Jul	Jun
Adenovirus (not typed)		2	2				3		3	2	8	3	1	1		25	40	63	58
Adenovirus (typing pending)		3					1		1	3	5					13	16	32	17
Barmah Forest virus	3	1									1		1		1	7	18	12	22
Bordetella pertussis	2	21	12	1	1		17		11	5	29	34	3	8	3	147	145	186	171
Brucella species																0	0	2	0
Campylobacter jejuni																0	0	0	0
Chlamydia pneumoniae																0	0	0	0
Chlamydia trachomatis, not typed	60	95	19	24	2		74		44	24	119	36	15	28	20	560	595	609	624
Coxiella burnetii			2				1				2	1				6	8	5	6
Cryptococcus species		1					1				1					3	4	2	0
Cytomegalovirus (CMV)	1	6	6				5		4	4	15	8	2	4		55	39	55	46
Entamoeba histolytica																0	2	1	0
Enterovirus - not typed		1	1				2				1					5	1	4	1
Epstein-Barr virus (EBV)	4	22	8		1		37		17	3	36	18	6	4	3	159	121	130	124
Flavivirus unspecified	2	1		1						1	1			2		8	7	16	15
Hepatitis A virus	1	1					1		1	2						6	1	3	3
Hepatitis B virus	8	2	3	1		1	18		5	2	46			1		87	96	74	102
Hepatitis C virus	15	43	25	4			40		19	6	79	28	16	6	4	285	269	300	260
Hepatitis D virus																0	0	0	0
Hepatitis E virus							1									1	0	0	0
Herpes simplex Type 1	15	34	9	8	1		30		36	7	48	22	9	7	3	229	246	294	251
Herpes simplex Type 2	10	22	5	4			22		14	3	40	16	4	6	7	153	156	175	195
Herpes simplex virus - not typed																0	0	0	0
HIV-1		2														2	6	5	5
HTLV-1																0	0	0	0
Influenza A virus	1	5	2				7			1	3	3	2	1		25	186	1326	219
Influenza B virus	1	4			1		3		2	2	7		1			21	23	36	27
Legionella pneumophila (all serogroups)																0	0	1	1
Legionella species													1			1	2	3	2
Leptospira species	2										1					3	4	8	2
Measles virus											1					1	1	0	0
Mumps virus							1				1					2	1	2	1
Mycoplasma pneumoniae	1	8	3	3			11		5	4	10	4	1		1	51	44	59	67
Neisseria gonorrhoeae	4	4	1	1			8	1	5		4	7		2		37	31	28	28
Parainfluenza virus Type 1									1		1					2	0	4	2
Parainfluenza virus Type 2																0	6	5	14
Parainfluenza virus Type 3		2	1				3		6		7		1	4		24	17	20	9
Parvovirus		2							8		2		2			14	15	18	18
Pneumocystis carinii		1														1	0	0	3
Respiratory Syncytial virus	1	7	2				8		1	5	5	4	5		1	39	44	155	242
Rickettsia - Spotted Fever Group		1		2							1	1				5	3	6	5
Ross River virus	4	5	4				4		7	2	8	8	2	3	2	49	49	63	96
Rubella virus																0	1	0	1
Salmonella paratyphi A																0	0	0	0
Salmonella paratyphi B																0	0	0	0
Salmonella typhi																0	0	0	0
Shigella dysenteriae																0	0	0	0
Shigella flexneri																0	0	0	0
Streptococcus Group A	5	8	1	1	2		6		7	4	12	11	1	6	2	66	57	73	84
Toxoplasma gondii																0	0	1	0
Treponema pallidum	22	9	6	1			26		6	4	35	7	1	10	2	129	122	102	102
Trichomonas vaginalis	8						3				1	1		2		15	19	14	11
Varicella Zoster virus	15	27	11		1		25		16	16	46	18	5	4	3	187	154	178	193
Yersinia enterocolitica																0	1	0	
TOTAL	185	340	123	51	9	1	358	1	219	100	576	230	79	99	52	2423	2550	4070	3027

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

May 2009 and further historical clinical data can be obtained by contacting your local Medical Liaison Officer

QML Pathology updates Oct 09

>> Introducing our New Gold Coast Laboratory Pathologists



Dr Sally Williams
BSc MBChB PhD FRCPATH
Consultant
Histopathologist/
Cytopathologist

After graduating with a Bachelor of Science in

Zoology in 1973 (University of Hull, UK), Dr Williams continued with postgraduate studies, receiving an MBChB in 1981 (University of Sheffield, UK) and a PhD in 1984 (University of London, UK). Dr Williams began her training in pathology in north England, and in 1992 received her Fellowship with the Royal College of Pathologists.

From 1992 to 2009, she worked as a Consultant Histopathologist/Cytopathologist in Wales, and in August 2009 joined the QML Pathology Gold Coast Branch.

Special Interests:
General histopathology and cytopathology.

Associations:
International Academy of Pathology, the Association of Clinical Pathologists (UK), and the British Society of Clinical Cytology.

Phone: (07) 5668 4444
Email: Sally.Williams@qml.com.au



Dr Jeff Winslow
FCAP FRCPA
Consultant
Histopathologist

Dr Jeff Winslow graduated with a B.S. in psychobiology from UCLA in 1992, before

completing his medical degree at the University of Iowa in 1997. After training in anatomical and clinical pathology at the University of Vermont/Fletcher-Allen Health Care, Dr Winslow completed a prestigious surgical pathology fellowship at Barnes-Jewish Hospital/Washington University in St Louis. In 2002, he became a Diplomate of the American Board of Pathology in anatomical and clinical pathology, and in 2008, he obtained his fellowship with the RCPA in anatomical pathology.

From 2002 to 2006, Dr Winslow worked as a general pathologist at Lancaster General Hospital, Pennsylvania, USA, serving as Director of Point of Care Testing (2002-2005) and as Director of Surgical Pathology and Autopsy (2005-2006).

Dr Winslow spent the next three years working as a Histocytopathologist at Diagnostic Medlab in Auckland, New Zealand.

In 2009 Dr Winslow joined the QML Pathology Gold Coast team as a Consultant Histopathologist.

Special Interests:
Gastrointestinal and genitourinary pathology

Publications:
Collagenous gastritis: a long-term follow-up with the development of endocrine cell hyperplasia, intestinal metaplasia and epithelial changes indeterminate for dysplasia. Am J Clin Pathol, 2001, 116:753-758.

Associations:
Royal College of Pathologists of Australasia (Fellow), College of American Pathologists (Fellow), American Society of Clinical Pathologists (Fellow), United States and Canadian Academy of Pathology, Gold Coast Medical Association.

Phone: (07) 5668 4444
Email: Jeff.Winslow@qml.com.au

Temporary Relocation for Pindara Lab & Collection Centre

During the redevelopment of the specialist suites at Pindara Hospital, our temporary home will be just across the road at Pindara Professional Centre.

New Address:

Ground Floor
Pindara Professional Centre
JD Bell House
8-19 Carrara Street, Benowa

Opening Hours:

Monday to Friday
7.30am – 5.30pm

Phone:

Collection Centre (07) 5539 6755
Laboratory (07) 5510 0400

>> Doctor's Noticeboard

City Fertility Centre-Gold Coast has opened a new laboratory and clinic at Robina. The clinic is situated at Suite 2, Ground Floor, Eastside Building, 232 Robina Town Centre Drive, Robina. This is opposite the Rocket, and near the Robina station. There are dedicated parking spaces under the building marked for CFC clients. Phone: 1300 859 116.

City Fertility Centre-Gold Coast also has opened new rooms at John Flynn Hospital in the Medical Centre opposite the QML Pathology Collection Rooms.

Clinical Director, Dr Andrew Davidson, recently welcomed gynaecologist Dr Neil Wallman to the group of five doctors providing fertility treatment through CFC-GC at John Flynn Hospital.

Dr Navid Adiv, Paediatric Rheumatologist, Musculoskeletal and Sports Medicine, has moved premises.

The new address is:

Suite 13, Level 10
Evan Thomson Building
Wesley Hospital
24 Chasely Street
AUCHENFLOWER QLD 4066

Phone: (07) 3870 1029
Fax: (07) 3871 0700
Mobile: 0423 910 066

Dr Adiv can be contacted for referrals and to discuss patients.

Dr Nicholas Demediuk MBBS, DRANZCOG, FRACGP. B.Ed

Practice restricted to vasectomy and neo-natal circumcision. No-scalpel, micro-keyhole and minimally invasive vasectomy, walk in – walk out. No-needle vasectomy also available on request.

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Medical Oncologist, Dr Alison Hadley, has recently commenced consulting at Brisbane Private Hospital with the Queensland Haematology and Oncology Group. Alison has special interests in colorectal cancer, gynaecologic oncology, and breast and genitourinary cancers. To contact Alison, please call her Queensland Haematology and Oncology Group rooms on (07) 3834 6489.

New Collection Centres

Hawthorne

Shop 4, 163-171 Riding Rd
Phone: (07) 3399 6902
Opening Hours:
7.30am - 12.30pm, 1.00pm - 3.00pm (Mon-Fri)

Nerang

Shop T41, Nerang Mall Shopping Centre
Cnr Gilston Rd & New St
Phone: (07) 5502 1437
Opening Hours:
8.00am - 1.00pm, 2.00pm - 4.30pm (Mon-Fri)

Murrumba Downs

Shop 5, 272 Ogg Rd
Phone: (07) 3204 6807
Opening Hours:
8.00am - 1.00pm (Mon-Fri)

Greenslopes

Suite 2, Darin Professional Centre
633 Logan Rd
Phone: (07) 3847 2442
Opening Hours:
7.30am - 12.30pm, 1.00pm - 3.30pm (Mon-Fri)

Victoria Point

Shop 13, Bendigo Bank Place
127 Colburn Ave
Phone: (07) 3207 6598
Opening Hours:
7.00am - 5.00pm (Mon-Fri)

Daisy Hill

Unit 4b, 11-13 Allamanda Dr
Phone: (07) 3208 8725
Opening Hours:
7.30am - 12.30pm (Mon-Fri)

QML Pathology updates Oct 09

>> QML Pathology Strengthens Support for AMAQ Foundation

For the ninth consecutive year, QML Pathology has supported the AMAQ Foundation with a \$20,000 donation. QML Pathology has been an advocate of the Foundation since its establishment in 2000, and has played an important role in its development, helping to provide improved medical services to people in need, particularly in rural and remote Queensland, and contributing to medical education and research.

Realising the importance of Australia's rural areas, QML Pathology strongly supports the AMAQ Foundation's mission for the improvement of medical conditions in areas of need and the advancement of medical research. Our own commitment to regional communities is proven through our ongoing expansion of laboratories and collection centres throughout Queensland and northern New South Wales.

The donation to the Foundation will assist clients and help fund projects at Augathella, Nanango, Bundaberg, Townsville, Cairns, Charleville and Thargomindah. In particular, QML Pathology's donation will provide scholarships to three fourth year medical students at James Cook University (JCU) enabling them to complete their university studies. The Foundation's scholarships are awarded to medical students who are committed to medicine in rural Queensland and who are suffering from financial hardship. We look forward to seeing the students graduate in 2011.

It is evident that the Foundation has made a real difference to the Australian rural community. QML Pathology are proud to support these endeavours and to continue the strong partnership with the AMAQ Foundation.



Dr Steve Hambleton (AMAQ Foundation President), Dr Debbie Norris (Medical Director, QML Pathology) and Melinda McGrath (CEO QML Pathology).

>> STI Pack

Introducing our latest pack

The prevalence of sexually transmitted infections (STIs) continues to increase world wide, emphasising the need to continuously educate the general public. This pack features information for both the clinician and the patient on some of the more common STIs. The patient brochures give an overview of each STI in an easy to understand manner.

This pack includes the following information:

- Chlamydia – Patient Information Brochure
- Genital Herpes – Clinical Article
- Genital Herpes – Patient Information Brochure
- Genitourinary Chlamydia Infection – Clinical Article
- Gonorrhoea – Patient Information Brochure
- Neisseria gonorrhoeae – Clinical Article
- Syphilis – Patient Information Brochure
- Whose Game was Empires (Syphilis) – Clinical Article
- Microbiological Review of Trichomonas Vaginalis – Clinical Article

If you would like a copy of this pack, please contact your local Medical Liaison Officer or email us at info@qml.com.au with the name of the pack and your contact details.



>> Vitamin D

Following my recent newsletter article (August 2009), I was pleasantly surprised and overwhelmed by the volume of feedback from colleagues regarding the findings and recommendations. Our initial intention was simply to report our data and to provide some feedback to the requesting clinicians. Although the findings themselves proved surprising to many, these mirror many reported surveys^{1,2,3,4} using methods similar or identical to ours as well as local experience from other Queensland laboratories (verbal communication). The findings from our sister laboratory in Victoria (Dorevitch Pathology) produced even more startling figures.

Interesting comments emerged as to the validity of the commercial vitamin D assays and of the values chosen for defining deficiency and insufficiency.

Most experts would probably agree that the field of vitamin D assessment is not mature yet and most commercial vitamin D assays leave something to be desired. At QML Pathology, we use DiaSorin Liaison vitamin D assay which is one of the most widely used vitamin D methods in Australia. We participate in external quality assurance programs for vitamin D and our assay performance is in line with instrument and reagent medians.

I must emphasise that our vitamin D deficiency cut-point (vitamin D level <50 nmol/L) was not defined by QML Pathology. Although we perform thousands of

assays, our patients are a selected group and may not be representative of the general population. The vitamin D deficiency cut-point was recommended by an outside panel of expert endocrinologists and any other groups which were represented in the panel⁵. In situations where our assay performance correlates and compares well with the methods used in major studies, as is the case with vitamin D testing, our approach is to adopt the recommendations coming from 'expert bodies' rather than attempt to establish a normal range from our own patient base. However, in the light of information and experience arising from the recent interest in vitamin D and the subsequent increase in the number of patients undergoing testing and monitoring, it is likely that these recommendations will be under review.

If and when further recommendations come to light, we at QML Pathology will be delighted to keep you up-to-date.

Finally, I would like to thank one of our readers for pointing out that there are now several forms of 1000 IU/tablet cholecalciferol available in Australia.

With best wishes

Julia Chang

Chemical Pathologist

1. van der Mei IA et al. The high prevalence of vitamin D insufficiency across Australian populations is only partly explained by season and latitude. *Environ Health Perspect* 2007;115:1132-1139.

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4. van der Mei IAF et al. Vitamin D levels in people with multiple sclerosis and community controls in Tasmania, Australia. *J Neurol* 2007;254:581-590.

5. Working Group of the Australian and New Zealand Bone and Mineral Society; Endocrine Society of Australia; Osteoporosis Australia. Vitamin D and adult bone health in Australia and New Zealand: a position statement. *Med J Aust* 2005;182(6):281-5.