

QML PATHOLOGY

newsletter October 2010

>> *Clostridium difficile* Infections

Dr Shalinie Perera, Consultant Microbiologist

Since the discovery of *Clostridium difficile* (*C. difficile*) as the cause of pseudomembranous colitis and the cause of many cases of antibiotic associated diarrhoea 30 years ago, *C. difficile* has risen to become a major hospital pathogen. *C. difficile* is the most commonly recognised cause of infectious diarrhoea in hospitalised patients.

>> *Clostridium difficile* Infections

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The continued rise of *C. difficile* infections worldwide has been accompanied by the rapid emergence of a highly virulent clone, designated PCR ribotype 027. Anecdotal evidence suggests that infections with this hypervirulent strain cause more severe disease and excess mortality relative to other strains.

In 2010, Australia reported its first confirmed hospital transmitted case of the hypervirulent 027 strain.

Epidemiology

Epidemiology of *C. difficile* infections worldwide has gone through several changes over recent years.

There have been well-documented changes in the incidence and severity of *C. difficile*-associated disease (CDAD) across Canada and the United States. The mortality rate from CDAD in the US increased from 5.7 per million population in 1999 to 23.7 million in 2004. The hypervirulent 027 strain was found to be associated with the outbreaks in the US and Canada, and subsequently with outbreaks in the UK and other parts of Europe.

Another important change in the epidemiology is the recognition of community acquired CDAD in the absence of classic risk factors such as antibiotic exposure, although a health care setting transmission is the primary mode of acquisition.

All clinicians should be aware of the changing epidemiology of CDAD and undertake measures to reduce the risk of disease in their patients.

Transmission

C. difficile organisms are shed in faeces. Any surface, device or material that becomes contaminated with faeces will serve as a reservoir. The spores can survive up to 5 months on surfaces and are highly resistant to most germicides. Spores are transferred to patients mainly via the hands of health care workers.

Risk Factors for CDAD

Antibiotic use is the most widely recognised risk factor of CDAD. The antibiotic classes most frequently implicated are fluoroquinolones, clindamycin, broad spectrum penicillins and cephalosporines. However, any antibiotic can predispose to colonisation by *C. difficile*.

Other established risk factors include, advanced age (> 65 years), and severe illness, and possible additional risk factors include gastric acid suppression, enteral feeding, cancer chemotherapy and haemopoietic stem cell transplantation.

Microbiology and Pathogenesis

Toxin producing strains of *C. difficile*, a spore forming anaerobic bacillus, is the causative agent of CDAD. Colonisation of the intestinal tract occurs via the feco-oral route and is facilitated by disruption of normal flora due to antimicrobial therapy. The organism produces exotoxins that bind to receptors on intestinal epithelial cells, leading to inflammation and diarrhoea. Two exotoxins, A and B, are thought to be the primary cause of colonic mucosal injury. The hypervirulent strain produces an additional toxin, known as the binary toxin, which has been linked with increased severity of CDAD.

Clinical Features of CDAD

It can cause a spectrum of manifestations ranging from an asymptomatic carrier state to severe fulminant disease with toxic megacolon. About 20% of hospitalised adults and up to 50% of those in long-term care facilities are asymptomatic carriers. It is also carried in the gut of 3% of healthy people.

Symptoms of *C. difficile*-associated colitis includes, watery diarrhoea up to 10-15 times/day, abdominal pain, low grade fever and leukocytosis. The symptoms may begin during antibiotic therapy or 5-10 days following treatment.

Fulminant colitis may manifest as severe abdominal pain, diarrhoea, abdominal distension, fever, hypovolemia and marked leukocytosis (up to 40,000/ul or higher). Diarrhoea may be less prominent if associated with atonic colon.

Diagnosis

An early diagnosis is very important for reducing severe outcomes and reducing transmission.

The following measures should be in place to facilitate early diagnosis:

- Stool specimens should be obtained from patients in or admitted to health care settings as soon as possible after the onset of diarrhoea
- All specimens must be kept refrigerated until testing can be done as the toxin degrades at room temperature
- Specimens kept unrefrigerated for periods greater than two hours will need to be disposed and a new specimen collected
- Testing of specimens from asymptomatic patients is not recommended
- Routine screening of asymptomatic individuals is not recommended
- Repeat testing may be necessary when initial testing is negative, and there is a strong suspicion of *C. difficile* infection.

There are two categories of laboratory tests for *C. difficile* diagnosis – stool toxin assays and organism detection assays.

Stool Toxin Assays

Stool toxin assays include PCR for the toxin gene and enzyme immuno assays (EIA) or cell cytotoxicity assays for direct detection of toxins. PCR testing is a rapid, sensitive and specific testing modality. EIA testing is the preferred testing modality in most clinical laboratories due to the relatively simple technique and quick results, but EIA testing has poor sensitivity. Cell cytotoxicity assay is performed mostly in research laboratories.

Anaerobic Culture

Although extremely sensitive, is performed less frequently in clinical microbiology laboratories. It requires 2-4 days for a result.

At QML Pathology,

PCR testing is performed on all specimens with a request for *C. difficile* testing. PCR testing targets the genes for toxin A and toxin B, and the binary toxin, which is a screening test for the new hypervirulent strain. All specimens that are binary toxin positive will be followed up further by anaerobic culture and PCR ribotyping of isolates to detect the new strain. The above testing protocol will ensure screening of all stool specimens with a request for *C. difficile* for the hypervirulent strain.

Treatment

The initial step is the cessation of the inciting antibiotic as soon as possible.

Metronidazole is the initial therapy of choice for non-severe CDAD. The recommended regimen is 400mg orally 8 hourly for 7-10 days.

Relapse occurs in 10- 25% of cases, and an initial relapse that is not severe should be treated with metronidazole.

For severe disease, refractory disease and subsequent relapses, oral vancomycin is the preferred therapy at a dose of 125mg qid. for 7-10 days, and an infectious disease physician or a clinical microbiologist should be consulted in the management of such cases.

Infection Control Practices

Contact precautions should be implemented for all patients with confirmed or suspected CDAD. Contact precautions should be in place for at least 48 hours after the diarrhoea has ceased.

Recommended precautions include:

- private rooms for infected patients
- gloves and gowns when entering patient rooms and during patient care
- dedicated equipment whenever possible
- performing hand washing after removing gowns and gloves, and before leaving the room. **Normal or antibacterial liquid soap and water should be used, as alcohol-based hand hygiene products are unable to remove *C. difficile* spores**
- adequate environmental decontamination should be ensured, with initial cleaning using a detergent solution followed by a hypochlorite-based disinfectant.

References

1. Guidelines for the management of patients with *Clostridium difficile* infections(CDI) Queensland Health - 29/06/10
2. Therapeutic Guidelines Antibiotic – 2006
3. UpToDate – Epidemiology, Microbiology, and Pathophysiology of *Clostridium difficile* infection
4. The Changing Epidemiology of *Clostridium difficile* infections Clinical Microbiology Reviews – July 2010



Dr Shalinie Perera FRCPA

Consultant Microbiologist

Ph: (07) 3121 4074

Email: Shalinie.Perera@qml.com.au

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>> Diabetes Campaign

14 November is World Diabetes Day and is a globally-celebrated event to increase awareness about diabetes. This year's theme is Diabetes Education and Prevention, and in line with this theme, QML Pathology is launching a diabetes awareness campaign.

With approximately 1.7 million¹ Australians currently diagnosed with diabetes, and 275¹ Australians developing diabetes every day, Australia is 'caught up' in the same epidemic of diabetes that is affecting other first world countries.

Diabetes mellitus (DM), and to a lesser extent the milder abnormalities of impaired glucose tolerance and impaired fasting glycaemia, are associated with a significant increase in cardiovascular risk. In addition to this, diabetes is our most prevalent cause of visual deterioration and blindness in patients under the age of 60 and remains the second most common cause of renal impairment requiring dialysis. Most importantly, recent studies² have demonstrated the benefits of early diagnosis and intensive treatment in preventing or delaying the development of these long-term complications.

Pathology plays an essential role in the detection and effective monitoring of all forms of diabetes. Our campaign will focus on those patients visiting QML Pathology collection centres, and 'known' diabetics due for pathology testing.

We have developed four new patient brochures – a general patient brochure about diabetes and three brochures designed for diabetics: Cholesterol and Other Lipid Tests, Diabetes and the Glycosylated Haemoglobin (HbA1C) Laboratory Test, and Diabetes and the Urine Albumin Creatinine Ratio Test.

In addition to the patient brochures, we have the Diabetes Pack for doctors. This pack reviews the diagnosis of diabetes in the non-pregnant and pregnant states, expands on new developments in the investigation of type 1 diabetes, assesses diabetic control, and discusses the assessment of diabetes-associated tissue damage.

This pack includes the following information:

- Diabetes Pack - Introduction
- Gestational Diabetes
- HbA1c in Diabetes Management
- Autoimmunity in Type 1 Diabetes
- Diabetic Tissue Damage
- Diabetes Register.

If you would like copies of the pack or the patient brochures, or would like further information about the campaign, please contact Marketing on **(07) 3121 4506** or **info@qml.com.au**.

References:

1. <http://www.diabetesaustralia.com.au/Understanding-Diabetes/Diabetes-in-Australia/>
2. National Evidence-based Guidelines for the Management of Type 2 Diabetes Mellitus, Dec 2001: Diabetes Australia Guidelines Development Consortium



Surgical Audit Category 1 CPD Points

Please be aware that the end of the RACGP 2007 - 2010 Triennium is approaching. If you would like your Surgical Audit individual ALM finalised, please contact Jo Wilson-Farr, CPD Coordinator, on **(07) 3121 4506** or email **jo.wilsonfarr@qml.com.au**.

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WARFARIN DOSING OVER THE CHRISTMAS PERIOD

QML Pathology wishes to advise that over the upcoming Christmas period, the QML Pathology Warfarin Care Clinic will be closed. Please note that **NO NEW REGISTRATIONS** will be taken from 5.00pm on Tuesday, 14 December 2010, with the registration line re-opening at 7.00am on Tuesday, 4 January 2011.

During this period, it is essential that any new patients on Warfarin are supplied with instructions, as QML Pathology will be unable to monitor them until we re-open in January. Unfortunately, QML Pathology cannot provide Warfarin control for patients under a period of two weeks.

As a result, we would appreciate if you could arrange a colleague to supervise any Warfarin patients you control while you are on leave. Please note that this also applies to interstate patients on holiday in Queensland.

>> Doctor's Noticeboard



Dr Michael Gillman, Mens Health, Weight Loss and Lifestyle Medicine, has commenced consulting sessions at St Andrew's Place Spring Hill. His consulting rooms at Cleveland will also remain operational. Dr Gillman continues his interest in

the treatment of male sexual problems such as erectile dysfunction and premature ejaculation.

Appointments can be made via his rooms at Spring Hill **(07) 3831 6202** or Cleveland **(07) 3821 7780**. For further information visit **www.drmmichaelgillman.com**.



Dr David Burdon-Jones, Dermatologist, will be commencing practice at South East Dermatology on 5 November 2010. Dr Burdon-Jones is a Queensland medical graduate who trained and worked in Dermatology in South Australia, before going to work in the

UK for seven years. His areas of special interest are skin cancer, psoriasis, contact dermatitis and acne.

David would be pleased to assist with your referral cases.

Please forward referrals to:

Dr David Burdon Jones
1202 Creek Rd
Carina Heights QLD 4152

Alternatively, fax **(07) 3398 2156** or email **info@sebderm.com.au**.

Dr Andrew Davidson, Fertility Specialist and Gynaecologist, will be moving in October/November 2010 to:

Suite 606, The Rocket
203 Robina Town Centre Drive
Robina QLD 4226

Phone: **(07) 5562 2992**

Fax: **(07) 5562 2991**

Email: **reception@adavidson.com.au**

Dr Davidson will still be consulting at John Flynn Medical Centre on a regular basis, with appointments made through the Robina telephone number.

Dr Nicholas Demediuk has moved his practice from Currimundi to new purpose built rooms at Lake Kawana. His telephone, email and web addresses remain the same:

'The Edge' East
Suite 7, 10 Lake Kawana Blvd
Bokarina QLD 4575

Phone: **1300 DR SNIP (1300 377 647)**

Website: **www.drsnip.com.au**

Dr Demediuk is a General Practitioner, specialising in vasectomies and circumcisions for 30 years using advanced minimally invasive techniques. Patients can access detailed information on the website

www.drsnip.com.au or by contacting **1300 377 647** or **admin@drsnip.com.au**.

Dr Demediuk welcomes the opportunity to answer any queries that you may have, and can be contacted via email **dr.n.demediuk@pmc.net.au** or mobile **0418 550 827**.

Changes to Liquid-Based Cytology at QML Pathology

Please note that from August 2010 QML Pathology has changed its liquid-based cytology vials from ThinPrep to BD SurePath™. The main difference of BD SurePath™ for smear takers and doctors is that the collection device is placed into the vial for processing at the laboratory following the preparation of a conventional slide.

Therefore, QML Pathology **will no longer be supplying ThinPrep vials**. We will, however, continue to accept and process ThinPrep samples in the interim.

If you have any questions regarding BD SurePath™, please contact Cytology on **(07) 3121 4485** or your local Medical Liaison Officer.

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All New
Online Results

>> Path-Way is Coming Soon

QML Pathology will soon be launching Path-Way, a new web-based application, providing you with real-time results, anytime, anywhere.

Instant Access

As soon as the result is available at the laboratory, it is available at Path-Way - enabling you to view your patients' results quickly, efficiently and securely over the Internet.

With no paper to handle, instantaneous delivery and secure access, Path-Way ensures your patients' results are available real-time, anywhere, on time, all the time.

Path-Way Works for You

If you are a solo practitioner or work in a group practice, Path-Way can be tailored to create a central register designed to suit your preferences. Allowing you to access and manage only those results you wish to.

New Features

- Increased search functionality, including new filters
- Unique username and password
- Update your account details online
- View pending requests
- Print off hard copy reports in a familiar format
- View interactive charts
- View cumulative results

If you have any questions regarding Path-Way, please contact your local Medical Liaison Officer.



Path-Way

By QML Pathology



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New Collection Centres

Caloundra

Caloundra Private Hospital
Consulting Suites
96 Beerburum St
Phone: (07) 5492 0290
Opening Hours:
9.00am - 12.00pm (Mon-Wed, Fri)

Carina

396 Stanley Rd
Phone: (07) 3843 5688
Opening Hours:
7.30am - 12.30pm (Mon-Fri)

Charters Towers

87 Mosman St
Phone: (07) 4787 8189
Opening Hours:
8.00am - 12.00pm,
12.30pm - 4.00pm (Mon-Fri)
8.00am - 11.00am (Sat)

Clontarf

Shop 8, Clontarf Bayside Plaza
9 Elizabeth Ave
Phone: (07) 3283 3504
Opening Hours:
7.00am - 5.30pm (Mon-Fri)
8.00am - 12.00pm (Sat)

Innisfail

74-76 Edith St
Phone: (07) 4061 4917
Opening Hours:
8.00am - 11.45am (Mon-Fri)

Landsborough

3/4 Mill St
Phone: (07) 5439 9540
Opening Hours:
7.00am - 12.00pm (Mon-Fri)

Logan Central

57 Station Rd
Phone: (07) 3209 4253
Opening Hours:
8.00am - 1.00pm (Mon-Fri)

Mackay

Tenancy D, Courts Corner
142 Nebo Rd
Phone: (07) 4951 0830
Opening Hours:
8.30am - 1.00pm,
1.30pm - 4.00pm (Mon-Fri)

Narangba

Shop 3, 30 Main St
Phone: (07) 3385 6938
Opening Hours:
7.30am - 12.30pm (Mon-Fri)

Nimbin

35 Cullen St
Phone: (02) 6689 1549
Opening Hours:
9.30am - 11.30am (Tue, Thu)

Petrie

Frenchs Forest Shopping Centre
Shop 5, 86 Beeville Rd
Phone: (07) 3285 1586
Opening Hours:
7.30am - 1.00pm (Mon-Fri)

Sarina

33A Central St
Phone: (07) 4943 2093
Opening Hours:
8.30am - 1.00pm,
1.30pm - 4.00pm (Mon-Fri)

Taringa

Shop 101
Gailey Fiveways Shopping Centre
144 Indooroopilly Rd (Cnr Gailey Rd)
Phone: (07) 3871 1165
Opening Hours:
7.30am - 12.30pm,
1.00pm - 3.30pm (Mon-Fri)

Upper Mount Gravatt

The Village Shopping Centre
Shop 9, 1932 Logan Rd
Phone: (07) 3343 7435
Opening Hours:
8.30am - 12.30pm,
1.00pm - 4.30pm (Mon-Fri)

Varsity Lakes

Suite C, 191 Varsity Parade
Phone: (07) 5575 7211
Opening Hours:
7.30am - 12.30pm (Mon-Fri)

Waterford West

Waterford Village
Shop 5A, 42-48 Bourke St
Phone: (07) 3200 6364
Opening Hours:
7.30am - 1.00pm (Mon-Fri)

West End

109 Vulture St
Phone: (07) 3255 0027
Opening Hours:
7.30am - 1.00pm (Mon-Fri)

Infectious Diseases Report - Geographic Distribution - September 2010

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)	1	10	2				6		4		9		1	1		34	37	24	20
Adenovirus (typing pending)		4	2						1	4	3	3	1		1	19	24	13	14
Barmah Forest virus							1		1		1	3	1	1	2	10	16	8	18
Bordetella pertussis	1	36	28	5	1		40		34	19	61	35	17	8	11	296	310	260	224
Brucella species				2										1		5	7	1	0
Campylobacter jejuni																0	0	0	0
Chlamydia pneumoniae																0	0	0	0
Chlamydia trachomatis, not typed	68	141	31	25	2	1	107		43	39	153	49	9	42	19	729	744	724	740
Coxiella burnetii		2								1	1	3				7	11	13	5
Cryptococcus species							4				1					5	3	0	2
Cytomegalovirus (CMV)	5	12	6				13		10	2	17	9	1	2	1	78	52	65	49
Entamoeba histolytica																0	1	1	0
Enterovirus - not typed			1							1						2	2	1	1
Epstein-Barr virus (EBV)	7	17	3			1	24		15	4	26	9	7	16	5	134	107	111	107
Flavivirus unspecified		2	1			1	1		1					1		7	7	16	17
Hepatitis A virus							1									1	1	6	3
Hepatitis B virus	8	6	3	1	2		11		4	4	46	1		5	2	93	82	91	85
Hepatitis C virus	13	52	14	4	3		24		20	6	85	27	4	12	9	273	306	300	307
Hepatitis D virus																0	0	2	0
Hepatitis E virus																0	0	0	1
Herpes simplex Type 1	18	37	19	3			37		33	9	65	23	10	14	7	275	258	255	227
Herpes simplex Type 2	15	31	8	3	1		19		8	2	41	18	3	7	4	160	162	146	184
Herpes simplex virus - not typed																0	0	0	0
HIV-1	4	1					4		2		4	1				16	10	5	10
HTLV-1																0	0	0	1
Influenza A virus	3	22	6			2	23		23	3	24	10	11	5	6	138	126	47	37
Influenza B virus	1	2	4				3			2	8	1	1			22	11	3	2
Legionella pneumophila (all serogroups)											2	3				5	0	0	0
Legionella species											1					1	0	1	3
Leptospira species	1										1					2	1	5	3
Measles virus		1														1	6	0	0
Mumps virus		1														1	1	0	0
Mycoplasma pneumoniae		5	2				1		2	1	5	3		4		23	28	23	17
Neisseria gonorrhoeae	13	7	1				4		2	1	15			5	1	49	63	41	55
Parainfluenza virus Type 1													1			1	2	4	2
Parainfluenza virus Type 2											2					2	3		5
Parainfluenza virus Type 3	1	2	3	1			2		2	2	8	2	1			24	13	3	2
Parvovirus		3					2		1		6	4	1	1		18	18	17	15
Pneumocystis carinii												1				1	1	3	2
Respiratory Syncytial virus	3	6	1	1			3		8	3	5	2	3	4		39	29	40	53
Rickettsia - Spotted Fever Group		2									1		1			4	4	6	4
Ross River virus	4	2	4	1			3		2		4	3		2	1	26	12	39	52
Rubella virus																0	0	0	0
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	7	6	4	1			13		9	5	14	5	3	4	1	72	68	65	64
Toxoplasma gondii		1					1				1					3	1	2	4
Treponema pallidum	22	12	4	4			21		4		28	7	2	13	1	118	114	116	113
Trichomonas vaginalis	5						2		1		4	1		4		17	8	9	13
Varicella Zoster virus	13	34	10	2	1		25		23	9	68	17	4	9	11	226	208	198	182
Yersinia enterocolitica																0	0	0	0
TOTAL	213	457	157	53	10	5	395	0	253	117	710	242	82	161	82	2937	2857	2664	2643

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

August 2010 and further historical clinical data can be obtained by contacting your local Medical Liaison Officer