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New and improved IMVS website
FREE iPhone APP with loads of features

Supporting Training and Medical Research
www.imvs.sa.gov.au
From the Executive Director

IMVS IS HEADED BY PROFESSOR RUTH SALOM A MEDICAL GRADUATE WHO HAS SPECIALISED AS A SURGICAL PATHOLOGIST.

WELCOME to the 75th edition of our IMVS Newsletter, I trust you will find our new look newsletter and the articles contained in this issue interesting and informative.

It is now more than two years since I joined the IMVS as Executive Director and reporting pathologist, a position I am proud to occupy and continue in the tradition of medical leadership. My predecessor Professor Brendon Kearney AM immediate past Director of the IMVS continues to contribute to IMVS as the site Director at Royal Adelaide Hospital and as a haematologist.

In selecting articles for publication in the IMVS Newsletter we aim to provide you with a mixture of topics some we believe will be useful to you in your clinical practice, others will spotlight some of the latest research which is taking place here at the IMVS in South Australia.

This year Professor Angel Lopez co-Director and Founder of our Centre for Cancer Biology received the highly-coveted South Australian Scientist of the Year award. This is the second time in three years this prestigious award has been bestowed to our researcher. Professor John Hopwood was awarded the prize in 2008.

Our commitment to research, teaching and training is based on our motto of a not for profit organisation supporting training and medical research.

The IMVS has been providing metropolitan and regional South Australians with a comprehensive quality pathology service since 1938 and continues to grow to meet the ever increasing need of the people of South Australia. Our laboratories now include those at Women’s and Children’s Hospital (WCH) and Flinders Medical Centre. This not only improves our accessibility to clinicians and patients but also improves our expertise. The WCH laboratory has expanded our peri natal, neonatal and paediatric expertise.

We are committed to continuous improvement and it is my great pleasure to announce that we have launched our new web site. This will give both clinicians and patients ready access to important information regarding pathology testing via the internet.

The IMVS is the first Australian pathology provider to release an ‘iPhone app’ which is free and includes Google maps for all our collection centres, contact numbers and much more, including an interactive game.

For more information on all of these innovative improvements to our service see page 12, or better still log on and visit us at www.imvs.sa.gov.au. While you are there we would welcome any suggestions you may have regarding content or topics for future IMVS Newsletters.

I would like to thank you for your support in 2010 and wish you well for 2011.

Professor Ruth Salom
MEDICARE REBATES for pathology were decreased in the 2009 Federal Budget and some private pathology providers increased patient out of pocket expenses as a result.

All pathology providers are currently reimbursed by the Federal Government for 85% of the Medicare scheduled fee for the three most expensive tests on a request. If this is accepted by the provider they can bulk bill Medicare directly at no additional cost to the patient. If however, the provider wants more than 85% of the scheduled fee the patient will receive an account and must pay a Medicare gap. Similarly, if a test is not listed on the Medicare rebate the patient will have to pay a full fee set by the provider.

Last year’s Federal Budget saw the specimen collection fee for licensed private pathology collection centres reduced (public providers have never been reimbursed for this service). As a consequence some private pathology providers have increased their test charges above the Medicare rebate to compensate. These charges vary between States and providers and in South Australia range from $60 to $155 for the major pathology providers.

The IMVS bulk bills all pathology requests listed on the Medicare schedule; there are no out of pocket expenses to patients. As a not for profit organisation the proceeds from our diagnostic pathology service provide a full 24 hour seven day a week service to hospitals and doctors across the State, maintain a complement of trained staff and fund medical research. Funding of research alone amounts to about $9 million annually.

This relationship between the provision of a quality pathology service to the community of South Australia, training and medical research is a fundamental strength of the IMVS, which you support whenever you chose IMVS for your diagnostic pathology.

Microarray on MBS

Microarray testing is now available for the investigation of intellectual disability, developmental delay, autism or at least two congenital abnormalities (MBS item 73292).

The microarray test is the first line genetic test for these indications. It allows diagnosis of small deletions and duplications previously not detectable by karyotyping. Published studies and our own experience indicates that the abnormality detection rate will more than double (6% to >12%). Tests such as subtelomere MLPA and MLPA/FISH for microdeletion and/or microduplication syndromes will no longer be necessary in most cases.

When ordering microarray testing, please include the following:

1. Request ‘Microarray test’
2. Clinical information consistent with MBS item 73292
3. Instructions to the patient centre to provide blood in both an EDTA tube and a lithium heparin tube. (Our patient centres have been notified of the requirements.)

When the IMVS receives a request for ‘chromosomes’, ‘karyotype’, ‘MLPA’ or ‘FISH’ for the investigation of intellectual disability, developmental delay, autism or congenital abnormalities, one of our senior staff will contact you to clarify your request.

There will be no gap payment for private patients.

SA Science Award

Professor Angel Lopez shared this year’s highly-coveted South Australian Scientist of the Year title in the annual South Australian Science Excellence Awards.

Professor Lopez is Co-director and founder of the Centre for Cancer Biology which is located within IMVS. His team’s research, supported by an NHMRC Program grant and other highly prestigious national and international funding, focuses on leukaemia, and they have developed a candidate treatment for eliminating leukaemia stem cells – the holy grail of cancer research currently.

FOBT

In October IMVS introduced a new faecal occult blood testing assay in line with the National Bowel Cancer Screening Program. The test offers a simplified sample collection system that has received wide patient support. The collection of only two consecutive samples with a no-mess sample stick offers an equivalent positivity rate and positive predictive value to that achieved with three consecutive samples in the superseded test. It is expected that the convenience of the new test system will improve patient compliance with collection requirements.

DID YOU KNOW?

May 2010 marked the thirtieth anniversary of the eradication of small pox. Vaccination, it’s a great idea!
For patients presenting with haemorrhage or about to undergo an elective or emergency surgery INR is an important indicator. Attempting to return a mildly abnormal INR to a value of 1.0 may be elusive and may bring with it risks associated with the chosen treatment.

Whilst Fresh Frozen Plasma (FFP) is usually the treatment of choice in such circumstances the prescribed dose may be ineffective, as large volume infusions are required to make the correction. Additionally, FFP has a number of disadvantages, including large volume infusion with an associated increased risk of adverse events: allergic reactions, fluid overload and acute lung injury (TRALI) adverse events.

**Abnormal INR**

What defines a significant coagulopathy?

Recent literature examined bedside and interventional radiology procedures and compared the resultant bleeding in patients with and without a coagulopathy. The results indicated that even patients with coagulopathy did not experience a higher incidence of abnormal bleeding compared with those without coagulopathy.

One reason for this observation, is a very interesting theoretical correlation between the international normalised ratio (INR) and the recipient’s level of clotting factors. With an INR less than 1.5, there is an exponential relationship with the overall level of clotting factors, meaning that decreasing the INR by even a very small amount would require a substantial amount of plasma.

However when the INR is greater than 1.7, the relationship is more linear, indicating that the INR can be corrected more quickly for every plasma unit transfused. Consequently, trying to reverse an INR greater than 2.0 yields a higher return whereas trying to correct a ‘coagulopathy’ associated with an INR less than 1.5 is of little or no benefit.

Figure 1 shows expected INR decrease after plasma transfusion (500 mL per unit) in adults from a clinical study. To lower an INR from 2.5 to 1.5 requires approximately two litres of plasma, with proportionally less plasma required to reverse lesser coagulopathy.

However attempting to reduce an INR of 1.5 to 1.3 could (in theory) require more than three litres of plasma! Because a patient with an initial INR of 1.5 still has a substantial reserve of clotting factors, only minimal correction is achieved.
When should patients receive plasma?

The question is; “When should a patient with a coagulopathy receive plasma therapy?” More definitely, should hospitals adopt a transfusion trigger for plasma infusion when INR is 1.6 or higher?

Based on empirical evidence with bleeding in patients undergoing invasive procedures and on experience with those having single factor deficiencies, the answer is probably yes.

For patients with clotting factors VIII and IX below 30 percent, haemostasis starts to become impaired, so maintaining the levels of all clotting factors above this value is desirable. In theory, when the INR approaches 2.0, the levels of clotting factors fall below the critical 30 percent. Setting the plasma transfusion threshold at greater than or equal to 1.6 for bleeding patients or those about to undergo an invasive procedure, provides a buffer before the patient’s clotting factors drop below the critical level.

Studies describing the effect of transfusing plasma to patients with coagulopathy have in general shown very little change in the INR when the starting level was low; indicating that adherence to an INR equal to or greater than the 1.6 threshold for plasma transfusion is significant.

Conclusion

The evidence suggests that plasma provides little or no benefit in treating a ‘coagulation abnormality’ characterised by an INR of less than 1.6. The optimum transfusion threshold for plasma is unknown but most likely is associated with an INR of 1.6 or higher in a bleeding patient or one about to undergo an invasive procedure, but it may be as high as 2.0.

Procedures for patients on Warfarin therapy are clearly laid out in national guidelines (Warfarin reversal: consensus guidelines, on behalf of the Australasian Society of Thrombosis and Haemostasis. MJA 2004; 181: 492–497).

Cancer drug a treatment for bone loss?

In recent years IMVS consultants providing clinical haematology services in the Royal Adelaide Hospital (RAH) have been involved in evaluating a new drug, imatinib for the treatment of chronic myeloid leukaemia (CML). They have shown imatinib to be remarkably effective in the treatment of this disease which previously had a very poor prognosis.

At the same time as its clinical effectiveness was being assessed in the hospital, imatinib was being studied by a team of scientists in the IMVS who discovered that it was also uniquely capable of suppressing another highly specialized cell, the osteoclast. Osteoclasts are responsible for removing bone during the continuous cycle of bone formation and removal which occurs naturally in a healthy skeleton.

In order to find out whether long-term treatment with imatinib affected the osteoclasts in the bone marrow of patients with leukaemia, two small bone samples collected from each imatinib-treated patient were reviewed by Professor Barrie Vernon-Roberts, a leading international expert on bone pathology at the IMVS.

The purpose of the first bone sample was to confirm the presence of leukaemia before treatment began, and the second to confirm the eradication of leukaemia from the bone marrow (after 1–3 years of treatment with imatinib).

The amounts of bone in the second samples from 80% of the patients whose leukaemias were successfully treated with imatinib, but not with other drugs, had increased substantially when compared with the amounts in the first samples taken before treatment began. This unexpected and large increase in bone formation had occurred even in those patients with severe osteoporosis prior to receiving imatinib.

Patients whose bones are severely weakened by osteoporosis are prone to fractures of the hip, back pain and collapse of vertebral bodies and other manifestations of weakened bone. This critical insufficiency of bone has been shown to be largely unresponsive to other efforts to stimulate the bone-forming cells to make new bone. In osteoporosis the bone-forming cells in the bone marrow seem to be dormant and cannot be re-activated by treatment. That was until the previously unsuspected effects of imatinib on bone became evident.

In recognition of their contribution to this important field, Associate Professor Zannettino and his team have been awarded a three year translational research grant from the US Leukemia and Lymphoma Society. The team were also invited to write a definitive review article for the esteemed medical journal of the American Society of Hematology, Blood.

This unique and important collaboration between clinicians and researchers is a fundamental strength of the IMVS, which you support whenever you chose it for your diagnostic pathology.
Medications, both prescription and non-prescription, can be bought online legitimately within Australia. Importation of medications into Australia where a prescription is required is possible provided regulatory requirements are met, although such internet transactions are fraught with counterfeits and organised crime. When shipped most of these medications contain little, if any, active constituent.

An emerging trend in recent years has been the marketing of ‘herbal’ and ‘traditional’ remedies or ‘dietary supplements’ containing undeclared chemicals, prescription drugs and their analogues. Unfortunately the Therapeutic Goods Administration (TGA) can not test all the products on the domestic market for potentially harmful contaminants, let alone all those available on the internet. Instead it must rely on the manufacturer to assure their safety.

On the internet, the most commonly marketed fraudulent health products include treatments for hair loss, more than three times the recommended daily dosage of sibutramine, predisposing consumers to an unacceptable likelihood of serious side effects.

Meizitang and Lida Daidaihua slimming capsules first came to the attention of the IMVS in May 2008 following the admission of a patient into the psychiatric unit of the Royal Adelaide Hospital with drug induced psychosis. Withdrawal of the capsules produced a complete resolution of symptoms within several days and testing identified the presence of sibutramine. Later that year the IMVS identified undeclared sibutramine in another product, Pearl White slimming capsules, subsequent to the admission of a patient to the Alice Springs Hospital with florid psychosis.

The internet has not been limited to disseminating only undeclared prescription drugs. In conjunction with a global shortage of ecstasy, exploitation of loopholes in legislation in the UK permitted the rapid increase in use of cathinone derivatives, suspected to be responsible for the death of up to 25 people there. This lead the Home Secretary to ban these substances as a class effective from April 16th 2010. Of particular concern were mephedrone and methylone, analogues of methamphetamine and ecstasy respectively, both of which were illegal in Australia. Naphyrone analogues were banned in the UK from July 13th 2010 and yet still new drugs replace them. Unfortunately it is in the nature of humankind to abuse psychoactive drugs, and with an enthusiastic and expanding marketplace through the internet the industry has become well established.
As the compounds become less well known so they become harder to identify and their effects harder to predict.

The IMVS experience with identifying designer drugs began with the epidemic of paramethoxyamphetamine related poisonings in the 1990s, believed to be responsible for the deaths of up to 30 people in South Australia. In addition to routine drug screens, referring suspect agents for identification is another useful public health contribution made by the IMVS.

Contrary to the claims the product is entirely synthetic

“PEARL WHITE SLIMMING CAPSULE

The capsule is made refinedly from carefully selected pearls of Tai lake in China, and natural rare and precious vegetables, such as ginseng fleece-flower root, cassia seed and flos chrysanthemi indici, etc. It is rich in various trace elements, and it is natural product without any chemical component. The product has the function of adjusting human bodies in double-way. It can directly and more quickly decompose extra fat and reduce weight. At the same time of reducing weight and slimming the body, it also can nourish skin, beautify and whiten skin and make the skin more elastic. It is the top choice for beauty-pursuing women.

Function: weight reduction, facial beautification

Applicable to: people with high blood fat, fat people, and beauty-pursuing women.

Inapplicable to: children and pregnant women

Method of taking: take one before breakfast and before supper separately, one capsule each time”
Two recent developments have advanced our understanding of Prostate Specific Antigen (PSA) testing and the role it has in general practice. While not resolving the dilemma regarding the net benefits versus harms of regular testing, they at least give the clinician a little more to work with.

Randomised controlled trials not the answer

The first development was the publication in 2009 of mortality results from two major randomised controlled trials of prostate cancer screening. The outcome of the US Prostate Lung Colorectal and Ovarian Screening Trial was not conclusive, in that although no mortality difference was found between those annually screened and the control group, 15% of men in the screened group were non compliers and 52% men in the control arm were PSA tested during the course of the study. This contamination greatly decreased the difference between intervention and control groups making it a relatively poor test of screening. Other criticisms were short follow-up, high pre-study PSA test rates and low number of prostate cancers diagnosed.

Given these two results, it is not surprising that most authorities have concluded that we still don't know whether the benefits of a population-based screening program for prostate cancer exceed the harms.

Measure of future and current risk?

The shortcomings of PSA as an indicator of the presence of prostate cancer are well known, but a number of prospective studies demonstrate that PSA may be helpful as a measure of future risk. In the Baltimore Longitudinal Study of Aging, the relative risk of prostate cancer for men aged 40 to 49.9 was 3.75 (range 1.6 to 8.6) when the PSA level was at or greater than the median (0.60 ng/mL) compared with men with PSA levels less than the population median. In a larger and more recent study in Sweden PSA A risk management approach

A risk management approach to prostate cancer early detection offers many more options than a 'screen/no screen' regimen. Exploring a man's individualised risk involves asking about known risk factors, including whether he has had a previous PSA test or other investigations for prostate cancer.

A second trial – the European Randomised Study of Screening for Prostate Cancer did report a 20% reduction in mortality in the (four-yearly) screened group. This survival benefit was only seen after seven years, however, and a large number of men (1410) would need to be screened and 48 treated for a single life to be saved, suggesting substantial over diagnosis and treatment.

Not all cancers can be detected with a PSA test

in men 44 – 50 years old was predictive for prostate cancer up to 25 years later. While biases exist in some studies, in a recent review of this topic it was concluded that: ‘the predictive value of PSA has been validated in prospective studies and the risk associated with a greater than median PSA at baseline is remarkably consistent and substantial’.

The Urological Society in its latest position statement on PSA screening goes one step further and suggests a single PSA test at age 40 to establish future risk, and a monitoring decision based on that risk. This approach has been interpreted as screening from age 40 years and widely criticised. However unless all men are offered such a test, such criticism doesn't seem justified. If a patient wants to actively manage his risk from prostate cancer, then a single PSA test to determine future risk can be very helpful. If, based on the result, he chooses a monitoring program it can also provide a baseline for future tests.
A single PSA test may also placate an anxious patient whose aim is to rule out cancer rather than early detection, but herein lies a trap. Even a single test carries the risk of discovery of a cancer that may not be clinically important, but may harm quality of life. On the other hand, some aggressive cancers do not produce an elevated PSA. Counselling the patient about the pros (early detection), cons (over-treatment) and uncertainties (may not pick up some cancers) of PSA testing should be undertaken prior to even a single test.

**DRE result**
Both PSA and DRE (digital rectal examination) should be done if the purpose is to detect current cancer. An abnormal DRE increases risk of current cancer by a factor of two.

**Family history**
It is clearly important to establish whether a father or brother has been diagnosed at an early age. Such a history increases a man's risk of diagnosis by 2 to 3 fold – even more if more than one first degree relative is diagnosed.

**Age**
Age is an additional risk factor for current cancer with risk increasing 1000 fold from a man in his 30s to a man in his 70s. However age has a sting in the tail in that while risk of prostate cancer increases with age, the threat from prostate cancer decreases. This is because competing causes of death become more important as a man grows older and there is less time for the prostate cancer to progress.

**Early detection counselling**
If a patient chooses an early detection program then it should be emphasised that regular testing, not a single test, is required. Exactly how often to test is dependent on the result of the first PSA test. There are no guidelines on this, and anything from annually to four yearly may be appropriate.

The discussion should cover the advantages of early detection (more treatment options with the possibility of cure) as well as the cons (no guarantee of cure or detection of cancer that is not a threat but for which treatment may harm quality of life). Not all cancers can be detected with a PSA test.

A show card has been developed to guide this discussion, it is available at www.andrologyaustralia.org.

‘Positive’ – now what?
A risk assessment approach recognises that PSA represents a continuum of risk, so there is no single threshold above which a test can be regarded as ‘positive’. Historically >4 ng/ml signalled the need for further investigations, however we now know that a sizable proportion of men with a PSA under 4.0 ng/ml will have prostate cancer.

Nevertheless total PSA is a guide for what to do next. As we have said, a PSA below the median reflects a low risk category, and above the median can suggest the need for monitoring for future risk of cancer. The risk of current cancer is higher in the presence of other risk factors such as positive family history and abnormal DRE. Prediction tools such as the Prostate Cancer Prevention Trial risk calculator can assist with combining all these factors into a single risk estimate.

If a patient has a high PSA (for example over the 95 percentile for his age – see Table 1, p11), then first rule out other causes – a urinary infection, prostatitis, benign prostatic hypertrophy (free to total PSA <10% suggests cancer is more likely), recent ejaculation (allow 48 hours). If a patient has been hospitalised for urinary symptoms, then urinary retention or recent catheterisation can cause PSA elevations. Retest after three months to rule out normal variability. The rate of increase of PSA (velocity) is normally measured over 12 to 18 months. A PSA velocity greater than 0.4 ng/ml/yr is more likely to indicate cancer.

Consider specialist referral if the PSA exceeds the age-related upper limit of normal (95th percentile), the DRE is abnormal or the PSA velocity is high.

Don’t wait until a PSA reaches 10 ng/ml to refer for further investigation. This is not watchful waiting or active surveillance these approaches require a diagnosis (i.e. a positive biopsy) so that the risk, based on Gleason grade and extent of cancer is better understood. If you watch a PSA rising between 4 and 10, you are increasing the chance that the cancer is no longer organ-confined at diagnosis. This will limit treatment options and reduce opportunity for cure.

**Summary**
In summary, when a patient asks about prostate cancer testing, by individualising his risk of current and future cancer, you and he may have more options than the old ‘test or not test’ decision dilemma. Nevertheless he still needs to be informed of the pros and cons and to work out his own preferences, so this is typically a long consultation. A patient information summary to help explain the issues (PHIP numbers 1 and 2) is available at www.prostatehealth.org.au.

A final caveat: we do not have randomised controlled trial evidence that this approach is more effective than any other, and non-PSA producing cancers would certainly slip through more readily unless a DRE was combined with the PSA test.

**DID YOU KNOW?**
While the risk of prostate cancer increases with age, threat from such a diagnosis decreases with age. For younger men, there is more time for the cancer to grow and become metastatic, and fewer competing causes of death. The old adage – “a man is more likely to die with prostate cancer than of it” is not necessarily true for men younger than about 65!

continued on page 11
A hyper virulent epidemic strain (PCR ribotype 027) of *Clostridium difficile* has emerged in recent years in North America and Europe resulting in increasingly frequent, severe and recurrent infection.

This strain has been transmitted for the first time in an Australian hospital and aged care facility (Melbourne) in May 2010. Hyper virulent *C. difficile* has not yet been reported outside of Victoria.

**Epidemiology**

*Clostridium difficile* is the most common cause of nosocomial and antibiotic associated diarrhoea, which, if untreated may lead to pseudomembranous colitis. Most patients with *C. difficile* infection (CDI) have a history of receiving antibiotics, although an increasing proportion of community acquired CDI cases overseas have no such history. Whilst most commonly seen following cephalosporin and fluoroquinolone use, any antibiotic use and some antineoplastic drugs can lead to CDI.

*C. difficile* is a strict anaerobe and dies rapidly outside the colon however it has the ability to produce spores which can survive in the environment for many months. The spread of spores from an infected patient to the environment and then to other patients is via the faecal-oral route, through aerosols associated with the diarrhoea and on contaminated hands.

Normally less than 5% of the healthy population carry *C. difficile* in their intestinal tract without any adverse effect. Exposure occurs during contact with infected patients or their environment, most commonly in hospitals and long term residential facilities where the carriage rate may be as high as 20% due to patient to patient spread.

Transmission to healthy individuals causes no apparent symptoms as long as *C. difficile* is present in low concentrations. Only when the organism is allowed to reach high concentrations and produce significant levels of toxin will symptomatic disease occur.

**Clinical features**

Damage to the colon mucosa is caused by the toxins produced by *C. difficile*. Lesions of dead cell debris, fibrin and mucus coalesce to form a layer in the colon, giving the disease its name, pseudomembranous colitis.

Symptoms range from watery diarrhoea to severe ulceration of the gut with bloody diarrhoea. Other symptoms may include fever, loss of appetite, nausea and abdominal pain. Untreated pseudomembranous colitis can be fatal and present similarly to septic shock.

**High risk**

CDI should be suspected in patients at highest risk, including those with:

1. Increased susceptibility to infection – disruption of normal colonic flora mostly as a result of antibiotic use but also from some antineoplastic agents.
2. Increased likelihood of exposure – hospitalisation or residence in a long term care facility.
3. Increased susceptibility to colonisation – gastric acid suppression, nasogastric feeding, older age.

**Who to test**

- Only test patients aged more than two years who have diarrhoea; asymptomatic carriage occurs, particularly in infants, and does not require treatment.
- Any adult with severe or prolonged diarrhoea during or following antibiotic treatment; onset can occur many weeks after cessation of the antibiotics.
- Any current or recently hospitalised patient (within the past 12 weeks) or resident of a long term care facility with any diarrhoeal illness (defined as more than three stools in a 24 hour period) regardless of recent/current antibiotic treatment.

Tests requested should include culture and toxin testing for *C. difficile*.
Case management

Treatment is to cease administering the antibiotic precipitating the disease if possible and administer metronidazole. If the treatment is successful and the patient recovers there is still a 20% chance of relapse. Multiple relapses are not uncommon.

If symptoms do not resolve refer the patient to an infectious diseases physician. Tests of cure are not necessary.

Control/prevention

- Prescribe in accordance with recommended guidelines (Therapeutic Guidelines: Antibiotic) and avoid unnecessary use of broad spectrum beta-lactam and fluoroquinolone agents.
- Monitor patients receiving antibiotics known to have such an effect.
- Ensure good hand hygiene with all patient contact.
- Ensure that recommended infection control procedures for gastroenteritis are being followed for all cases in long term facility residents or hospital inpatients, regardless of cause (use the Guide to the Management of Gastroenteritis Outbreaks in Residential Environments in SA, available at www.dh.sa.gov.au/pehs/PDF-files/SAGastroGuidelinesResidentialEnv-CDC-100106.pdf)

Contact

Communicable Disease Control Branch
Dr Anne Koehler Director
- phone (08) 8226 7177 (all hours).

Alert all facility managers and infection control practitioners whenever a diagnosis of CDI is made.

Reference
CDCB 05/08/10
Public Health Information Sheet.

Table 1 PSA Distribution

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<th>50th *</th>
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<td>70-79</td>
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</table>

* Median ** Upper limit of normal

References
The IMVS has recently launched its new web site, a powerful new resource for clinicians featuring ready access to important pathology testing information.

- Download from the new IMVS Web site – or iTunes.
- Search for your nearest patient centre (Google maps)
- Answers to patients FAQs
- Interactive game
- And much much more!

IMVS Call Centre
Metropolitan 8222 3000
Regional and Country 1800 188 077