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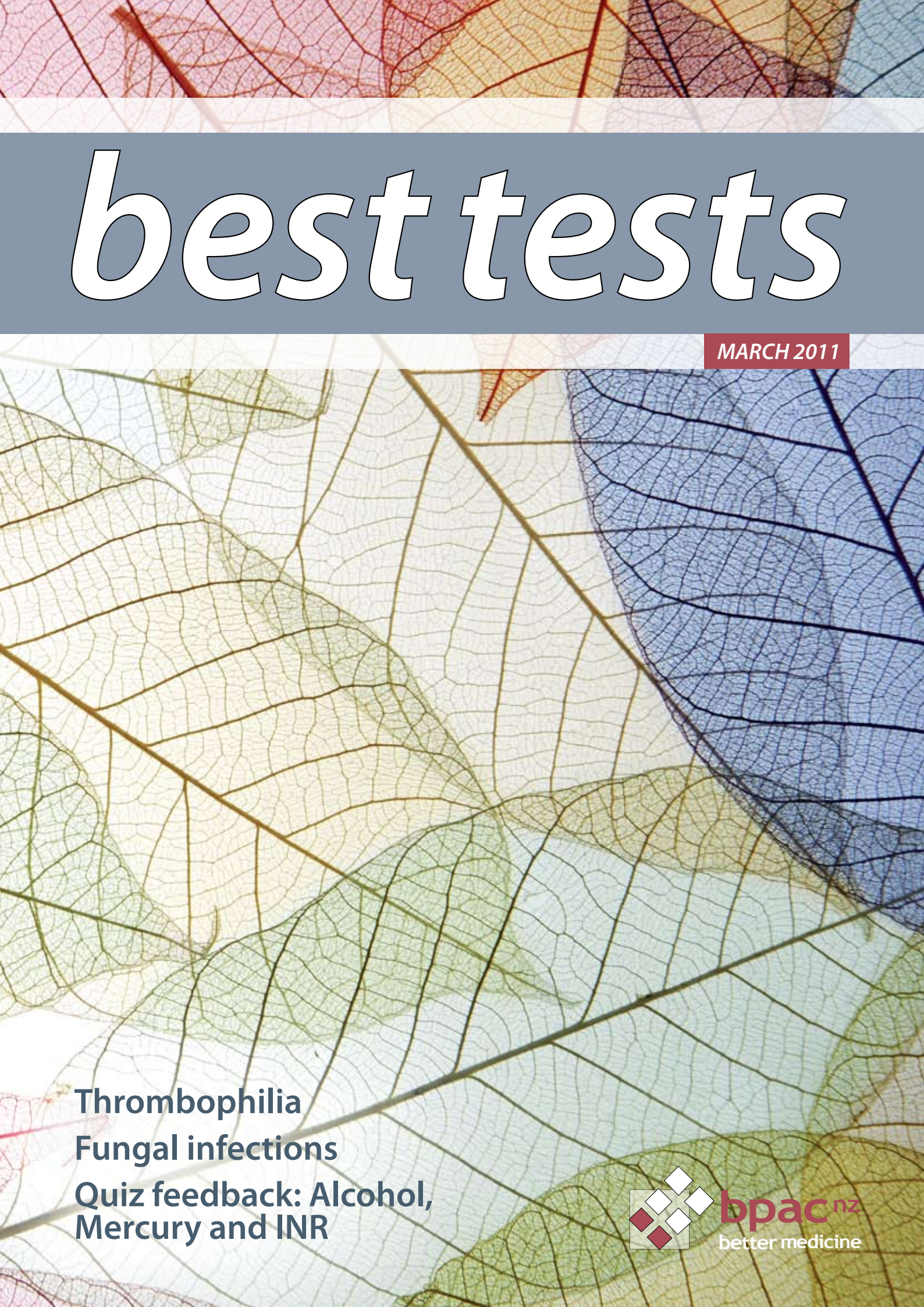
MARCH 2011



Thrombophilia

Fungal infections

Quiz feedback: Alcohol, Mercury and INR

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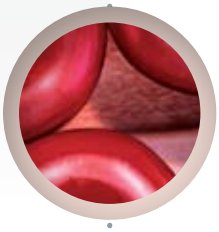

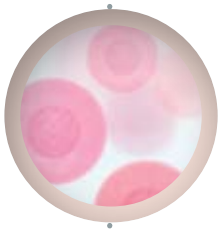

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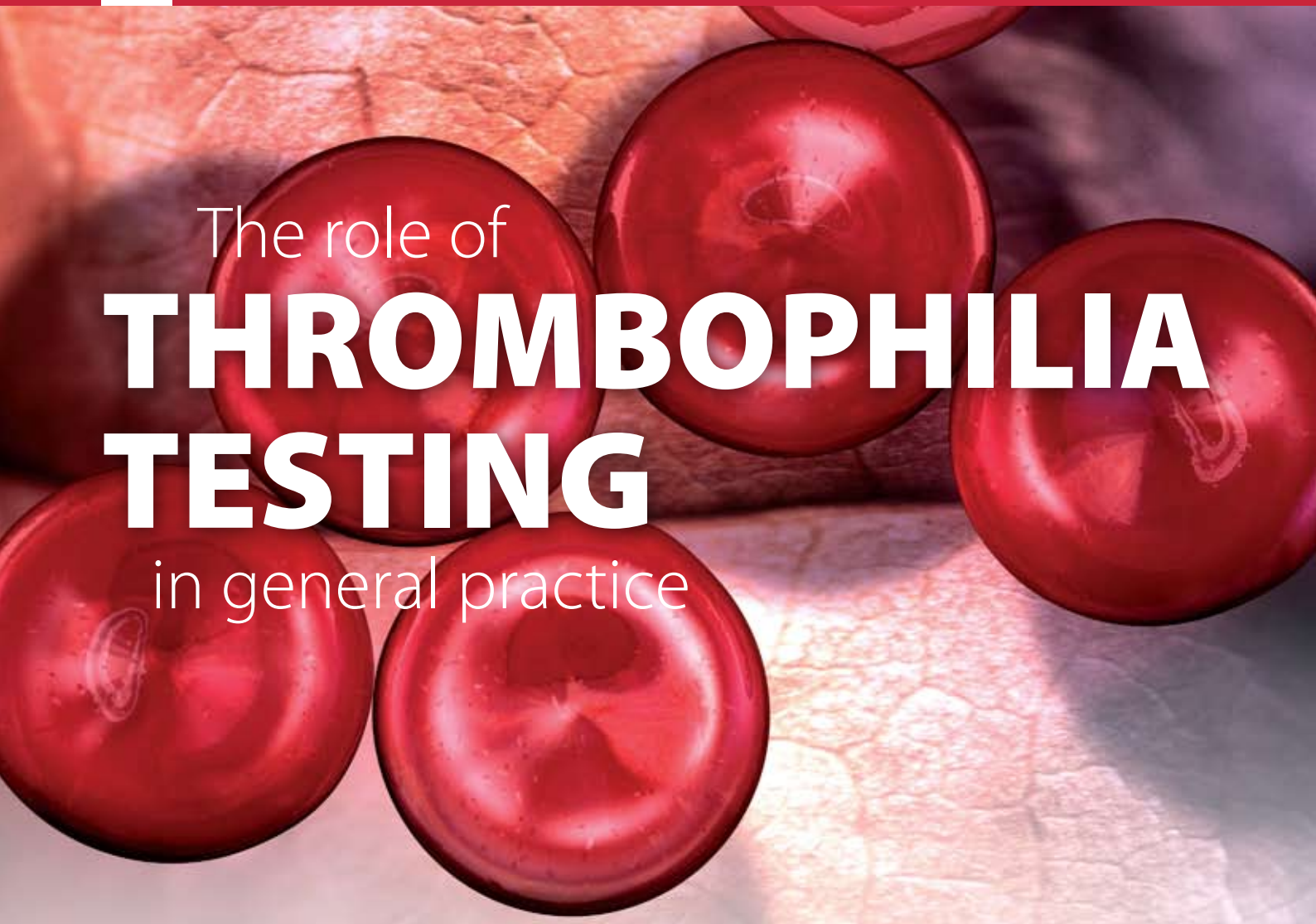

The role of THROMBOPHILIA TESTING in general practice

Key concepts:

- Thrombophilia testing is rarely indicated
- Thrombophila testing should only be performed in specific situations when the results will alter management
- Situations in which thrombophilia testing may be appropriate include; people presenting at a young age with an unprovoked venous thrombosis and a family history, children with purpura fulminans and some pregnant women (Page 4)

Thrombophilia is the increased tendency for a person to develop blood clots. There are a number of factors that contribute to increased thrombotic risk, many of which are well recognised and some of which are unknown. In most cases, the presence of one or more risk factors is thought to contribute to a thrombotic event. However, in some cases, described as idiopathic or unprovoked, a patient has no clear triggering event. Although over the last few years there has been increased interest in laboratory tests for investigating thrombophilia, their role in general practice is limited, their use is controversial and the results in most cases will not influence management. Testing may also lead to unnecessary anxiety and psychological distress, given that some inherited thrombophilic traits are very common but are of limited clinical significance.

Thrombotic risk is an accumulation of a number of factors. Virchow's triad demonstrates this risk in terms of physiological states that promote thrombosis, including; circulatory stasis, hypercoagulability and vascular wall injury (Figure 1, Page 4). Predisposing factors or current

health status can alter one or more components of this triad. Most patients presenting with venous thromboembolism (VTE), will have more than one recognised risk factor, with overall risk increasing as the number of risk factors increase.[1] Risk factors for VTE are listed in Table 1.

Table 1: Risk factors for VTE[1]

Strong risk factors (odds ratio > 10)
Fracture (hip or leg)
Hip or knee replacement
Major general surgery
Major trauma
Spinal cord injury
Moderate risk factors (odds ratio 2–9)
Arthroscopic knee surgery
Central venous lines
Chemotherapy
Congestive heart or respiratory failure
Hormone replacement therapy
Malignancy
Oral contraceptive therapy
Paralytic stroke
Pregnancy/postpartum
Previous venous thromboembolism
Thrombophilia
Weak risk factors (odds ratio < 2)
Bed rest > 3 days
Immobility due to sitting, e.g. prolonged car or air travel Increasing age
Laparoscopic surgery, e.g. cholecystectomy
Obesity
Pregnancy/antepartum
Varicose veins

Clinical assessment of patients at increased thrombotic risk

When a patient presents to primary care with a VTE or a family history of VTE, it is important to perform a thorough clinical assessment to determine the presence of risk factors (Table 1), and to collect a personal and family medical history. This assessment can help to determine if the event was provoked, i.e. whether risk was exacerbated by external risk factors, or unprovoked, i.e. occurred for no apparent reason. The thrombotic load (large or small thrombosis) and the site (proximal or distal) should also be noted.

What is included in a "thrombophilia screen?"

The tests included in a thrombophilia screen generally include:

- Factor V Leiden
- Prothrombin gene mutation
- Antithrombin
- Protein C and Protein S
- A lupus anticoagulant screen will sometimes be included

It is recommended that all requests for thrombophilia tests are first discussed with a haematologist. In addition, requests should be accompanied by all relevant clinical information. Laboratories may reject the specimen unless there is sufficient clinical information to justify testing.

The choice of tests will depend on clinical information. For example, antithrombin, Protein C or Protein S deficiency is more likely in a younger person with a spontaneous VTE, and less likely in an older person with other risk factors for a VTE.[3]

Testing principles

Thrombophilia testing should only be performed when the test results will alter management. In most cases management will be determined by clinical presentation, rather than test results. There is a lack of evidence for indiscriminate screening,[4] and instead it is recommended that careful and selective testing should be done only if the results would affect the patient's medical management or provide useful information for the health care of the family.[5]

Although Factor V Leiden (3–7%) and Prothrombin gene (1–3%) are the most prevalent mutations,[6] they only increase an individual's risk of a first VTE by approximately five-fold and have little effect on the risk of recurrence after a first VTE. Antithrombin, Protein C and Protein S are relatively rare mutations, but the presence of these mutations increases an individual's risk of a first VTE by approximately ten-fold and risk of recurrence by approximately two-fold.[6]

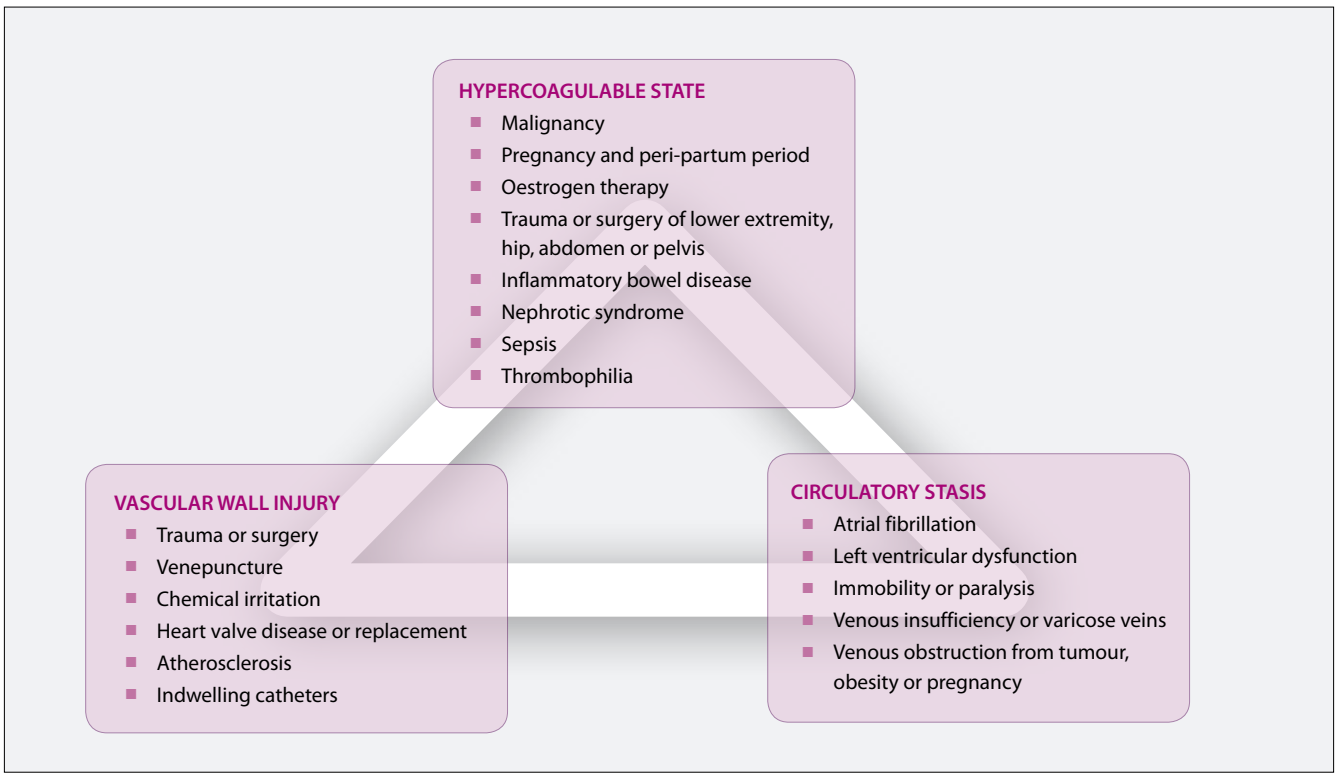

Figure 1: Virchow's triad (Adapted from Merli, 2006)[2]

There are a number of other markers that may be implicated in increasing risk of VTE, however, they have currently not been demonstrated to be independent risk factors.[7] In addition, it is likely that a number of other yet to be identified mutations exist.

Who should be tested?

Although there has been increased interest in thrombophilia testing over the last few years, the role of testing for determining thrombotic risk is likely to have been overstated. Recent guidelines indicate that in most cases thrombophilia testing will not influence management or determine individual risk.[8]

Thrombophilia testing is therefore only recommended in specific situations for selected patients where the results will influence management. These situations include:

- **People presenting with unprovoked venous thrombosis at an early age (<40 years), with a family history of thrombosis (more than two other symptomatic first degree family members).** The yield of testing and the significance of positive results are likely to be increased in this group of patients. However, strong clinical history should be taken into account when making future decisions such as contraceptive options, pregnancy management and prophylaxis in high-risk situations, irrespective of the results of thrombophilia testing. Negative results in an individual with a strong personal or family history of VTE does not necessarily mean that they are at low risk of VTE.

- **Children with purpura fulminans.** This is a rare condition presenting as a progressive haemorrhagic skin necrosis. It may be either inherited (as congenital Protein C deficiency) or acquired (Protein S deficiency). All infants and children with purpua fulminans should be tested urgently for Protein C and S deficiency,[8] since this result will alter management in this situation.

- **Pregnant women at risk of venous thrombosis.** Pregnant women who have had a previous VTE due to a minor provoking factor, i.e. a less significant risk factor, or who have a first degree relative with a previous VTE due to minor provoking factor, should be tested.[8] Most pregnant women with a previous unprovoked VTE will be given anticoagulation treatment based on clinical risk alone, and testing is not required.

Who should not be tested?

Anticoagulation following acute VTE

Thrombophilia testing is not recommended in the acute phase of a thrombotic event, or in patients on anticoagulant treatment. The intensity and duration of anticoagulation following a diagnosis of VTE is most often initially determined in secondary care, but it is usually the same in patients with or without an inherited thrombophilia. Decisions regarding duration of anticoagulation are based on whether the first event was provoked, what other risk factors are present and the risk of anticoagulation, regardless of whether the patient has an inherited thrombophilia.[8]

Family history for thrombosis

Factor V Leiden and Prothrombin gene mutation are considered low risk thrombophilias, and case finding in asymptomatic relatives is not indicated.[8]

Antithrombin, Protein C and Protein S deficiencies are considered high risk thrombophilias, but testing should only be considered in thrombosis-prone families after careful explanation of inheritance and disease risk.[8]

Oestrogen containing hormone preparations and thrombosis

If a patient has a first degree relative with a history of VTE, then this is a contraindication for the patient to be prescribed an oestrogen-containing hormonal preparation. Therefore any woman with a first degree relative with VTE (whether or not they have been tested) should consider avoiding oestrogen-containing preparations, e.g. hormone replacement therapy or the combined oral contraceptive pill. Testing for inherited thrombophilias will not provide a precise estimate of risk and is not recommended.[8]

Thrombophilia and flying

VTE is a relatively uncommon event among healthy travellers on long-haul flights, with approximately one event occurring per 4500 flights. Thrombophilia testing is unhelpful and, instead, risk should be assessed based on the presence of clinical risk factors.[9] Those at particular risk include people with a history of VTE, active cancer or recent surgery, especially orthopaedic surgery to the lower limbs. It is recommended that air travellers with a high risk of DVT be considered for prophylaxis with knee-length compression stockings.[10]

Case studies

Case 1: A well-informed, intelligent 22-year-old female has been on the combined oral contraceptive (COC) pill since age 18 years. She is a smoker. There is no significant past medical or family history of VTE. She has read that she is at risk of DVT being on the COC and asks to be tested for thrombophilia. Is testing indicated?

There is no indication to request thrombophilia tests for this patient. There is a slightly increased risk for women on COC, although the fact that she has been on the COC for more than a year without incident puts her in a lower risk group as patients with thrombophilia who develop DVT tend to do so in the first year. Any perceived risk would be best managed by reducing other contributing factors such as obesity, and recommending smoking cessation, if relevant.

Case 2: A 50-year-old male presents prior to a long distance flight. His sister died from a PE two years ago. He is very worried because he had a spontaneous DVT himself several years ago. He is also obese and has very bad varicose veins. Is testing indicated?

This patient has a strong personal and family history of VTE and testing is not going to determine management. Prophylaxis is advisable in view of the patient's risk factors and the patient's anxiety about his sister's death.

Case 3: A healthy 33-year-old female presents in her first pregnancy. She tells you she had previously had VTE when she flew to England ten years ago. Is testing for hereditary thrombophilia indicated?

Recent clinical guidelines recommend that this patient should have thrombophilia testing.[8] Travel is considered a minor risk factor for VTE, and on its own would be unlikely to contribute to the thrombotic event. Therefore, it is likely there are other provoking factors present. If clinical assessment does not identify any other contributing factors, thrombophilia testing would be indicated.

Acute presentation of venous thromboembolism (VTE)

Although patients may present with the classic symptoms of deep vein thrombosis (DVT) or pulmonary embolism (PE), they can also pose a diagnostic challenge if the classic signs and symptoms are absent. In patients with symptomatic VTE, PE manifests in one-third and DVT alone in two-thirds.

The most common symptoms of PE are dyspnoea (73%), pleuritic pain (66%) and cough (37%), and the most common signs are tachypnoea (70%), lung crepitation (51%) and tachycardia (30%).[11] Patients with DVT commonly present with pain, erythema, warmth and swelling of the affected limb.[11]

The incidence of VTE in the general population is approximately ten cases per 10 000 people, per year. However, this estimate is dependent on age as there is a significant increase in VTE incidence particularly after age 40 years. The risk of VTE for a person aged 25–35 years is approximately three cases per 10 000 people, whereas for a person aged in their 70's the risk is more than ten times higher than this (30–50 cases per 10 000 people).[12]

D-dimer can be used to confirm absence of VTE

D-dimer is a fibrin degradation product, and is elevated in nearly all patients with VTE, but can also be elevated in patients with infection, malignancy or recent surgery. Because of the low specificity of D-dimer for VTE, its key role is as a negative predictor of VTE, i.e. a low or normal D-dimer level with a low pre-test probability makes VTE an unlikely diagnosis.

D-dimer can be used in conjunction with the Wells Rule or the Primary Care Rule (Table 2)[13] to determine the probability of a DVT. Historically, the Wells Rule has predominantly been used in New Zealand, but more recently the Primary Care Rule has become popular. Both

Table 2. Wells Rule and the Primary Care Rule Scoring to rule out deep vein thrombosis (DVT) (Adapted from van der Velde et al, 2011)[13]

Variables	Wells Rule	Primary Care Rule
Male gender	n/a	1
Oral contraceptive use	n/a	1
Presence of active malignancy (within last 6 months)	1	1
Immobilisation paresis/plaster lower extremities	1	n/a
Major surgery (within last 3 months)	1	1
Absence of leg trauma	n/a	1
Localised tenderness of deep venous system	1	n/a
Dilated collateral veins (not varicose)	1	1
Swelling, whole leg	1	n/a
Calf swelling > 3 cm	1	2
Pitting oedema confined to the symptomatic leg	1	n/a
Previously documented DVT	1	n/a
Alternative diagnosis at least as likely as DVT	–2	n/a
Positive D-dimer result	n/a	6
Cut-off scores for considering DVT as absent	**≤1**	**≤3**

rules can be safely used to reduce unnecessary referrals for compression ultrasonography, although the Primary Care Rule reduces unnecessary referrals slightly more.[13]

Patients with a high probability of DVT should be referred for ultrasound irrespective of the results of the D-dimer test. Using this approach, only approximately 0.5% of patients with an initially negative assessment, i.e. a low Clinical Probability Score and negative D-dimer, are likely to be later diagnosed with DVT.[3]

Differentiating between DVT and SVT

It can sometimes be difficult to differentiate between DVT and superficial vein thrombosis (SVT). SVT or superficial thrombophlebitis, is often associated with conditions that increase thrombotic risk, e.g. surgery or trauma, immobilisation, malignancy. A patient with SVT will often present complaining of a painful, red, firm lump in the lower leg. Clinical examination will usually confirm the diagnosis, but in some cases further investigation may be required as SVT and DVT can co-exist (because a superficial thrombus can move into the deep veins).

The presence of clot within a vein may be palpable as an indurated (hardened) nodular cord, however in some cases the clot may only be accurately diagnosed with ultrasound.

DVT should be suspected if:[14]

- The superficial thrombosis is in the upper medial third of the thigh*
- The swelling in the lower leg is more than would be expected with SVT alone
- The SVT is extending
- The diagnosis of SVT is uncertain
- There are risk factors for DVT, e.g. history of DVT, malignancy, oestrogen therapy or thrombophilia

N.B. Clots that occur in the main deep vein of the thigh ("superficial" femoral vein) should be classified and treated as a DVT as the femoral vein is part of the proximal deep venous system.

* When SVT occurs close (within 3 cm) to the sapheno-femoral there is an increased risk of DVT (+/- PE) therefore treatment should be as for DVT.[14, 15]

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References

1. Anderson F, Spencer F. Risk factors for venous thromboembolism. Circulation 2003;107:I-9.
2. Merli G. Pathophysiology of venous thrombosis, thrombophilia and the diagnosis of deep veing thrombosis-pulmonary embolism in the elderly. Clin Geriatr Med 2006;22(1):75-92.
3. Kyle C (ed). A handbook for the interpretation of laboratory tests. 4th Ed. Auckland: Diagnostic Medlab; 2008.
4. Toll D, Oudega R, Boulten R, et al. Excluding deep vein thrombosis safely in primary care. J Fam Pract 2006;55(7):613-8.
5. Caprini JA, Glase C, Anderson C, Hathaway K. Laboratory markers in the diagnosis of venous thromboembolism. Circulation 2004;109(suppl I):I-4-I-8.
6. Tripodi A, Mannacci PM. Laboratory investigation of thrombophilia. Clin Chem 2001;47(9):1597-1606.
7. Markris M. Thrombophilia: grading the risk. Blood 2009;113(21):5038-9.
8. Baglin T, Gray E, Greaves M, et al. Clinical guidelines for testing for heritable thrombophilia.Br J Haematol. 2010;149(2):209-20.
9. Firkin F. Flying and thromboembolism. Aust Prescr 2009;32:148-50.
10. Sajid MS, Desai M, Morris R, Hamilton G. Knee-length graduated compression stockings for thromboprophylaxis in air travellers: A meta-analysis. Int J Angiol. 2008;17(3): 119–123)
11. Osinbowale O, Ali L, Chi YW. Venous thromboembolism: a clinical review. Postgrad Med 2010;122(2):54-65.
12. White RH. The epidemiology of venous thromboembolism. Circulation 2003;107:I-4.
13. van der Velde EF, Toll DB, ten Cate-Hoek AJ, et al. Comparing the diagnostic performance of 2 clinical decision rules to rule out deep vein thrombosis in primary care patients. Ann Fam Med 2011;9:31-36.
14. Fernandex L, Scovell S. Superficial thrombophlebitis of the lower extremity. UpToDate 2010. Available from: www.uptodate.com (Accessed March, 2011).
15. Ho WK. Deep vein thrombosis – risks and diagnosis. Aust Fam Physician 2010;39(6):468-74.

Collecting specimens for the investigation of

FUNGAL INFECTIONS

FUNGAL MICROGRAPHS FROM PUBLIC HEALTH IMAGE LIBRARY, CENTER FOR DISEASE CONTROL

Fungal infections are caused by dermatophytes

Fungal infections of the skin, nails and hair are caused by dermatophytes, which require keratin for nutrition. The estimated lifetime risk of acquiring a superficial fungal infection is between 10 – 20%,[1] although these are rarely, if ever, invasive.

Organisms involved in fungal infections

Superficial fungal infections may be caused by one of over forty different species of dermatophytes, belonging to the following three genera;

- *Trichophyton spp* – found in hair, nails and skin, transmitted by soil, animals or humans
- *Microsporum spp* – common cause of scalp ringworm in children, usually transmitted by animals
- *Epidermophyton spp* – most commonly affects the groin, transmitted from person to person

Fungal infections are named according to the site affected rather than the causative agent (Table 1).

Investigating fungal infections

Diagnosis of a fungal infection is often made by clinical appearance alone, but sometimes laboratory examination of skin scrapings, hair or nail cuttings can help when the diagnosis is uncertain.

When do fungal specimens need to be collected?

Minor localised infections can be treated topically without the need for fungal testing.

Specimens should be sent to confirm disease when the infection is chronic, severe or when considering systemic therapy. Laboratory fungal testing is also justifiable in the following circumstances:[3]

- To confirm fungal infection before starting on oral treatment, e.g. if the patient has been treating the lesion with topical steroids or a fungal infection involving the hair, palms of the hands or soles of the feet
- To determine the species of fungus to allow targeted oral treatment
- On epidemiological grounds, e.g. people in contact with an animal in cases of animal ringworm

Table 1: Classifications of superficial fungal infections.[2]

Classification	Affected site	Notes
Tinea pedis "athelete's foot"	Feet	The most common fungal infection. Initial infection can be dry and scaly, however secondary bacterial infection and accumulation of soggy debris can commonly occur.
Tinea capitis	Scalp	More common in children. Infected hair can break leaving a bald area.
Tinea barbae	Beard	Common among men that work with animals, e.g. agricultural workers, due to animal to human transmission. May be accompanied by bacterial folliculitis, secondary to ingrown hairs.
Tinea corporis "ring worm"	Skin other than bearded area, scalp, groin, hands or feet	Tends to present as irregular expanding rings with a raised border.
Tinea cruris "jock itch"	Groin, perineum and perianal areas	Lesions may be on the inner thighs, pubic, inguinal region or scrotum. Yeast infections (usually *Candida albicans*) are also commonly found in these areas.
Tinea manuum **Tinea pedis** – "moccasin-type"	Hands Soles of feet	Can be asymptomatic and is characterised by dryness and increased skin markings. Often only one hand or one foot is affected.
Tinea unguium	Nails	Also known as onychomycosis. Most fungal nail infections are caused by spreading of Tinea pedis. Toenails are much more commonly affected than fingernails.

How to collect a suitable specimens

In most cases, collection of fungal specimens is performed at the laboratory. If this is not possible, or if the clinician wishes to collect the sample themselves, the following guidance may be helpful.

- Ensure that the patient has not used anti-fungal medications for the previous three days.
- If collection of the specimen is proving difficult, then consider asking the patient to do it themselves, under supervision. Patients are often more aggressive at getting a good sample than a collector who is trying to be gentle.

Skin scrapings

To optimise skin scraping specimens:

- Prepare the skin for scrapings – remove any traces of skin products or medications with an alcohol wipe
- Scrape the skin using a scalpel (held at a blunt angle)
- Choose the best area to scrape – if multiple lesions are present choose the most recent for scrapings as old loose scale is often not satisfactory. Ensure that the leading edge of a rash is sampled (this is where fungal growth is most likely to be active).
- The skin scrapings should then be gently removed from the skin surface and placed into a laboratory specimen container

Quantity is crucial – the greater the amount of specimen, the better the result. If it is difficult to get sufficient scrapings it may help to ask the patient to stop applying creams and to avoid scrubbing the affected area for a few days and then try again.

Nail cuttings/scrapings

To optimise nail cuttings/scraping specimens:

- Clean the nail with an alcohol wipe
- Use the blunt end of a lancet or other instrument and firmly scrape under the nail plate until the crumbling white degenerating portion is reached
- Collect any white keratin debris beneath the nail directly into the specimen container
- Nail clippings should also be collected

Again, quantity is crucial – the greater the amount of specimen, the better the result.

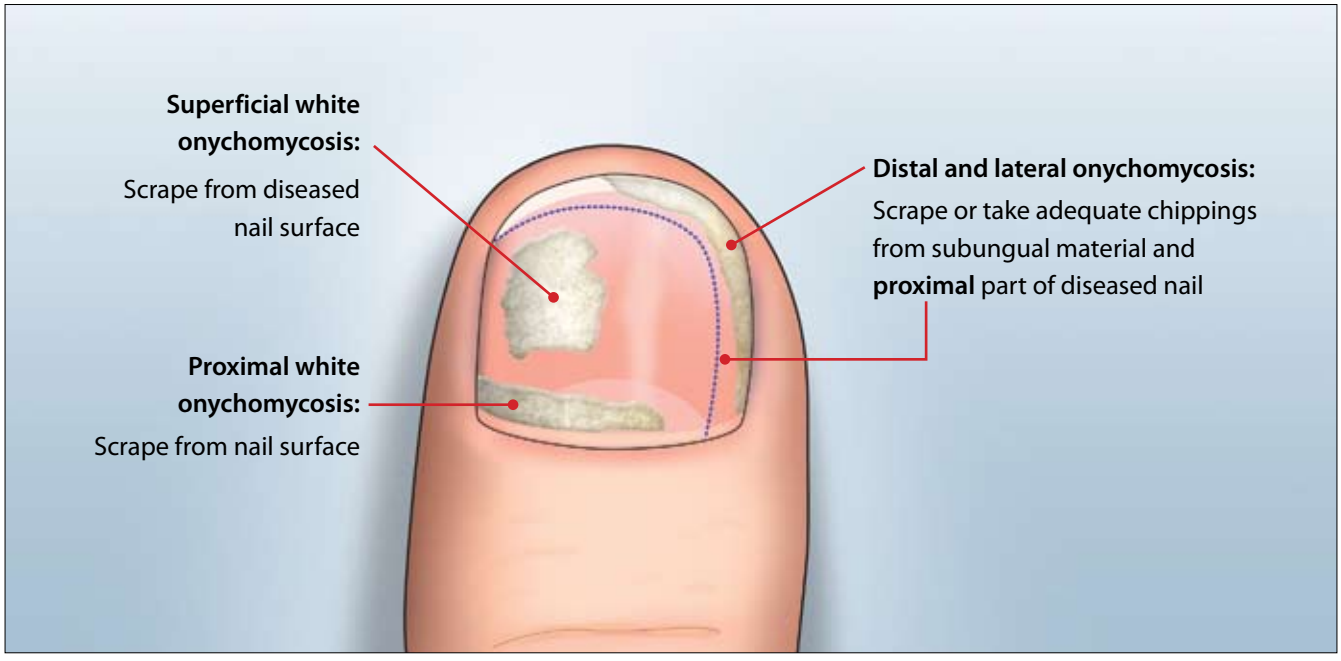

Figure 1: Recommended sites for nail specimens (adapted from Denning et al, 1995).[3]

N.B. proximal white onychomycosis is rare and only seen in immunocompromised patients. Full clinical review would be indicated for a person presenting with these symptoms.

Having the specimen taken should be painless apart from occasional slight discomfort when subungual specimens are taken. Figure 1 shows the appropriate sites from which nail specimens should be obtained.[3]

Hair specimens

To optimise hair specimens:

- Pluck hairs from the affected area using tweezers
- Scrape the affected area using a scalpel (held on a blunt angle), on to a piece of paper
- If available, examination of the scalp with a Wood's lamp can guide the collection of samples from affected areas

Laboratory analysis

At the laboratory, specimens are first examined under the microscope. Fungal elements are sometimes difficult to find, especially if the tissue is very inflamed, so a negative result does not rule out fungal infection.

A sample is then cultured for approximately three weeks, although most positives are reported after one to two weeks.[2] Testing has a reasonably low level of sensitivity, so a negative result still does not exclude the presence of a fungal infection.

Specimen collection should be repeated after a negative result if fungal infection still appears likely, preferably prior to treatment.

N.B. Consider a wide differential diagnosis as there are some other explanations for ring-shaped or scaly rashes, e.g. pityriasis rosea, discoid eczema.

Negative results do not necessarily rule out fungal infection

A negative culture result may arise due to:[4, 5]

- Feature of methodology
- Incorrect initial clinical diagnosis
- Sampling errors associated with poor collection technique
- Sampling errors associated with inadequate specimen
- The presence of non-viable hyphae elements in the distal region of a nail
- An uneven colonisation of a nail with the fungus
- Overgrowth by contaminant saprophytic fungi
- Anti-fungal treatment used prior to collection of the specimen
- A delay in the specimen reaching the laboratory
- Incorrect laboratory procedures
- Slow growth of the organism

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References

1. Noble S, Forbes R, Stamm P. Diagnosis and Management of common tinea infections. Am Fam Physician 1998;58(1):163-74, 177-8.
2. Kyle C (ed). A handbook for the interpretation of laboratory tests. 4th Ed. Auckland: Diagnostic Medlab; 2008.
3. Denning D, Evans E, Kibbler C, et al. Fungal nail disease: a guide to good practice (report of a working group of the British Society for Medical Mycology). BMJ 1995;311:1277.
4. DermNet NZ. Mycology. New Zealand Dermatological Society Inc. Available from: www.dermnetnz.org/doctors/fungal-infections/mycology.html (Accessed March, 2011).
5. IMVS Pathology. Newsletter Issue 72. Onychomycosis: sample collection made easy. IMVS, Australia, 2009. Available from: www.imvs.sa.gov.au/wps/wcm/connect/SA+Pathology+Internet+Content/IMVS/News/IMVS+Newsletter/ (Accessed March, 2011).

Should I still use both CRP and ESR when investigating temporal arteritis?

No, CRP alone is adequate as the initial test

In a 2006 publication on ESR/CRP, bpac^{nz} recommended that both CRP and ESR should be tested simultaneously for patients in whom temporal arteritis was suspected.[1] However, this is no longer regarded as best practice and in October 2009, an update was published recommending CRP alone as the initial test.[2]

The use of ESR in the initial diagnosis of temporal arteritis is largely based on its inclusion in the 1990 American College of Rheumatology criteria for classification of temporal arteritis.[3] However, this reference is now over 20 years old and the role of ESR as a routine test of the inflammatory response has since been questioned.

ESR and CRP results will sometimes appear discordant when investigating temporal arteritis. In most cases this will be a normal ESR with an elevated CRP, but an elevated ESR and a normal CRP, while unusual, is also consistent with temporal arteritis. In a study which examined the sensitivity of CRP and ESR, it was determined that elevated ESR had a sensitivity of 76% to 86% for temporal arteritis, while an elevated CRP had a sensitivity of 97.5%. When using the criteria of an elevated ESR or CRP, or both, the sensitivity was 99.2%.[4]

Applying this to a clinical context, it is considered that the 1.7% increase in sensitivity gained by using both ESR and CRP compared to the use of CRP alone is not clinically relevant. Any patient with a strong clinical history should have a temporal artery biopsy or empirical treatment irrespective of the results of laboratory tests.

References

1. bpac^{nz}. CRP vs ESR: Assessing and measuring the inflammatory response. bpac^{nz}, July 2005. Available from: www.bpac.org.nz

2. bpac^{nz}. Report: CRP ESR & Thyroid function testing. bpac^{nz}, October 2009. Available from: www.bpac.org.nz

3. Hunder GG, Bloch DA, Michel BA, et al. The American College of Rheumatology 1990 criteria for the classification of giant cell arteritis. Arthritis Rheum 1990;33(8):1122-8.

4. Parikh M, Miller N, Lee A, et al. Prevalence of a normal C-reactive protein with an elevated erythrocyte sedimentation rate in biopsy-proven giant cell arteritis. Ophthalmology 2006;113(10):1842-5.

QUIZ FEEDBACK

Alcohol, Mercury & INR

Introduction

This quiz feedback provides an opportunity to revisit Best Tests, November 2010, which focused on appropriate use of laboratory tests when considering hazardous drinking, mercury toxicity and INR monitoring. All general practitioners who participated in this quiz will receive personalised online feedback and be allocated one hour of CQI activity.

1.	In primary care, what is the best approach for identifying heavy drinking?		
		Your peers	Preferred
☐	Use a questionnaire on all young adults to detect binge drinking	15%	
☐	Ask family members about the patient's drinking habits	4%	
☐	Only investigate if blood tests show some potentially alcohol related changes	1%	
☐	Ask a simple screening question	97%	✓

Comment:
General practice is in an ideal position to identify hazardous drinking. However, a high level of suspicion may be required to detect alcohol-related issues as they can be easily missed or "disguised" by other health problems. It is currently recommended that a useful approach for detecting hazardous drinking is to integrate two to three simple questions about alcohol use into a primary care consultation to provide an opening for a more in-depth discussion.

2.	Why do blood tests have a limited role when investigating hazardous drinking?		
		Your peers	Preferred
☐	Results may be elevated by a number of other conditions	92%	✓
☐	Result may not be elevated in all people who drink at harmful levels	77%	✓
☐	Results may not be elevated by binge drinking	75%	✓
☐	The results need to be interpreted with caution	84%	✓

Comment:
Laboratory tests are not recommended for the routine screening of hazardous drinking in primary care. This is because, although blood tests frequently show a number of changes in relation to alcohol use, they generally lack sufficient sensitivity and specificity for this purpose. Instead, studies have shown that validated questionnaires are the best way to screen for hazardous alcohol use because they are more sensitive, more specific and less expensive than blood tests, which are only indicated as an adjunct to screening.

3.	Approximately what percentage of New Zealanders identify themselves as current drinkers		
		Your peers	Preferred
☐	20%	1%	
☐	40%	2%	
☐	60%	5%	
☐	80%	92%	✓
☐	100%	0%	

Comment:
Alcohol consumption is an established part of New Zealand culture, with 80% of all adults over the age of 18 years, identifying themselves as current drinkers.

4.	Approximately, what percentage of New Zealanders are estimated to drink at harmful levels?		
		Your peers	Preferred
☐	20%	96%	✓
☐	40%	2%	
☐	60%	1%	
☐	80%	<1%	
☐	100%	0%	

Comment:
It has been estimated that 20–25% of New Zealanders consume alcohol at a harmful or hazardous level. It is important to keep in mind that the harms associated with alcohol are not just confined to the heaviest drinkers. Research has identified that the majority of alcohol related problems in people who drink are seen in the 90% that consume alcohol moderately, compared to the 10% that drink heavily.

5.	Which of the following are potential sources of exposure to mercury?		
		Your peers	Preferred
☐	Amalgam dental fillings	71%	✓
☐	Handling liquid mercury	94%	✓
☐	Fish	95%	✓
☐	Paint work prior to 1970's	16%	

Comment:
Fish is by far the biggest source of exposure to organic mercury, in the form of methyl mercury. Organic mercury is passed along the food chain from smaller fish to larger predator fish, e.g. swordfish, shark, tuna, which contain the highest levels of accumulated mercury. Inhalation and skin absorption of mercury can occur when handling liquid mercury, e.g. broken thermometers, sphygmomanometers, fluorescent light bulbs. Dental amalgam fillings contain mercury but contribute only a minor amount to the total mercury levels in the body.

6.	Which of the following are considered appropriate indications for testing mercury?		
		Your peers	Preferred
☐	The presence of amalgam fillings	2%	
☐	History of exposure to liquid mercury	81%	✓
☐	When investigating Alzheimer's disease	2%	
☐	Occupational health monitoring	93%	✓

Comment:
Situations in which mercury testing is indicated include; history of mercury ingestion (other than normal consumption of fish), known occupational risk or neurological symptoms that may be the result of mercury poisoning.

Situations in which mercury testing is not indicated include; patients with non-specific symptoms such as memory loss, cognitive decline, depression or chronic fatigue syndrome, the presence of amalgam fillings, autism spectrum disorder or Alzheimer's disease (there is no convincing evidence that mercury is linked to either of these conditions) or for routine "screening" or an "annual check".

7.	For a patient treated with warfarin, for approximately what percentage of time it is reasonable to expect INR levels to stay in range?		
		Your peers	Preferred
☐	20%	1%	
☐	40%	3%	
☐	60%	85%	✓
☐	80%	12%	
☐	100%	1%	

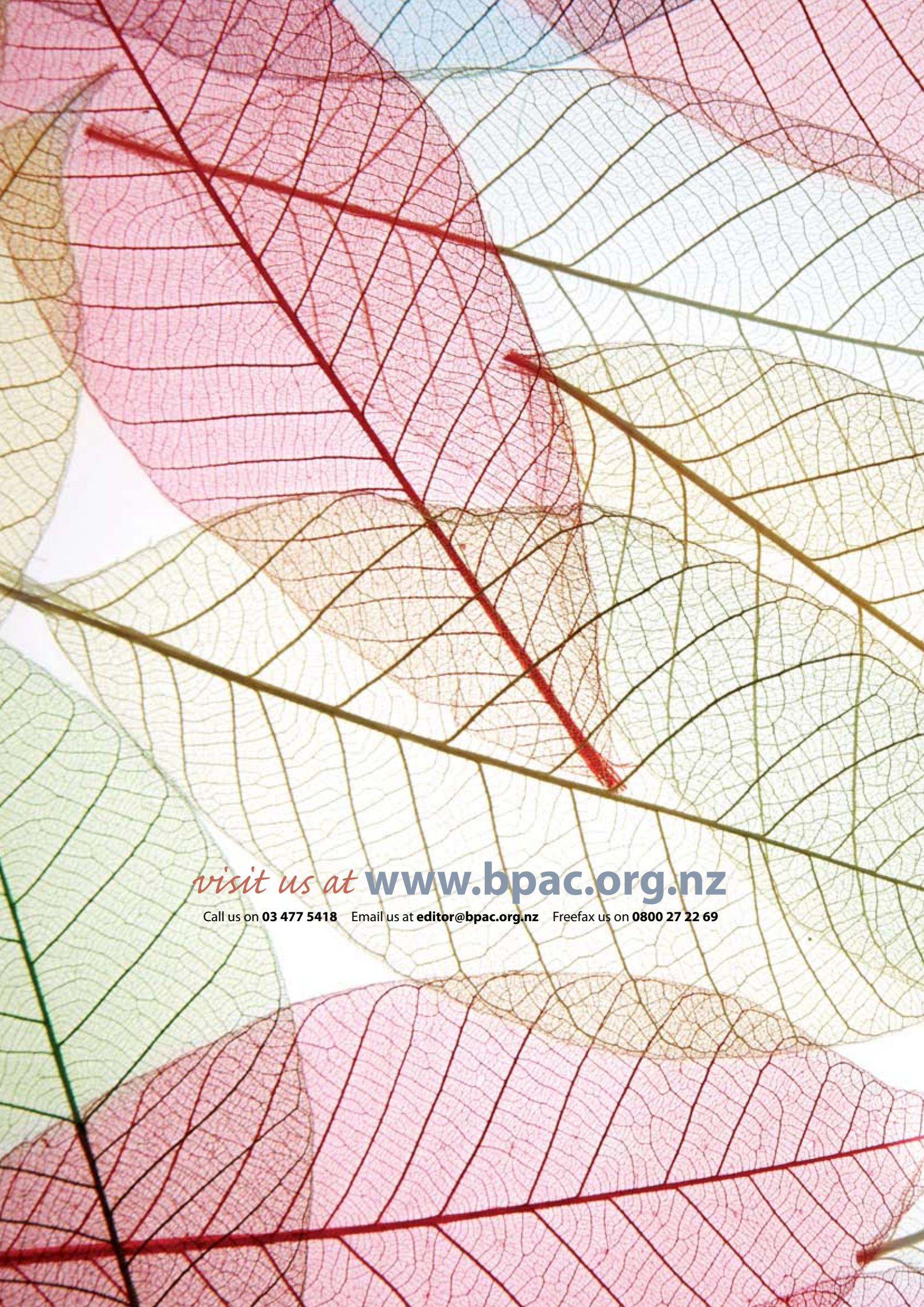
Comment:
Although the INR target range is usually 2.0 – 3.0, in most cases it is only in this range approximately 55 to 60% of the time. Computerised decision support provides an automated system in which the time within target can be increased to up to 70% in some cases.

8.	What is the usual testing frequency for INR, for people established on warfarin?		
		Your peers	Preferred
☐	2–4 weeks	7%	
☐	4–6 weeks	83%	✓
☐	6–8 weeks	14%	✓
☐	8–10 weeks	<1%	
☐	10–12 weeks	1%	

Comment:
Regular testing of the INR is essential for all people taking warfarin. For most people once the INR is stable, the rate of INR testing can be extended to two weekly and then four to six weekly. In some stable patients the frequency may be extended out to eight weeks. However, people with higher levels of risk, e.g. certain co-morbidities, may need more frequent testing.

Co-morbidities which can influence INR results include:

- Congestive heart failure – may cause hepatic congestion of blood flow and inhibit warfarin metabolism, this may be particularly troublesome during exacerbations of heart failure
- Hypothyroidism – decreased catabolism of vitamin K clotting factors may decrease INR values
- Hyperthyroidism – conversely, hyperthyroidism may increase catabolism of vitamin K clotting factors and increase INR values
- Liver failure – may cause elevation of INR due to reduced production of clotting factors
- Other illnesses – other intermittent conditions such as fever, vomiting and diarrhoea may affect the INR; ill patients may also reduce their usual dietary intake



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