Newsletter June 07

QML Pathology. | Vetnostics

QML Pathology Welcomes New Staff

Shaun Hickey - QML Pathology Vetnostics Manager
Shaun Hickey was recently appointed as the new QML Pathology Vetnostics Manager. Shaun graduated with a B App Sc (Med Lab Sc) from the Queensland University of Technology in 1998 after having previously completed Diploma studies in agriculture (An Hus) from the University of Queensland, Gatton College. From 1995 - 2000 Shaun worked in a variety of laboratory positions at Veterinary Pathology Services before commencing with QML Pathology as a Pathology Scientist and Laboratory Supervisor. Shaun has held positions as a Laboratory Supervisor for QML Pathology in Mt Isa and Gladstone, and has been actively involved with the provision of veterinary pathology services to regional Queensland. In addition Shaun has a personal interest and 25 years experience in the exhibition and breeding of stud dairy cattle, the horse racing industry, and more recently as a breeder and exhibitor of West Highland White Terriers. Shaun is dedicated to ensuring that Queensland Veterinary practitioners receive only the highest quality pathology service. Shaun is happy to discuss any veterinary pathology queries and can be contacted on (07) 3121 4013 or via email **shaun.hickey@qml.com.au**.

Dr Ian Wilkie - Consultant Veterinary Histopathologist
Dr Ian Wilkie graduated from the University of Queensland in 1972, and after 5 months in practice returned to university to work on a research project and complete a MVSc in toxico-pathology. In 1976 he moved to Canada and completed a Diploma in Diagnostic Pathology course at the Ontario Veterinary College, Guelph. This was followed by a year in the United Kingdom in laboratory animal pathology and three years at the Western College of Veterinary Medicine, Saskatoon as a Diagnostic Pathologist for the Provincial Diagnostic Service. Following completion of a DVSC at the Ontario Veterinary College Dr Wilkie spent six years as a Diagnostic Pathologist for the Ontario Ministry of Agriculture and Food. In 1989 Dr Wilkie returned to Australia to work as a Diagnostic Pathologist in Victoria before returning to Queensland in 1993 to his current position at the Queensland Veterinary School.

Janet Patterson-Kane - Consultant Veterinary Histopathologist
Janet graduated from Massey University, New Zealand in 1991 and spent 2 years in practice prior to returning to Massey to complete a PhD on equine tendon disease. In 1996 she took a position as Resident in Anatomical Pathology at the University of Florida, and in 1998 moved to the Livestock Disease Diagnostic Center at the University of Kentucky, working there as a Diagnostic Specialist until 2000. She passed the American College of Veterinary Pathologists (ACVP) board-certifying examination in anatomical pathology in 1999. From 2000-2006 Janet was a Senior Lecturer in Veterinary Pathology and was Head of Diagnostic Services at the Royal Veterinary College, University of London. She returned to Australia in January 2007 and is currently Associate Professor in Veterinary Pathology at the University of Queensland, working in both diagnostics and research. Janet's main interests are equine pathology, musculoskeletal disease, and zoological and wildlife pathology.

Small Animal Medicine Consultant

Martine Perkins has been appointed as an additional Small Animal Medicine Consultant to support the increasing demands on Veterinary Medical Consultant, Dr Sue Foster. Martine graduated from the University of Sydney in 1996. Until 1999 Martine spent her time working in various practices in Sydney and the UK. In 1999 Martine took up a position at the University of Sydney Veterinary Centre as Senior Small Animal Medical Registrar. This involved her seeing referral cases as well as the teaching of students. In 2002 she obtained her MACVSc in Small Animal Medicine and subsequently completed a Fellowship training program in canine medicine. The desire to have a family prevented Martine from proceeding to the Fellowship exams. Martine presently works one day per week in a Sydney practice.Martine's in-depth knowledge in canine medicine and her experience in practice should be of great assistance in helping you deal with the more difficult cases.Martine will be involved in validation of some cases as well as being available for case discussions on Tuesdays and Thursdays.

Acquisition of Vetpath

Symbion Health has recently acquired VETPATH, a provider of veterinary pathology services to practitioners in Western Australia and the Northern Territory. VETPATH has been established for over 20 years and will remain a stand alone specialist veterinary pathology laboratory within Symbion Health's Western Diagnostic Laboratories.VETPATH has been at the forefront in the development of a number of feline and canine serology tests which, along with their very experienced pathologists Sue Beetson, John Jardine, Mary McConnell, Elaine Twomey and Jenny Hills, will now be available across the Symbion Vetnostics network.The expansion of the number and depth of expertise within the Vetnostics network as a result of this acquisition further illustrates Symbion Health's commitment to its specialist veterinary pathology businesses.

Availability of Pathologists for Urgent Enquiries

Our Veterinary Pathologists and Consultants will generally respond to your enquiries between 9.00am – 5.00pm, Monday to Friday. However, for those very urgent cases that cannot wait for consultative advice during normal business hours, we have a Duty Pathologist that can be reached through results enquiries 13 39 36. We would appreciate that this service is only utilised for those most urgent cases, so that we do not overload our finite resources.

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Price List - Effective 1st July 2007

Please find enclosed with this newsletter a copy of our new price list (effective 1st July 2007). This price list and also our more comprehensive list, including all of the available companion animal tests, can be emailed to you upon request. Should you require an electronic copy please contact Shaun Hickey on (07) 3121 4013 or **shaun.hickey@qml.com.au**.

Email Addresses

We have found that more and more Practitioners prefer to receive our newsletters and information sheets via email.

Therefore, for the purpose of receiving newsletters and seminar programs by email, please email your practice address, plus individual practitioners address (i.e. multiple addresses from vets in the one practice is permissible), to: Shaun Hickey (**shaun.hickey@qml.com.au**) and state that you wish to be included in our general emailing list. All those who respond will be put into a DRAW FOR 3 BOTTLES OF WINE (drawn 17 July 2007).

Equine BAL Culture

Bronchiolar lavage (BAL) and tracheal wash fluids are collected for the assessment of lower airway disease in horses.

We are frequently asked to perform bacteriological culture on both sample types. Unfortunately BAL samples and tracheal wash samples collected via endoscope are unsuitable for culture as these are usually contaminated by oropharyngeal flora and will have a very mixed bacterial population. Contaminants often overgrow any bacteria that could be significant. Some bacteria e.g. Pseudomonas will live quite happily in the endoscope and BAL tubes, and are often resistant to many disinfectants used to clean this equipment, thus making the interpretation of the significance of these cultures impossible.

Additionally the BAL procedure does not sample the correct area of the lung needed for microbiological assessment. If you require culture of the lower respiratory tract of horses, samples need to be collected by a transtracheal aspiration. Where this is not possible, for instance in performance horses, a triple guarded collection catheter system with a glycol plug for collection of microbiological samples by endoscope should be used. This is the Mila catheter – EMAC800 available from Vetquip in Sydney, tel 1300 888 427 or email: **sales@vetquip.com.au**.

We at Symbion Vetnostics perform cytology on both sample types and therefore an aliquot for cytology should be put in an EDTA tube and samples for culture in a sterile container. Smears made at the time of the collection from floccules of mucus allow more reliable assessment of cytology. PLEASE REMEMBER TO LABEL ALL SAMPLES WITH name, date and sample type.

Hypothyroidism: Is it the most misdiagnosed disease?

QML Pathology Veterinary Medical Consultant
Dr Sue Foster BVSc, M Vet Clin Stud, FACVS (Feline Medicine)

Canine hypothyroidism is a relatively uncommon endocrinopathy in Australia, yet it is commonly 'diagnosed'. The big problem with the diagnosis of hypothyroidism is that no single diagnostic test confirms the diagnosis of hypothyroidism (Feldman and Nelson, 2004). Diagnosis of hypothyroidism depends on appropriate clinical signs, lack of concurrent non-thyroidal disease, consistent haematology and biochemistry results, and thyroid function testing.

So how should you approach diagnosing hypothyroidism in dogs?

1) Make sure all signs are typical for the disease. The most common signs in hypothyroidism are lethargy, weight gain, weakness, endocrine alopecia and pyoderma. If any of the signs are not consistent, then other disease(s) need to be investigated PRIOR to thyroid function testing. **Polydipsia is NOT a sign of hypothyroidism** and any disease causing polydipsia is likely to affect total T4 assays, and may affect free T4 assays also. This is particularly true for hyperadrenocorticism.
2) Check haematology and biochemistry to try and rule out non-thyroidal diseases and to see if any features associated with hypothyroidism are present. 75% of cases are reported to have hypercholesterolaemia so even though a normal cholesterol does not rule out hyperthyroidism, it lessens the chance.
3) If no other diseases are evident, or if mild non regenerative anaemia (0.28-0.36L/L) or hypercholesterolaemia is present, then consider thyroid function testing.

Total T4 Concentration

This can be used as an initial test. Whilst it is well-known that illness in euthyroid dogs can decrease serum T4 concentration, it is not as well-known that the range of serum T4 concentration overlaps between hypothyroid dogs and healthy dogs. In one study, the range of serum T4 concentration in 62 healthy dogs was 12.9 nmol/L to 42.5 nmol/L, and in 51 hypothyroid dogs was undetectable to 19.3 nmol/L. Random daily fluctuations in T4 into the hypothyroid range can occur in healthy dogs (Feldman and Nelson, 2004).

The reference range for normal T4 concentration is undoubtedly different in different breeds. Greyhounds especially have a much lower reference range, and a range of 14+/- 6 nmol/L is more appropriate in greyhounds (Gaughan and Bruyette, 2001) and probably other sighthounds. Young Labradors have also been shown to have lower mean T4 concentrations than young Beagles or mongrels (Minten et al 1985).

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Factors that can cause decreased T4 concentration include:

a) age: decreased T4 in dogs > 6 y.o.
b) body size: large dogs > 30kg have lower concentrations than small dogs < 10kg
c) breed, especially sighthounds: standard reference ranges are probably inappropriate to account for all breeds
d) random daily fluctuations
e) concurrent illness especially hyperadrenocorticism
f) drugs such as phenobarbitone, frusemide, sulphonamides, non-steroidal anti-inflammatory drugs e.g. carpofen.

In summary, a normal total T4 rules out hypothyroidism in nearly all cases and the main benefit of T4 testing is exclusion of hypothyroidism! A low total T4, unless accompanied by classical clinical features, haematology (non regenerative anaemia; <50% hypothyroid dogs) and biochemistry (hypercholesterolaemia: 75% hypothyroid dogs), is not adequate for diagnosis of hypothyroidism.

Free T4

'Serum free T4 measured by modified equilibrium dialysis [available only through IDEXX in Australia and Symbion sends all free T4 samples to IDEXX] is the single most accurate test of thyroid gland function' (Feldman and Nelson, 2004). Free T4 (fT4) concentration is less affected by illness than total T4 concentration, although sick euthyroid dogs can still have fT4 results consistent with hypothyroidism. Hyperadrenocorticism nearly always suppresses fT4 in addition to total T4. A normal free T4 is unlikely to occur in hypothyroidism (sensitivity 98%).

Note: fT4 by analogue assays do not correlate well with those obtained with equilibrium dialysis techniques. fT4 by analogue assay provides little improvement in accuracy over that provided by measurement of total T4 (Panciera, 1999).

Canine TSH

Serum canine TSH (cTSH) concentration may be increased in hypothyroidism but is normal in up to 38% of hypothyroid dogs. It has a high specificity when used for diagnosis of hypothyroidism, so long as it is used in conjunction with serum T4 or fT4 concentration. In general, cTSH is more likely to be within the reference range in euthyroid dogs with concurrent illness than total T4 or fT4. However, some dogs with euthyroid sick syndrome have high cTSH concentrations.

TSH Stimulation Test

This is considered the gold standard to differentiate hypothyroidism from euthyroid sick syndrome. Recombinant human TSH (rhTSH) has been validated for this test at a dose of 50-92 µg / dog IV with serum total T4 measured prior to administration and 6 hours after. Euthyroid dogs have a post-TSH T4 > 30-40 nmol/L. Dogs with primary hypothyroidism have results <20 nmol/L. The grey zone in between is a non-diagnostic area: early hypothyroidism or euthyroid sick syndrome. Dogs with hyperadrenocorticism and dogs receiving phenobarbitone will have decreased responsiveness to TSH, and severe systemic illness can result in post-TSH T4 concentration in the hypothyroid range. However, this test should not be performed on dogs with severe systemic illness.

rhTSH is very expensive but if you can get hold of a 'cheap' vial, a TSH stimulation test can be really useful when pursuing a diagnosis of hypothyroidism. Once opened, reconstituted rhTSH can be stored for up to 4 weeks in the fridge and up to 8 weeks in the freezer (in an insulin syringe).

What about Therapeutic Trials?

Thyroid hormone supplementation with twice daily levothyroxine should be continued for a minimum of 6 to 8 weeks before critically evaluating therapy. After 4 weeks of therapy, total T4 concentration must be measured 4-6 hours post dosing to ensure dosing is adequate. This could mean 8 weeks of 'misdiagnosis' in addition to the cost and inconvenience of twice daily medication, and cost and inconvenience of monitoring serum T4 concentrations. In addition, if there is no response to medication, 6-8 weeks are required after withdrawal of the drug prior to revaluating thyroid function. Realistically, it is easier to ensure that one has the right diagnosis before embarking on thyroxine treatment, unless you have a very high clinical suspicion and no other diseases are apparent.

In Summary

Like many other endocrine diseases, hypothyroidism requires astute clinical acumen, routine haematology and biochemistry, and specific endocrine function testing. Rarely can an accurate diagnosis be achieved without multiple thyroid function tests.

References

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4) Feldman EC, Nelson RW. Canine and Feline Endocrinology and Reproduction. 3rd edn. Saunders, St Louis, 2004 pp 89-143
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8) Scott-Moncrieff JS, Nelson RW, Bruner JM, Williams DA. Comparison of serum concentrations of thyroid-stimulating hormone in healthy dogs, hypothyroid dogs, and euthyroid dogs with concurrent disease. J Am Vet Med Assoc 1998;212:387-391

For any further information please contact the Vetnostics department at QML Pathology on **(07) 3121 4013** or visit the QML Pathology Vetnostics website **www.qml.com.au/vetnostics.asp**