Feline UPDATE
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Pfizer Animal Health
The Feline Centre Langford and Pfizer Animal Health working together for the benefit of cats

Feline Dentistry and Oral Conditions

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In this edition of Feline Update:

- Dentistry
- Geriatrics.

Articles include:

- Feline Dentistry and Oral conditions, Feline Hyperthyroidism, Dental Anaesthesia and Top Tips for Geriatric Veterinary Care

Oral conditions and dental disease are some of the major problems affecting older cats. Some studies estimate as many as 80% of our older cats have dental disease that needs professional treatment. Unfortunately very few of these patients would show obvious signs of oral discomfort or even any signs of disease, so the mouth often gets overlooked as a potential problem area. Many cats will become less social when in pain or perhaps appear a bit more lethargic with no overt signs such as anorexia, pawing at the mouth or hypersalivation as one would expect with dental disease. It is therefore important that every time an older cat is presented for any problem, the mouth be thoroughly checked.

Figure 1: Early periodontal disease. Gingivitis with bleeding of the tissue, together with gingival recession on the canine can be seen. There is calculus build up and generalized gingivitis on the premolars.

PERIODONTAL DISEASE

Periodontal disease is the most common disease affecting cats *(figure 1)* and although it is typically thought of as an old age problem, it will often occur in young patients too, in a much more aggressive form. Certain breeds are also particularly prone to developing this aggressive periodontitis at an early age. Understanding periodontal disease, the causes and potential risk factors may help in its management. It is also important to understand that periodontal disease is not just a disease of the mouth but a disease that will have systemic consequences and should not be glossed over as just unpleasant "smelly" breath.
Periodontal disease is the progressive inflammation and destruction of the periodontal tissues (the supporting structures of the tooth that hold the tooth in its socket), which eventually leads to attachment and ultimately tooth loss. The initial inflammation results from plaque accumulation on the surface of the tooth. Plaque can be described as a microbial community embedded in a matrix of polymers of bacterial and salivary origin. The first stage of the disease is when the gingiva becomes inflamed, and is referred to as gingivitis. In the early stage gingivitis is completely reversible if the plaque is removed, but left untreated may progress to periodontitis. The tissue destruction that occurs in periodontitis patients is partly due to the bacterial activity, but mainly due to the host's inflammatory and immune response. Once the tissue has been destroyed, which is seen clinically as gum recession, root exposure or even loose teeth, the destruction is irreversible and no treatment is ever going to restore the tissues and tooth back to health. Ultimately the tooth is lost due to loss of the attachment apparatus, but the

consequences of this disease are often underestimated and much more serious. Studies have shown that advanced periodontal disease can lead to heart, liver, kidney and respiratory problems because of the bacteraemia resulting from severe periodontal disease. Periodontitis can also complicate management of diseases such as diabetes mellitus because of the chronic infection and chronic inflammatory response, but also because of localized pain and sometimes the cat becomes reluctant to eat, making glucose stabilization very difficult. Locally, advanced periodontal disease can result in oronasal fistula formation (communication between the mouth and nose due to tissue destruction by bacteria), jaw fractures as a result of bone loss, and pain.

Adult onset periodontitis is a slow progressive disease. The easiest way to prevent periodontitis is to remove plaque on a daily basis. Daily tooth brushing is the best way to control plaque accumulation; however this is not always easy or practical in cats. Products such as gels and mouth rinses containing chlorhexidine are good for controlling plaque and relatively easy to apply. If no homecare is carried out, cats will need to have professional periodontal therapy –the frequency of treatment depending on the individual cat. Unfortunately all dental work needs to be carried out under general anaesthesia, a concern in our older patients, so it is worth trying to minimize the number of dental procedures needed by trying some sort of homecare at least.

Whilst periodontal disease is the most common dental disease affecting cats, conditions such as resorptive lesions and fractured teeth also occur commonly in the older cat.

Figure 2: Resorptive lesion affecting the lower canine. This is seen as a pink discolouration of the crown with an area of granulation tissue on the lingual aspect of the tooth, covering the demineralised tooth surface.

RESORPTIVE LESIONS

Resorptive lesions are the second most common dental condition affecting cats *(figure 2).* Some studies estimate up to 75% of cats presented for dental treatment have resorptive lesions. Intra-oral radiography is required to assess resorptive lesions and treat appropriately as two very distinct types of resorptive lesions occur.

Type 1: These lesions are often associated with periodontal disease. Clinically these lesions occur at the neck of the tooth, visible just above the gingival margin. The gingival margin is usually inflamed. Often they occur in the furcation. Radiographically there is little alteration in the root radiodensity or in the appearance of the periodontal ligament space. The actual resorptive lesion shows as a very distinct radiolucency at the neck of the tooth extending into the crown. There may also be bone loss between the roots, and the alveolar bone adjacent to the tooth defect is also often resorbed *(figure 3).*

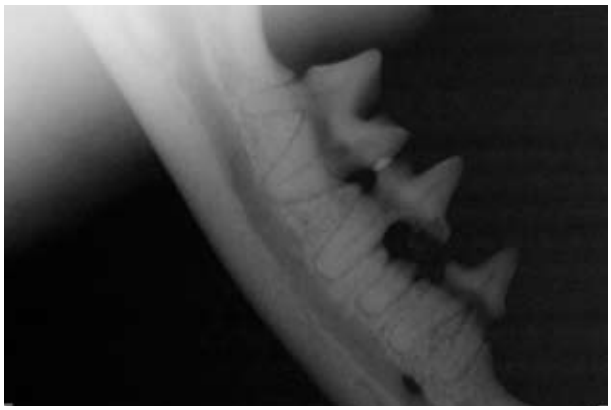

Figure 3: Type 1 resorptive lesion. The radiograph shows horizontal bone loss of the mandibular premolars and molars. The fourth premolar (middle tooth) has a radiolucent defect at the mesial root but no evidence of further root resorption or ankylosis.

Type 2: These lesions are characterized by only slight gingivitis. The lesion usually starts on the root surface and may become clinically visible as a pink discolouration of the crown, and if enamel and dentine has been demineralised, there is a scalloped defect, often covered by granulation tissue. Radiographically there is loss of the lamina dura, periodontal ligament space and root structure. The root density is often the same density as bone. The lesion visible in the crown may appear as a less dense area. In advanced lesions, the crown may be missing and only resorbing roots undergoing replacement are visible radiographically *(figure 4).* The different types of lesions can only be distinguished radiographically. It is important to differentiate between the two lesions as treatment differs. The current recommendation is that all affected teeth should be extracted as the lesions almost invariably progress and become more painful. Feline tooth extraction is usually difficult but becomes more so when the integrity of the tooth is damaged by the destructive resorption process. There may be spot ankylosis which may/may not be visible on radiographs. With TYPE 1 lesions, the whole root and remaining tooth substance must be removed. Often a surgical extraction technique is required to remove the teeth as the roots are prone to fracture.

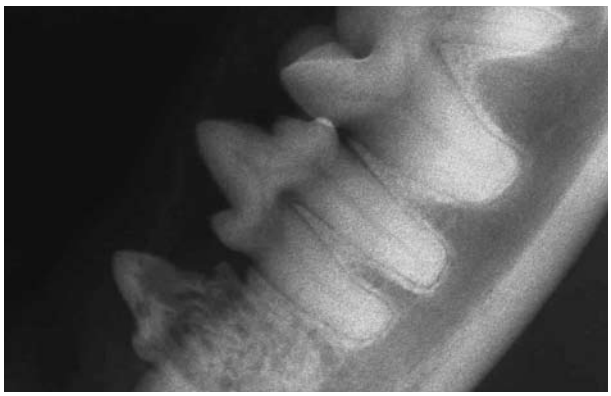

Figure 4: Type 2 resorptive lesion. The premolar roots have lost their density and structure, with loss of the periodontal ligament.

With TYPE 2 lesions, crown amputation with intentional root retention has been proposed as an alternative to whole-tooth extraction. This technique is acceptable provided pre-op radiographic assessment has been performed, ensuring that the lesion is a type 2 lesion. However, this technique is only appropriate for teeth that do not have any radiographic evidence of endodontic disease or periodontitis. Teeth with endodontic disease (i.e. periapical inflammation) or periodontitis and teeth in cats with gingivostomatitis should be removed entirely.

FRACTURED TEETH

Cats frequently get fractured teeth. Any tooth can become fractured whilst the canine teeth are most often affected due to their prominence at the front of the mouth. Fighting and hunting may lead to fractured teeth. A blow to the underside of the chin (RTA or falling from height) causes the mouth to close with great force and the teeth of opposite jaws hit together. This may lead to fractured canines and fractures through the palatal root of the carnassial tooth (difficult to see on conscious examination). It appears as a hairline crack in the upper

carnassial tooth through the crown separating the palatal root *(figure 5)* and causes considerable discomfort for the cat when trying to eat as pressure from the opposing tooth is applied directly to the fracture site.

When the pulp is exposed either by crown or root fracture, the tooth requires treatment. It is not acceptable to leave or monitor the fractured tooth on the basis that the cat appears to be eating normally. The opening to the pulp allows ingress of bacteria and other saliva borne agents which cause inflammation and infection of the pulp, resulting in significant pain. The pulp cannot recover and the pathology spreads down the pulp canal to the apex of the root. After a variable time, the pulp will become necrotic and the pulp canal a reservoir of infection. These contents will leak through the apical delta and cause a reaction in the periodontal ligament at the base of the socket. In advanced cases, a swelling may develop or a draining sinus tract can result, and occasionally a localized osteomyelitis *(figure 6)*.

ORAL TUMOURS

The mouth is the fourth most common site for tumours. Loose teeth should always be radiographed prior to extraction to ascertain whether the tooth is mobile due to loss of attachment as seen in periodontitis, or because of bony destruction as a result of neoplasia *(figure 7)*. Neoplasia should also be a differential diagnosis for any non-healing extraction site *(figure 8)*. The most common oral tumour in cats is squamous cell carcinoma, followed by fibrosarcoma.

The prognosis for oral tumours is generally guarded to poor, as the diagnosis is often made in a late stage of the disease and treatment options are very limited.

TOP TIPS FOR GERIATRIC DENTISTRY:

- **Radiography, radiography, radiography!**
- Systemic consequences, including pain, should not be underestimated and delaying treatment should be avoided
- Blood pressure monitoring, preventing hypothermia, careful use of endotracheal tubes and multimodal pain control help minimize anaesthetic risk
- Chlorhexidine products such as gels and mouth rinses are extremely useful when treating cats

In summary, almost every older cat presented to you will have a dental condition requiring treatment. The discomfort is often masked well in cats, and the pain and its consequences should not be underestimated. The benefit of performing dental procedures is outweighed by the risks associated with anaesthesia when carried out correctly.

On occasion, reference may be made to drugs which are not licensed for use in animals. The Editor does not take any responsibility for the safety and efficacy of such products. Any persons using these products do so entirely at their own risk.

Figure 5: Fractured palatal root of the upper fourth premolar.

Figure 6: Unusual presentation of a fractured canine tooth causing severe swelling and osteomyelitis.

Figure 7: Mobile mandibular canine tooth. The tooth is mobile due to extensive bone loss as a result of a squamous cell carcinoma of the mandible.

Figure 8: Non-healing extraction site of the mandible. Histopathology results indicated a squamous cell carcinoma.

About the author, Lisa Milella BVSc MRCVS. Lisa graduated from the University of Pretoria in 1997 and has been working in the UK ever since. She developed an interest in dentistry whilst working in small animal practice and has completed extensive further training. She is working towards her European Diploma and recently started her own practice; The Veterinary Dental Surgery in Surrey, accepting referrals for all types of dental problems in pet animals. She is also involved in overseas charity work for International Animal Rescue, travelling all over the world treating exotic species in need of her help, such as dancing bears in India.
See **www.vetdentalreferrals.co.uk** for more information.
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SKINNY OLD CATS: FELINE HYPERTHYROIDISM

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INTRODUCTION

Hyperthyroidism is the most common feline endocrinopathy. It is usually due to functional adenomatous hyperplasia of the thyroid gland with both thyroid lobes commonly involved (approximately 70% of cases).
An estimated 8 to 20% of hyperthyroid cats will also have ectopic (intrathoracic) hyperfunctional thyroid tissue. Thyroid carcinoma is rare and is reported to occur in 1-3% of hyperthyroid cats.

The exact cause of feline hyperthyroidism is still unclear. Postulated theories include: dietary or environmental factors, genetic factors and immune mediated mechanisms.

SIGNALMENT AND CLINICAL SIGNS

Figure 1: A classic hyperthyroid cat in poor body condition with a poor haircoat.

Hyperthyroidism due to functional adenomatous hyperplasia usually occurs in middle aged domestic shorthaired cats with an average age of approximately 12 years, although earlier diagnosis is leading to increased numbers of affected younger cats. Clinical signs commonly reported include combinations of:
a palpable goitre, weight loss, polyphagia, polydipsia, polyuria, hyperactivity, tachycardia, vomiting, cardiac murmurs and an unkempt hair coat *(figure 1)*.

Less commonly reported clinical signs include: diarrhoea, anorexia, weakness/lethargy, panting, dyspnoea, alopecia, congestive heart failure and cardiac arrhythmias. Clinical signs are progressive in cats that do not receive treatment. Up to 10% of hyperthyroid cats have 'apathetic' hyperthyroidism with major clinical signs including anorexia and depression.

TOP TIP: *A small number of hyperthyroid cats have 'apathetic' hyperthyroidism with major clinical signs including anorexia and depression. Always exclude concurrent disease in such cases.*

A small number of hyperthyroid cats will have a functional thyroid carcinoma. Clinical signs are similar to those of cats with benign adenomatous hyperplasia of the thyroid glands. Cats with functional thyroid carcinomas may show a lack of response to medical, surgical or low dose radioiodine treatment, have an unusual thyroid gland appearance at surgery (invasion of local structures, increased vascularity, unusual shape/size) or unusual thyroid gland on palpation. Histopathology is required for definitive diagnosis and scintigraphic findings may be similar to those of benign adenomatous hyperplasia. Thyroid carcinomas are often locally invasive and can metastasise to local lymph nodes and the lungs.

'High dose' radioiodine is an effective sole treatment for thyroid carcinoma, frequently achieving prolonged survival.

INDICATORS FOR A THYROID CARCINOMA

- Large, firm and adherent goitre
- Lack of/limited response to medical treatment
- Lack of/limited response to radioactive iodine at standard dose
- Vascular mass, with invasion of local tissues
- Very high TT4 levels (note not seen in all cases)

TOP TIP: *thyroid carcinoma should be considered in cats that fail to respond to conventional treatment of hyperthyroidism. Histopathology is required for definitive diagnosis. High dose radioiodine treatment is an effective sole treatment in many cases.*

ALWAYS SUBMIT RESECTED THYROID GLANDS FOR HISTOPATHOLOGY - THE ODD ONE WILL BE A CARCINOMA!

Hyperthyroidism often leads to cardiac changes including ventricular hypertrophy. Although these changes may be clinically insignificant in many cats, this may lead to congestive heart failure with irreversible cardiac changes if the hyperthyroidism is not successfully treated. It is important to remember that some hyperthyroid cats will also have underlying primary cardiomyopathies, unrelated to their hyperthyroidism, which may progress despite treatment of hyperthyroidism.

Hypertension may occur in hyperthyroid cats and is often mild to moderate. Its severity may be worsened by the presence of concurrent chronic kidney disease (CKD). If present, hypertension should be treated and monitored in hyperthyroid cats to reduce the risk of end-organ damage occurring. Hypertension may not resolve following curative treatment of hyperthyroidism and monitoring should continue long term *(figure 2)*.

Figure 2: All hyperthyroid cats should have their blood pressure measured as a proportion will be hypertensive, even when on treatment.

DIAGNOSIS

Once hyperthyroidism is suspected based on history and physical examination a minimum diagnostic database should include: serum total thyroxine level (TT4), haematology, biochemistry, urinalysis and systolic blood pressure measurement.

Haematological changes that may be present include mild to moderate increases in packed cell volume, red blood cell count, haemoglobin concentration, leucocytosis, mature neutrophilia as well as lymphopenia and eosinopenia. These changes are non-specific and not clinically significant.

Common biochemical changes that may be present include elevations in alanine aminotransferase (ALT) and alkaline phosphatase (ALP) which can be marked (without hepatic dysfunction and these values return to the normal range with successful treatment), hyperphosphatemia and azotaemia.

The most clinically significant biochemical change is azotaemia because this has implications for assessment of renal function prior to and during treatment.

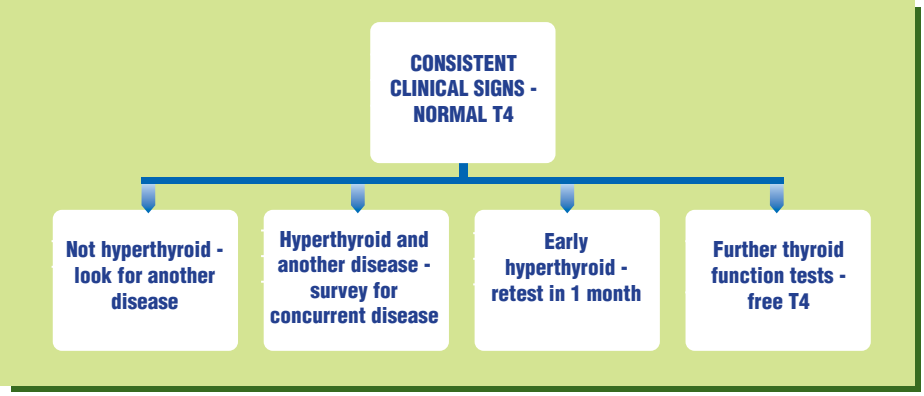
TOP TIP: *If elevated ALT and/or ALP are noted in a cat with consistent clinical signs of hyperthyroidism then TT4 should be measured. Values may return to normal following treatment but keep an open mind as the cat may have concurrent hepatic disease. Also a complicating factor is that a side effect of thyroid medication can be a hepatopathy, increasing the liver enzymes.*

Postulated explanations for the increased enzyme levels include: direct toxic effects of thyroid hormones, altered bone metabolism, liver hypoxia and congestive heart failure. Elevation of phosphate without concurrent renal disease is believed to be caused by altered bone metabolism. Azotaemia may occur in association with concurrent chronic kidney disease and may be worsened by increased protein catabolism and hypertensive renal injury.

Urinalysis findings are usually unremarkable with variable urine specific gravities (USG) reported which also has implications for assessment of renal function in hyperthyroid cats.

An elevated TT4 level is consistent with a diagnosis of hyperthyroidism, however some cats with hyperthyroidism (especially with mild or early stage disease) may have a TT4 level that is within the reference range. This may be the result of normal variation in day to day TT4 levels or suppressed serum TT4 levels in cats with concurrent disease. Recent studies suggest that cats with hyperthyroidism and concurrent disease causing reduction of the T4 usually have a TT4 at the top of the reference range.

If hyperthyroidism is strongly suspected in a patient with a normal TT4 then the first step is to recheck TT4 in 2-4 weeks. It is also advisable to look for concurrent disease that either explains the clinical signs, or is lowering the TT4. The next step may be to measure free T4 levels. Free T4 is a more expensive and a less specific test for diagnosing mild cases of hyperthyroidism (i.e. false positives can occur). It must be measured by equilibrium dialysis as other methods are less accurate. A high free T4 combined with a mid to high normal range TT4 and clinical signs and history consistent with hyperthyroidism would be supportive of a diagnosis of hyperthyroidism. However, because of the potential for falsely positive free T4 results an investigation for underlying disease should always be performed and a high free T4 alone should not be used to confirm the diagnosis.



TOP TIP: *if hyperthyroidism is strongly suspected in a cat with a mid to high normal TT4, retesting TT4 in a few weeks time may confirm the diagnosis but also look for any other underlying disease.*

Other tests that may be used to diagnose hyperthyroidism may include scintigraphy *(figure 3)*, TSH measurement, or dynamic thyroid function tests

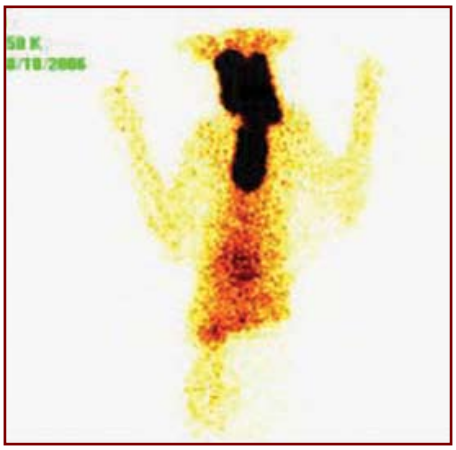


Figure 3: Scintigraphy is performed at some centres to identify the overactive thyroid tissue. This image shows large, bilateral regions of overactive tissue, as well as ectopic tissue entering the thorax.

(thyroid stimulating hormone response test, thyrotropin-releasing hormone response test, triiodothyronine suppression test). However there are some limitations to the use and interpretation of several of these additional tests and they are rarely required to reach a diagnosis of hyperthyroidism.

CONCURRENT DISEASE

Concurrent diseases are common in this group of older cats. The presence of concurrent disease, the type of concurrent disease and its severity may have implications for the diagnosis of hyperthyroidism and the treatment chosen. Concurrent diseases may progress with treatment of hyperthyroidism, progress during the post-radioiodine treatment isolation period, or increase the general anaesthetic risk of the patient during surgical thyroidectomy. Commonly identified concurrent diseases in hyperthyroid cats include: chronic kidney disease, neoplasia, urinary tract infections, pulmonary disease, dental disease and osteoarthritis.

TOP TIP: *concurrent diseases are common in hyperthyroid cats and some may influence treatment choice. Concurrent disease may also become more obvious/symptomatic once the hyperthyroidism is treated.*

Additional testing to further investigate concurrent diseases may be indicated in some cats. This may include echocardiography, electrocardiography, thoracic radiographs, abdominal ultrasound and urine culture.

THE CAT WITH HYPERTHYROIDISM AND CKD

The most commonly discussed concurrent disease in hyperthyroid cats is chronic kidney disease (CKD). Although hyperthyroidism may contribute to the development of CKD, via glomerular hypertension, it may also 'mask' underlying CKD by increasing the glomerular filtration rate. Treatment of hyperthyroidism may 'unmask' clinically significant CKD and this is usually apparent within 4 to 8 weeks following successful treatment. Numerous studies have tried to identify ways to predict which cats will develop CKD following treatment. Measurement of pre-treatment glomerular filtration

rates may be helpful to predict cats at risk of development of CKD however this is not a readily available test. The absence of more simple indicators means that assessment of an individual cat's CKD risk is difficult. For this reason, reassessment of renal function (urea, creatinine and USG) during euthyroidism, following medical treatment of hyperthyroidism, is often recommended prior to definitive treatment (thyroidectomy or radioiodine).

TOP TIP: *there is no easy way to predict which cats will experience 'unmasking' of chronic kidney disease following curative treatment of hyperthyroidism. Reassessment of renal parameters following medically induced euthyroidism may assist with treatment decision making.*

The decision to treat the azotaemic cat with hyperthyroidism should be based on the cat's clinical signs. The clinical signs of hyperthyroidism are unpleasant for the cat and untreated hyperthyroidism may actually cause progression of CKD. Therefore these cats should be treated ideally medically and monitored closely regards clinical signs and body weight. The azotaemia may worsen slightly due to a fall in the glomerular filtration rate but the cat's clinical condition may take priority and the CKD managed appropriately. Concurrent diseases common to both conditions (hypertension, urinary tract infections, proteinuria) must be investigated and treated.

TOP TIP: *cats with CKD and hyperthyroidism: hyperthyroidism is unpleasant for the cat and may cause progression of renal disease. Therefore it is advisable to treat the hyperthyroidism, manage the CKD and monitor the cat's weight and clinical signs. The azotaemia may worsen - but treat the cat not the lab results!*

TREATMENT

The three available treatment options for feline hyperthyroidism include medical, surgical or radioiodine treatment. Which treatment or combination of treatments is most appropriate will vary between individual cats and their owners.

MEDICAL TREATMENT

Medical treatment of hyperthyroidism is relatively cheap, easy to use, widely available and is commonly used following initial diagnosis of hyperthyroidism. The most commonly used anti-thyroid drugs are the thioureylenes methimazole *('Felimazole')* and carbimazole *('Vidalta') (figure 4)*. Carbimazole is almost entirely converted to methimazole following administration. These drugs interfere with iodine incorporation into tyrosyl residues of thyroglobulin, and inhibit the production of thyroid hormones. They also inhibit iodinated

Figure 4: Licensed medical treatment for hyperthyroidism.

tyrosyl residues from coupling to form iodothyronine.

Methimazole/carbimazole have no effect on the release or activity of pre-formed thyroid hormones and may take several weeks for a clinical response to be apparent. Depending on the individual cat and the formulation used, dosing may be required once to three times daily. Good owner compliance is also required for medical treatment to be effective.

The most common adverse effects reported with methimazole/carbimazole use include: vomiting, inappetance and lethargy. These side effects may be mild and self limiting or may require temporary drug withdrawal for 2 to 3 weeks before recommencing therapy. Less common side effects may include: self-induced excoriations of the head/neck, agranulocytosis, thrombocytopenia, immune mediated haemolytic anaemia and hepatotoxicity. These less common side effects may be serious or life threatening and medical treatment should be discontinued. Acquired myasthenia gravis and peripheral lymphadenomegaly have also been reported. Adverse effects usually occur within the first 2 to 3 months of treatment.

TOP TIP: *adverse effects to methimazole/carbimazole usually occur within the first 2 to 3 months of treatment These may include vomiting, inappetance, lethargy, and less commonly, facial excoriations, serious haematologic abnormalities and hepatotoxicity.*

Monitoring of TT4 levels following the initiation of medical treatment should be performed every 2 to 3 weeks initially until euthyroidism is achieved and then every 3 to 6 months thereafter. Renal function should be assessed on treatment, and haematology and biochemistry performed to look for potential side effects of the medication.

TOP TIP: *because medical treatment is non-curative, the underlying adenomatous thyroid hyperplasia may continue to progress with continued thyroid gland enlargement and dose adjustments required over time.*

SURGICAL TREATMENT

Surgical thyroidectomy is a potentially curative, widely available and relatively easy to perform treatment for hyperthyroidism. Medical treatment is often used first to achieve euthyroidism and to assess renal function when euthyroid.

An estimated 70% of cats with hyperthyroidism will have bilateral disease and require bilateral thyroidectomy for curative treatment. Additionally some cats will also have ectopic (intrathoracic) thyroid tissue (1 in 5 cats in one study) meaning surgery will not be curative. Pre-operative scintigraphy using pertechnetate will identify ectopic tissue and determine if both thyroid glands are involved but is not widely available.

Modified extracapsular techniques for thyroidectomy are recommended to try to reduce the risk of accidental damage to the cranial parathyroid glands. The most important potential surgical complication is post-operative hypocalcaemia following parathyroid gland damage. Ideally ionized calcium levels should be monitored post operatively for several days (an I-STAT analyzer is very useful for this if available, but total calcium will also be reduced in most cases of hypoparathyroidism). If clinical hypocalcaemia occurs then medical management with calcium and vitamin D supplementation will be required for a variable period of time before parathyroid function returns weeks to months later. Less common complications may include Horner's syndrome, laryngeal paralysis and a change in meow.

TOP TIP: *when performing a surgical thyroidectomy; the owners should always be warned of the possibility of recurrence due to bilateral disease or ectopic tissue.*

RADIOIODINE TREATMENT

Radioactive iodine treatment is the gold standard treatment of hyperthyroidism. It involves the administration of radioactive iodine[131]. Radioiodine is actively concentrated in the thyroid glands (including ectopic tissue) and has a half life of 8 days. It emits beta-particles which cause most of the damage to hyperfunctional tissue but only travel up to 2mm thereby sparing adjacent tissues. It is a simple to perform and potentially curative treatment. Medical treatment is often used first to achieve euthyroidism and to assess renal function prior to curative treatment with radioiodine.

Many treatment centres now use fixed 'low dose' radioiodine treatment for adenomatous thyroid hyperplasia with success rates of more than 90% with a single treatment. Subcutaneous administration

by a single injection is often preferred due to ease of administration and reduced occupational health and safety risks

Complications are rare and clinical hypothyroidism does not usually occur. In successfully treated cats, a decrease in TT4 levels and regression of clinical signs of hyperthyroidism can occur within a few weeks post-treatment. It may take several weeks to months for euthyroidism to occur in some cats following treatment.

The main limitations of radioiodine treatment include availability, cost and the requirement for a few weeks of confinement following treatment. Confinement times post-treatment vary with individual institutions and local regulations. Here at Bristol three weeks isolation is the standard but is very well tolerated, with even anxious cats settling in quickly. Vets and owners can be deterred by cost, but considering the cost of medication and monitoring over several years, this safe and effective treatment may actually be cheaper! An assessment of suitability is always performed before treatment to look for concurrent disease.

TOP TIP: *radioiodine treatment is a safe and potentially curative treatment for hyperthyroidism. Costs of treatment may be similar or even less than long term medical treatment or multiple thyroidectomies.*

Factors that may influence treatment choice for individual cats include: costs, owner preference, access to radioiodine facilities, ease of administration of medications, surgical expertise and the presence of concurrent disease. The majority of cases of feline hyperthyroidism can however be successfully managed long term with one or a combination of treatment modalities.

References available on request.

A useful resource for owners of hyperthyroid cats is ***'Caring for a cat with hyperthyroidism'*** by Dr Sarah Caney. See http://**www.catprofessional.com** for more information.

'Roaring' success for ISFM Amsterdam congress

The opportunity to learn from top-flight speakers in feline dentistry and pain relief and to party in Amsterdam proved a popular combination for the International Society of Feline Medicine (ISFM, formerly the European Society) Congress (June 18 – 20). Twenty-six countries were represented by the 452 delegates attending from as far afield as the US, China and Korea. UK delegates accounted for a third of those attending.

The ISFM Congress, 'Feline pain management and dentistry', sponsors were Boehringer Ingelheim, Hill's, Merial, Bayer, Intervet-Schering Plough and Pfizer Animal Health.

The keynote speakers on dentistry were Philippe Hennet and Margherita Gracis. Sheilah Robertson, Polly Taylor and Duncan Lascelles spoke on feline pain management.

Delegates commented that they found the lectures on pain recognition and control particularly useful. 'The speakers were able to provide practical tips and share new information in this difficult area of feline medicine,' said Feline Advisory Bureau's chief executive Claire Bessant.

MP3 recordings of most of the ISFM Amsterdam Congress talks will soon be available to download from www.isfm.net/shop at £2.99 each or £60 for all 22 sessions. The Congress proceedings cost £40 and can be ordered online or from FAB headquarters on 01747 871 872. Save money by buying the MP3 recordings and the proceedings together for £80.

Don't miss out next year when the ISFM Congress will be held in Vienna (June 23-26) with the combined themes of feline ophthalmology and respiratory disease. Full details will be posted on www.isfm.net/congress/2011.

Anaesthesia and Analgesia of Feline Dentistry Patients

Louise Harvey *BVSc CertVA MRCVS from the anaesthesia department, Langford Veterinary Services, University of Bristol discusses this tricky subject.*

The risk of anaesthesia is often what owners of older cats with dental disease are worried about most. This article looks at how the anaesthesia of these patients can be optimised.

Dental disease is….

- Usually painful, often chronically so and treatment will require extra analgesia.
- Usually more advanced/severe in older cats.
- Often overlooked, necessitating treatment at a late stage when body condition is poorer.
- Sometimes concurrent to other disease.
- Occasionally needed after trauma, e.g. road traffic collisions with palate and jaw fractures.
- Likely to cause a reduced quality of life if dental disease is untreated.

Geriatric cats are…

- More likely to have concurrent disease, such as hyperthyroidism, chronic kidney disease, diabetes mellitus, hypertension.
- Known to have reduced organ function (normal part of ageing process).
- Likely to have a reduced quality of life if dental disease is untreated.

The main considerations for anaesthetising a cat for dental treatment are:

- Analgesia.
- Protection of airway (risk to airway includes kinking endotracheal tube (ETT), aspiration of contaminated water/blood).
- Risk of hypothermia (water spray wetting coat, prolonged procedure).
- Other concurrent disease/reduced organ function.
- Potential need for extra monitoring.

MULTIMODAL ANALGESIA

Pain is most effectively treated if the neural pathways which transmit pain (from nerve ending to the cerebral cortex) are modified at several levels by administration of a combination of classes of analgesics rather than just one type of drug. Also, the use of a combination of drugs may allow lower doses of individual drugs with reduced risk of side-effects. Good nursing can also help minimise the impact of patient pain and is often under-estimated.

1. Opioids

These drugs should be given as part of the pre-anaesthetic medication as their administration at this time will allow them to work intra-operatively. Through helping to control intra-operative stimulation they reduce the requirement for anaesthetic agents and allow the vaporiser setting to be reduced as part of a balanced anaesthetic technique. Full mu receptor agonists such as morphine (0.1-0.2mg/kg every 4-6 hours) and methadone (0.1-0.2mg/kg every 4-6 hours) are appropriate for dental treatment but buprenorphine 0.02mg/kg every 6-8 hours), a partial mu receptor agonist, is also a very effective opioid in cats.

2. Non-steroidal anti-inflammatory drugs (NSAIDs)

Although some NSAIDs are now licensed for pre-operative use (meloxicam, carprofen, robenacoxib), many anaesthetists prefer to give NSAIDs at the end of anaesthesia rather than pre-operatively in case hypotension occurs intra-operatively with the attendant risk of reduced renal blood flow. Care is needed to check what medication a cat is already receiving as many geriatric cats are now treated with meloxicam as it is now licensed for long-term control of musculoskeletal pain in cats. The unnecessary administration of extra NSAID could cause toxicity. Also, a wash-out period of 4-5 days is needed between administrations of different NSAID drugs. There are many contra-indications to the administration of NSAIDs – notably renal, hepatic, and cardiac disease, dehydration/hypovolaemia and administration of steroids.

3. Local anaesthetic techniques

Effective nerve blocks give excellent intra-operative analgesia and if long acting drugs are used can also give excellent post-operative analgesia. Lidocaine has a rapid onset but lasts a maximum of 2 hours. Bupivacaine may take 20-40 minutes to take effect but lasts 4-6 hours. Doses should be carefully calculated and safe maximum doses not exceeded (bupivacaine 1mg/kg, lidocaine 4mg/kg). Injection must not be intravascular. Bupivacaine is particularly cardiotoxic but is safe if used properly. Time to take effect is important. If dental radiographs are to be taken, it may help to perform blocks beforehand.

- **Maxillary nerve block:** The maxillary nerve runs ventral to the orbit and may be blocked by percutaneously inserting a needle to a depth of about 0.5cm at an angle 90° to the skin, immediately caudal and ventral to the most cranio section of the zygomatic arch, level with the molar tooth.
- **Infra-orbital nerve block:** The infra-orbital nerve is the rostral extension of the maxillary nerve and it innervates the muzzle. The infra-orbital foramen is ventral to the eye, approximately 1cm dorsal to the third premolar at the junction of the maxilla and the zygomatic arch and is approached with the lip retracted dorsally. Local anaesthetic must be instilled into the foramen and along the canal to desensitise the teeth. Because the infraorbital canal is very short in cats (only a few millimetres), no attempt should be made to direct the needle up the canal or there is a risk of causing orbital trauma. Instead, if the needle tip is positioned directly over the foramen and pressure is applied above and cranial to the site during injection, local anaesthetic may be directed caudally.
- **Mandibular nerve block:** The mandibular nerve enters the mandible via the mandibular foramen on the

Location for mandibular nerve block.

medial aspect of the mandible just rostral to the angular process.
The needle is passed transcutaneously 1cm rostral to the rostral edge of the angular process, pointing 0.5cm dorsally. Care is needed to avoid intra-vascular injection.

- **Mental nerve block:** The mental nerves are rostral extensions of the mandibular nerve. Mental foraminae (2-3) occur on rostral lateral mandible at a level between the canine and the first premolar. Local anaesthetic should therefore be fanned out along the lateral mandible from just caudal to the canine to the first premolar with the lip retracted ventrally. The extremely small size of the mental foraminae precludes the insertion of a needle into the foramina and along the mandibular canal to block incisor innervation, therefore for lower jaw dentistry, a mandibular nerve is preferable.

Location for mental nerve block.

PROTECTION OF THE AIRWAY

The airway needs particular attention to be paid to it during dental procedures. The following should be considered to help prevent complications:

- An Endotracheal tube (ETT) should always be used and secured properly with a tie behind the ears that holds the tube in place.
- Uncuffed ETTs are generally preferred in cats. If the larynx is properly desensitised with lidocaine for intubation, and a laryngoscope used for improved visualisation of the glottis, most cats can be intubated with a 4.5-5.0mm tube leaving only a little space around the tube, accordingly protecting the airway and posing minimal resistance to breathing.
- If a cuffed ETT is used, great care MUST be taken to prevent over-inflation of the cuff as tracheal rupture can easily occur (the Veterinary Defence Society deal with 12-15 cases every year!) The low volume-high pressure type of cuffs of the red rubber ETTs are difficult to inflate in a controlled fashion. High volume-low pressure cuffs (of the PVC ETTs) are much safer in this respect.

Dry throat packs - these should be dampened slightly with a little water to soften them before use.

- For extra protection against aspiration of contaminated water spray and blood, a throat pack can be inserted and removed at the end of the procedure.
- Careful not to kink the ETT as the patient is moved, and avoid twisting of the expiratory limb of T-piece with Jackson Rees modification causing over- pressurisation of the airways and lung trauma. It is always safer to loosen the contact and hold the patient's ETT firmly during turning the cat and this also prevents trauma to the tracheal mucosa associated with ETT movement.
- Moisture can result in loosening of the connector from the ETT and there is a risk of disconnection. Connectors should be of the correct size for the ETT and when the ETT is checked before use the connection should also be checked. Minimum dead space connectors are very helpful, especially when using capnography as a monitor as these connectors have side-stream ports.

PREVENTION OF HYPOTHERMIA

Hypothermia is a problem with just about every feline anaesthetic. It is a major physiological stressor and predisposes to cardiac arrhythmias, delayed recovery and other problems such as infection, and as such should be prevented rather than treated at the end of the procedure. Simple measures can go a long way!

The best ways to minimise hypothermia are:

- Wrap the cat in bubble wrap and a vet bed/blanket to reduce radiant and conductive heat losses and prevent the cat becoming wet
- Insertion of a single use heat and moisture exchanger (HME) between the endotracheal tube and the breathing system - can increase the work of breathing and it adds dead-space
- Maintain a really warm ambient environment - VERY important.
- Use a heat mat – these can cause burns though so place a blanket between cat and mat and monitor closely.
A digital thermometer should be slid between under the patient to check that the temperature does not exceed 38°C.
- Forced warm air circulating blankets are very effective and also help keep the patient dry. Washable, re-usable blankets are now available making these systems very cost-effective.
- Application of 'hot-hands' (latex gloves filled with warm water) – these must not be too hot. Best wrapped in paper towel then placed inside insulating materials with the cat. They can go cold!

GERIATRIC PATIENTS/CONCURRENT DISEASE

From maturity onwards, age-related changes occur in all organ systems with loss of functional capacity and compensatory mechanisms. These include:

- Reduced renal function - blood tests are useful for detection of renal failure but they do not help identify cats with reduced renal reserve, as over 75% of renal function needs to be lost before urea and creatinine levels rise due to renal dysfunction. Great care is needed to avoid further kidney damage.
- Changes affecting the cardiovascular and respiratory systems - can lead to increased risk of hypotension (low blood pressure) and respiratory depression. Reduced lung compliance and respiratory muscle strength are examples of respiratory system changes.
- Reduced drug metabolism - recovery from anaesthesia can be delayed as drug metabolism may be reduced as a result of an intrinsic reduction in hepatic function or as a result of reduced hepatic blood flow secondary to cardiovascular depression.
- Nervous system changes - can cause older cats to be affected by sedative and anaesthetic drugs to a greater degree than younger cats and lower doses of drugs and lower vaporiser settings will be required. A balanced anaesthetic technique and close monitoring are very important.
- Cats with hyperthyroidism should be stabilised with medical treatment before anaesthesia is performed.

The Geriatric Cat with Renal Disease

Cats with chronic kidney disease (CKD) can be anaesthetised for dental treatment. As dental disease is painful and reduces quality of life, renal disease should not be a reason to withhold

Anaesthesia and Analgesia of Feline Dentistry Patients *(continued)*

treatment. However, extra care is needed to prevent further renal damage.
The following should be considered:

- The patient must be hydrated. Water should never be withheld prior to anaesthesia and intravenous fluid therapy (IVFT) during, and preferable also before, anaesthesia is vital. IVFT should be directed at lowering urea and creatinine levels, avoiding hypotension and correcting electrolyte imbalances.
- Hyperkalaemia and hypokalaemia are especially important to correct pre-anaesthesia.
- Avoid hypotension - many sedative and anaesthetic drugs decrease blood pressure and cardiac output. Balanced anaesthesia will reduce the risk of this but all volatile anaesthetics and most injectable anaesthetics cause dose-dependent hypotension. Alpha-2 agonists, e.g dexmedetomidine, medetomidine, are drugs which dramatically decrease cardiac output are probably not appropriate.
If acepromazine is used, it should be with caution. Anaesthesia time should be minimised and blood pressure should be monitored and hypotension treated aggressively (see below).
- Many patients with CKD are hypertensive and these cats are less tolerant of swings in blood pressure, especially hypotension. Blood pressure should be monitored closely, e.g. using the Doppler method which is non-invasive and fairly simple to apply.
- Cautious use of NSAIDS – NSAIDS are usually contra-indicated in patients with CKD but in some circumstances their use may be justified (severe orthopaedic or dental pain) with owner consent. However, they should never be given to a hypotensive patient and doses reduced. Other methods of analgesia should be maximised (opioids, local anaesthesia).

MONITORING

"For every mistake made for not knowing, hundreds are made for not looking". You are the most important monitor!

Doppler blood pressure monitoring can provide vital information during anaesthesia.

Other useful monitoring aids are:

- Pulse oximeter.
- Blood pressure monitoring.
- Doppler is the most useful non-invasive method in cats.
- Blood pressure cuffs must be of the correct size, i.e. cuff width approximately 40% of the limb circumference.
- Capnography – side-stream (otherwise dead space increased excessively).
- Rectal temperature.
- ECG.
- Keep an anaesthetic record – you'll notice trends and will therefore be better informed and able to adjust your patient's anaesthetic (and it's a legal document!).

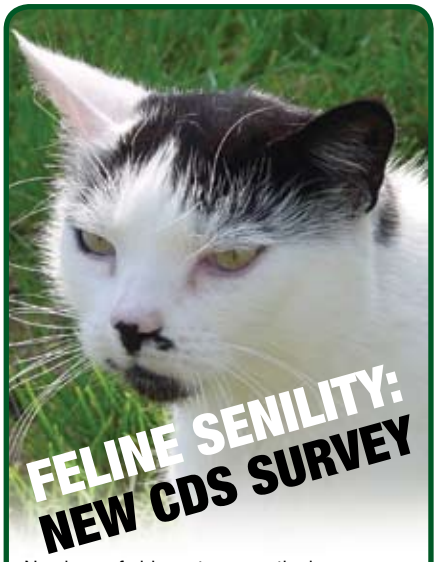
HYPOTENSION

Hypotension is a common, potentially very serious problem usually associated with an excessively deep plane of anaesthesia, although not exclusively so. It is likely to result in poor perfusion and organs such as the kidneys are extremely vulnerable to damage. Maintaining anaesthesia on the lowest vaporiser setting possible is therefore always desirable, although this may necessitate adjustments several times during the dental procedure in response to the waxing and waning surgical stimulus. It is desirable maintain Doppler measured blood pressure above 80 mmHg. If the patient was hypertensive prior to anaesthesia, Doppler measured blood pressure should probably be kept above 100 mmHg.

What to do if hypotension recorded –

- Turn down vaporiser –some of the factors that reduce requirement for anaesthetics are hypothermia, old age, anaemia, hypoproteinaemia, pre-anaesthetic medication, uraemia, hypotension
- Increase rate of IV fluid administration
- Consider extra analgesia (e.g. opioid, local anaesthesia) if vaporiser setting can't be reduced without patient responding – balanced anaesthesia
- If bradycardic (heart rate lower than 90-100 bpm), administer atropine – usually not needed if bradycardia is due to excessive depth of anaesthesia and/or hypothermia and these problems are sorted out.

Doppler blood pressure monitoring can provide vital information during anaesthesia.



FELINE SENILITY: NEW CDS SURVEY

Numbers of older cats are on the increase and the health issues that affect our ageing felines have become more and more important. Amy Cotter, a current veterinary student at the Royal (Dick) School of Veterinary Studies in Edinburgh is conducting a research study on older cats under the supervision of Professor Danièlle Gunn-Moore (University of Edinburgh) and Dr Sarah Caney **(www.catprofessional.com)** Owners of cats aged 11 years or more are invited to participate in this study which takes the form of a online questionnaire. The study is aimed at finding out more about a condition called Cognitive Dysfunction Syndrome (CDS), more commonly known as feline senility. This condition has many similarities to Alzheimer's Disease in people and is thought to affect many older cats. Affected cats can suffer from signs including disorientation and confusion, changes in sleep patterns, crying for attention (especially at night), toileting accidents and changes in the cat's behaviour and relationships with people and other animals (for example becoming more demanding of human attention). Professor Danièlle Gunn-Moore is one of only a handful of experts who is actively researching CDS in cats and is a world renown specialist in this area of feline medicine.
The questionnaire asks owners about changes in the behaviour of their cat since reaching 11 years of age and it is hoped that the information gathered will help understand how common CDS is and whether there are any links to other conditions such as high blood pressure. Professor Gunn-Moore has said 'not only will this project provide key information about CDS now, but it will also provide a follow up to a questionnaire conducted 15 years ago by feline behaviourist Vicky Halls. We hope that this study will take us a step closer to finding ways to prevent CDS from developing in older cats'.
All owners completing the questionnaire will receive a 25% discount off books sold on the Cat Professional website. The 'Caring for a cat with…' series of books published by Cat Professional are designed to support owners of cats with a range of medical conditions and prices start at just £7.00.
All participants will also be entered into a draw to win a 6 month supply of Hill's™ pet food. (Further information and the questionnaire can be found at **www.catprofessional.com).**

CARING FOR THE SENIOR PATIENT

TIPS FOR PRACTITIONERS

by Samantha Taylor BVetMed(Hons) CertSAM DipECVIM-CA MRCVS

The days when older cats were not treated for various chronic conditions are definitely over.

Just as the human population is aging, the proportion of older cats is also growing. With improvements in healthcare and growing owner expectations, every small animal practitioner can expect to treat cats in this age group. There are over 4 million cats over 8 years of age in the UK and this is also an opportunity to target this group with specific clinics.
Cats are the masters of hiding disease and owners may not notice the subtle signs of pain/illness. By educating owners, asking the right questions and handling older cats correctly in the clinic, the quality of life of these feline OAPs can be improved.

Below are some specific tips and advice to consider when dealing with cats over 8-10 years of age, along with ideas for setting up senior clinics.

- If you are regularly anaesthetising cats, old or young, or other small patients, consider investing in a Bair Hugger to prevent peri-operative hypothermia. The cost of the blankets can be billed to the owners, who are usually happy to pay a little more and make a big difference to recovery, drug metabolism etc.
- Invest in fluid pumps or syringe drivers as they are a must when treating cats, particularly elderly cats under anaesthesia, as this group of cats who can suffer reduced vascular compliance and are therefore at increased risk of volume overload.

continued overleaf

OSTEOARTHRITIS – DON'T MISS THIS PAINFUL AND TREATABLE CONDITION IN SENIOR CATS!

Clinical signs are subtle and lameness is unusual - ask owners about the following:

- Reduced jumping onto furniture and hesitation jumping down.
- Stiff, stilted gait.
- Reluctance to use cat flap.
- Litter tray accidents, missing the tray with urine or faeces.
- Constipation should always raise the concern about OA.
- Reduced grooming with scurfy, matted coat.
- Lack of interaction with family, not wanting to be stroked.
- 'Slowing down' - going out less frequently.
- Overgrown claws indicating reduced activity.
- Remember owners may perceive changes as part of normal ageing.

HOME MANAGEMENT TECHNIQUES ARE IMPORTANT ALONG WITH ANALGESIA

- Provide soft beds in accessible locations in quiet areas.
- Igloo beds and cardboard boxes provide safe, secure locations to sleep.
- Provide steps up to higher favourite places e.g. sofa and also up to cat flap.
- Use low sided litter trays and soft textured litter.
- Put food, water and litter trays on same level of house so cat doesn't need to go up and down stairs (but not food/water close to litter tray).
- Radiator beds are popular if not too high to jump into.
- Make sure overgrown claws are clipped as they add to discomfort in walking.

NON-STEROIDAL ANTI-INFLAMMATORIES CAN PROVIDE EXCELLENT ANALGESIA BUT CONSIDER CASE CHOICE

- If using oral meloxicam longer term you may be able to use a lower dose and still achieve adequate analgesia, ensure cat's weight is accurately recorded.
- Ensure water intake is adequate for cats receiving NSAIDS (water fountains, water bowls outside to collect rainwater, wide brimmed ceramic bowls full to the top) – *see figure 2 (overleaf).*
- Check renal function before prescribing – assessment of urine SG along with urea and creatinine.
- Cats with chronic kidney disease are still in pain from OA, consider alternative analgesics or discuss a risk/benefit analysis to the use of NSAIDS with owners, these cats must maximise their water intake.

Bristol Cats

The 'Bristol cats' study

Researchers at the University of Bristol are undertaking a new study designed to help improve the health and welfare of cats, and are looking for help from vet practices with clients in the 'BS' postcode region.
Why is the 'Bristol Cats' study being carried out? Because little is known about the causes of some diseases and common behaviour problems of cats (e.g. obesity, hyperthyroidism, inappropriate elimination, spraying and lower urinary tract problems). The results from this study can be used to help improve the health and welfare of cats in the future, in the same way that the "children of the 90's" study has helped our knowledge of childhood diseases.

How can I help?

If you have clients in the BS postcode region and you have not yet received this advertising material, or would like additional posters/leaflets, then please contact a member of the study team, using the details below. Please encourage kitten owners to take part in this important study. Briefly, we need people who live in the Bristol area (with a "BS" postcode) who have a kitten between the ages of 2 and 4 months to register with us. They will be asked to complete questionnaires (paper or online) when their cat is aged 2-4 months, 6, 12 and 18 months, relating to a variety of straightforward questions about their kitten's diet, lifestyle and behaviour, etc. All eligible questionnaires will be entered into a prize draw for £100 Marks and Spencer vouchers, which will be drawn on 2nd December 2010.

For further information about the study please visit our website:
www.vetschool.bris.ac.uk/cats
or contact: Jane Murray Tel: 07827 981412, Email: **cat-study@bristol.ac.uk**

- Always record the weight and body condition score of cats seen in the clinic. This is especially important for older cats as small decreases in weight may be an early marker of disease. Cat scales in consult rooms avoid both the inaccuracy of dog scales and the stress for the cat of being put onto such scales, often in waiting rooms in front of dogs.
- Remember how useful urinalysis can be, providing cheap and rapid information on renal function. Always measure specific gravity. Specific gravity less then 1.035 may indicate underlying early chronic kidney disease and should prompt further investigation. *See Figure 1.*

Figure 1: Urinalysis is a cost effective way of assessing renal function and SG should always be measured on every sample

- Senior/geriatric cats are the age group of cats that are more frequently affected by urinary tract infections. These can occur without clinical signs so performing urine cultures is important in at risk cats including cats with CKD, diabetes mellitus and hyperthyroidism. Learn to perform conscious cystocentesis safely to gain vital information.

Figure 2 – A wide brimmed ceramic bowl filled to the top and put outside can help increase water intake in older cats

- When introducing a prescription diet to older cats this must be done carefully to ensure compliance. Do not introduce during periods of stress/illness such as when hospitalised, especially if the cat is nauseous or food aversions may result. Ask owners to slowly introduce at home.
- If more than one company makes a prescription diet then stock or order a small amount of each for the owners. Fussy older cats can change preferences day to day and this allows feeding of a different flavour or texture day to day but maintaining desired features of the diet.
- Do not miss hypertension in this age group. At risk cats should all have their blood pressure measured (CKD, hyperthyroidism) and ideally all older cats should have BP measured as part of a complete clinical examination.
- Do not miss osteoarthritis (OA) in this age group. Clinical signs can be subtle and go unnoticed by owners. Ask the right questions. See box for further information.
- Take any opportunity to radiograph an older cat's joints (i.e. if under anaesthesia for another reason), if you observe degenerative changes it is likely to be causing pain and the cat may benefit from treatment, even if clinical signs are not reported as they can be so subtle.
- The hospitalised older cat will be more susceptible to stress as they are less adaptable to change. Think about making them more comfortable by using cardboard boxes in the cages so they feel safe and secure.
- Buprenorphine can be given onto the buccal membranes by owners to provide analgesia after a painful procedure such as a dental or when NSAIDS are contra-indicated and owners can also administer this at home (off licence route).

SENIOR CAT CLINICS IN GENERAL PRACTICE – DO THEY WORK?

- Yes, but only with motivated clinicians/nurses to run them. Often vets are too busy to organise such clinics but a keen nurse can work wonders!
- Vet run, or nurse run clinics, or a combination of both work well e.g.
  - Initial nurse appointments for weighing, BP and dental check and transfer to vet clinic if problems identified.
  - Extend booster appointment times for older cats to allow discussion of other potential problems and measurement of BP.
- Do not over charge for the clinics, it is likely that within this age group problems will be noted, leading to further work/treatment so the aim is to get these cats through the door and not deter clients with high cost testing.
- Target tests for common conditions, i.e. instead of a full biochemistry/haematology which may be cost prohibitive start by measuring a free catch urine SG (very good non-absorbent litter now available and can be given to client prior to appointment) and dipstick for glucose. Go on clinical signs/physical examination regards other tests such as T4 if indicated (e.g. goitre palpated).
- Questionnaires prior to appointments, with literature on geriatrics, starts the client thinking about their older cat and may save time in consult e.g. mobility questionnaires for OA.
- Recruit clients via mail shots to older cats, literature in waiting rooms or start with patients already identified i.e. hyperthyroid cats, diabetics, cats with CKD and invite to check up appointments with BP, weighing and urinalysis in nurse clinics.
- Schemes such as the Feline Advisory Bureau's Wellcat for Life can provide literature for clients and a source of information **http://www.fabcats.org/wellcatveterinary.php**

Langford VETERINARY SERVICES

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