

CP/Clinic

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Shelter Medicine

Veterinary assessment and the rehoming process

Behaviour

Providing hiding opportunity in the clinic

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Community cats and human behaviour change

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Approaching FIP on a limited budget

Contents

4 Shelter Medicine

Veterinary assessment and the rehoming process by Caroline Reay

8 Behaviour

Providing hiding opportunity for the hospitalised cat by Charlie Wright

12 Shelter Medicine

The unowned cat population and human behaviour change by Jane Clements

16 Shelter Medicine

Approaching feline coronavirus and feline infectious peritonitis on a limited budget by Samantha Saunders

20 CP news

All the latest news from Cats Protection

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Meet the team

Dr Jocelyn Toner

How long have you worked for CP? I have been with CP just over 6 months

What did you do before working for CP? Previously, I have worked as a clinical vet for the RSPCA and PDSA

What is your role within CP? I am the Field Veterinary Officer for West England Wales and N. Ireland

What do you like most about your job? I enjoy the huge variety involved, one day I can be chatting to volunteers, the next discussing a case with another vet, or visiting an adoption centre or helping come up with new ways to improve cat welfare.

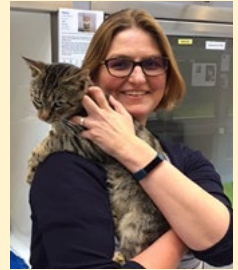
What is your most memorable CP moment? On my first day I attempted to leave the office to go home and then realised I didn't know how to get out of the building. Fortunately I was rescued by a passer-by!

Do you/did you have a pet/-pets? We currently have 2 dogs, 2 cats, 4 chickens and a pet rat!

What are your hobbies/other interests? I just love kayaking with the family

Where is your favourite place to visit? Pretty much anywhere near water – and I am happy!

If I wasn't doing this, I'd probably be... living in the country with lots of rescue animals and learning to make cheese!



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Veterinary assessment and the rehoming process

Caroline Reay BVSc CertVR MRCVS explores the veterinary role within a shelter and rehoming setting

Although our clinic is owned by a charity – The Blue Cross, which also rehomes unwanted pets – working with the Cats Protection (CP) Mitcham Homing Centre has brought us a better understanding of the rehoming process. The Blue Cross rehoming centres are geographically distant from our London veterinary service, so our clinical team is only involved with a trickle of their cases. But we are close to the CP centre in Mitcham, bringing a great opportunity for us to work together. There is minimal travel distance for the cats and, in some cases, we can help those on reduced means to take on an unwanted cat, with the known benefits of pet ownership, while accessing help with healthcare.

Working with CP has brought the scale of the problem of unwanted pets up close and personal. We've also realised its vagaries. You can't control the rate of cats needing homes and the workload can vary markedly from month to month, so veterinary practices have to adapt. And while dispensing with those pesky owners might seem attractive to some, it can bring some different challenges, not least that of clipping female cats of unknown neuter history to look for a spay scar.

Blue Cross staff treating a CP cat at the Blue Cross hospital



Expense for one vs benefit for many

There are differences when dealing with unowned pets. In normal vet practice, the emotional bond between pet and owner is an important driver in decision making about the risks, benefits and practicalities of treatment in discussions between vet and owner. Vets have to present all available options for treatment but the amount of guidance given as to what is 'right' for the pet is variable. There are pros and cons – the animal may benefit from costly procedures such as joint replacement or MRI, instead of having to 'make do' with a cheaper alternative, but it can also mean that life is prolonged despite diminishing quality when an owner can't bear to let go, but can pay for palliative care. Conversely, when an owner can't afford the costs, an animal with a treatable condition may be euthanased.

When costly treatments may not necessarily be the right thing to do

With an unowned pet, there are fewer emotional complications (although it's surprising how quickly attachments flourish between animals and professional carers) and so welfare can lead decision making. But cost remains a factor and there has to be an element of pragmatism. It's important to select diagnostics to be cost effective, with the maximum impact on treatment decisions. And a costly treatment for one pet – say an animal with a cancer needing specialist surgery or even chemo/radiotherapy – can't be justified by a charity when there are so many unowned animals needing basic care. It's also true for complex fractures – costly fixation (which may have complications or even fail) versus amputation? There's a holistic welfare element too, balancing the welfare impact of long or difficult treatments against costs and the likelihood of a homeable pet at the end. Someone has to make the choice and it's seldom straightforward. Getting used to pragmatic decision making can take a while but it's useful in general practice too, when dealing with owners with limited means. The *CP Veterinary Guide*, available to all completely free online, is a good guide to pragmatic treatment and a worthwhile read for any vet.

Rehoming caseloads

When working with a homing centre, acute cases are unusual, as most of the cats are in a stable condition. But some cats will have health issues.

It's sadly common for cats to present for rehoming because of health problems that are beyond their owner's means, emotionally or financially, and not all are suitable for rehoming. These medical conditions become an obligation to a new owner and can be an obstacle to finding a new home. You don't want someone to end up with a pet that deteriorates within weeks, needing costly treatment or even euthanasia. Do new owners really understand uncertainty, say if a pet has had a tumour removed but it's not known whether it's likely to recur? When someone has set their heart on a pet they may hear only the more optimistic estimates of outcome and they may not appreciate the emotional impact of losing a pet. Unstable diabetics or those with



Leo's tongue lesion was an incidental finding during a dental. Biopsy showed this to be an inflammatory granuloma and he was subsequently rehomed.

advanced heart disease have an uncertain prognosis and time till homing is often quite extended which then becomes a welfare issue in itself. These cats might survive for months once diagnosed – but they could become seriously ill within weeks of rehoming, risking heartbreak for their new owners. While healthy FIV positive cats find homes with surprising ease it wouldn't be fair to rehome one with severe gingivo-stomatitis, for example, where the cat's quality of life is affected and could worsen over time.

But many cats with stable health problems can be rehomed, although of course it is essential that new owners are fully briefed. As at Blue Cross rehoming centres, each cat for rehoming is checked by a vet and health issues documented with an indication of prognosis, so that owners know whether they are ongoing and if further problems are likely. CP and Blue Cross have a good range of advice sheets on common problems and animals with mild kidney compromise or heart murmurs which haven't resulted in marked structural changes are regularly rehomed.

Stress and lifestyle changes

Stress related problems such as cystitis or skin allergic problems can have a favourable outlook. Once away from the source of stress (often a multicat household), the problem may resolve and the cat may live happily as a singleton thereafter. Helping these cats to a brighter future is very satisfying. But stress responses are very individual and some may be set early in life, often before birth, so sadly there are some cats that just don't stabilise on regular treatment and euthanasia may have to be considered. It's important for teams working with rehoming to realise that sad decisions are sometimes necessary.

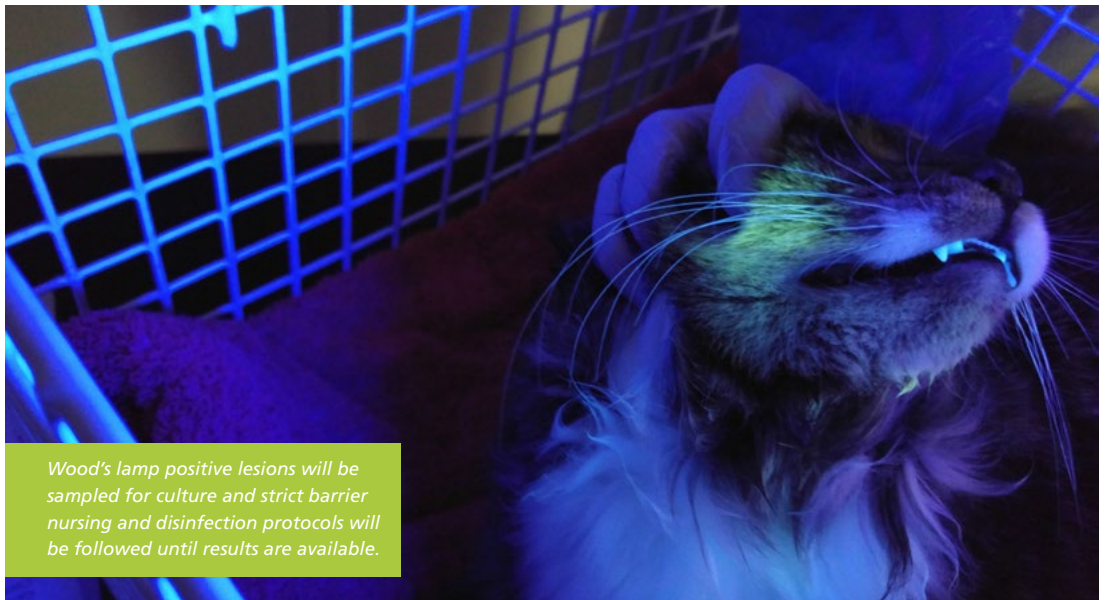
Additionally the lifestyle changes of rehoming are quite stressful in themselves, even with careful management. It's quite common for flu carriers to develop a mild runny eye or nose, which doesn't always mean 'antibiotics' and stress-related diarrhoea is also frequent. CP has an excellent 'first response' advice sheet on diarrhoea. Taking a common sense approach to diagnostic testing is advisable as it's fraught with hazard. The more you look, the more you find and pathogens can be a consequence of the disruption of bacterial flora caused by stress, even the more sinister ones like *Tritrichomonas foetus*. There's a fine line between managing cases on conservative treatment – time and an easily digestible diet – and a decision to

test further, especially as the aim is to get the cat rehomed as soon as possible. Some pathogens have zoonotic potential (although the risk is usually low) so it's important that new owners get realistic advice and, again, the CP advice sheets are very useful.

Other zoonotic conditions do crop up from time to time, apart from diarrhoea. Vets working with CP have to be vigilant for ringworm and the team at Mitcham are very aware of this condition too. Ringworm is taken seriously and CP has a detailed protocol.

Charities working together

It's unusual to see the stereotypical acutely flu-e-y cat, but the chronic effects – particularly eye damage – are frequent. Fortunately charity practice is a good place for vets to refine their skills and Blue Cross clinics have several vets who can perform keratectomies. One cat, 'Rosie' underwent a successful keratectomy to remove her corneal sequestrum before she was rehomed. Similarly with heart murmurs, commonly encountered but often incidental findings. CP has a clear protocol for when to scan and an accompanying owner information sheet. But, as in many charities, Blue Cross vets benefit from opportunities for informal learning and many Blue Cross vets can perform a basic – and cheap – scan to check for chamber enlargement or thickening, so cats for routine surgery like dentistry can be economically screened beforehand.



Wood's lamp positive lesions will be sampled for culture and strict barrier nursing and disinfection protocols will be followed until results are available.

Why medical assessments must be fundamental to the rehoming process

Many people 'normally' acquire adult cats from friends, as 'strays' or off free websites, and it's not unreasonable for a charity to expect minor dental care to be the responsibility of new owners. Dental plaque and calculus are common and, reasonably for a charity, CP priorities for dentistry are to relieve pain where's there's gingivitis, FORLs or broken teeth, rather than cosmetic. CP rehomed cats are not 'mint condition' yet there's sometimes an expectation from those involved with charities – new owners, employees and even vets examining a newly rehomed animal for the first time – that every animal going out should be as good as new. Most mature cats in the British population have at least some dental plaque or even calculus and although it may not have been removed in rehomed cats, it's always recorded on the rehoming form.

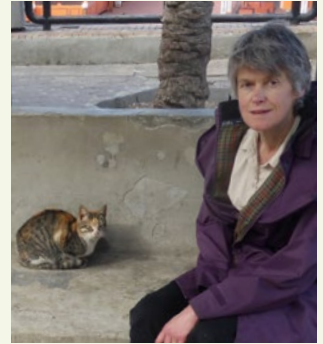
It can be quite a mind blowing experience, an afternoon at the centre checking 20 cats in a row. The scale shows why CP paperwork, which sometimes feels cumbersome, is essential. There are many individuals involved in care of these cats and it's essential that everything is recorded and passed on with the cat when it goes home. The Mitcham team are very helpful and have a good knowledge of their cats.

Veterinary assessment and advice is vital to the work of rehoming charities. Cats for rehoming arrive in varying states of health and vets have to give a realistic assessment of treatment options and future prospects, while keeping costs to a minimum. But, as a vet, it's fantastic to feel that you are making a positive contribution to feline welfare on a grand scale and giving unwanted cats a second chance.

Veterinary assessment and advice is vital to the work of rehoming charities. Cats for rehoming arrive in varying states of health and vets have to give a realistic assessment of treatment options and future prospects, while keeping costs to a minimum.

Caroline Reay

BVSc CertVR MRCVS



I qualified from Bristol University in 1986, having learned there that cats were not just small dogs. Although I've had several spells in private practice, most of my working life has been spent at Blue Cross. I've had a succession of cats over the years and the current post holder comes from CP. I'm interested in feline medicine but am particularly fascinated by cat (and dog) behaviour. I'm keen to encourage assessment of welfare and quality of life for pet animals, and have recently helped to introduce health and wellbeing checks into the Blue Cross hospitals.

Providing hiding opportunity for the hospitalised cat

Charlie Wright, BSc (Hons), SVN, discusses the cat's experience of the veterinary visit

It is well known that a visit to the veterinary practice can be a very a stressful event for cats.

In fact it has been reported to be one of the most common reasons for owners not taking their cat to the vets (Volk *et al*, 2014). The reason this environment can be so stressful for cats is due to their behavioural needs. Cats have a fundamental need to have control in their environment and to be able to avoid stressors. Unfortunately, as cat owners and cat professionals we may not always be providing cats with sufficient environmental control or the option of avoidance, and the veterinary environment is a prime example of this.

Most cats are taken to the veterinary practice because they are unwell and as such, are already likely to be experiencing negative emotions such as pain and anxiety. Cats are picked up by their owners, put into a carrier and taken on a car journey to the veterinary practice. Here, they have to endure sights and smells of other animals in the waiting room, before being examined in an insecure and often unfamiliar environment, which they have little or no control over. For the cats that are admitted to the veterinary practice and confined to a hospital cage, this stressful experience continues. While some cats will cope with hospitalisation better than others, as cat professionals there are things that we could be and should be doing, to make this experience as pleasant as possible for all of our feline patients.

The implications of a stressed hospitalised cat

Not only does stress have a negative effect on the cat's welfare during their stay, it can also create difficulties in handling, induce hyperalgesia, slow down recovery and limit interpretation of physiological parameters (Levensaler, 2014).

Physiological parameters such as rectal temperature, heart rate and respiratory rate are frequently used to assess the condition of hospitalised patients. The parameters are influenced by the hypothalamus-pituitary-adrenal (HPA) axis and the sympathetic nervous system, the systems that are activated as a result of the physiological stress response. In cats, elevated blood pressure as a result of stress from the veterinary environment has been particularly well documented and this is often referred to as the 'white coat-effect' (Belew *et al*, 1999). Difficulties in interpretation of these presents risk of disregarding a medically significant abnormal reading by putting it down to stress, or by misdiagnosing from an abnormal reading that is not medically significant but rather is an effect of stress (Soares *et al*, 2012). A good way to reduce this risk is to minimise stress by implementing stress reduction methods in the veterinary practice.

Stress reduction for hospitalised cats

An effective way of reducing stress of confined animals it to provide them with choice (Mills *et al*, 2013). For cats, an important choice is the being able to retreat from stressors (Rodan and Cannon, 2016). When a cat is caged, this appears to be in the form of hiding. Studies have found that caged cats that are not provided with sufficient opportunity to hide, show hide-seeking behaviours such as shredding newspaper or attempting to hide behind litter trays (Gourkow and Fraser, 2006; Vinke *et al*, 2014). Current literature recommends providing cats with opportunity to hide by either providing them with a box inside their cage, or by partially covering the cage front with a towel (Little, 2012; Herron *et al*, 2014; Horwitz and Little, 2016; Rodan and Cannon, 2016). Studies that have investigated

the efficacy of providing a box inside the cage have generally found that cats will use the box a large proportion of the time and that it appears to reduce stress (Ellis *et al.*, 2016; Skanberg, 2014; Vinke *et al.*, 2014; Kry and Casey, 2007). As for partial towel cover method however, there is an absence of research and as such no evidence for its efficacy in providing sufficient hiding opportunity and reducing stress in hospitalised cats. This lack of current evidence brings about two questions:

1. Is the partial towel cover to the front of the cage sufficient in providing hiding opportunity to cats and reducing their stress?
2. If so, how effective is this method in comparison to the provision of a box?

In the final year of my undergraduate degree in Animal Behaviour and Welfare, I undertook an Honours research project and used this as an opportunity to investigate these two questions.

Methodology

Over a three-month period, 42 healthy cats were admitted to a veterinary practice for routine neutering and were randomly allocated to one of three treatments;

1. Provision of a box within the cage (As shown in Figure 1)
2. Provision of towel partially covering the front of the cage (As shown in Figure 1)
3. Control – no change to the normal set up.

Following admission, behavioural observations were taken for 60 minutes and data was collected every 15 minutes to record four criteria.

- Kessler and Turner's (1997) cat-stress-score (CSS): A descriptive scoring system based on body language, posture and vocalisation, ranging from 1 (fully relaxed) to 7 (terrified)
- Where in the cage the cat was located (front, middle, or back)
- Presence of hide-seeking behaviour: This behaviour presented as frequent repositioning into corners of burying themselves under blankets/newspaper, as demonstrated in Figure 2, but did not include hiding in the box or behind the towel cover
- Use of treatment: Hiding in the box or behind the towel cover



Results: The effect of hospitalisation

It may be no surprise that on average cats spent significantly more time at the back of the cage (71%) ($P < 0.001$). The mean CSS of all cats was 3.32, which falls under 'weakly tense' (Kessler and Turner, 1997). There was a significant difference in CSS between the treatment groups ($P = 0.020$). Control cats had the highest mean CSS consistently at each sample point. There was also a significant difference in hide-seeking behaviour between the treatments ($P = 0.016$), and a correlation was found between hide-seeking behaviour and CSS within all groups ($r_s = 0.673$). This was stronger when tested solely in control cats ($r_s = 0.829$). The absence of a perfect correlation is due to some cats that had high stress scores but not displaying 'hide seeking' behaviour. One explanation for this may be that the cats that appeared stressed but did not hide-seek were experiencing behavioural inhibition, something that can occur under extreme stress (Bradshaw *et al*, 2012). Nevertheless, the correlation indicates that in general, the higher that CSS, the more hide-seeking behaviour a cat will show. Other research has found hiding behaviour to correlate to reduced sickness behaviour (Skanberg, 2014), further indication that hiding is coping behaviour for stress. The frequency of hide-seeking in control cats (34%) is similar to the frequency that Vinke *et al* (2014) found cats to be hiding behind their litter tray. These results demonstrate that when confined to a cage, cats will still display hide-seeking behaviour even in the absence of sufficient hiding opportunity, suggesting there is a strong motivation to hide.

Results: Provision of the partial towel cover

Towel cats showed less frequent hide-seeking behaviour (16%) and had a lower CSS (4.25) than control cats, as shown in Figure 3, but neither of these differences were statistically significant. However, towel cats spent significantly more time at the front of the cage (39%) than the other treatment groups ($P = 0.019$), which could suggest they were using the towel cover to hide behind. However, the absence of a correlation between towel treatment use (30%) and front cage position (39%) does not support this. As such, the results do not provide evidence that the partial towel cover is a sufficient in providing hiding opportunity and reducing stress of hospitalised cats.

Fig 3

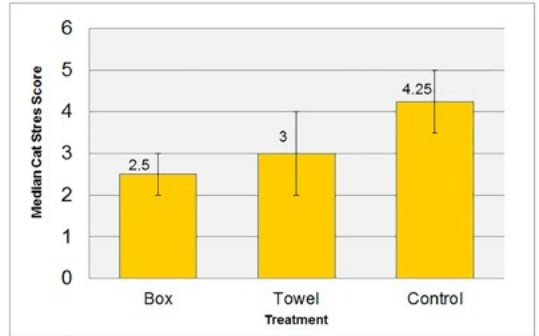


Figure 3 Median Cat Stress Score of treatment groups over 60 minutes. (Source: author's own)

Fig 4



Results: Provision of the box

Box cats had a 2% frequency of hide-seeking behaviour and, as shown in Figure 3, had the lowest CSS of the treatment groups (2.5). This difference was only significant between box cats and control cats ($P = 0.007$). However, the difference in treatment use between box cats (68%) and towel cats (30%) was significant ($P = 0.027$), with the majority of cats choosing to use the box as a hide, like the cat in Figure 4. This could be why box cats spent a large proportion of time at the back of the cage (70%), but again this was not significant in comparison to the other treatment groups and did not correlate to use of the box. Overall, cats that were provided with a box had the lowest mean CSS, displayed the least hide-seeking behaviour and used the box more than the partial towel cover appeared to be used.

Conclusion

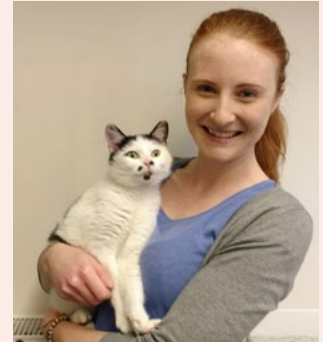
The study demonstrates the relationship between stress of caged cats and presence of hide-seeking behaviour. Cats will show hide-seeking behaviours even in the absence of sufficient hiding opportunity and will try to use what they can to evade the stress of unfamiliar confinement by hiding. While the partial towel cover method is recommended in literature this study failed to find evidence that it significantly reduces cat stress nor that it is as sufficient as the box in providing hiding opportunity. The results did however, like other studies, suggest that providing a box helps reduce cat stress and provides sufficient hiding opportunity. Therefore, when considering choice and hiding opportunity as stress reduction method for feline patients, it is important to consider whether or not what we are providing them with is having the desired effect. Providing a hospitalised cat with a box to hide in is likely to give them more choice and therefore more control over their otherwise rather threatening environment.

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Charlie Wright

BSc (Hons), SVN



Charlie is training as Student Veterinary Nurse at an ISFM Gold status Cat Friendly Clinic in Shropshire and is also working towards her application as a Certified Clinical Animal Behaviourist (CCAB) under ASAB.

The unowned cat population and human behaviour change

Jane Clements, RVN and Head of Neutering at CP introduces 'Cat Watch' and what information can be gained from it

While we know there is a large stray and feral population in the UK, there are currently no accurate figures for the number of unowned cats.

Without knowing this figure and without an understanding of the density of these populations, along with the welfare issues they face, we are not in a good position to target our activities in order to best help these cats that, in many ways, have the greatest welfare need.

Unneutered cats, especially in urban areas are often the cause of nuisance for communities; this can mean that the cats are devalued in society which could potentially lead to cruelty issues or just ignorance of the cats, leaving them to fend for themselves and breed continually. We would like to see neutered, managed populations of 'community cats' which is a much better situation for the cats and better for communities. Clearly understanding how people view and feel about these cats, as well as an understanding about their interactions with them is crucial to achieving this aim. In many cases, some human behaviour change is needed in order to positively alter the care outdoor living cats receive.

In September 2016, we launched the first ever in-depth study of this population with the first pilot in Bulwell Nottingham – Bulwell Cat Watch.

Bulwell was selected as the first pilot area as it is a very deprived ward of the UK, scoring as such in government multiple deprivation figures, according to 2011 census data. Where we see multiple deprivation we would also expect to see stray cat populations, so we wanted to test this hypothesis.

Research phase

Bulwell is a ward of Nottingham, with approximately 8,000 households. The research phase started with a door to door survey of 776 households. The survey

questions were designed to give us an understanding of the residents' knowledge of cats in the area, their understanding of feline reproduction and some questions taken from values modes (a psychographic classification system based on an individual's beliefs and motivations).

The results of the survey gave us a baseline with regards to the numbers of unowned cats people thought there were near where they lived, their current attitudes towards the cats and some insight into how best to frame our messages throughout the project.

In conjunction with the survey we also ran stakeholder and community meetings, resident focus groups and stakeholder interviews. Building relationships with key stakeholders such as the neighbourhood community officers, community police and respected community volunteers and residents was also crucial to this phase.

Building relationships with key stakeholders such as the neighbourhood community officers, community police and respected community volunteers and residents was also crucial

Citizen science and engagement activity

The project was also based on citizen science methodology, therefore we had a number of different ways people could report a possible stray cat to us. An app was developed by Edina at Edinburgh University, a Facebook group was launched, as well as CP presence in community 'hubs' and at events.

This was essential to getting the cat intelligence we needed and also to starting the journey of behaviour change towards the attitudes and care of the outdoor cats.

We were able to map the streets which were reported as 'hot spots' and this really enabled us to see the densities of the populations and meant we could start a programme of intensive outreach to find carers of cats and start a Trap-Neuter-Return programme. Any strays that were friendly domestic cats; often abandoned or lost with no identification were taken into one of our adoption centres for rehoming.

Results

At the end of the first three months, we completed an initial evaluation of the project. 529 cats were reported to us in this time, and after de-duplication we estimated figures of 200 stray cats as a minimum and 400 as a maximum in the ward.

The community responded positively to the project and comments included: "It is making us aware to look out for and look after stray cats. Didn't know there was so many strays", "Some people don't know what to do about stray cats or how to get them help" and "Encourages community spirit and helps bring people together".

55% (n=35) of people felt they were more aware of cat welfare issues because of the project, with 41% indicating they would do more to look after unowned cats in Bulwell.

Since December 2016, we have been working on targeted TNR and rehoming. We have neutered 130 cats and rehomed 48. An evaluation of the impact on the population and further outputs will be conducted early 2018.

We believe we have achieved a better understanding of the unowned population in Bulwell and we have enabled cat carers to manage and maintain these cats in the community. Neutering will achieve a healthier, stable population which

decreases the nuisance aspect for people who may not be cat lovers, and this means the cats can be seen as more of an asset to the community, as residents and mousers!

Our Community Neutering Officers really feel they have become part of the community now and they have developed strong relationships. One of the key partnerships is our work with the Nottingham Probation Trust. The Trust builds cat shelters for us, which we can place in gardens to keep the cats warm in the colder seasons.

Case studies

Jeffery

We found Jeffery during the intensive door-knocking phase of hotspot streets. All residents living in the street reported that he had been abandoned around three years ago. Almost all residents were kindly feeding him, but nobody felt they could offer him a home, so he was living outdoors. Jeffery is very friendly and was desperate for love and a warm home when we found him.

He was clearly still struggling to cope without a permanent home, as he had not adapted well to the stressors and dangers of being an outdoor 'community' cat.

Our Nottingham Adoption Centre was full at the time, so we worked with one of Jeffery's carers and supplied her with a shelter for him in her garden and a supply of appropriate food. In the meantime, Jeffery was placed on the waiting list and soon came into the centre to find a forever home.



Jeffery – living outdoors, as a 'community cat'



Jeffery in CP's Nottingham Adoption Centre waiting to find a new home

Bob's cats

The objective of the project was to get as many reports about strays and ferals as possible and build engagement and trust from the community. From information gained by door knocking and community hubs, one particular colony of feral cats came to our attention.

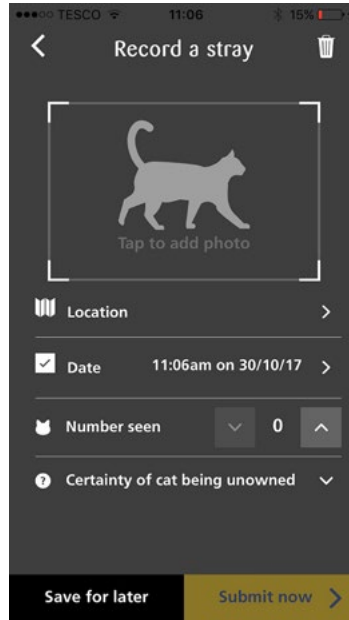
Bob had been looking after feral cats for some time. We were initially unable to speak with him on the doorstep, so we sent a letter explaining all about Bulwell Cat Watch and Bob got in touch with us a few days after receiving the letter.

The trust built with Bob over the months of working with him and his confidence grew with us as he could see the cats being neutered and returned, looking healthy and happy.

After volunteers and staff had been working with Bob for six months we successfully helped neuter 16 feral cats.

Since finishing the colony at Bob's he has been in touch to say all the cats are looking good and are happy and that he would let us know if anymore moved into the area.

The objective of the project was to get as many reports about strays and ferals as possible and build engagement and trust from the community. From information gained by door knocking and community hubs, one particular colony of feral cats came to our attention.



The Cat Watch app, used to register and identify suspected stray cats

What next?

Following on from the very positive results in Bulwell, we will be conducting a further four pilot areas. Everton in Liverpool has already been launched, with Little Horton in Bradford to follow in November. Next year will see the launch of Luton and Beeston, (Nottingham) Cat Watch projects. These wards have different socio-demographics and so the aim will be to see how these perform, looking to the possibility of further areas and eventually extrapolation of the data to enable national estimates of the urban unowned population and targeting of our resources to help those cats most in need.

The current Cat Watch app (developed by Natural Apptitude) can be downloaded from on Apple or Android platforms by searching for 'Cat Watch'.

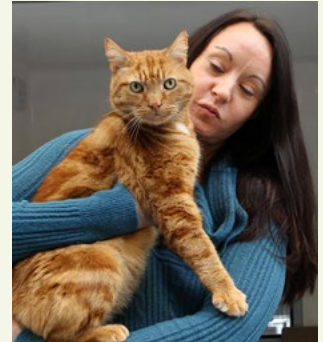
We also have a farm cat stream to the project and the pilot study of this research is due to be published soon.

If you live or work in any of the project areas and would be interested in being involved, we would love to hear from you!

Please email jane.clements@cats.org.uk

Jane Clements

RVN



Jane qualified as a Veterinary Nurse in 2002 and since then has lectured in veterinary nursing and animal care, most recently at Hartpury College in Gloucestershire. This was followed by a four-year period with the Guide Dogs for the Blind Association, working in dog welfare. A passion for animal welfare brought Jane to Cats Protection in 2012 and she is currently CP's Head of Neutering. Jane has a special interest in using human behaviour change theories and models to increase the impact of projects for the benefit of cat welfare.

Approaching feline coronavirus and feline infectious peritonitis on a limited budget

Samantha Saunders BSc (Hons) BVetMed MRCVS takes a pragmatic look at FIP and its diagnosis

Feline coronavirus (FCoV) is a highly prevalent infectious pathogen, particularly in multi-cat environments (Drechsler et al, 2011). FCoV is transmitted by the faecal-oral route, often via fomites, and leads to two distinct disease types: a transient to persistent enteric disease that usually involves only mild clinical signs and the fatal systemic disease known as feline infectious peritonitis (FIP). Around 5-10% of cats infected with FCoV will develop FIP (Addie et al, 1995). Although any cat can develop FIP, those at the highest risk are less than two years of age and male (Riemer et al, 2015). Pedigree cats in general may be at an increased risk of FIP, but no consensus exists as to which specific breeds are most susceptible (Norris et al, 2005, Pesteanu-Somogyi et al, 2006).

Pathogenesis

It is thought that, in most cases, a cat is initially infected with a mild form of FCoV that then mutates within that cat to a more virulent form of FCoV capable of causing FIP (Kipar and Meli, 2014). However, this is an oversimplification as there is no viral mutation (or set of mutations) that can consistently distinguish a mild from a virulent FCoV. Other factors determine the course of FCoV infection in a cat, including the immune response of that cat to the virus and viral load. The best explanation we currently have for the pathogenesis of FIP is as follows:

1. After initially infecting the epithelial cells lining the small intestine, the virus moves into monocytes.
2. Once in monocytes, the virus acquires mutations that allow it to replicate sustainably in this cell type.

3. The monocytes, activated by replicating virus, interact with vascular endothelial cells and attract other leukocytes, forming pyogranulomatous lesions.

Antibody-antigen complexes are no longer thought to be involved in the pathogenesis of the disease (Kipar and Meli, 2014).

Though outbreaks of FIP undeniably occur, the reasons behind them are not fully understood. Some of the factors that are thought to contribute to outbreaks are virulent strains of FCoV that more readily cause FIP, high viral load and genetic susceptibility to FIP (Drechsler et al, 2011).

Clinical presentation

Pyogranulomatous lesions in and around vessels lead to the vague and wide-ranging clinical signs seen with FIP. As a result, signs vary depending on which organs are affected. Commonly involved sites are the peritoneum, pleurae, abdominal viscera (Figure 1), mesenteric lymph nodes and central nervous system (Kipar and Meli, 2014), leading to clinical signs including ascites, dyspnoea, uveitis, ataxia and seizures. More general findings include persistent pyrexia that is refractory to antibiotics, weight loss (Figure 2), inappetance and lethargy (Riemer et al, 2015).

Pyogranulomatous lesions in and around vessels lead to the vague and wide-ranging clinical signs seen with FIP



Figure 1: Intestine taken from a cat with FIP at post mortem, showing multiple granulomatous lesions. Image courtesy of The Feline Centre, Langford Vets, University of Bristol.



Figure 2: A young pedigree kitten with FIP, showing weight loss and a generally unthrifty appearance. Image courtesy of The Feline Centre, Langford Vets, University of Bristol.



Figure 3: A sample of effusion fluid taking from a cat with FIP, demonstrating a typical yellow, clear, frothy appearance. Image courtesy of The Feline Centre, Langford Vets, University of Bristol.

FIP is often classified into 'wet' and 'dry' forms, with the former involving serosal inflammation, effusions and a shorter survival time, and the latter involving solid lesions and a longer survival time. However, it is more realistic to consider these two presentations the extremes of a spectrum, with most cases sitting somewhere in the middle (Kipar and Meli, 2014). Rare cases have been reported of FIP presenting as lesions restricted to the mesenteric lymph nodes and/or intestine (Harvey et al, 1996, Kipar et al, 1999), but it is unknown whether such cases commonly arise and are simply missed or misdiagnosed.

Diagnosis

It is important to bear in mind that definitive ante-mortem diagnosis of FIP is extremely difficult, even with an unlimited budget. In a situation where finances are limited, a strong presumptive diagnosis is a reasonable aim.

Typical changes on routine haematology and biochemistry are mild to moderate non-regenerative anaemia, microcytosis, lymphocytopenia, neutrophilia with or without left shift, hyperbilirubinaemia, hyperglobulinaemia, hypoalbuminaemia and an albumin to globulin ratio of less than 0.8 (Riemer et al, 2015), though these findings are neither present in all cats with FIP nor unique to FIP. Markedly elevated alpha-1 acid glycoprotein (greater than 1.5 mg/ml) can support a diagnosis of FIP, but this acute phase protein can be elevated with other inflammatory conditions (Giori et al, 2011).

The presence of a characteristic effusion, particularly in both the thoracic and abdominal cavities, is very suggestive of FIP, so using ultrasonography to look for and sample fluid is worthwhile even where effusion is not apparent on physical exam. Typically, an FIP effusion is clear to cloudy, yellow and viscous (Figure 3) with a high protein content (greater than 35 g/l) and low cellularity (fewer than 5,000 nucleated cells/l; predominantly macrophages and neutrophils) (Addie et al, 2009). Rivalta's test is a quick, cheap, in-house test that can be performed on effusions, but its use is limited as it is not specific for FIP and interpretation of the result is very subjective (Fischer et al, 2013). An effusion albumin to globulin ratio of less than 0.4 (Shelly et al, 1988) and alpha-1 acid glycoprotein

level of greater than 1.5 mg/ml (Hazuchova et al, 2016) support a diagnosis of FIP.

Immunohistology, immunocytology and reverse transcription polymerase chain reaction (RT-PCR) are the methods available for direct detection of the virus (as opposed to detection of changes associated with disease). Immunohistology carried out on surgical biopsies of affected tissue is considered the gold-standard test for diagnosing FIP, but in many cases it is neither ethical nor financially viable to carry out surgery on a sick cat. Unfortunately, the sensitivity of immunohistology is drastically decreased when carried out on fine needle aspirate or tru-cut tissue samples as lesions may be missed (Giordano et al, 2005). Immunocytology can be carried out on effusion or cerebrospinal fluid, but the test can result in both false positives and negatives (Felten et al, 2016). RT-PCR is a highly specific (though not infallible) test that can give useful information when carried out on effusion fluid (Doenges et al, 2016b) and, in patients with neurological signs, cerebrospinal fluid (Doenges et al, 2016a). However, its cost can be prohibitive where finances are limited. The use of RT-PCR on blood is not recommended due to low sensitivity and specificity (Doenges et al, 2016b), and, where a tissue sample is available, immunohistology is superior to RT-PCR. Methods combining RT-PCR and sequencing (eg Idexx FIP Virus RealPCR™) offer no advantage over RT-PCR alone (Felten et al, 2017) and cannot be recommended.

Detection of anti-FCoV antibodies in the serum, effusion fluid or cerebrospinal fluid cannot be used to diagnose FIP because positive titres are frequently found in healthy FCoV-infected cats and negative results are possible in cats with FIP (Hartmann et al, 2003, Boettcher et al, 2007). Similarly, detection of virus in the faeces by RT-PCR demonstrates only a cat that is shedding FCoV and gives no information about FIP.

A sensible approach for the diagnosis of FIP on a budget would involve haematology and biochemistry (including alpha-1 acid glycoprotein), effusion fluid analysis, effusion fluid RT-PCR (if financially viable) and cerebrospinal fluid RT-PCR (if financially viable and neurological signs are present). Taken in the context of signalment, history and physical exam, these tests support a strong presumptive diagnosis of FIP.

Treatment

There is currently no proven effective treatment for FIP. The kindest thing that can be done for a cat in a shelter setting is to euthanase on diagnosis of FIP. Where a cat is in a home the guardians will often want time with the cat to come to terms with the diagnosis prior to euthanasia, and indeed some cats with FIP can have a good quality of life for many months prior to succumbing to the disease. This is perfectly acceptable if the cat's welfare is not compromised and support can be provided for the interim period (eg frequent check-ups, nutritional support), but care must be taken not to offer false hope.

Prevention

Since FIP is invariably fatal and there is no effective treatment for it, we should be aiming to prevent the disease wherever possible. Efforts to prevent FCoV infection in the first place are unlikely to be successful, particularly in a shelter setting, since the virus is endemic in most populations. Therefore, a more practical aim would be to reduce the risk of FCoV-infected cats developing FIP. Frustratingly, the stressful events known to precipitate FIP in many cases (adoption, vaccination and surgery) are necessary for the cat's wellbeing so cannot be avoided, but other risk factors (upper respiratory tract infection and time spent in a shelter) (Riemer et al, 2015) can be reduced by following best shelter practices for decreasing stress and maintaining a hygienic environment (see the Association of Shelter Veterinarians 'Guidelines for Standards of Care in Animal Shelters'). In a home setting, Addie et al (2009) recommend minimising the number of cats in a household, keeping well-adapted sub-groups of no more than three cats, maintaining hygiene standards, allowing outdoor access and providing multiple litter trays that are cleaned regularly and kept away from food bowls.

When FIP occurs in a multi-cat household, no special measures need to be taken for in-contact cats as they will have already been exposed to the virus (Drechsler et al, 2011). For guidance on how to manage in-contact cats in the face of an FIP case or outbreak in a shelter setting, see the Cats Protection 'Feline Coronavirus and Feline Infectious Peritonitis Procedures'.

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Samantha Saunders

BSc (Hons) BVetMed MRCVS



After qualifying from the Royal Veterinary College in 2013, Samantha worked as a vet in a small animal rescue centre in London and spent time as an anatomy demonstrator at the RVC. She is now undertaking a PhD at the University of Bristol, building tools to further our understanding of feline coronavirus and FIP. Her interests include feline medicine, infectious disease and shelter medicine.

All the latest news from Cats Protection

Scottish Government's review of animal sanctuaries

In September, the Scottish Government announced its intention to prepare legislation for a modern system of registration and licensing of animal sanctuaries and rehoming activities, allowing for independent accreditation of applicants to reduce the burden on local authority inspectors. Cats Protection welcomes this announcement and hopes it will lead to the creation of minimum standards within the Scottish industry similar to those which already exist in England through the Association of Dogs and Cats Homes (ADCH) code of practice.

This review will be followed by a review of licensing for dog, cat and rabbit breeding, dealing and selling so that conditions in breeding establishments in Scotland can be properly controlled and breeders identified when advertising animals for sale. Again, Cats Protection welcomes this. Updating pet vending laws in Scotland will be a huge step towards safeguarding the welfare of cats and other pets bred for sale. This follows a similar review for England, carried out by DEFRA in 2015/2016 and Cats Protection is involved in advising on the content of new regulations governing England.

Evidence of cats entering the UK with zoonotic diseases. Can you help?

Have you or anyone in your practice treated a **cat which has entered the UK in the last year** with ticks or tapeworms? We need to gather evidence from across the UK to support our work calling for the reintroduction of tick and tapeworm treatment for cats entering the UK. We are looking for cases of cats that were infected with tapeworm *Echinococcus multilocularis* and/or with the tick borne disease leishmaniasis which is also zoonotic. We will be raising this issue with the Westminster Government as part of our work to ensure that Brexit takes opportunities to enhance public safety and animal welfare.

How frequent are these cases, what types of ticks do you see most frequently and are there any particular difficulties in treating cats in these cases? Specific examples are always really helpful. If you are able to provide any information, please could you kindly email our Advocacy & Government Relations team – campaigns@cats.org.uk



BVNA congress 2017

Seven CP members of staff from within Veterinary, Learning & Development as well as Neutering Departments attended this year's BVNA congress and manned the CP stand.

A competition with the chance to win one of five cat hides proved ever popular and received just under 350 correct entries.

Approximately 800 of CP's *The Behaviour Guide* were handed out to any delegate interested in cat behaviour and will hopefully help further an understanding of cats, their often enigmatic behaviour and in particular their welfare needs.

Delegates also had the chance to sign up to receive the *CP Clinic* newsletter and it is exciting to see this number steadily rising as well.

Lastly, awareness of our Veterinary Nursing Community Neutering volunteer role was raised, leaflets containing further details were handed out and any interested parties were asked to get in touch.



Information for vets webpage gets a new look

This section of the CP main website contains documents, flow charts, useful links and information aimed at vets and nurses providing veterinary care for cats in the care of Cats Protection.

The guidance applies veterinary shelter medicine principles to issues not infrequently faced by CP. The information is not a substitute for specific clinical judgement and veterinary advice for individual cats, as it is appreciated that all cases are different. The guidance and protocols do not translate to owned cats, where husbandry, infectious disease risks and feline stresses can differ significantly.

Hopefully, the new layout will make it easier to navigate these pages and find the required information.

Sections include:

- Vet protocols and resources
- Prepubertal neutering
- Vet products and discount schemes
- Feline Fort (cat hide)
- Understanding Feline Origins – counting towards CPD!
- CP Clinic articles – last two 2017 issues

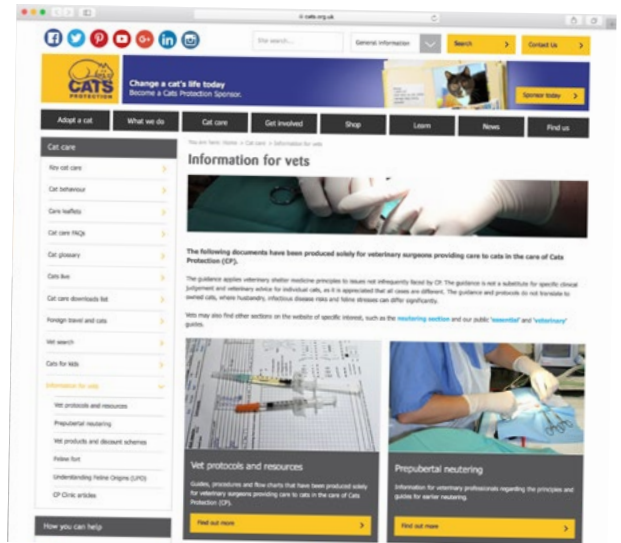
Link to Information for Vets section:

www.cats.org.uk/cat-care/vets-info

Vets may also find other sections on the website of specific interest, such as the neutering section and our public 'essential' and 'veterinary' guides, which can be useful as additional client information in a clinic setting.

www.cats.org.uk/cat-care/care-leaflets/essential-guides

www.cats.org.uk/cat-care/care-leaflets/veterinary-guides



Tyneside Adoption Centre – a warm welcome for homeless cats

Our newest adoption centre is nearly ready to welcome its first cats.

After the foundations were laid in January of this year, our brand new Tyneside Adoption Centre is very nearly ready to open its doors. With 48 modern uPVC pens, isolation wing and Training & Education Room, the centre is the first new facility built by Cats Protection since Warrington Adoption Centre and Gildersome Homing Centre back in 2013.

Better for cats, better for visitors

Starting from scratch allows us to build the centre, with the welfare of the cats at the forefront of plans. Special planting schemes around the pens have been designed to attract wildlife, providing stimulation for cats in the centre's care and a dedicated isolation wing to minimise infectious disease outbreaks.

The centre's design is also welcoming for people, with a large, airy reception area. A Meet and Greet room allows people to meet cats in a relaxed setting, giving a truer reflection of its character and a far better chance of being rehomed.

The new centre will help the numerous branches already working in the area to support even more cats in the North East. We hope it will rehome around 500 cats a year, while also helping to raise the profile of our work around the local area.

Pre-clinical EMS placements

Any vet or vet nurse students can now complete their pre-clinical Extra Mural Studies (EMS) placements with Cats Protection.

At our CP adoption centres (AC), students will have the opportunity to gain a whole host of skills and experiences as part of their placement while making a huge difference to cats and kittens.

If you are a vet or vet nurse student, you can complete a minimum of two weeks with Cats Protection and will be supported to develop many fundamental skills and the knowledge you need to succeed and make this placement a great start to your veterinary career.

Throughout your placement, you will develop animal handling, husbandry and communication skills. You will be introduced to CP's minimum veterinary standards (MVS) and the principles of shelter medicine and learn about the importance of kitten neutering and population control. You will get the chance to meet and learn from our amazing team and will also have access to Cats Protection's online learning platform and resources on topics such as cat behaviour, infectious diseases and their control, cat care and welfare and our *Veterinary Guide*.

Check out our leaflet for more information:
www.cats.org.uk/uploads/documents/VOL_2459_VetStudent_Leaflet_v3.pdf

Contact information:

If you are interested in completing your pre-clinical EMS placement with Cats Protection or would like further information, please do get in touch with us! You can visit your local adoption centre and have a chat with the manager or give them a call.

T: 03000 12 12 12

E: volunteering@cats.org.uk

W: www.cats.org.uk/find-us





We'll protect him while his owner seeks safety.

We know that for many victims of domestic abuse, fleeing violent relationships is made impossible simply because they cannot bear to lose their pets.

That's where Cats Protection steps in. Through Paws Protect we take in and provide safe refuge for victims' cats until their owners are in a position to reclaim them. Since 2004, we have helped more than 400 cats and 225 families escape domestic abuse.

By making a donation today you can help us to support even more.

We regret that this service is currently only available to adults fleeing domestic abuse within the South East.

Text **CATS88** to **70660** to donate £3 to Paws Protect (Text costs £3 plus network charge)

Text **KITTEN88** to **70660** to donate £5 to Paws Protect (Text costs £5 plus network charge)

Cats Protection receives 100% of your donation. Obtain bill payer's permission. Supporter Services 0800 917 2287.

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Paws Protect
Cat fostering for people fleeing domestic abuse