Continuing Professional Development | Business Success | Clinical Skills

vet 360

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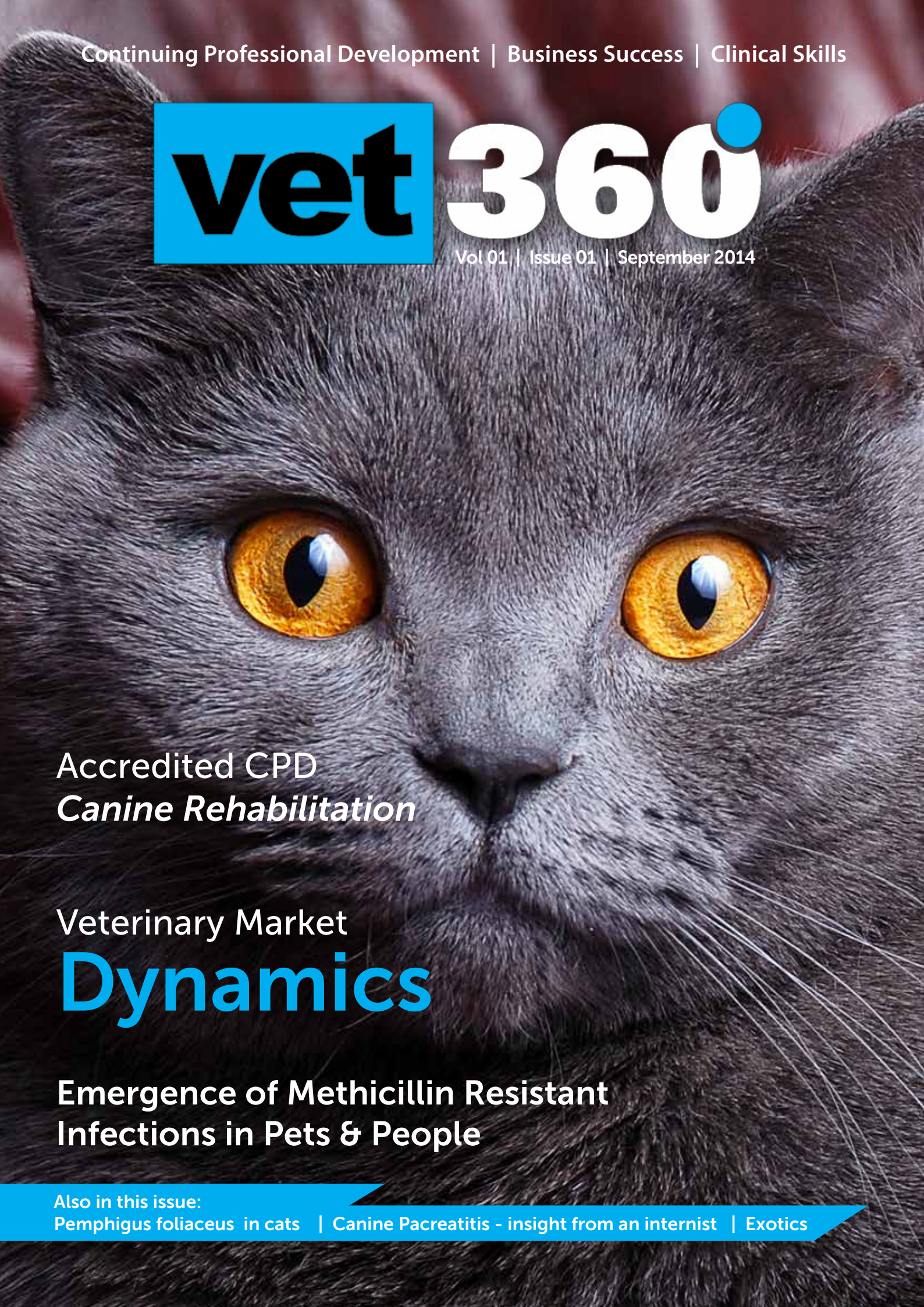

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Canine Rehabilitation

Veterinary Market
Dynamics

Emergence of Methicillin Resistant Infections in Pets & People

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BECAUSE EVERY DOG DESERVES TO BE AN ULTRA DOG

Editor's Note


Dr Liesel van der Merwe

I am very proud to welcome you to this first edition of Vet360. This publication aims to bring information, both veterinary and practice management, into the hands of the veterinarians across the various disciplines, in a concisely packaged format. The publication will initially be distributed bi-monthly in hardcopy and monthly in electronic format. Each edition will feature one CPD accredited article, Journal Updates will feature summaries, by various local specialists, of clinically relevant articles. Companion animal medical and surgical issues will be addressed in short Expert Opinions and lectures. Herd health, food safety, equine practice, exotic animal practice and veterinary business and staff management will also feature in each issue. Our aim is to have an even spread between local expert authors and sourced licensed material. Where licensed material is being used, we will endeavour to get a comment by a local opinion leader to ensure we are taking the South African perspective into consideration. We have two editorial panels – one comprised of specialists in their fields to evaluate magazine content for accuracy, and another panel comprised of forward thinking private practitioners to evaluate the panel for relevance. Together these should keep us on the right track.

This edition contains a CPD accredited article by Dr Megan Kelly on the rehabilitation of dogs with neurological injuries. To complement this, we have made a directory of trained animal rehabilitation therapists as well as training institutions. Currently there are three recognised training facilities/procedures in South Africa: Equine-librium, the course offered by Tennessee University and EquineWorks. Equine-librium College of Veterinary Physiotherapy, based in Plettenberg Bay has a 4-year degree course for dogs and equines and is currently being registered at the Department of Higher Education and Training (DHET). Their graduating year will be in 2014. Tennessee University offers a course in canine rehabilitation (CCRP – certified canine rehabilitation practitioner) which encompasses 1 week of lectures, distance learning, 40 hours of practical work as well as case studies. The course is now being offered at Onderstepoort for the first time from the 25th to the 30th March 2015, and hopefully annually therafter. Students who have already completed their coursework will be sitting their examinations for their CCRP certification this month. Applicants need to be a qualified veterinarian, veterinary nurse or physiotherapist to have sufficient background knowledge to attend the training. Equiworks, based in Nottingham Road, Natal uses the Equinology® system which offers advanced courses in equines and a more basic component in canines. There is a working group to get animal rehabilitation recognised as a paraveterinary profession by the SAVC.

I hope you find the information in this magazine relevant, to the point and easy to read - think of it as consultation room reading while you wait for a client. We would welcome comments and ideas regarding content, format and delivery mode to editor@vet360.co.za.

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Vet360 is a source of current, relevant educational material for practising veterinary professionals in Southern Africa. Published Bi-monthly in hard copy and monthly electronically. Distritubution: Southern Africa, 3000 copies.

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vet360 Advisory Board

VET360 aims to be a leader in the field of continuing veterinary development in Southern Africa by providing veterinary professionals from diverse disciplines with tools to help them meet the challenges of private practice. The magazine aims to make information accessible, both paper and electronic, and provide clinical, business and other veterinary information in a concise form to enable the practitioner to rapidly acquire nuggets of essential knowledge.

Editor

Dr. Liesel van der Merwe BVSc MMedVet (Med) Small Animals

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Market Dynamics

and the State of the Veterinary Profession in the USA

While many American veterinarians focus on the impact of the current economy on financial metrics for their hospitals, it is clear that while the economy might play some role in the current lacklustre performance of many veterinary practices, the root cause of these problems likely preceded the economic downturn by many years.

Many studies have been done on marketplace dynamics and yet it appears that the veterinary profession has been slow to respond, which has put them in a precarious situation competitively.

Some of the most profound findings of these marketplace studies have been the following:

- Pricing of veterinary services may be inappropriate given the ultimate value delivered, and with clients desiring more predictability in veterinary expenses
- There is a discrepancy between preventive care initiatives that practices say they recommend and what actually takes place
- Practices attribute poor compliance to client's unwillingness to pay whereas noncompliance is typically associated more with the practice's failure to make a firm recommendation or to convey the value or importance of a recommendation
- There is opportunity to increase demand for veterinary services, especially in preventive and chronic care, with cats being particularly underserved
- Veterinarians lack the business skills that could result in more appropriate economic success
- The supply of veterinarians does not closely match demand
- The economy impacts veterinary spending, but primarily by exacerbating existing issues

If the contention is correct that the economy is not the main driver of the current veterinary marketplace situation, then it is likely also correct that things will not automatically self-correct as the economy improves, even though any increase in discretionary spending will ultimately benefit small businesses, including veterinary practices.

It appears clear from marketplace studies that veterinary practices need to take more of an interest in business practices, especially reviewing financial data with some regularity, improving client communication skills, and focusing on customer service initiatives. We also need to re-visit our pricing, our marketing, and our payment options to better articulate our role as "solutions providers" rather than just purveyors of veterinary services.

Some of the key performance indicators (KPIs) that are most troubling in the long term may not seem as problematic in the short term. For instance, client visits have been trending downwards over the past decade, at the same time as average client transactions have been trending upwards. While this might seem encouraging that total revenue is keeping pace even in the face of decreasing clinic traffic, when we realize that this is happening because we are trying to extract more and more money from fewer and fewer client visits, one might reasonably question the sustainability of such a model.

There are likely many reasons why clinic traffic is down. Veterinarians are quick to cite the economy as a prominent cause, and this is likely implicated to some extent, but since this trend has been noted over more than a decade, it can't explain it all. No doubt that the internet also plays a role, as much veterinary and peer advice is available for free online. In fact, crowd sourcing of medical information has been commonplace in both human and veterinary medicine for many years.

One profit centre that has seen more than its share of outside competition is dispensing. Many of the medications used by veterinarians are now available at less client cost from retail outlets and pharmacies, so also would lead to less foot traffic in veterinary practices. This is at least partly an inventory selection issue, since many veterinary practices stock human generic medications, or non-prescription over-the-counter (OTC) medications that are available from retail outlets at a fraction of the cost that they are sold by veterinary clinics. As long as veterinarians choose to preferentially dispense products for which substitutes are readily available at substantially lower prices, such client defections will likely continue unabated.

Veterinarians are most competitive in administering injectable medications, and dispensing veterinary-labelled prescription products for both treatments and preventive care. Dispensing human generics when veterinary-labelled products are available is clearly not a veterinary standard of care and doesn't benefit anyone – the pet receives a product for which supporting data are lacking, the client pays an inflated price over what they could have purchased the prescription for elsewhere and, given current veterinary pricing models, the veterinary practice is very unlikely to have made much if any profit. By dispensing over-the-counter products for which substitutes are available elsewhere is not a sustainable dispensing model, and helps build the market of retail competitors who will eventually claim most of those customers. It's important to realize that this is not an efficacy issue, but rather a retail business practices issue. Finally, we are starting to see some prescription products, such as heartworm preventives, being designed exclusively for distribution through retail channels, and if successful, it is likely that this trend will continue. Many other retailers, including supermarkets, are partnering with internet pharmacies to broaden their scope.

Where do we go from here?

As with most businesses, veterinarians need to compete strongly on the basis of their least-substitutable service, which is their knowledge of veterinary medicine and their ability to advise pet owners on the basis of this expertise.

When examining practice revenue opportunities, the best prospects are associated with outpatient care in terms of preventive care (wellness), earlier detection of disease and pre-disease states, better management of chronic conditions, improving communication with clients (and thereby compliance), and enhancing customer service initiatives and making it easier for clients to do business with us.

Profit centres that have been very important to the profession in the past (such as dispensing) will likely continue to be important if basic changes are made to the business model. In the past, mark-ups used have not been in line with standard retail pricing models and have created a challenge for practices trying to compete with retail outlets. Paying associates production (commission) on dispensed items also confounds the prospects for competitive pricing. Changes will be needed such that veterinarians charge appropriate professional fees for professional services and appropriate retail fees for dispensing services, better capturing value where it is provided. Like any other retail business, practices will need to be more selective in the products they stock, emphasizing injectables (which ensure compliance), and veterinary-labelled prescription products. This will become more and more important as additional alternatives enter the marketplace, pushing practices towards limiting their inventory to products that best support their desired standards of care.

For veterinarians to maintain their relevance in a marketplace where medications are available from many sources, pet health care information floods the internet, vaccination schedules have changed, and low-cost and even no-cost veterinary services are available elsewhere (many from not-for-profit agencies), changes in the way veterinary services are delivered will need to be considered.

It is likely that such changes will help create a much more dynamic profession – one focused on preventive and chronic care, public health, integrated medicine and pet owner advocacy. This will be an exciting opportunity for the profession, but also will present a challenge to implementation, since it differs from the current veterinary business model.

Exploiting untapped potential (headroom) has great upside for practice growth. Creating new opportunities is the best option for increasing headroom and the willingness of pet owners to be compliant and follow recommendations is actually directly related to the bond they have with their pet. In turn, facilitating that process relies on communication skills of the veterinarian, to reinforce the value of pets, and the urgency and necessity for their proper care. Clearly, appropriate health care is in everyone's best interest – the pet, the owner, the veterinary practice, and society.

Recommended Reading

Ackerman, L: Five-Minute Veterinary Practice Management Consult, 2nd Edition, Wiley-Blackwell Publishing, 2014.

American Animal Hospital Association – American Veterinary Medical Association Preventive Healthcare Guidelines Task Force: Development of new canine and feline preventive healthcare guidelines designed to improve pet health. J Am Vet Med Assoc, 2011; 239(5): 625-629.

American Animal Hospital Association Compliance Studies, 2003 & 2009. www.aahanet.org

AVMA, U.S. Pet Ownership and Demographic Sourcebook, 2012 www.avma.org

Bayer Veterinary Care Usage Studies, I & II, 2011. http://www.ncvei.org/articles/FINAL_BAYER_VETERINARY_CARE_USAGE_STUDY.pdf

Brown, JP; Silverman, JD: The Current and Future Market for Veterinarians and Veterinary Medical Services in the United States (MegaStudy). J Am Vet Med Assoc, 1999; 215(2): 161-183.. http://www.avma.org/reference/mega715c.pdf

Favaro, K; Romberger, T; Meer, D: Five Rules for Retailing in a Recession. Harvard Business Review April 2009, 64-72.

Lue, TW; Pantenburg, DP; Crawford, PM: Impact of the owner-pet and client-veterinarian bond on the care that pets receive. J Am Vet Med Assoc, 2008; 232(4): 531-540.

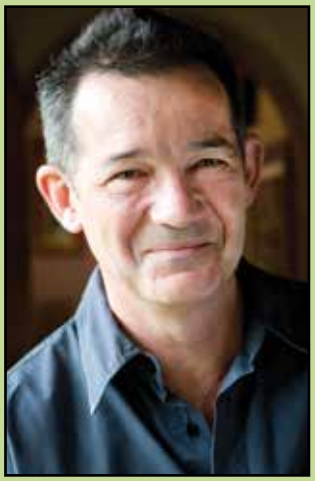
Veterinary Pet Insurance: The VPI®-Veterinary Economics Financial Health Study, 2014 http://vpivetchannel.com/download-white-papers/

Volk, JO; Felsted, KE; Cumming, RF; et al: AVMA-Pfizer Business Practice Study. J Am Vet Med Assoc, 2005; 226(2): 212-218. http://www.ncvei.org/article.aspx-?id=39

Workforce Needs in Veterinary Medicine (National Academies of Sciences), 2012. http://www.nap.edu/catalog.php?record_id=13413

[Dr. Lowell Ackerman is the Veterinary Specialty Director for Zoetis (USA) and the Editor-in-Chief of Five-Minute Veterinary Practice Management Consult]

COMMENT



The Institute for Veterinary Practice members were given advanced warning by Dr Lowell Ackerman at the IVPD Annual Business Congress this year.

This up to date concise article says that the old veterinary model has to change to one which focuses on lifelong care.

We are highly educated with more technology than ever before. Knowledge and diagnostic ability alone are useless without communicating the value of the transaction and developing a deeper relationship with clients whether they are companion animal clients or production animal clients in business.

Understanding the business of veterinary and communicating the value of what we do through our dedicated staff to our clients, makes all the difference.

Dr Larry van Niekerk
Vet Squared Innovet

Vet Squared is a private veterinary consultancy that illustrates the commitment to helping veterinarians and the profession both locally and in Africa. Services include practice valuations and business consulting and core competency – helping veterinarians run profitable practices. Dr Larry van Niekerk's innovative spirit started Vet Squared – capitalizing on his insight into the veterinary profession gained from 32 years in private practice as well as being founder and Chairman of the Institute for Veterinary Practice Development Ltd. Larry has interests in other veterinary businesses notably the Animania Veterinary Group comprising of a veterinary hospital and clinic, online and retail store and ancillary veterinary services such as grooming and training.

SELL VETERINARY CLIENTS ON YOUR SERVICE

By W Dane Foxwell, Andrew Roark, DVM, MS

When was the last time you received sub-par customer service?

I recently ran into trouble with an online travel-booking service and ended up spending hours on hold. I traded emails with people who weren't willing or able to help me and ultimately swore I would drive across the country before åI used that company again. In short, my experience was so bad that I've sworn off that company for good, and if I could hurt their website's feelings, I would. Did I tell my friends of my displeasure? You bet.

Now, think about the last time someone wowed you with customer service. For me, I was in a restaurant last month where the waitress treated me like I was the only person there. She explained what the restaurant was known for, shared what was popular and asked questions about the kinds of dishes I generally like. When the meal was over, I didn't want a to-go box—I wanted a job there. I often tell friends about this restaurant and hope to get back as soon as possible. But here's the interesting part: The food wasn't particularly amazing. It was very good, but there are lots of restaurants with very good food. The way the staff there made me feel, however, was incredible. That's the power of outstanding customer service.

At its core, customer service is simply the pursuit of customer satisfaction. Studies have shown that a satisfied customer is more likely to become a loyal customer, which is important for two bottom-line reasons. First, the cost of attracting a new client can be as much as 10 times the cost of retaining an existing one. Second, satisfied and loyal customers are more willing to pay higher prices than neutral or dissatisfied clients. Not surprisingly, the cost of dissatisfied customers is high. While the average satisfied customer tells eight people about their experience, the average dissatisfied customer tells 222. Given this reality, it's worth investing some time in trying to ensure that pet owners visiting your practice feel as satisfied as possible.

Here are five tips, backed by customer service research, to help ensure your clinic is making a good impression on pet owners.

1 Communicate more

One study showed that the more people who positively interact and communicate with customers, the more likely it is that customers will feel satisfied with their experience. This means pet owners who have positive interactions with two front-desk staff members, three technicians and two veterinarians are more likely to become loyal clients than pet owners who interact with one front-desk staff member, one technician and one veterinarian. Simply having everyone on your staff greet each person they meet can make a difference. A smile and a "hello" is all it takes.

You can get the ball moving on more and better interaction two easy ways. First, for team buy-in, explain this idea at a team meeting and ask for help. Second, simply lead by example. Greet staff members every morning with a positive attitude and encourage them to do the same to each other. This way when they interact with a customer, it will be something they automatically do, rather than something they need to think about.

2 Improve the customer experience

There are three segments of the customer experience: before the service, during the service and after the service.

Before the pet owner comes to your clinic, opportunities to improve the experience include phone calls, wellness care reminders, your website and your social media interactions. During the service, you can boost client satisfaction by minimizing wait times, designing pleasant clinic aesthetics, making sure your team is professionally dressed and, most important, effectively communicating the value of goods and services. After the service, interactions such as follow-up calls and educational emails may further improve the overall pet owner experience. Always remember: The customer's perception of experience quality is more strongly affected by how the experience was delivered than what service was delivered. (Up to a point, obviously. Friendly, timely interactions can't make up for poor clinical care.) Attitude may not be everything, but it makes a huge difference.

3 Exceed expectations

The relationship between expectations and satisfaction is nonlinear, which means that the amount by which you exceed or fail to meet an expectation does not directly relate to how satisfied or dissatisfied a pet owner will be with your service. The fact is, even slightly exceeding a customer's expectations can produce major increases in his or her satisfaction.

On a basic level, customers coming to a veterinary hospital expect very little. They expect to come to a clean building, to be seen relatively quickly and to have their pet's health evaluated by people who treat them and their pets with care and respect. Fortunately, this leaves a lot of room for exceeding expectations. You might do that by offering coffee for customers and snacks for pets, providing up-to-date reading material or doggy toys in the waiting room, or having receptionists greet all clients and pets by name.

With that said, don't confuse providing "little extras" with delivering a great basic service. Getting a cup of coffee is nice, but not if it's served in a dirty waiting room 30 minutes after a client's appointment was scheduled to begin.

4 Put clients' minds at ease

From start to finish: Ease of access, convenience, process ease, familiarity, perception of expertise and the relationship built with the customer are some of the biggest factors in customer satisfaction. Pet owners who must struggle to find your clinic, grapple with their dog while they sign in, comprehend an incomplete explanation of their pets' medical conditions or struggle to form a relationship with your staff won't feel content and relaxed. You can soothe customer nerves and bolster their confidence in your service by simplifying and streamlining the check-in/out processes, clearly addressing all concerns when they come up and assisting with unloading or loading pets from vehicles. The main point here is that small efforts to make the entire process as smooth and relaxed as possible for both the pet and the pet owner can pay off in a big way.

5 Handle unhappy customers quickly and effectively.

Fact: 8 percent of unhappy customers will become loyal customers if they feel their complaint was handled quickly and effectively. That may not sound like much, but the significance becomes apparent when we consider that just a 5 percent increase in customer retention can lead to anywhere from a 25 to 85 percent increase in bottom-line production. When pet owners are unhappy, find some immediate way to show that you hear their concerns and then make things right in a way that quickly and effectively addresses their issue.

Remember that people equate the speed in which we return their phone calls to how important we believe that person to be. Responding quickly, even if it's only to let an angry pet owner know that their complaint has been heard and is being investigated, may mean the difference between having the opportunity to work through a problem and reading about the problem in a negative online review of your practice.

Research on the subject of customer satisfaction has again and again come to the same conclusion: There are major economic benefits to making customers feel satisfied. Beyond the business benefits, there's an upside that's not so easy to measure, but which matters just the same—the pride you and your clinic staff feel in having provided the best possible service to those who came to you for help.

W. Dane Foxwell is a fourth-year DVM student at the University of Missouri College of Veterinary Medicine. Dr. Andy Roark also contributed to this article. He practices in Greenville, S.C. and is the founder and managing director of veterinary consulting firm Tall Oaks Enterprises.

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Growth or decline:
What makes the difference in a veterinary practice?

Here's a hint: It's not the economy, clients' desire for good care, or your level of competition.

By Mike Paul

Depending on what you read, we are either in need of more veterinary schools or dealing with an overcapacity of veterinarians. We're either seeing an increase in pet ownership or a decline in pet ownership, serving a greater number of clients or fewer clients than ever. The failings of our profession are likely to be caused by any or all of these issues; it just depends on the color of your glasses.

The way we interpret veterinary industry studies is also subject to our perspective—whether it's in line with that of organized medicine, manufacturers and suppliers, or deans and legislators in states that "want" a veterinary school. These studies may have statistical validity, but hey, statistics are like a bikini—what they reveal is interesting, but what they conceal is critical.

In the late nineties many practices were economically stagnant. The American Animal Hospital Association (AAHA) and the American Veterinary Medical Association (AVMA) commissioned a study that eventually led to the formation of the National Commission on Veterinary Economic Issues, a group focused on convincing veterinarians to charge more for their services. Unfortunately, the focus on fees said little about perception of value and nothing about client experience. In many cases the cost of veterinary medicine rose but there was little change in the service provided.

Studies upon studies

Perhaps as a result, 10 years later the industry again found itself in an economic backslide. A growing number of discount provider options, the unexpected impact from the Internet and online pharmacies, improper implementation of vaccination guidelines—all of these factors allowed practices to hit a wall. Enter the 2011 Bayer Veterinary Usage Study (Executive Summary of the bayer Veterinary Care Usage study, JAVMA Vol 238 No 10, May 15 2011), which pointed out such factors as a difficult global and U.S. economy, expanding competition from an increased number of care providers and services available, and greater utilization of the Web as a source of information. These factors were easy to understand. We could wring our hands, hope for a turnaround in the economy and take solace in the

knowledge that everyone was in the same boat.

The Bayer study also pointed out three client-driven factors, which included inadequate appreciation of the value of routine preventive health care, increased sensitivity to the cost of veterinary care (i.e., "sticker shock") and poor utilization of feline healthcare services. Each is an actionable item, but the only one that seems to have caught on is the utilization of feline services. Organizations like CATalyst, the American Association of Feline Practitioners (AAFP - www.catvets.com)and International Cat Care - www.icatcare.org (formerly Feline Advisory Bureau) have inspired many practices to make an effort to improve feline care. While veterinarians are certainly not being inundated by cat visits, the numbers are improving. Change is coming, albeit slowly.

Every individual in every type of practice in the industry has been exposed to these same realities and has had opportunity to respond. Every practice was, to one degree or another, looking down the barrel of the same gun. And yet while some practices quaked and even collapsed, others prospered and grew. Why? Here we are, years later, and another study—this one sponsored by the American Animal Hospital Association (AAHA) and IDEXX—has demonstrated some very significant differentiation.

The State of the Industry presentation of the AAHA/IDEXX study was presented at AAHA Nashville. It focused on practice growth and client bonds and reported that in 2013, 27 percent of practices experienced a significant decline in revenues of 4 to 9 percent of their business. That is simply not sustainable. The most successful 23 percent of practices grew 10.7 percent. Most practices stayed basically flat. Interestingly, successful practices were subjected to the same economic and societal realities as less successful practices. Unemployment rates within a region were not so dissimilar. Geographic location, size of practice and even client demographics were shown to be relatively similar from upper Manhattan to Manhattan, Kansas.

Breathing life into the industry

So what distinguishes growers from decliners? The State of the Industry presentation did reveal that to be special we must be exceptional. According to the report, the most important factor in success is not only recognizing the bond owners have with their pets, but also honoring the bond in every aspect of our service. Surveys conducted for the Partnership for Healthy Pets organization indicate that pet owners and veterinarians want the same result—to provide care in the best interest of the pet. We are simply not stating the truth when we bemoan the fact that clients don't want good care. They do not want what they do not value, and they cannot value what wedon't assign value to! We must make certain that each and every member of our staff considers himself or herself a partner in the health of each pet. Staff should communicate the value of your service, not the price.

As the saying goes, "Those who fail to learn from history are doomed to repeat it." That sentiment underlines my belief that there is nothing really new, and we tend to keep repeating our mistakes as individual practices and as an industry. We continue to do what has not been working instead of reinventing the client experience and breathing life into the industry.

Putting everything in place

Mise en place is a French phrase that means "putting in place," and it's most often employed in terms of cooking—that is, setting up your ingredients prior to starting a recipe. As someone who enjoys cooking, I can tell you that arranging ingredients makes things much easier, and failure to plan ahead makes even the simplest task a challenge. In a sense, our profession would benefit from a French cooking lesson. Why not try forward-booking office visits and services so that pet owners know that you're looking ahead? It may be a real shift in thinking to schedule an appointment three (or even 12!) months in advance, but as a successful entrepreneur once told me, "There is an urgency of now."

I believe that having good clients is the key to a successful practice. It is easy to blame clients for our problems, but in reality, we choose the clients we have. Good clients want veterinarians who want what they want—the good health and well-being of their pets. There is no "secret ingredient" in successful practices that's missing from struggling practices—except for a commitment to work and follow through on the things we claim to offer. There is no substitute for exceptional patient care and charging appropriately for that care.

Perhaps more importantly, we must learn to provide exceptional customer care. We must work to make the exception the rule by focusing on the importance of the bond that exists between people and their pets. We must communicate our commitment to that relationship. Now, I know we all do these things some of the time, even most of the time. But the key is to make every customer feel our commitment, every time. We need to be sure that clients get in their car thinking not, "I got what I paid for" but instead "I got what I wanted."

The emergence and prevalence of MRSA, MRSP & MRSS in pets and people

Should you be concerned about getting a form of this stubborn infection from your patients—and vice versa? Here's an overview of this increasingly common and concerning bacteria—consider it MRS 101.

By Kimberly S. Coyner, DVM, DACVD,

Article reprinted with the permission of Veterinary Medicine, December 2012, Vol 107, No 12, Pages 516 – 521, Veterinary Medicine

In the past 15 years, treatment of canine pyoderma and other infections in small animals has been made more difficult by the emergence of antibiotic resistance in staphylococcal bacteria in the form of methicillin-resistant Staphylococcus aureus(MRSA), methicillin-resistant Staphylococcus pseudintermedius (MRSP) and methicillin-resistant Staphylococcus schleiferi (MRSS). MRSA infections have gained much public attention, and as veterinarians we need to understand methicillin-resistant infections and how they relate to our animal patients as well as to pet owners.

Part 1 of this two-part article will give you the information you need to understand methicillin resistance in veterinary practice. Next month in part 2, you'll learn how to diagnose and treat methicillin-resistant skin infections as well as implement measures to reduce the spread of infection.

WHAT IS METHICILLIN RESISTANCE?

Methicillin is a beta-lactam antimicrobial introduced in the 1950s. It is relatively resistant to beta-lactamase, so it was used to treat penicillin-resistant staphylococci. However, bacterial resistance to methicillin emerged soon after its introduction.

Methicillin resistance is mediated by bacterial production of an altered penicillin-binding protein (PBP2a), which does not allow microbial binding of beta-lactam antibiotics. Therefore, methicillin-resistant isolates are resistant to all beta-lactam antibiotics (penicillins, cephalosporins, and carbapenems) and are also frequently resistant to other classes of antibiotics.[1,2] The protein PBP2a is encoded by the mecA gene that resides on a mobile genetic element called thestaphylococcal cassette chromosome mec (SCCmec).

A laboratory diagnosis of MRSP is actually done by testing for bacterial resistance against oxacillin, a similar antibiotic that is more stable for testing purposes.[1,2] For S. aureus, cefoxitin has supplanted oxacillin as the marker for methicillin resistance.

MRSA in people

Staphylococcus aureus is often commensal in humans and is carried in (colonizes) the nasal passages of 29% to 38% of people.[2,3] The prevalence of MRSA colonization in people in the United States is estimated to be 0.8% to 3.5%, but 30% to 40% of clinical S. aureus organisms isolated from human infections are methicillin resistant, and MRSA is now one of the most common nosocomial pathogens in the world.[2,3]

MRSA first emerged in the form of hospital-ac-

BY THE NUMBERS

The MRSA link between people and pets

- In one large survey evaluating colonization of Staphylococcus aureus in 122 households (including 242 people, 132 dogs, and 161 cats), 14.3% of dogs carried MSSA,4.3% of cats carried MSSA, 1.5% of dogs carried MRSA, and 0% of cats carried MRSA. Staphylococcus aureus strains were identical in five of 10 households where S. Aureus was isolated from both people and pets.1
- In a review of nasal carriage of 736 owners and 830 dogs, S. aureus was isolated in 24% of people and 8.8% of dogs; of 17 owner/dog colonized pairs, six were identical.
- In another survey of S. aureus colonization in people and pets from 586 households (in which 7.85% of dogs and cats were colonized with MSSA and 3.41% were colonized with MRSA), the same strain of MRSA was isolated from both people and pets in less than 1% of households.
- In a study of 418 pets belonging to I.S. veterinary dermatologists, 1.9% (8 pets) were colonized by MRSA, and in only one household (2 pets) was concordance between human and animal MRSA strain noted.

REFERENCES
1. Hanselman, BA, Kruth SA, Rousseau J, et al. Coagulase positive staphylococcal colonization of humans and their household pets. Can Vet J 2009;50(9):954-958
2. Boost MV, O'Donoghue MM, James A. Prevalence of Staphylococcus aureus carriage among dogs and their owners. Epidemiol Infect 2008;136(7):953-964
3. Kottler S, Middleton JR, Perry J, et al. Prevalence of Staphylococcus aureus and methicillin-resistant Staphylococcus aureus carriage in there populations. J Vet Intern Med 2010;24(1):132-139
4. Morris DO, Boston RC, O'Shea K, et al. The prevalence of carriage of methicillin-reistant staphylococci by veterinary dermatology practice staff and their respective pets. Vet Dermatol 2010;21(4):400-407

quired infections within a year of the introduction of methicillin, but it was not until the mid-1980s that this problematic pathogen became a steadily increasing clinical problem. In 2003, a national hospital infection surveillance report revealed that 64.4% of healthcare-associated S. aureus infections in intensive care units were caused by MRSA, compared with 35.9% in 1992.[4]

Hospital-acquired MRSA is typically associated with resistance to multiple antibiotic classes in addition to beta-lactams, and it is reported to cause increased morbidity and mortality in people compared with methicillin-susceptible staphylococcal infections, usually associated with bacteremia, pneumonia, cellulitis, osteomyelitis, endocarditis, and septic shock.[5] Identified risk factors for increased transmission of hospital-acquired MRSA include:

- Previous antimicrobial therapy (use of fluoroquinolones and cephalosporins has been linked to the emergence of resistance of methicillin-resistant staphylococci[6,7])
- Immunosuppressive disease4
- Invasive medical instrumentation (e.g. intravenous and urethral catheters, bypass machines, prosthetic devices)[4]
- Surgery[4]
- Hospitalization[4]

In the mid- to late 1990s, methicillin-resistant staphylococcal infections that were genetically different from the hospital-acquired MRSA strains (and often susceptible to non-beta-lactam antimicrobials) were identified in healthy people without prior hospital exposure; since then community-associated MRSA has become an increasing problem.[8] Although most community-associated MRSA infections have involved skin and soft tissue infections, serious invasive infections have also occurred, and the strains responsible for these infections have now entered the healthcare setting, obscuring the line between community and hospital strains.9 Identified risk factors that increase transmission of community-acquired MRSA include:

- Crowded living conditions[4]
- Shared bathing facilities[4]
- Intravenous drug use[4]
- Contact with someone else who is colonized or infected with community-acquired MRSA.4

MRSA in pets

Methicillin-resistant staphylococci have been documented since the 1970s in large animals but was not reported in dogs until the 1990s.[10] The prevalence of S. aureus colonization in dogs and cats is low and, when present, is usually assumed to have originated from an in-contact human.[11-17] Epi-

Methicillin resistant Staphylococcus – the South African perspective

Dr Marijke Henton
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The resistance of bacteria to antibiotics has been a concern for a number of years, but is now far more than just a concern, as the incidence of resistant pathogens and opportunists is increasing expotentially in South Africa.

Methicillin resistant strains of *Staphylococcus* have been isolated from animals for the past 20 years or more, but the increase has been frighteningly rapid over the last few years.

The incidence and disease distribution of resistant strains in South Africa is broadly similar to the incidence in other parts of the world, as quoted in this insightful article, except that *Staphylococcus schleiferi* is rarely found here at present. South African resistant strains are also usually resistant to many other antibiotics.

Tests for oxacillin and cloxacillin resistance were initially based on methicillin, as the result for methicillin resistance was far more accurate for predicting this type of resistance. The current most accurate method of determining resistance is by detecting PBP2a production or the presence of the mecA gene. These tests are too costly and time-consuming for ordinary diagnostics , but they are used by researchers to determine the accuracy of the various commercial laboratory tests for methicillin resistance. There are a number of such tests and their accuracy depends on both the test conditions and the species of *Staphylococcus* involved. Not all laboratories in South Africa use the currently recommended tests. The test preferred for determining resistance in *Staphylococcus aureus* differs from that which is mostr accurate for e.g. *Staphylococcus pseudointermedius*. The accuracy of the various commercial tests is still being compared by researchers, with far more work being done on the human *S. aureus* pathogen than the veterinary pathogen *S. pseudointermedius*.

The research in this article showing that isolates from pets and their owners are often the same, should be another concern for veterinarians. We are all in close contact with our patients, and may bring these extremely resistant strains home to our loved ones.

Antibiotic stewardship is the science of using antibiotics in a responsible manner, and it is imperative that veterinarians and other health care workers adhere to the precepts.

demiological studies generally show that MRSA in pets belongs to the same strains as the dominant regional hospital-acquired and community-associated MRSA (in contrast to MRSA from livestock animals, which usually belongs to unique animal-associated lineages).[18]

Most small animals exposed to MRSA do not develop clinical disease; some become temporarily colonized, and most eliminate the organism. Colonization involves survival of MRSA on the body without any adverse effect. As in people, colonized animals usually show no adverse effects unless risk factors allow for development of clinical infection, including surgery, trauma, skin wounds, and immunosuppression. Optimal sites for MRSA screening in small animals have not been identified, but most references cite the use of nasal, rectal, and perineal swabs for bacterial culture.[11,12,15,16,19]

MRSA in dogs and cats is most frequently cultured from wounds, abscesses, otitis, and pyodermas.[20] In one review of 40 dogs infected with MRSA compared with 80 dogs with methicillin-susceptible S. aureus (MSSA), risk factors identified were receipt of antimicrobial drugs (especially fluoroquinolones and beta-lactams, which increased risk of MRSA by five and three times, respectively) and intravenous catheterization.[21] In a study comparing carriage of S. aureus in 50 dogs with normal vs. 59 dogs with inflamed skin, 16% of healthy dogs carried MSSA, and none carried MRSA. Staphylococcus aureus was cultured in 12% of dogs with inflamed skin, and 17% of these cases were methicillin resistant.[20]

Unlike MRSA in people, which is often associated with increased morbidity and mortality, there does not appear to be a significant difference in patient outcome between dogs infected with MSSA vs. MRSA, possibly because most infections are superficial (pyodermas and otitis) and not invasive. This is an important point to consider when counseling owners of pets with MRSA.[21]

Do pets contract MRSA from their owners?

Potential risk factors for acquisition of MRSA colonization by pets include contact with children and contact with human hospitals (especially if pets are allowed to lick patients or be fed treats by patients).[22] Ownership of a pet by a person in the healthcare field was found to be a risk factor for MRSA colonization of the pets in one study,[15] but not in another.[2] Other studies have investigated the link between people and pets as well (see the sidebar "By the numbers: The MRSA link between people and pets").

Although pets that are colonized or infected with MRSA most likely contracted the bacteria from people (Figure 1), pets may have the capability to be carriers of MRSA and subsequently pass it back to in-contact people, though most of the evidence is circumstantial and cannot definitively prove the direction of transmission.[12,16] In a study from the United Kingdom, MRSA carriage was 7.5% in 120 owners of MRSA-infected pets—much higher than the 1.5% carriage in the general U.K. population.[23]In another report, 47 dogs and 52 cats were sampled in 66 households in which a MRSA-infected human patient resided; 11 of 99 pets (11%) representing nine (13.6%) households were MRSA-positive.[24] In six of these households, the human and animal source strains were genetically concordant. For each day of delay in sampling the pet after the person's MRSA diagnosis, the chance of isolating MRSA from the pet decreased by 13.9%, suggesting that MRSA carriage in pets is temporary.[24]

MRSP: A MORE COMMON CULPRIT IN PETS

While S. aureus is not considered to be a normal flora on dogs, companion animals do normally carry other species of Staphylococcus bacteria that can become pathogenic—S. pseudintermedius (previously known as Staphylococcus intermedius) most commonly and, less commonly, S. schleiferi (see below).[16,19,20,25,26] In recent years, MRSP has

BY THE NUMBERS

MRSP in people

- In 13 owners of dogs with deep pyoderma caused by MSSP, six of 13 were found to carry Staphylococcus pseudintermedius (often the same strain as in their dogs), compared with one of 13 control persons without daily dog exposure. When the same owners were resampled after the clearance of their dogs' infections, they were found to no longer be carriers.1
- In two difference studies, 3.9% to 5.3% of veterinary dermatologists in the United States and Europe were found to have asymptomatic carriage or MRSP.2,3
- At a veterinary teaching hospital in Japan, 6% of 219 veterinarians, students, and staff were found to be carriers of MRSP.4
- In one large survey evaluating asymptomatic carriage of S. pseudintermedius in 122 households (including 242 people, 132 dogs, and 161 cats), 4.1% of people, 46.2% of dogs, and 60.8% of cats carried MSSP, while 0.4% of people, 4.5% of dogs, and 1.2% of cats carried MRSP. Lack of routine hand washing after handling household pets was significantly associated with S. Pseudintermedius colonization in people.5
- In 20 households with a history of an MRSP-positive pet in the past year MRSP was cultured from 4% of owner nasal swabs and from 44% of environmental samples.6 In the same study, in 13 vet clinics with at least one MRSP-positive case in the past year, MRSP was cultured from four of 141 (3%) of veterinary personnel and from 31 of 200 environmental decontamination.6

REFERENCE

1. Guardabassi L, Loeber ME, Jacobson A. Transimssion of multiple antimicrobial-resistant Staphylococcus intermedius between dogs affected by deep pyoderma and their owners. Vet Microbiol 2004;98(1):23-27
2. Morris DO, Boston RC, O'Shea K, et al.The prevalence of carriage of meticillin-resistant staphylococci by veterinary dermatology practice staff and their respective pets. Vet Dermatol 2010;21(4):400-407
3. Paul NC, Moodley A, Ghibaudo G, et al. Carriage of methicillin-resistant Staphylococcus pseudintermedius in small animal veterinarians: Indirect evidence of zoonotic transmission. Zoonoses Public Health 2011;58(8):533-539
4. Ishihara K, Shimokubo N, Sakagami A, et al. Occurrence and molecular characteristics of methicillin-resistant Staphylococcus aureus and methicillin-resistant Staphylococcus pseudintermedius in an academic veterinary hospital. Appl Enviro Microbiol 200;75(15):5165-5174
5. Hanselman BA, Kruth SA, Rousseau J, et al. Coagulase positive staphylococcal colonization of humans and their household pets. Can Vet J 2009;50(9):954-958
6. Van Duijkeren E, Kamphuis M, van der Mije IC, et al. Transmission of methicillin-resistant Staphylococcus pseudintermedius between infected dogs and cats and contact pets, humans and the environment in households and veterinary clinics. Vet Microbiol 2011;150(3-4):338-343

emerged as a clinically important pathogen causing infections in dogs and cats.

Like MRSA, methicillin-resistance in S. pseudintermedius is mediated by PBP2a, which is encoded by the mecA gene. In addition to beta-lactam antibiotic resistance, most MRSP strains are also resistant to other classes of antibiotics.[12,27]

MRSP in people

Staphylococcus pseudintermedius is not considered to be a human pathogen, but it has occasionally been reported to cause severe infections in people,28 and people may be colonized by S. pseudintermedius, in some cases by the same strain of S. pseudintermedius that infects their pets.[29-35]

MRSP in pets

The prevalence of MRSP colonization varies depending on the population studied, with rates of 1.5% to 2% in dogs in the community and dogs admitted to veterinary hospitals16,20 and up to 7% of dogs with inflammatory skin disease (Figures 2A & 2B).[20] The prevalence of MRSP in healthy cats was found to be 4%.[36] As in MRSA in people, risk factors for the development of MRSP in animals include prior antibiotic use and hospitalization; emergence of methicillin-resistance in S. pseudintermedius may be due to selection pressure from antimicrobial use or horizontal spread of resistance factors from MRSA within the community.[16,37-40]

Most clinical reports of methicillin-resistant infections have included superficial and deep pyoderma, otitis, and wound infections. Unlike MRSA in people, there is no indication that MRSP is more virulent than methicillin-susceptible S. pseudintermedius (MSSP), and most reported infections have been treated successfully, though possibly with a longer time to resolution.[41]

For example, treatment outcomes in dogs with methicillin-resistant pyoderma compared with outcomes in methicillin-susceptible cases were evaluated in a study of 123 MSSP and 93 MRSP clinical cases.[42] The study found that most cases resolved (with topical treatment, systemic antimicrobial therapy, or both), regardless of methicillin sensitivity, although some MRSP cases took longer to resolve compared with the MSSP dogs. Corticosteroid administration was significantly associated with lack of resolution of all pyodermas at the first three- to four-week recheck examination.[42]

In a study comparing 56 dogs with MRSP infection with 112 control dogs with MSSP infections (most patients had pyoderma), mortality rate was not significantly different between study groups, and systemic administration of antimicrobials within 30 days before diagnosis of infection was significantly associated with risk of MRSP.[40]

Clinical cure of MRSP does not necessarily equate to microbiologic cure. In a sampling of dogs that initially had an MRSP pyoderma, 26 of 42 (61.9%) were still colonized with MRSP at follow-up, even though the pyoderma had clinically resolved. Additionally, in the same study of 60 dogs with pyoderma that did not have MRSP initially, MRSP was isolated from the skin after treatment in 17 dogs (28.3%).[43]

MRSS: A NEW PLAYER ON THE FIELD

Staphylococcus schleiferi subspecies coagulans is a relatively newly described coagu-

lase-positive staphylococcal pathogen in dogs.[13,20] Staphylococcus schleiferi subspecies schleiferi is a coagulase-negative variant that has been reported to be a normal component of human preaxillary flora and also has been implicated in human nosocomial infections, postsurgical infection, osteomyelitis, and endocarditis.44 This variant can also be pathogenic in animals and is increasingly found in methicillin-resistant infections.[44]

Although S. schleiferi is isolated less commonly in veterinary patients, one study found that S. schleiferi has a higher incidence of methicillin resistance then either S. aureus or S. pseudintermedius.[45] In a study of 225 dogs with S. schleiferiinfections (usually of the skin and ears), the most common underlying cause was atopy, and prior treatment with beta-lactam antibiotics was a risk factor for methicillin resistance. Of the 225 isolates (117 coagulase-negative and 95 coagulase-positive; 13 had no coagulase status reported), 129 (57%) were methicillin resistant, and coagulase-negative isolates were more likely to be methicillin resistant than coagulase-positive isolates.[44]

BY THE NUMBERS

MRSA colonization in veterinary professionals

A variety of studies have shown that MRSA colonization ma be an occupational risk for veterinary professionals:

- At an international veterinary conference, MRSA was cultured from 6.5% (27/417) of attending veterinarians and veterinary technicians; large-animal practitioners were at greater risk of colonization (15.6%) compared with small-animal practitioners (4.4%)
- Another study of 341 attendees at a veterinary surgery conference identified nasal MRSA carriage in 17.3%, with equal rates between small-and large-animal practitioners.
- In a sampling of 171 American veterinary dermatologists and staff, 3.5% were colonized with MRSA; a similar study in Europe and 128 veterinary dermatologists found that 1.6% were colonized. '
- At a veterinary teaching hospital in Japan, nasal samples from 219 veterinarians, students, and staff were cultured, and 9.6% were found to carry MRSA.
- In a study from the United Kingdom, MRSA nasal carriage of MRSA was 12.3% in veterinarians attending MRSA-infected animals.

Equine and large-animal veterinarians have an even higher risk of MRSA colonization, often by strains of equine of porcine origin:

- Screening cultures of veterinary personnel attending an international equine conference revealed that 10.1% were colonized by MRSA (a history of routine hand washing between farms and patients was found to be protective).
- Nasal cultures of 107 personnel at equine farms in Canada and New York State revealed that 13% were colonized with a strain of MRSA uncommon in people but indistinguishable from the MRSA-5 cultured from horses from the same farms.
- Livestock veterinarians exposed to pigs increased the risk of their carriage of livestock-associated MRSA CC398 by 12 times.
- In a German study, 45% of veterinarians caring for pig farms were found to be carriers of MRSA train CC398, which is the porcine-associated strain.

REFERENCES
1. Hanselman BA, Kruth SA, Rousseau J, et al. Methicillin-resistant Staphulococcus aureus colonization in veterinary personnel. Emerg Infect Dis 2006;12(12):1933-1938
2. Burstiner LC, Faires M, Weese JS. Methicillin-resistant Staphylococcus aureus colonization in personnel attending a veterinary surgery conference. Vet Surg 2010;39(2):150-157
3. Morris DO, Boston RC, O'Shea K, et al. The prevalence of carriage of methicillin-resistant staphylococci by veterinary dermatology practice staff and their respective pets. Vet Dermatol 2010;21(4)400-407
4. Paul NC, Moodley A, Ghibaudo G, et al. Occurrence and molecular characteristics of methicillin-resistant Staphylococcus pseudintermedius in small animal veterinarians: Indirect evidence of zoonotic transmission. Zoonoses Public Health 2011;58(8):533-539
5. Ishihara K, Shimokubo N, Sakagami A, et al. Occurrence and molecular characteristics of methicillin-resistant Staphylococcus aureus and methicillin-resistant Staphulococcus pseudintermedius in an academic veterinary hospital. Appl Environ Microbiol 2010;76(15):5165-5174
6. Loeffler A, Pfeiffer DU, Lodyd DH, et al. Meticillin-resistant Staphylococcus aureus carriage in UK veterinary staff and owners of infected pets: new risk groups. J Hosp Infect 2010;74(3)282:288
7. Anderson ME, Lefebvre SL, Weese JS. Evaluatio of prevalence and risk factors for methicillin-resistant Staphylococus aureus colonization in veterinary personnel attending an international equine veterinary conference. Vet Microbiol 2008;129(3-4):410-417.

CONCLUSION

Now that you know more about how common methicillin-resistant staphylococci are in pets and the risks of infection to both people and pets in your veterinary practice, see next month's issue for a guide to diagnosing and treating these stubborn infections in your patients and steps you can take to curtail their occurrence.

REFERENCES
1. Deresinski S. Methicillin-resistant Staphylococcus aureus: an evolutionary, epidemiologic, and therapeutic odyssey. Clin Infect Dis 2005;40(4):562-573.
2. Kottler S, Middleton JR, Perry J, et al. Prevalence of Staphylococcus aureus and methicillin-resistant Staphylococcus aureus carriage in three populations. J Vet Intern Med 2010;24(1):132–139.
3. Graham PL 3rd, Lin SX, Larson EL. A U.S. population-based survey ofStaphylococcus aureus colonization. Ann Intern Med 2006;144(5):318–325.
4. Boucher HW, Corey GR. Epidemiology of methicillin-resistant Staphylococcus aureus. Clin Infect Dis 2008;46(Suppl 5):S344-S349.
5. Cosgrove SE, Sakoulas G, Perencevich EN, et al. Comparison of mortality associated with methicillin-resistant and methicillin-susceptible Staphylococcus aureus bacteremia: a meta-analysis. Clin Infect Dis 2003;36(1):53-59.
6. Dancer SJ. The effect of antibiotics on methicillin-resistant Staphylococcus aureus. J Antimicrob Chemother 2008;61(2):246-253.
7. Aldeyab MA, Monnet DL, Lopez-Lozano, JA, et al. Modelling the impact of antibiotic use and infection control practices on the incidence of hospital-acquired methicillin-resistant Staphylococcus aureus: a time-series analysis. J Antimicrob Chemother 2008;62:593-600.
8. Naimi TS, LeDell KH, Como-Sabetti K, et al. Comparison of community- and health care–associated methicillin-resistant Staphylococcus aureus infection. JAMA2003;290(22):2976-2984.
9. Gordon RJ, Lowy FD. Pathogenesis of methicillin-resistant Staphylococcus aureus infection. Clin Infect Dis 2008;46(Suppl 5):S350-S359.
10. Tomlin J, Pead MJ, Lloyd DH, et al. Methicillin-resistant Staphylococcus aureusinfections in 11 dogs. Vet Rec 1999;144(3):60-64.
11. Weese JS. Methicillin-resistant Staphylococcus aureus: an emerging pathogen in small animals. J Am Anim Hosp Assoc 2005;41(3):150-157.
12. Weese JS, van Duijkeren E. Methicillin-resistant Staphylococcus aureus andStaphylococcus pseudintermedius in veterinary medicine. Vet Microbiol 2010;140(3-4):418-429.
13. Morris DO, Rook KA, Shofer FS, et al. Screening of Staphylococcus aureus,Staphylococcus intermedius, and Staphylococcus schleiferi isolates obtained from small companion animals for antimicrobial resistance: a retrospective review of 749 isolates (2003-2004). Vet Dermatol 2006;17(5):332-337.
14. Lloyd DH. Reservoirs of antimicrobial resistance in pet animals. Clin Infect Dis2007;45(Suppl 2):S148-S152.
15. Boost MV, O'Donoghue MM, James A. Prevalence of Staphylococcus aureuscarriage among dogs and their owners. Epidemiol Infect 2008;136(7):953-964.
16. Hanselman BA, Kruth SA, Rousseau J, et al. Coagulase positive staphylococcal colonization of humans and their household pets. Can Vet J2009;50(9):954-958.
17. Manian FA. Asymptomatic nasal carriage of mupirocin-resistant, methicillin-resistant Staphylococcus aureus (MRSA) in a pet dog associated with MRSA infection in household contacts. Clin Infect Dis 2003;36(2):e26-e28.
18. McCarthy AJ, Lindsay JA, Loeffler A. Are all methicillin-resistant-Staphylococcus aureus (MRSA) equal in all hosts? Epidemiological and genetic comparison between animal and human MRSA. Vet Dermatol 2012;23(4):267-275.
19. Fazakerley J, Nuttall T, Sales D, et al. Staphylococcal colonization of mucosal and lesional skin sites in atopic and healthy dogs. Vet Dermatol2009;20(3):179-184.e
20. Griffeth GC, Morris DO, Abraham JL, et al. Screening for skin carriage of methicillin-resistant coagulase-positive staphylococci and

Staphylococcus schleiferi in dogs with healthy and inflamed skin. Vet Dermatol 2008;19(3):142-149.
21. Faires MC, Traverse M, Tater KC, et al. Methicillin-resistant and –susceptibleStaphylococcus aureus infections in dogs. Emerg Infect Dis 2010;16(1):69-75.
22. Lefebvre SL, Reid-Smith RJ, Waltner-Toews D, et al. Incidence of acquisition of methicillin-resistant Staphylococcus aureus, Clostridium difficile, and other health-care-associated pathogens by dogs that participate in animal-assisted interactions. J Am Vet Med Assoc 2009;234(11): 1404-1417.
23. Loeffler A, Pfeiffer DU, Lloyd DH, et al. Meticillin-resistant Staphylococcus aureus carriage in UK veterinary staff and owners of infected pets: new risk groups. J Hosp Infect 2010;74(3):282-288.
24. Morris DO, Lautenbach E, Zaoutis T, et al. Potential for pet animals to harbour methicillin-resistant Staphylococcus aureus when residing with human MRSA patients. Zoonoses Public Health 2012;59(4):286-293.
25. Fitzgerald JR. The Staphylococcus intermedius group of bacterial pathogens: species re-classification, pathogenesis and the emergence of meticillin resistance. Vet Dermatol 2009;20(5-6):490-495.
26. Vanni M, Tognetti R, Pretti C, et al. Antimicrobial susceptibility ofStaphylococcus intermedius and Staphylococcus schleiferi isolated from dogs. Res Vet Sci 2009;87(2):192-195.
27. Bemis DA, Jones RD, Frank LA, et al. Evaluation of susceptibility test breakpoints used to predict mecA-mediated resistance in Staphylococcus pseudintermedius isolated from dogs. J Vet Diagn Invest 2009;21(1):53-58.
28. Van Hoovels L, Vankeerberghen A, Boel A, et al. First case of Staphylococcus pseudintermedius infection in a human. J Clin Microbiol 2006;44(12):4609-4612.
29. Morris DO, Boston RC, O'Shea K, et al. The prevalence of carriage of meticillin-resistant staphylococci by veterinary dermatology practice staff and their respective pets. Vet Dermatol 2010;21(4):400-407.
30. Paul NC, Moodley A, Ghibaudo G, et al. Carriage of methicillin-resistantStaphylococcus pseudintermedius in small animal veterinarians: Indirect evidence of zoonotic transmission. Zoonoses Public Health 2011;58(8):533-539.
31. Ishihara K, Shimokubo N, Sakagami A, et al. Occurrence and molecular characteristics of methicillin-resistant Staphylococcus aureus and methicillin-resistant Staphylococcus pseudintermedius in an academic veterinary hospital. Appl Environ Microbiol 2010;76(15):5165-5174.
32. van Duijkeren E, Kamphuis M, van der Mije IC, et al. Transmission of methicillin-resistant Staphylococcus pseudintermedius between infected dogs and cats and contact pets, humans and the environment in households and veterinary clinics. Vet Microbiol 2011;150(3-4):338-343.
33. Sasaki T, Kikuchi K, Tanaka Y, et al. Methicillin-resistant Staphylococcus pseudintermedius in a veterinary teaching hospital. J Clin Microbiol2007;45(4):1118-1125.
34. Tanner MA, Everett CL, Youvan DC. Molecular phylogenetic evidence for noninvasive zoonotic transmission of Staphylococcus intermedius from a canine pet to a human. J Clin Microbiol 2000;38(4):1628-1631.
35. Guardabassi L, Loeber ME, Jacobson A. Transmission of multiple antimicrobial-resistant Staphylococcus intermedius between dogs affected by deep pyoderma and their owners. Vet Microbiol 2004;98(1):23-27.
36. Abraham JL, Morris DO, Griffeth GC, et al. Surveillance of healthy cats and cats with inflammatory skin disease for colonization of the skin by methicillin-resistant coagulase-positive staphylococci and Staphylococcus schleiferi ssp.schleiferi. Vet Dermatol 2007;18(4):252-259.
37. Huerta B, Maldonado A, Ginel PJ, et al. Risk factors associated with the antimicrobial resistance of staphylococci in canine pyoderma. Vet Microbiol2011;150(3-4):302-308.
38. Yoo JH, Yoon JW, Lee SY, et al. High prevalence of fluoroquinolone- and methicillin-resistant Staphylococcus pseudintermedius isolates from canine pyoderma and otitis externa in a veterinary teaching hospital. J Microbiol Biotechnol 2010;20(4):798-802.
39. Nienhoff U, Kadlec K, Chaberny IF, et al. Methicillin-resistant Staphylococcus pseudintermedius among dogs admitted to a small animal hospital. Vet Microbiol2011;150(1-2):191-197.
40. Weese JS, Faires MC, Frank LA, et al. Factors associated with methicillin-resistant versus methicillin-susceptible Staphylococcus pseudintermedius infection in dogs. J Am Vet Med Assoc 2012;240(12):1450-1455.
41. Frank LA, Loeffler A. Meticillin-resistant Staphylococcus pseudintermedius: clinical challenge and treatment options. Vet Dermatol 2012; 23(4):283-291.
42. Bryan J, Frank LA, Rohrbach BW, et al. Treatment outcomes of dogs with methicillin-resistant and methicillin-susceptible Staphylococcus pseudintermediuspyoderma. Vet Dermatol 2012;23(4):361-368.
43. Beck KM, Waisglass SE, Dick HLN, wt al. Prevalence of meticillin-resistantStaphylococcus pseudintermedius (MRSP) from skin and carriage sites of dogs after treatment of their meticillin-resistant or meticillin-sensitive staphylococcal pyoderma. Vet Dermatol 2012;23(4):369-375.
44. Cain CL, Morris DO, Rankin SC. Clinical characterization of Staphylococcus schleiferi infections and identification of risk factors for acquisition of oxacillin-resistant strains in dogs: 225 cases (2003-2009). J Am Vet Med Assoc2011;239(12):1566-1573.
45. Jones RD, Kania SA, Rohrbach BW, et al. Prevalence of oxacillin- and multidrug-resistant staphylococci in clinical samples from dogs: 1,772 samples (2001-2005). J Am Vet Med Assoc 2007;230(2):221-227.

Puppy School in Practice –
are you missing out on an opportunity?

All too often adorable puppies grow into badly behaved tearaways and end up rejected – they may be excluded from the family 'pack', euthanased or given up for adoption. A visit to your local animal welfare shelter or Gumtree will reveal many healthy young adult dogs which are no longer wanted now they have outgrown their cute appeal.

So what's the solution? Ensuring your clients start training their pups from a very early age and making that option available at your practice is certainly a step in the right direction. Research has shown that a puppy learns more social skills in its first 16 weeks of life than the subsequent years ahead.

Benefits to the puppy are that they will be well adjusted members of the family and society. Well behaved pets have a better relationship with their pet parents and for the family it means their vision of a much loved, well behaved member of their family has been realised.

For the veterinary practices, that have their own puppy schools, the benefits are countless too. It is the start of a lifelong relationship with a brand new puppy parent. An added advantage is that the puppies become very familiar with visiting the vet. Dogs actually enjoy coming into the practice and will often jump onto the examination table quite happily. It also makes everyone's job in practice easier if the dog is used to being handled.

It has been shown that owners are more likely to care better for their puppies if they fulfil their needs. That means they are prepared to seek veterinary care sooner, use the best products available and not seek euthanasia as an early treatment option.

Hill's sponsors and supports puppy schools all around the country. Read on why Hill's puppy schools are the best choice:

- Hill's offers the only training courses accredited by a South African university, starting at an introductory level working through to advanced courses that included adult education in the curriculum. The courses are facilitated by Dr Quixi Sonntag.
- Support for the puppy schools and instructors; clothing; equipment.
- Website to promote puppy schools to the general public, including a listing of all the schools we sponsor: visit www.puppyschools.co.za for more information.
- For the puppy parent we offer our starter kits and graduation rosettes
- Nutrition talk covering feeding schedules, safe treats and chews, and many other feeding and food related topics that worry new pet parents.

For more details on Hill's Puppy Schools contact Hill's Pet Nutrition on 0800 228 783 / infoza@hillspet.com or speak to your Hill's Territory Manager.

Assessing the risk of parvovirus infection in puppies attending socialisation classes

By Jennifer L. Garcia, DVM, DACVIM

Stepita ME, Bain MJ, Kass PH. 2013 Frequency of CPV infection in vaccinated puppies that attended puppy socialization classes. Journal of the American Animal Hospital associatioon Vol 49::95-100.

Why they did it

The best time to begin socialization training in young dogs is between 4 and 16 weeks of age, yet sequestering puppies until their full course of vaccines is completed is often recommended. In this study, the authors sought to determine if puppies ≤ 16 weeks of age that attended puppy socialization classes were at increased risk of contracting canine parvovirus (CPV) infection compared with dogs that did not.

What they did

Researchers gathered data from 21 clinics in the United States, including clinics in both high- and low-income areas as well as from four cities with distinct seasonal patterns. Information was gathered on puppies examined between birth and 16 weeks of age with respect to signalment, CPV vaccination status, whether the puppy was suspected of or confirmed as having CPV infection, and whether the puppy had attended socialization classes.

In addition, dog trainers in the same four cities were contacted to participate if they taught puppy classes with enrollees that were predominantly < 20 weeks of age and that had at least one CPV vaccine before starting the first class. Information about these puppies included signalment, vaccine history, and whether the puppy was suspected by the trainer as having CPV infection before or while attending classes. These cases were followed up further with the owners to determine whether CPV infection had been diagnosed.

What they found

Information collected from participating clinics included data on 1,012 puppies, and of these 48 (4.7%) attended puppy socialization classes and 876 (86.6%) did not. Class history of the remaining 88 dogs was unknown. CPV infection was diagnosed in 14 dogs that did not attend socialization classes and was not diagnosed in any of the dogs that did. In addition, information on 231 puppies from 24 dog trainers was evaluated. CPV infection was not suspected by the trainers in any of these dogs.

Take-home message

Puppies ≤ 16 weeks of age that attended socialization classes are at no greater risk of developing CPV infection than those that do not attend these classes. The authors caution, however, that this population was not a random sample and that these results are not generalizable to all geographic areas.

Urinary incontinence in female dogs - how common is it?

By Jennifer L. Garcia, DVM, DACVIM,

Forsee KM, Davis GJ, Mouat EE, et al. 2013 Evaluation of the prevalence of urinary incontinence in spayed female dogs: 566 cases (2003-2008). Journal of the America Veterinary medical association. Vol 242:959-962.

Why they did it

The goal of this study was to provide more recent data on the prevalence of acquired urinary incontinence and determine which factors are most commonly associated with a diagnosis of acquired urinary incontinence in a large population of dogs that had undergone ovariohysterectomy.

What they did

Between January 2003 and January 2008, 566 owners of spayed female dogs responded to phone surveys and questionnaires about the presence or absence of urinary incontinence (defined as nocturia and unconscious leaking of urine). Owners who reported episodes of incontinence received questionnaires to further assess the degree of incontinence, diagnostic testing, and history.

What they found

The authors determined the prevalence of acquired urinary incontinence to be 5.12% (29/566 dogs), much lower than the 20% previously reported. No association was noted between a dog's age at the time of ovariohysterectomy and the onset of incontinence; acquired urinary incontinence developed an average of 2.3 years after ovariohysterectomy (range 0.5 to four years).

Neither was a significant association was found between emergency ovariohysterectomy or the number of litters before ovariohysterectomy and the development of acquired urinary incontinence.

However, a significant association was noted between body weight and the development of incontinence: large dogs (≥ 15 kg) were seven times as likely to develop incontinence compared with small dogs (< 15 kg).

Take-home message

The prevalence of acquired urinary incontinence is much lower than previously thought, but dogs that weigh ≥ 15 kg have a greater risk of developing the disorder. Possible caveats to the interpretation of this data include the possibility of an undiagnosed medical disorder resulting in signs of incontinence as well as the short follow-up period, as previous studies have suggested that it may take up to 12 years for acquired urinary incontinence to develop in this population.

Which gives better long term survival - surgical or medical portosystemic shunt management?

By: Liesel van der Merwe BVSc MMedVet (Med)

Greenhalgh SN, Reeve JA, Johnstone T et al. 2014. Long-term survival and quality of life in dogs with clinical signs associated with a congenital portosystemic shunt after surgical or medical treatment. Journal of the Veterinary Medical Association Vol 245:527-533

Why they did it

Congenital portosystemic shunts (CPSS) in dogs can be managed surgically, using various techniques, as well as medically with a combination of dietary changes and drug administration. It has long been assumed that surgical correction is preferred as it has the theoretical ability to restore normal physiology. The authors wanted to evaluate if the choice of medical or surgical management affected patient survival rate and quality of life.

What they did

The prospective study included patients with clinical signs attributable to CPSS confirmed as having a portosystemic shunt by either ultrasonography, portoventography or exploratory laparotomy. Selection of treatment method was made by the owner based on discussions with the attending clinician and was thus not randomised. Despite this the two groups were evenly balanced with regards to type of shunt and signalment. All dogs underwent medical stabilisation (dietary, antimicrobial and synthetic disaccharide) for an initial 3 week period. Thereafter medically managed dogs continued to receive a combination of therapies to control their gastrointestinal, neurological and urinary tract clinical signs. For dogs undergoing surgery: cellophane band, ameroid constrictor or ligature methods were used according to surgical preference. Owners completed questionnaires at time of entry into the study and periodically thereafter. Recruitment was between June 2002 – Oct 2007 and animals remained in the study for a period up to 10 years (3650 days).

What they found

The final study population comprised of 124 dogs - extrahepatic CPSS was diagnosed in 110 and intrahepatic CPSS in dogs. Of the 124 dogs, 97 (78%) were treated surgically (ligation (39), ameroid constrictor (29), partial ligation (24) and cellophane band (5)) and 27 (22%) were treated medically. The median (ie time taken to get to middle patient (# 62) in the group – not average) follow-up period was 1 936 days. Forty-five dogs died or were euthanased during the study period (0 - 3 323 days, median 759 days). Cause of death was not determined in most cases so may not have been from CPSS causes, but this does not affect the validity of the evaluation of the endpoint.

Median survival in the medically treated group was 836 days, 89% died during the follow-up period of 10 years. Only 22% of the surgically treated dogs died and the median survival could not be measured as the majority were still alive at the end of the study. Only 5 of 97 dogs died in the post-operative period, one after a second surgery. Survival of the surgically treated dogs was significantly ($p=<0.001$) greater then dogs which underwent medical treatment. Age at diagnosis and shunt type did not significantly affect survival. Shunting fraction was not assessed as a variable.

Take-home message

Surgical treatment of CPSS in dogs resulted in significantly improved survival and lower frequency of ongoing signs compared with medical management. Survival was not affected by age at diagnosis, thus there is no evidence that surgery has to be performed early in life to be effective.

Canine pancreatitis

Insight from an internist

By Jennifer L. Garcia, DVM, DACVIM, VETERINARY MEDICINE

We all know how difficult the diagnosis and treatment of canine pancreatitis can be. In his presentation "Canine pancreatitis: No such thing as a typical case," Michael Willard, DVM, MS, DACVIM, shared his experience in the management of these cases.

Diagnostic insight

While the history and physical examination are critical components of patient assessment, their utility in these cases has more to do with looking for and ruling out diseases that can mimic pancreatitis. Data collected from the minimum databases (complete blood count, serum chemistry profile, and urinanalysis) will also help. Dr. Willard pointed out that, unlike before, we have come to know that amylase and lipase activities are not reliable markers of pancreatitis. Hyperlipidemia is not a common finding, but if it is noted in a patient with an acute onset of vomiting and diarrhea, pancreatitis should be high on the differential diagnosis list.

According to Dr. Willard, trypsin-like immunoreactivity (TLI) is not a very sensitive indicator of pancreatic inflammation but may be supportive if it is elevated. The canine pancreatic lipase immunoreactivity (cPLI) assay, on the other hand, is very sensitive (85% to 90%), but its specificity is questionable. Even a small, perhaps not clinically significant foci of inflammation in the pancreas can cause a positive result, he noted. The best use of cPLI is in ruling out pancreatitis if the results are negative.

Abdominal radiography is indicated in these cases to look for other problems as well; classic signs of pancreatitis (e.g. loss of detail in the right cranial quadrant, dilated duodenum) are not always present. Abdominal ultrasonography is the most useful imaging modality we have for diagnosing pancreatitis, but it is not perfect. Dr. Willard pointed out that he has seen some cases in which sonographic changes lag behind clinical signs, so serial ultrasonographic examinations may be needed. Findings may change even within a few hours.

Pancreatic abscesses may occur and are typically sterile, so they can often be treated medically with ultrasound-guided drainage. Septic abscesses may be more common in cats, Dr. Willard noted. In his experience, pancreatic masses are more often inflammatory in nature than cancerous masses and may not require surgical removal unless insulinoma is suspected. A biopsy will be needed for a definitive diagnosis.

One of the biggest challenges with this disease is pets with severe clinical signs and whether they have severe sterile pancreatitis versus septic peritonitis. These conditions may look similar in that they both can have abdominal effusion, and bacteria may not always be seen even in cases of septic peritonitis. The abdominal fluid in both cases may be variably inflammatory.

Treatment tips

In terms of management, Dr. Willard offered the following:

- Offer low-fat food as soon as possible. You may consider this step even if there is some low-grade vomiting as long as feeding does not make the patient worse. Be sure to start slow.
- Begin fluid therapy. We tend to underestimate a patient's need for fluids, so err on the side of more in the absence of cardiac or renal disease. Hydration status may be difficult to assess in obese (no skin tent) or nauseated dogs (moist mucous membranes due to nausea).
- Since there are no robust studies, it is controversial whether fresh frozen plasma provides any benefit. It can be used if you suspect disseminated intravascular coagulopathy.
- Consider administering colloids. You can consider hetastarch if the albumin concentration is < 2 mg/dl (will provide more oncotic support than plasma).
- Total or partial parenteral nutrition is rarely needed.
- Administer analgesics. Consider butorphanol for very mild cases, methadone for moderate cases, and hydromorphone or fentanyl for severe cases.
- Only use antiemetics if vomiting or nausea are severe; otherwise, they may mask improvement. Dr. Willard recommended maropitant as a first-line drug.
- Consider proton pump inhibitors for dyspepsia—pantoprazole or omeprazole.
- Administer antibiotics only for severe cases or

those with suspected systemic inflammatory response syndrome. If possible, consider sample collection (e.g. peritoneal fluid, aspirated abscess material) before antibiotic administration.

- Since their use in pancreatitis is controversial, reserve corticosteroids for patients that are not responding to therapy and then consider a physiologic dose.

Contact your specialist

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Pemphigus Foliaceus in Cats

Dr Rick Last – Specialist Veterinary Pathologist
BVSc, MMedVet (Path) MRCVS

Introduction

Pemphigus foliaceus (PF) is the most common feline autoimmune dermatosis. In cats lesions of PF are superficial pustules which, as the result of being thin roofed, frequently rupture to form crusts and underlying erosions. Lesion distribution is usually bilaterally symmetrical and most frequently involves nasal planum / muzzle, ear pinnae, nipples, ventral abdomen, nail (ungual) folds and footpad margins. (Fig 1 - 7) Exudates on the feet can be quite severe and frequently lesions are restricted to the feet alone. PF has a mean age of onset at 6.1 years, no sex predeliction and in ± 80% of affected cats pruritis is observed.

Pathophysiology of the condition involves autoantibody targeting the intercellular desmosomal proteins in the upper levels of the stratum corneum with resultant cell dissociation (acantholysis) with vesicle formation. Currently known triggers of PF in cats include genetic (spontaneous), drug induced, chronic disease associated and more recently sunlight exposure. Remember "drugs" include food colorants, preservatives, anti-oxidants and texture modifiers.

Diagnosis

Cytology involves examination of smears prepared form pustule contents or crusts. Intact pustules provide the best diagnostic material, but are frequently not present in cats and so the yellow crust adhered to the eroded epidermis is most commonly examined. Newly erupted areas should be selected for sampling as these are less likely to be affected by bacterial colonization and self-trauma. Gently peel back crusts (pinnae and top of the head are good locations) to reveal shiny, sometimes blood tinged, eroded epidermis. (Fig 1-2) Impression smears of the underside of the crust and eroded epidermis are made and stained with Diff-Quik® for examination. Cytology may provide a tentative diagnosis based on the presence of free lying or rafts of acantholytic keratinocytes intermingled among well preserved neutrophils and / or eosinophils. (Fig 8) However, histopathology is required for definitive diagnosis.

Punch skin biopsies (at least 3 but preferably 5-6) collected into 10% buffered formalin for histopathology, are the diagnostic samples of choice for confirmation of the diagnosis. Remember in cats pustules are thin roofed and therefore very delicate, rupturing early and making sampling of intact pustules extremely difficult. Felines produce waves of acantholytic keratinocytes which are then encountered at the same level within multiple biopsies. This shedding of acantholytic keratinocytes into the surface crust highlights the importance of submitting crust material together with the skin biopsies in formalin, as there is a high probability of observing diagnostic acantolytic keratinocytes in crust material. The area should not be prepared prior to biopsy as cleaning reduces the diagnostic value by scrubbing away crusts and superficial epidermis. Obtaining in-tact pustules in biopsies usually requires hospitalization of the patient for vesicle watching ensuring pustules are biopsied as soon as they develop before rupturing.

Diagnostic Tips

Cytology *of pustule contents and / or crusts provides tentative diagnosis. Impression smears of the underside of peeled off crusts and exposed eroded epidermis offer the best chance of recovering acantholytic keratinocytes.*

Histopathology *(skin biopsies in 10% buffered formalin) pathognomonic lesions enable confirmation of the diagnosis. Minimum of 3 punch biopsies in 10% buffered formalin is required.*

Histological examination of skin biopsies from cats with PF reveal that acantholytic keratinocytes are numerous in pustules and crusts with rafts being common. Pustules most commonly contain well preserved neutrophils but eosinophils may sometimes be encountered. Follicular involvement is seen in ±25% of cases, while mast cells form a significant component of the dermal infiltrate.

Therapy

In cats, unlike dogs, corticosteroid therapy alone is frequently successful with multidrug protocols being less commonly applied in felines. Recent studies have shown that daily prednisalone at 2 mg/kg as a monotherapy, has proven effective for inducing remission of PF in cats. Adverse effects were uncommon at this low dose and in a small population of these cats, permanent remission may be induced. Some dermatologists prefer a more aggressive initial treatment (4-5 mg/kg prednisolone daily) that induces remission followed by maintenance therapy (2 mg/kg every second day) for long term control. Other glucocorticoids which have proven successful include triamcinolone (0.4 - 0.8 mg/kg/day), methylprednisilone (3 – 5 mg/kg/day) or dexamethasone (0.4 – 0.6 mg/kg/day).

Irrespective of which steroid is used patients should be checked every 2 weeks until no new lesions are seen. As long as new lesions are appearing remission has not been achieved. Once remission has been achieved adjustments in the dose of steroid (reducing mg/kg) and frequency of application (extend to every second or third day) can be considered. Repositol glucocorticoids such as Depo-medrol, have no place in the management of immune mediated diseases.

If cortocosteroid monotherapy is unsuccessful then additional medications can be added. Multidrug protocols which have been utilised in cats include cyclosporine (5 mg/kg daily) or chlorambucil (0.1 mg/kg daily or 0.25 mg/kg every second day) in addition to the corticosteroids. These multidrug protocols are glucocorticoid sparing.

Safety studies for cyclosporin have shown that dosages used clinically do not have any significant effect on feline blood glucose levels and in general this drug is well tolerated by cats. The most commonly reported adverse effects are vomiting, diarrhoea and anorexia. There are single rare reports of fulminant systemic infections with Toxoplasma and Mycobacteria in cats on cyclosporin. In some cases cats can be weaned off steroids altogether with cylosporin then used as a monotherapy for maintenance.

The principle adverse reactions documented in

Fig 1: Nasal planum with surface yellow crusts.

Fig 2: Ear pinna inner convex surface revealing multiple crusts, areas of epidermal erosion (arrowhead) and rare intact pustules (arrow).

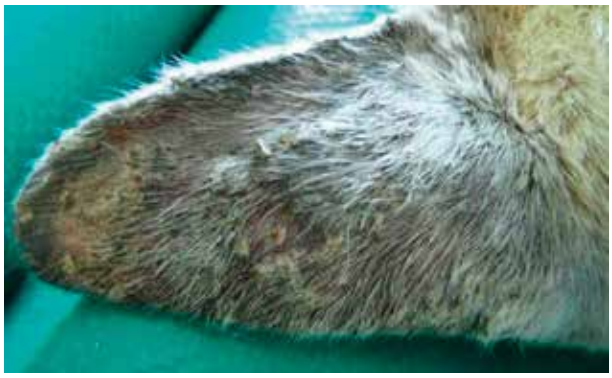

Fig 3: Ear pinna outer concave surface with multiple crusts with coalescence of many small crusts to form extensive areas of crusting.

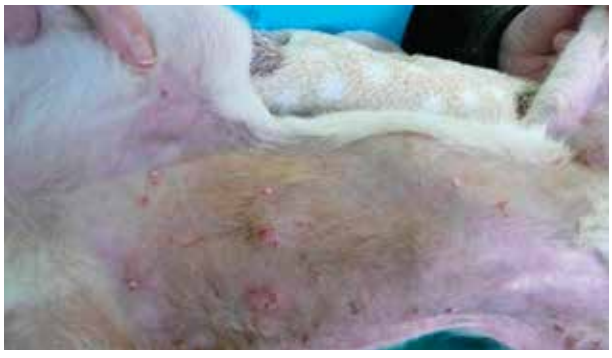

Fig 4: Ventral abdomen with multiple surface crusts and epidermal erosions involving the abdominal skin and nipples.

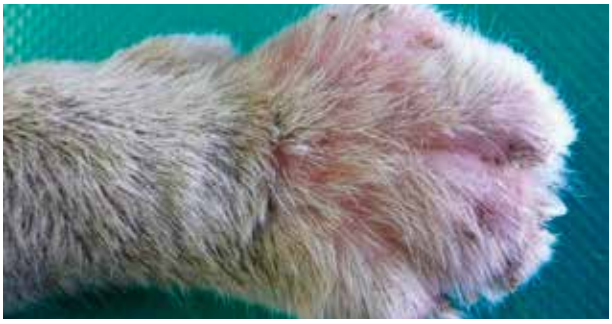

Fig 5: Foot dorsal aspect with areas of alopecia and crusting around the nail beds.

Fig 6: Foot with severe crusting of the nail beds plus crusting around the outer aspects of the footpads.

Fig 7: Foot with secondary bacterial infection of the nail beds and severe exudation.
**Figures 1 – 7 courtesy of Dr Marlies Bohm – King Edward Referrals, Port Elizabeth.*

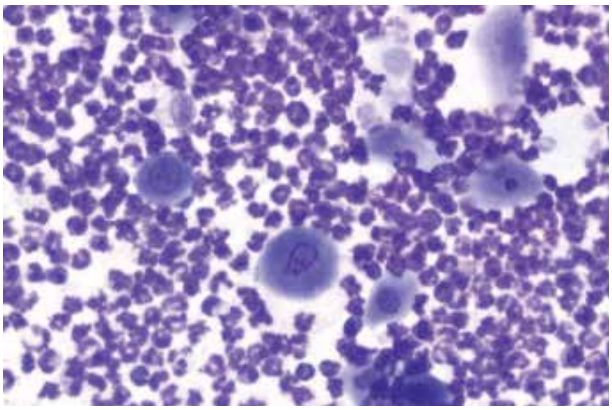

Fig 8: Cytological smear revealinging acantholytic keratinocytes among well preserved neutrophils.

cats on chlorambucil are nausea, inappetance and idiosyncratic myelosuppression. Full blood count, blood chemistry, urinalysis, boody weight and appetite should be monitored every 2 weeks during induction therapy and every 6-12 weeks during maintenance.

In general, secondary bacterial infections in cases of PF are of less concern in cats than dogs. If bacterial infection is evident on cytological or histological examination, then topical and systemic antibiotic therapy would be indicated in the initial phases of the immunosuppressive therapy. In cases complicated by previous antibiotic treatment, bacterial culture and antibogram for selection of an appropriate antibiotic is indicated.

THERAPY OPTIONS AT A GLANCE

Prednisalone monotherapy
Option 1: Prednisalone @ 2 mg/kg/day (remission and maintenance).
Option 2: Prednisalone initial loading @ 4-5 mg/kg/day to induce remission followed by 2 mg/kg/day for maintenance

Multidrug protocols
Option 1: Glucocorticoids plus cyclosporine @ 5 mg/kg/day.
Option 2: Glucocorticoids plus chlorambucil @ 0.25 mg/kg every second day.

Depo Medrol has no place in the management of PF in cats

Prognosis

In the majority of cases the prognosis for feline PF is fair to good, although most cats require lifelong therapy. The more favourable prognosis in cats compared to dogs is probably related to less frequent drug reactions with many cats responding to corticosteroid monotherapy at low doses with minimal side effects.

References
1. *Angus J C 2005 Dermatology Secrets: Pemphigus foliaceus in cats. In: Proceedings of the North American Veterinary Conference. Orlando, Florida.*
2. *Irwin et al. 2012 Use of modified ciclosporin in the management of pemphigus foliaceous: a retrospec tive analysis. Veterinary Dermatology 23:403-409.*
3. *Simpson & Burton. 2013 Use of prednisolone as monotherapy in the treatment of feline pemphigus foliaceus: a ret rospective study of 37 cats. Veteri nary Dermatology 2013; 24:598-601.*
4. *Werner A. 2012 Pemphigus foliaceus in cats. Clini cal View Dermatology*

Pinioning and Wing Clipping
How, Why and When

Dr Dorianne Elliot DVN, BVSC
Bird and Exotic Clinic , Onderstepoort

One of the most distinctive characteristics of the birds as a group (with a few notable exceptions) must be their ability to fly. (Fig 1)This ability has allowed them to take advantage of a myriad of ecological niches and has been one of the outstanding influences in their massive, global success as a family.

Although vitally important for foraging, escaping enemies and attracting mates in the wild, in a captive situation flight is often an undesirable and sometimes even dangerous ability. Flight allows escape from enclosures and a startled pet bird may fly straight into dangerous situations.

It is for this reason that many captive birds have their ability to fly limited in either temporary or permanent fashion. Note that I refer to limiting their ability, not removing it completely. In practically every situation, all that is needed is to prevent the bird from being able to gain height and thus escape. Birds (especially parrots) that are rendered completely incapable of flight may lose confidence and become stressed, withdrawn individuals. This is completely understandable, considering how central to every aspect of their natural lives this ability is.

Vets are commonly presented with sternal injuries, occurring when poorly flying birds crash to the floor and traumatise their breast skin and muscle. Most need to be surgically repaired.

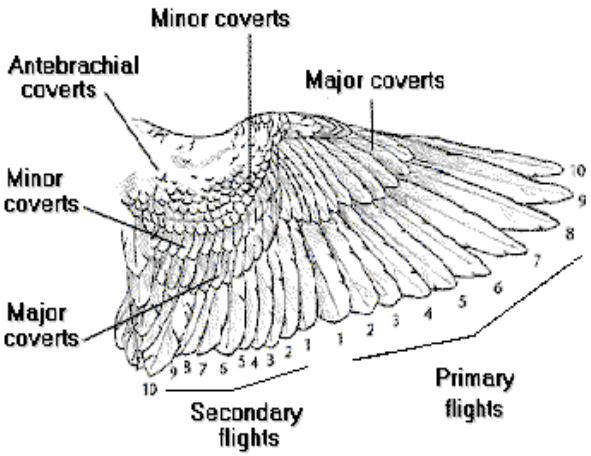

Fig 1: Wing feather nomenclature

Permanent flight limitation is often practiced on the waterfowl.

The technique of amputating the tip of one wing, thus preventing flight by leaving the bird permanently unbalanced is called pinioning. If performed correctly and humanely, there are few complications to this procedure. The technique differs, depending on the age and size of the bird.

Young ducklings (less than 1 week old) may be pinioned without anaesthesia by nipping off the last part of the wing. (Fig 2) A good antiseptic may be dabbed onto the cut surface. Older waterfowl should have either local or general anaesthetic before pinioning.

A cable tie or elastrator band (the type used to dock lambs tails) is first placed around the wing, just above the position where it is to be amputated. (Fig 3) This prevents blood loss. Some people prefer to leave the tie on overnight and then pinion in the

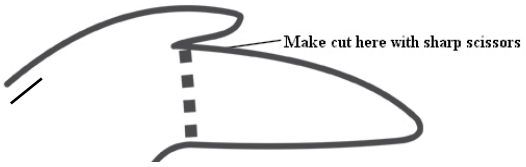

Fig 2: Use sharp shears and cut downwards in a straight line between the thumb of the wing and the tip.

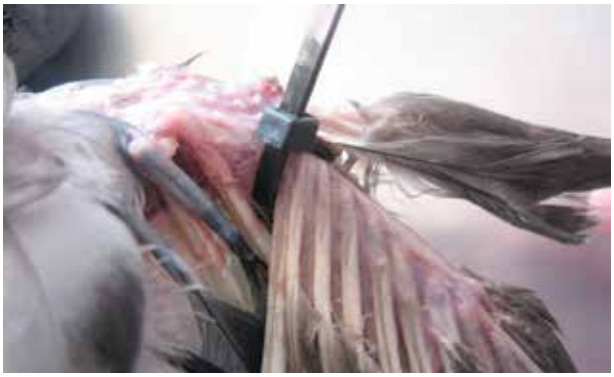

Fig 3: Placement of a cable tie around the wing to prevent bleeding prior to surgical pinioning.

morning, others go ahead immediately. Remember, never include the ulula (thumb). This piece of wing must stay behind to protect the stump and is also important as a site for muscle attachment, the wing may droop if it is removed.

Although it may seem like the perfect solution, parrots and other psittacine birds should NEVER be pinioned. This practice is considered unethical by the Exotic and Avian Practitioners Group of the South African Veterinary Association. Parrots are much more arboreal than waterfowl and thus need balanced wings give them the confidence to clamber around freely. Pinioned wings will cause them to fall heavily and greatly increase the chances of injury.

Parrots have extremely long life spans and bird vets, breeders etc are frequently placed in the position of having to re-home problem parrots. These birds are practically impossible to place into a breeding flock if they have been pinioned, as they struggle to balance during mating and are incapable of performing any type of aerial courtship. Hen birds also need to be able to escape amorous cocks and may be severely bitten, even killed if they cannot fly.

Temporary flight limitation consists of trimming the flight feathers that give lift to the bird. Correctly performed, the procedure is quick, painless and allows the bird enough flight to glide safely to the floor and to flap away from cats, etc.

Several different wing-trimming techniques are in use. There is much controversy about the best technique. The following is the technique with which I am most familiar and is my personal favourite.

Both wings are trimmed. The first six large flight feathers are trimmed high up on the shaft, so that the trimmed shaft is covered by the secondary feathers. (Fig 4-5) With the feathers trimmed in this way, the trimmed shafts do not scratch the bird and irritate it as they do when the feathers are left longer. The trimmed shafts are also invisible which makes this a cosmetically pleasing trim.

Fig 4: The first four to seven primaries on each wing are trimmed short, below the level of the secondaries. This prevents the rough shafts from rubbing on the flank skin and irritating the bird. The trimmed feathers are also not visible which gives a cosmetically pleasing, symmetrical

If performed just after moulting, feather trimming can be done as infrequently as twice a year, naturally if done before moulting, trims may be necessary more often.

Feather trimming should be customised to each individual bird. With the correct number of feathers trimmed, the bird should be able to flutter downwards from table height to land safely a few metres away. Should the bird be a strong flyer, more feathers may be trimmed. Some birds are safely grounded with as little as three or four feathers trimmed. Some need all 10, and even a few secondaries.

It is also important to allow young birds time to develop their flying skills and dexterity before trimming them. Birds that have confidence in their flying abilities are often more outgoing and confident than those that never learned to fly.

The technique where the two longest flight feathers are left long, has been associated with wing injuries as these two unsupported feathers may become trapped in the cage bars when the bird flaps, and break the birds carpus (wrist).

Light bodied birds may also be able to use these two feathers (the most important ones for creating "lift") to fly away, even if the other feathers are trimmed.

Trims involving only one wing (and thus unbalancing the bird) have been associated with more falls and sternal injuries than the "two wing" clips. Incorrectly applied "two wing" clips are also often associated with bad falls.

Each situation is different should be evaluated individually as to which flight limitation technique will be most appropriate.

Fig 5: The feathers are trimmed on the naked shaft, above the barbules for a neat and cosmetically pleasing appearance.

Cyathostomin

Resistance to Moxidectin - The risks and reality

Introduction

Small strongyles (cyathostominea) are now the main parasitic pathogen in equines. The successful anthemintic strategies used for the control of large strongyles have inadvertently led to the selection of drug resistant cyathostomes. There is a world-wide increase in the reported levels of anthelmintic resistance, and of most concern is the resistance of the cyathostominea to the macrocyclic lactones. There is documented evidence of cyathostomin resistance to the benzimidazoles and pyrantel salts. The growing evidence for resistance to both ivermectin and moxidectin must now be considered when designing worming programs. Strategies to slow down the selection for resistance, thereby extending the lifetime of currently effective anthelmintics must be implemented whenever possible.

Cyathostominae life cycle and pathogenecity

There are over 50 species of cyathostominea, with around 10 -12 making up the bulk of equine infestations.[1] Many horses harbour burdens of thousands of cyathostomes without detectable illness but the parasite has the potential to cause severe disease.

The cyathostome lifecycle

The cyathostomes have a direct, non-migratory life cycle. Only the L3 phase of the cyathostominae- are infective. These are ingested from pasture, with faecal egg shedding by the female adults, shown to be highest at dawn and dusk. Stabled horses are at a lower risk as the ammonia and moisture levels are detrimental to L3 survival. The ingested L3's penetrate the wall of the caecum and colon, where they either develop into L4's and on to female adult egg producing L5's , or they undergo a state of arrested development, known as HYPOBIOSIS, encysting within the walls of the large intestine, to re-emerge when environmental conditions are more conducive to larval survival. The infective L3 larvae can-

not ingest nutrients therefore their survival time is temperature dependent. In hot conditions, catabolism is rapid so the larvae are short lived, in colder conditions the larvae survive on pasture for much longer periods of time.

Weight loss, poor coat quality, poor performance and decreased food utilisation are less severe clinical signs of infection. More severe cases will show anaemia, pyrexia, severe weight-loss and varying degrees of a protein losing enteropathy, leading to hypo-proteinaemia and ventral oedema. Simultaneous emergence of the encysted cyathostomes can cause the clinical syndrome LARVAL CYATHOSTOMIASIS, with a reported mortality of up to 50%.[2,3] In the author's experience, this is seen more commonly in younger horses and in areas of more extreme climate changes between seasons.

Factors stimulating the formation of and re-emergence of the hypobiotic larvae are complex and not fully understood. Factors influencing hypobiosis may include cold conditioning of the L3 larvae just prior to ingestion, the population density of adult parasites within the intestinal wall and lumen and host immunity factors.[2] Anthelmintic treatment that targets the luminal stages may stimulate re emergence as this will cause a decrease in the luminal nematode population.

The inhibited larvae can remain encysted for months to years.[4] A consequence of this is that horses can have infestations of millions of NON EGG PRODUCING juvenile stages of cyathostominae and therefore have a negative or low faecal egg count (FEC).[5]

Host Immunity and recognition of Shedders

Horses show a huge variation in their susceptibility to cyathostomes and no life long immunity develops. therefore there is constant and life long exposure within grazing horses/ horses with access to pasture. [6] Most horses will regulate their infection levels and consistently have low levels of infection. Fewer animals will have higher nematode infestations (> 500egg per gram (epg)). The majority of the parasites will be within the minority of the population. It is these individuals that require identifying and addressing as these are the animals contributing to the bulk of pasture contamination. The aim of targeted worming control is to prevent contamination of the environment with the eggs of the target parasite, therefore decreasing the number of female adult worms before they can reproduce.

The only way to identify the shedders and gain a grip on the overall levels of infestation and presence or absence of anthelmintic resistance is by the use of FEC'S and FECRT's (faecal egg count reduction tests).

Anthelmintic Resistance

Owner concern, and easily available safe, effective and inexpensive anthelmintics has lead to the dramatic over-use of and the development of resistance. To the authors knowledge there are no new anti-parasitic chemicals being developed, or even in the pipeline. What is available now is all we have got. Strongylus vulgaris was succesfully treated by using he interval dosing system.. By the early 1980's S. *vulgaris* was becoming uncommon and cyathostomes were starting to account for 100% of strongyle eggs seen in FEC's. In 1983, the release of the first macrocyclic lactone, ivermectin, further reduced the prevalence of S. *vulgaris*.

Unfortunately, worming programs have become more and more haphazard, with poor client education and easily available anthelmintics, often being sold from non veterinary outlets . The increasing practice of the use of 'off label' anthelmintics is also contributing to resistance development. The nematodes are being exposed to sub-therapeutic doses of the anthelmintics, thus providing ideal conditions for resistance development (authors own experience). Of great concern is that reversion to drug susceptibility does not seem to occur in parasitic nematodes even when not exposed to that drug class for years.[8]

How does resistance develop?

Resistance is described as "a measurable decrease in the efficacy of a compound against a population of worms that were previously susceptible".

Anthelmintic resistance in nematodes is an inherited characteristic that is passed on from one generation to the next via the genome. The cyathostomes have extremely high levels of genetic diversity.[7] Resistance can develop upon first exposure to a drug or relatively quickly thereafter due to this genetic diversity combined with a huge population size and the fact that the steps required for a genotype to change from susceptible to resistant are relatively simple. Resistance to macrocyclic lactones is thought to involve several DNA mutations before the nematode acquires the full resistant genotype. The resistant genotype will then proportionally increase in the population. The rapid and widespread movement of horses allows quick and efficient distribution of these resistant worms to new farms and herds.

Moxidectin Resistance

Ivermectin is not effective against against encysted larvae, the most pathogenic lifestage which can potentially cause fatal colitis. Controlling this lifestage is vital to reducing cyathostomin induced dis-

ease. The lack of anthelmintic efficacy against the encysted stages may also have contributed to the relatively slow development of resistance to ivermectin. These 'untouched' encysted L3's increase the amount of untreated, susceptible worms, the 'in refugia' population, which is vital in diluting resistant genotypes, slowing down the onset of resistance.

One of the early signs of resistance is a reduction in the egg reappearance period (EPG). The EPG is the duration post deworming when he egg count remains negligible The EPG varies according to the anthelmintic used: Benzimidazoles at 6- 8 weeks, pyrantel at 6 weeks, ivermectin 8-10 weeks and moxidectin > 13 weeks.[9]

A decreased ERP for ivermectin has been reported in Europe, Brazil and the U.S.A.[10-11] Of much greater concern is the reported evidence of reduced efficacy of moxidectin[12-13] . In the authors own personal experience there have recently been cases of reduced EPG and failure of a reduction in FEC's of >80%. In fact the author has personal experience of cases of no reduction, but an increase in FEC'S when taken prior to and 7 days post moxidectin treatment in two equines from the same farm. Moxidectin resistant cyathostomins have also been reported in the UK.[14]

How do we address this emerging situation

If the random, blanket use of anthelmintics continues then widespread moxidectin resistance is inevitable. Action needs to be taken now by veterinary professionals to change current worming regimes and become proactive in devising strategies that provide nematode control whilst preventing resistance. No single protocol can be applied uniformly due to varying environmental influences, pasture management principles and herd dynamics. Veterinarian need to enhance their r understanding of the principle aims of control, the target parasites and the diagnostic tests available (along with their limitations)and arm themselves with the knowledge of the parasite populations sensitivity and resistance, then a best practice control program can be established for each individual setting. Interval dosing is the traditional method of worming and this was highly effective in reducing the incidence of *S vulgaris*. This is the administration of a specific drug at regular time intervals throughout the high risk periods. This method has several negative aspects (1)t owners are worming horses that don't necessarily require treating, thus decreasing the 'in refugia' population thus speeding up the development of resistance (2) unnecessary costs incurred (3) many owners are also dosing as the wrong intervals due to a lack of information on ERP's thus often exposing worms to constant sub-therapeutic levels of drug. This is thought to be one of the main reasons for widespread *Parascaris equorum* resistance to ivermectin.[16]

Strategic dosing employs the use of an anthelmintic at specific times to disrupt the seasonal cycle of transmission. This can become ineffective in periods of abnormal weather patterns and with the introduction of horses with high levels of infestation.

In the author's opinion, targeted dosing is the most logical approach to providing good anthelmintic cover in adult horses and slowing anthelmintic resistance. This will also get the veterinarian re- involved in deworming strategies. For each individual yard/ herd/pasture, individual levels of infestation and the presence of resistance to each anthelmintic, needs to be established. Although faecal monitoring will increase the costs of administering control programs, the alternative, i.e., expanding resistance, is unacceptable.

The gold standard practical technique is the FEC (faecal egg count) and FECRT (faecal egg count reduction test).[17] (Fig 1). The main limitations of these tests is the assumption that all strongyle eggs seen are small strongyles and that the FEC gives you no indication of the mucosal larval parasite levels. They will however give you an indication of that animal's potential to contaminate the pasture. These mucosal levels must not be allowed to build up to high levels in young horses due to the risk of larval cyathostomiasis, therefore the use of a larvicidal treatment needs to be incorporated into the regime of deworming young horses. Foals and weanlings should be considered separately from the adult population.

If a dewormer has just been administered start monitoring by taking FEC's after the ERP of the administered anthelmintic has elapsed. Individuals with FEC above the designated threshold should then be treated. Repeat FEC's should be performed at 10-14 days post treatment to establish the presence of resistance. FEC's can then be performed at 2-3 monthly intervals dependent upon the ERP of the product used. As the egg excretion dynamics of the population become apparent, FEC frequency can be reduced as the 'high shedders' become identified and controlled. A larvicidal dose of anthelmintic must be administered when appropriate, independent of FEC data especially in youngsters (moxidectin 0.4mg/kg or 5 days fenbendazole 10mg/kg).

The suggested criteria used to define anthelmintic resistance are that FEC's should be reduced by 95% after the administration of a macrocyclic lactone or benzimidazole, and 90% after administration of py-

rantel, at 10-14 days post treatment.[18] Horses with high FEC results can then be targeted and wormed appropriately, with follow up FEC's giving information on the presence of resistance. The 'cut-off' value for when to treat is a contentious issue and in the authors experience the value used needs to be tailored to each individual setting/yard/ herd. The most frequently cited FEC cut off value for determining treatment is 200-500 epg. Suggestions for repeat the treatment have been reviewed [20] (and include when faecal egg counts rise to 10 per cent of the counts recorded before treatment[21]; when 50 percent of horses have a mean epg above 200 [22] and when the mean epg of all the horses is more than 100. [23] Shedders should be treated to their FEC's. New arrivals to the population should have FEC's performed and treated accordingly, prior to release onto common pasture. Clearly, as well as anthelmintic control, good pasture hygiene should be maintained with frequent removal of faeces from the pasture.

Scheduling of Anthelmintics- yes or no?

One way to gain further control over anthelmintic use and abuse is to reschedule the anthelmintics, or consider scheduling moxidectin based products. Denmark introduced prescription only restrictions of anthelmintic drugs in 1999 and other European countries have implemented similar legislations over recent years (Germany and Austria). In Denmark, the frequency of treatment decreased over time. It has to be noted however, that with the reduction in anthelmintic treatment frequency and the use of targeted dosing, the potential for an increase in prevalence of other types of parasite (of most concern Strongylus spp, also Oxyuris equi and Gasterophilus spp) could occur. Denmark compared their incidence of Strongylus spp over a 10 year period to that of neighbouring Sweden who had not instituted selective targeted dosing regimes to such a level and found that the prevalence of Strongylus was similar between the two countries.[24] Further development h further development of FEC analysis techniques and larval burden detection techniques is also required.

For more info go to:
AAEP Parasite Control Guidelines. Lexington, Ky: American Association of Equine Practitioners, 2013. Available at: http://www.aaep.org/info/parasite-control-guidelines.

References

1. Reinemeyer, C.R., Smith, S.A., Gabel, A.A and Herd, R.P (1984) The prevalence and intensity of internal parasites of horses in the U.S.A. Vet Parasitol. 15, 75-83.
2. Love, S., Murphy, D. and Mellor. (1999) Pathogenecity of cyathostome infection. Vet Parasitol. 85, 113-121, discussion 112-121, 125-215.
3. Lyons, E.T., Drudge, J.H and Tolliver, S.C (2000) Larval cyathostomiasis. Vet Clin. N. Am: Equine Pract. 16, 501-13.
4. Murphy, D. and Love, S. (1997) T he pathogenic effects of experimental cyathostome infections in ponies. Vet Parasitol. 70, 99-110.
5. Dowdall, S.M., Matthews, J.B., Mair, T., Murphy, D., Love., S. and Proudman, C.J. (2002) Antigen specific IgG (T) responses in natural and experimental cyathostominae infection in horses. Vet Parasitol. 106 225-242.
6. Chapman, M.R., French., D.D, Taylor, H.W. and Klei, T.R (2002) One season of pasature exposure fails to induce a protective resistance to cyathostomes but increases numbers of hypobiotic third-stage larvae. J Parasitol 88, 678-683.
7. Gillard, J.S. and Beech, R.N. (2007) Population genetics of anthelmintic resistance in parasitic nematodes. Parasitol. 134. 1133-1147.
8. Jackson, F. and Coop, R.L. (2000) The development of anthelmintic resistance in sheep nematodes. Parasitol. 120 Supple. S95-107.
9. Mercier, P., Chick, B., Alves-Branco, F. and White, C.R (2001) Comparative efficacy, persistent effect and treatment intervals of anthelmintic pastes in naturally infected horses. Vet Parasitol. 99, 29-39.
10. Lyons, E.T., Tolliver, S.C., Ionita, M., Lewellen, A. and Collins, S.S. (2008) Field studies indicating reduced activity of ivermectin on small strongyles in horses on a farm in Central Kentucky. Parasitol.Res. 103, 209-215.
11. Molento, M.B., Antunes, J., Bentes, R.N. and Coles, G.C. (2008) Anthelmintic resistant nematodes in Brazilian horses. Vet Rec. 162, 384-85.
12. Lyons, E.T., Tolliver, S.C., Collins, S.S., Ionita, M., Kuzmina, T.A. and Rossano, M. (2011) Field tests demonstrating reduced activity of ivermectin and moxidectin against small strongyles in horses on 14 farms in Central Kentucky in 2007-2009. Parasitol Res. 108, 355-60.
13. Lyons, E.T., Tolliver, S.C. and Collins, S.S. (2010) Reduced activity of moxidectin and ivermectin on small strongyles in young horses on a farm (BC) in Central Kentucky in two field tests with notes on variable counts of eggs per gram of feces (EPGs). Parasitol Res. 107(6):1495-8.
14. Trawford, A.F., Burden, F.A. and Hodgkinson, J. (2005) Suspected moxidectin resistance in cyathostomes in two donkey herds at The Donkey Sanctuary, UK. Proceedings of the 20th International Conference World Association for Advanced Veterinary Parasitology, New Zealand. P196.
15. Kaminsky, R., Ducray, P., Jung, M., Clover, R., Rufener, L., Bouvier, J., Schorderet Weber, S., Wenger, A., Wieland-Berghausen, S., Goebel, T., Gauvry, N., Pautrat, F., Skripsky, T., Froelich, O., Komoin-Oka, C., Westlund, B., Sluder, A. and Maser, P. (2008) A new class of anthelmintics effective against drug resistant nematodes. Nature 452, 176-180.
16. Reinemeyer, C.R. (2009) Diagnosis and control of anthelmintic-resistant Parascaris equorum. Parasites & Vectors 2009, 2(Suppl 2):S8.
17. Kaplan, R.M. (2002) Anthelmintic resistance in nematodes of horses. Veterinary Research 33, 491-507.
18. Dargatz, D.A., Traub-Dargatz, J. L. and Sangster, N. C. (2000) Antimicrobic and anthelmintic resistance. Veterinary Clinics of North America: Equine Practice 16, 515-536.
19. Matthews, J. (2008) An update on cyathostomins: Anthelmintic resistance and worm control. Equine Vet Educ. 20,552-560.
20. Martin-Downum, K., Yazwinski, T., Tucker, C., Fincher, M., Ralph, J. and Hamilton, J. (2001) Cyathostome fecal egg count trends in horses treated with moxidectin, ivermectin or fenbendazole. Veterinary Parasitology 101, 75-79.
21. Borgsteede, F.H.M., Boersema, J.H., Gaasenbeek, C.P.H, and Van Der Burg, W.P. (1993) The reappearance of eggs in faeces of horses after treatment with ivermectin. Veterinary Quarterly 15, 24-26.
22. Taylor, S.M. and Kenny, J. (1995) Comparison of moxidectin with ivermectin and pyrantel embonate for reduction of faecal egg counts in horses. Veterinary Record 137, 516-518.
23. Boersema, J.H., Eysker, M. and Van Der Aar, W.M. (1998) The reappearance of strongyle eggs in the faeces of horses after treatment with moxidectin. Veterinary Quarterly 20, 15-17.
24. Neilson, M.K. (2009) Restrictions of anthelmintic usage: Perspectives and potential consequences. Parasit Vectors 2 Suppl. 2, 57.

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- Supply of general medical and surgical locum services in South Africa.

INTERESTING ECG 1

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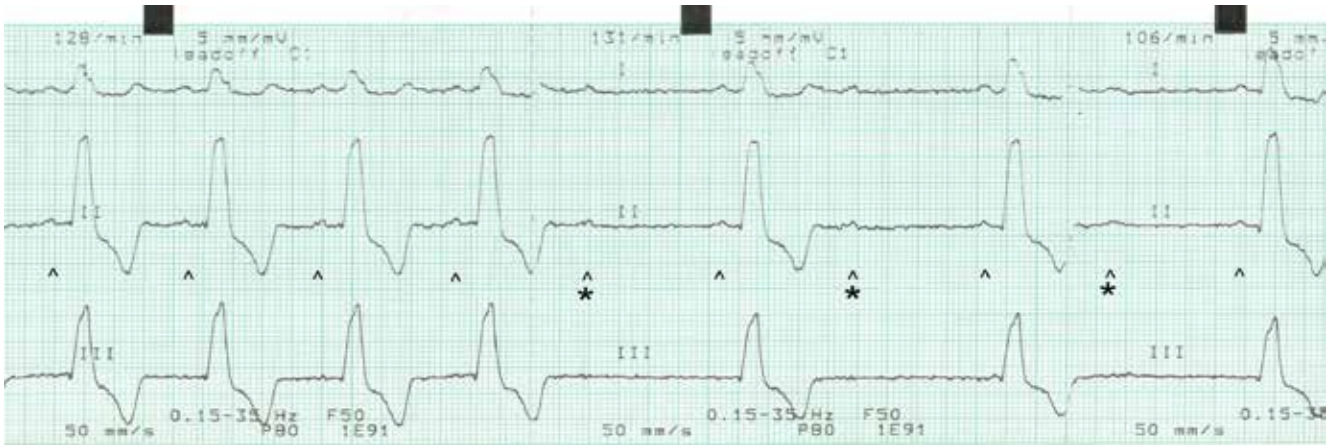

Signalment and history

A 9-year-old male crossbred dog presented with a recent history of exercise-induced syncope.

Heart rate alternated between 130 bpm and 65 bpm, both with regular rhythms.

Echocardiography was unremarkable.

Interpretation

- Intermittent second-degree 2:1 AV block with concurrent left bundle branch block.
- The blocked P waves are indicated *.
- The arrhythmia deteriorated to second-degree 2:1 AV block with periods of advanced 3:1 block, and increased frequency of syncopal episodes.
- There was no response to atropine, and a pacemaker was fitted.
- To date this dog has a healthy active life.

PATHOLOGY SNIPPET OR SNAP-IT

As a dour veterinary pathologist I pride myself in the following

- I no longer get bitten by 75 kg Rotweillers.
- I no longer suffer multiple lacerations while attempting to give cats pills.
- I no longer get defecated on down the back of my overalls by bulls, while I am crouched below their rear end measuring testicular circumference.
- I no longer have to prance around in a crash helmet collecting urethral swabs from virile stallions for CEM testing.

So when I received a phone call from a local crocodile farmer that he had dropped of a crocodile for post mortem at our Post Mortem Room I thought it was going to be another pretty routine task. However, check out what arrived for post mortem – but it was not dead yet!!!! I though damn, where's Crocodile Dundee when you need him most. Being a proud South African I simply applied the "Boer maak n plan" principles and as you can see I sorted out that crocodile with absolutely no problem. Who needs Crocodile Dundee anyway?

CONTRIBUTIONS: Please submit interesting/unusual/funny/strange case studies for publication. Ed

Rehabilitation of neurological patients

By Dr Megan Kelly, DVN, BVSc, Holisticvet

The most common neurological cases referred for physical rehabilitation are animals requiring post operative treatment after decompressive spinal cord surgery. Some may be suffering from inoperative conditions, such as degenerative myelopathy or fibrocartilagenous embolism. The goals however are the same and the therapies used will depend on the severity of the clinical signs and any compensatory problems that may have arisen since the initial diagnosis. Clinicians have recognized the role of physical rehabilitation for people with spinal cord injuries for a long time. There is a new movement in the veterinary field to offering these services to pet owners. Gone are the days of just sending the dog home post surgery, locking it in a crate and hoping for the best. We have tools to accelerate their recovery and these tools can be passed onto the conscientious owner if need be.

Motor function is severely disrupted following spinal cord injury or damage. The spinal cord however has an ability to regenerate and evidence suggests that biochemical changes at cellular level triggered by specific activities can result in sensorimotor recovery. This is termed neural plasticity.[1-3]

Neurological rehabilitation focuses less on repairing lost connections and more on influencing the spinal neural plasticity for regaining function by activity dependant means. [4] We focus on exercises that promote activation of load receptors and that trigger plantar cutaneous stimulation as well as stepping or gait training. [8]

Gait or locomotor training refers to helping a patient to relearn to walk safely and efficiently. It works to "awaken" dormant neural pathways by repetitively stimulating the muscles and nerves in the lower body.

Afferent feedback during walking contributes to extensor muscle activity during the stance phase of locomotion. The sensory input comes from the actual stepping, from the contact of the paw on the ground and from the muscle receptors. [6]

It is believed that there are special neural circuits called central pattern generators (CPG) which allow the body to make rhythmic movements without conscious effort. [5] They cause alternating stimulation of the extensor and flexor muscles. Neurological rehabilitation aims to stimulate these CPG's to assist with returning the patients to independent function.

Our main goals are in neurological cases are:

1. Minimize pain
2. Improve coordination and movement
3. Prevent muscle atrophy
4. Re-establish normal neural pathways
5. Re-establish urinary continence
6. Ideally return the patient to a state where they are able to function independently.

Analgesics and anti inflammatories are very important in managing pain in neurological cases. But there are also rehabilitation modalities that can assist in decreasing the requirements of medications.

Cold packs: Ideal the first 1-3 days after surgery 3 times daily for 3-5 mins. . Do not apply directly onto the sutures. Cold counteracts inflammation and has an analgesic effect.

TENS: (transcutaneous electrical nerve stimulation) low frequency impulses provide analgesia and can be used at home by the owner as well as in hospital. One can start using tens after 3 days post op.

Acupuncture: Blocks pain pathways back to the brain and releases endorphins and serotonins to assist with pain management and healing.

Patients may show varying degrees of co-ordination problems. Exercises to improve co-ordination and neural feedback include.

Bicycling: You can do this with the patient in standing or in recumbency. Hold the paw in your hand and using circular motions to flex and then extend the entire joint in a fluid like motion. If you are doing this exercise in standing make sure the paws touch the ground to ensure we get that cutaneous feedback necessary to stimulate neural feedback.

Weigh shifting: Make sure the patient is standing square with hind feet hip width apart. Standing behind the patient with ones hands on either side of the pelvis. Gently rock the patient from left to right and front and backwards. This exercise assists with muscle strengthening as well as coordination.

Poles on the floor: Lay a few poles a stride length apart on the floor and walk the patient over them. This assists with improving proprioception.

Exercises should begin immediately post surgery to min-

imize muscle wastage. Disuse muscle atrophy begins after 7- 10 days. It's better to maintain the muscle you have than loose it and try and regain it.

In cases where muscle atrophy is severe the prognosis is more guarded. This may indicate decreased nerve input to the muscle rather than just disuse atrophy. In order to prevent muscle wastage active motion is required.

Exercises used will depend on the neurological status of the patient.

Possible exercises may include:

Assisted standing: This should be done a few times daily with a harness. For smaller breeds with only hindlimb paresis or paralysis a hind harness with extra long handles can be used. (Fig 1)

The dogs' centre of gravity is just behind the shoulders. For this reason I recommend a harness that supports the body under the sternum and through the pelvis in large breed dogs. (Fig 2). Slings under the abdomen are not recommended as they place pressure on the abdominal organs and can cause stress in the lumbar vertebrae and then lumbosacral joint. (Fig 3)

Lower the harness to allow the patient to try and actively take wait on the limbs. If the pet drops on its hind legs use the harness to lift them back into the standing position. If the patient has proprioceptive deficits and is knuckling over make sure you continually correct the paw so the paw pads are touching the ground. If the patient is walking on the dorsum of the it's paw there is no neural feedback occurring. If you remember one thing to tell owners post operatively remember to tell them to continually correct the paws.

Flexor relex: This exercise can be done as soon after surgery as possible and several times a day. By pinching the skin between the toes we expect to elicit a withdrawal reflex. If the patient reacts then try and maintain the muscle tension in the leg for a short period of time before releasing.

Exercises with a ball (Fig 4): The ball is a great tool to support patients which can stand for short periods of time. The patient should be placed with its abdomen over patient ball allowing the animal ust to be able to reach the floor with its paws. Then move the ball gently back and forward and sideways.

Underwater treadmill: Once the incision has sealed (7-10 days) these machines are very useful in building muscle as well as gait or locomotor training. The water helps to support the body weight and give the patient stability. One finds that some animals which are not able to walk on land are able to walk in the underwater treadmill, supported by the bouyancy of the water.

Incontinence can be a reason for owners deciding not to continue with rehabilitation. The location of the lesion or spinal injury will determine the type or urinary incontinence. Patients with spinal lesions localised in the T3-L3

Figure 1: A daschund doing exercises in standing

Fig 2: A full body harness offering the correct support through the sternum and pelvis.

Fig 3: The incorrect way of supporting a paralysed or weak dog. Note the abdominal compression and how the pelvis falls into a flexed position stressing the lumbosacral area. A towel is something commonly used by owners and practioners resulting in the same compression and stress.

Fig 4: Dog with excercise ball

region develop an upper motor neuron (UMN) bladder, wheras those with lesions from L4 caudally will develop a lower motor neuron (LMN) bladder. UMN bladders are usually difficult to express becuse of increased urethral sphincter tone . LMN bladder are easily expressed and patients dribble urine due to overflow. Both upper and lower motor neuron bladders are prediposed to urinary tract infections due to incomplete emptying. It is very important to ensure that the bladder is expressed regularly and kept as small as possible to avoid this complication.

Owners can be taught to express bladders, or the dogs can wear diapers but other complications may arise such as continuous bladder infections and urine scald. Make sure that patients are taken out to urinate or expressed at least 4 times a day . Try not to stand over them as this can sometime be inhibitive for them. If they are unable urinate unassisted, it is sometimes helpful to initiate urination by placing moderate presure on the bladder and allowing them to continue emptying the bladder unassisted. one can express the bladder in slateral recumbency or standing position. Place your hands on either side of the abdoment and gently palpate the animals caudoventral abdomen for the presence of the bladder. Once you locate the bladder, which is often quite hard and tense and not necessaily that distended in UMN disease, gently and gradually place constant pressure by pushing your hands together and towards the pelvic outlet.until the bladder is emptied.Ensure tht the bladder is completely empty. Both valium (straited muscle relaxant) and prazoscin (alpah antagonist) can assist to reduce sphincter tone. If you have a patient that is struggling with incontinence I have found acupuncture to be most beneficial.

The exercises in this article can be given to owners to do or can be done by veterinary nurses or hospital staff. Remember to be consistent and to persevere. Rehabilitation of the neurogical patients can be back breaking hard work at times but the reward when you see them walk their first few steps is one of the best feeling you will ever have.

References

1 Plasticity of the spinal neural circuitry after injury Annu Rev Neurosci. 2004;27:145-67.

2. Activity-dependent plasticity in spinal cord injury Edgerton VR1, Tillakaratne NJ, Bigbee AJ, de Leon RD, Roy RR. JRRD Volume 45, Number 2, 2008 Pages 229–240 Journal of Rehabilitation Research & Development

3. Activity-dependent plasticity after spinal cord injury (SCI). Following SCI, rehabilitative therapies can promote significant structural and functional plasticity within central nervous system both rostral and caudal to injury.232 JRRD, Volume 45, Number 2, 2008

4 . Goldshmit Y, Lythgo N, Galea MP, Turnley AM (2008) Treadmill training after spinal cord hemisection in mice promotes axonal

COMMENT

CONDITIONS RESPONSIVE TO REHABILITATION THERAPY

Post-operative management of cranial cruciate ligament rupture requires very mild manipulation in early the post -operative phases. The anticipated gain in extension during the early rehabilitation period is 5 to 10 degrees per week.

With femoral neck ostectomy due to Legg-Calvé-Perthes disease, traumatic luxation, femur neck fractures and salvage procedures for severe hip dysplasia, early use of the limb is encouraged, thus pain control in the post-operative period is important.

In spinal cord disease caused by either intervertebral disc prolapse, vertebral malformations and malarticulations,fibrocartilagenous infarcts, degenerative myelopathy, inflammatory disease and spinal trauma physical therapy aims to: Reduce pain, maintain joint flexibility, prevent or reduce muscle atrophy and restore co-ordination and proprioception. Water therapy is extremely beneficial in dogs with severe paresis or paralysis.

Osteoarthritis management depends on the chronicity of the injury. Cold therapy is used for acute injury whereas heat therapy is more beneficial in chronic cases to reduce muscle spasms – applications should last 15-20 minutes. Take care not to burn the patient. An increase of 3°C at skin level and 1°C 3cm deep. Initially use slow, gentle exercise in underwater treadmill or pool to build muscle strength and endurance and minimize stress on joints. Then progress to land based exercises. Additionally electrical stimulation, laser therapy, ultrasound therapy can be utilised.

Obesity is endemic and worsens joint disease. Combined with caloric restriction exercise can cause a negative energy balance and will help maintain muscle mass.

Practical Considerations: Exercises must be done in an area where the flooring provides good traction. The patient may experience fatigue in the early post-operative period. The patient should be exercised without causing excess fatigue or loss of limb function due to discomfort. Give adequate rest phases. Initially exercise sessions should only last a few minutes, 3-5 times a day. Gradually increase duration and intensity. Short hill walks are a good way to increase intensity.

Editor

sprouting and synapse formation and improves motor recovery. J Neurotrauma 25: 449–465
5. MacKay-Lyons, Marilyn.Central pattern generation of locomotion: a review of the evidence. (Spinal Cord Injury Special Series). Physical Therapy jan 2002
6. Ichiyama RM, Courtine G, Gerasimenko YP et al. (2008) Step training reinforces specific spinal locomotor circuitry in adult spinal rats. J Neurosci 28: 7370–7375.
7. de Leon RD, Hodgson JA, Roy RR, Edgerton VR (1999) Retention of hindlimb stepping ability in adult spinal cats after the cessation of step training. J Neurophysiol 81: 85–94.
8. Dietz, V. & Duysens, J. Significance of load receptor input during locomotion: a review. Gait Posture 11, 102–110 (2000).
9 Millis, Levine, Taylor: Canine rehabilitation and Physical therapy 2004

CPD MULTIPLE CHOICE QUESTIONS AC/1194/14

ANSWER
using sms system/web (www.vetlink.co.za) or on 360 app

1. The most common neurological condition referred for physical rehabilitation is
a. Fibrocartilagenous Embolism
b. Degenerative Myelopathy
c. Cauda Equina Syndrome
d. Decompressive spinal cord surgery
e. None of the above

2. Neural plasticity occurs due to...
a. Mechanical breakdown in the spinal cord at cellular level
b. Biochemical changes in the spinal cord at cellular level
c. Breakdown in the spinal cord at cellular level
d. No change in the spinal cord at cellular level
e. None of the above

3. Central pattern generators cause...
a. Stimulation of extensor muscles only
b. Stimulation of flexor muscle only
c. Alternating stimulation of extensor and flexor muscles
d. No muscle stimulation
e. None of the above

4. Cold packs should be used in the first 1-3 days for...
a. 3-5 minutes
b. 10 minutes
c. 13-15 minutes
d. 30 minutes
e. None of the above

5. Bicycling exercises
1. improve range of motion
2. improve co-ordination
3. stimulates neural feedback
a. 1 only
b. 3 only
c. 1 and 2
d. 1 and 3
e. 1, 2, and 3

6. Exercises in neurological rehabilitation should start
a. immediately
b. 10 days after surgery or the incident
c. When the stitches are removed
d. 6 weeks post op
e. 3 months post op

7. Harnesses used to assist with neurological cases should
a. provide support through the sternum and the a domen
b. provide support through the sternum and the pelvis
c. provide support through the abdomen only
d. promote a flexed lumbosacral joint
e. none of the above

8. The underwater treadmill is a tool used in neurological rehabilitation of surgical cases. When?
a. First day after surgery
b. When the suture wound has sealed
c. 3 weeks post op
d. Never
e. None of the above

9. Muscle atrophy begins how many days after dis use
a. 1 day
b. 3 days
c. 7-10 days
d. never
e. none of the above

10. TENS stands for
a. Tender electrical nerve stimulation
b. Tender electrical neural stimulation
c. Transcutaneous electrical nerve stimulation
d. Transcutaneous electrical nerve switch
e. None of the above

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