Spay-Neuter Update
What *is* the Right Thing to Do?

Growing trend for alternatives to OHE for Spay
Fad or real trend??
The Good
Rather than continuing to regurgitate the long held dogmas that there are no negatives to gonadectomy, we are considering the consequences, and having an honest conversation
The Bad ????

Why????
• to determine whether lifetime duration of ovary exposure was associated with exceptional longevity
• lifetime medical histories, age at death, and cause of death for a cohort of canine 'centenarians'—exceptionally long-lived Rottweiler dogs (13 years)

• removal of ovaries during the first 4 years of life erased the female survival advantage in Rotts
Far Fetched Independent Conclusion
• Leaving an ovary will make them live longer
• Why not just spay them after 4 years of age?
• Would still get significant protection against mammary cancer and pyometra
• Can anything that happens to 13 year old Rotts be extrapolated to dogs in general??

Neutering dogs: effects on joint disorders and cancers in golden retrievers. De la Riva et al, 2013
• 759 client-owned dogs were examined for diagnoses of hip dysplasia (HD), cranial cruciate ligament tear (CCL), lymphosarcoma (LSA), hemangiosarcoma (HSA), and mast cell tumor (MCT).
• Patients were classified as intact (IF, IM), or neutered early (ENM, ENF) at <12 mo or neutered late (LNM, LNF) at ≥12 mo
Neutering dogs: effects on joint disorders and cancers in golden retrievers. De la Riva et al, 2013

<table>
<thead>
<tr>
<th>Condition</th>
<th>ENM</th>
<th>LNM</th>
<th>IM</th>
<th>ENF</th>
<th>LNF</th>
<th>IF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hip Dysplasia</td>
<td>10%</td>
<td>1%</td>
<td>5%</td>
<td>3%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>Ruptured Anterior Cruciate Ligament</td>
<td>3%</td>
<td>1%</td>
<td>0%</td>
<td>8%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Lymphoma</td>
<td>10%</td>
<td>0%</td>
<td>3%</td>
<td>6%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Hemangiosarcoma</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
<td>7%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Mast Cell Tumor</td>
<td>2%</td>
<td>4%</td>
<td>3%</td>
<td>2%</td>
<td>6%</td>
<td>0%</td>
</tr>
</tbody>
</table>

- Mammary tumors were not assessed
- EN gave disadvantage of 5-9% for CCL in both sexes, and HD & LSA in males; LN gave similar disadvantage for HSA & MCT in females.


- 683 Rottweiler dogs
- Male and female dogs that underwent gonadectomy before 1 year of age were much more likely to get bone sarcomas than sexually intact Rotts (lifetime risk 1 in 4)
- Rotts that did not die of bone sarcoma live an average of 8-9 months longer than those that died of bone sarcoma

Endogenous gonadal hormone exposure and bone sarcoma risk. Independent Conclusions??

- while bone cancer rates are lowest in IF, lifespan is also the shortest, by 2-3 years.
- Cohorts that live longest and have the lowest rates of bone cancer are males castrated > 3.5 yrs & females spayed > 5 yrs
- Agreed: Rotts spayed at < 1 yr are much more likely to get bone cancer (25% lifetime risk, 2-3x more likely than above)
- Spayed < 1 yr in giant dogs leads to increased rates of orthopedic problems, including bone cancer
- Historical Howe studies followed only 2 years


- Retrospective study breaking retrievers down into neutering at < 6 mos, 6-11 mos, year 1, years 2-8.
- Looked at rates of hip dysplasia, cranial cruciate rupture, and elbow dysplasia
- Also looked at rates of lymphoma, hemangiosarcoma, mast cell tumor and mammary cancer 😊


- Spaytings under 6 mos doubled risk of orthopedic problems
- Spaytings under 6 mos quadrupled risk of orthopedic problems
- Minimal increase in cancer due to spay in Labradors
- Spayed Golden at any age increased risk of cancer 3-4x
- No increase in cancer risk for neutering male retrievers
- Prostate cancer not looked at
**Canine Mammary Gland Tumor**

- Most common tumor in intact female dogs (42%)
  - 50% of them are malignant
- Rare in dogs less than 5 years old
- Duration of exposure to ovarian hormones early in life determines the overall mammary cancer risk (Dorn et al, 1968).
  - 0.5% if OHE prior to the first heat
  - 8% if OHE prior to the 2nd heat
  - 26% if OHE after the 2nd heat

**Canine Mammary Gland Tumor**

- Tumor risk increases incrementally each year and plateaus around 11–13 (Schneider, 1970)
- Intact females are more likely to have an anaplastic tumor type, compared to dogs spayed early or late in life, prior to MGT (Ogilvie, 2006)

**Canine Mammary Gland Tumor**

- OBJECTIVES: To determine whether parachutes are effective in preventing major trauma related to gravitational challenge: systematic review of randomised controlled trials.
  - Smith GC1, Pell JP
- CONCLUSIONS: As with many interventions intended to prevent ill health, the effectiveness of parachutes has not been subjected to rigorous evaluation by using randomised controlled trials. Advocates of evidence based medicine have criticised the adoption of interventions evaluated by using only observational data. We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.
Let’s Come to Our Senses!

**Do we get an accurate picture of how gonadectomy correlates with lifespan by isolating a few variables from the rest?**
- There are at least 2 large lifetime studies looking at entire health records, and all variables that are in the practice management software
- Both show that neutered dogs that go to the vet happen to live longer than intact dogs
- Remember – this does not prove cause and effect
- So why are we leaving ovaries in dogs?

Let’s Come to Our Senses!

- University of Georgia
- compared causes of death among over 40,000 sterilized and sexually intact domestic dogs (189 breeds)
- Sterilization associated with increase in lifespan by 14% in males and 26% in females

Let’s Come to Our Senses!

**Banfield State of Pet Health Report - 2013**
- More than 2 million animals in the Banfield database
- Not peer reviewed
- Castrated cats lived 62% longer than intact males
- Spayed cats lived 39% longer than intact females
- Castrated dogs lived 18% longer than intact males
- Spayed dogs lived 23% longer than intact females

Let’s Come to Our Senses!

**Banfield State of Pet Health Report - 2013**
- Intact dogs are more than twice as likely to be hit by a car as neutered dogs.
- Intact cats are 4 times as likely to be hit by a car as neutered cats
- Intact dogs are more than twice as likely to bitten by another animals as neutered dogs
- Intact cats are 3 times as likely to brought to a veterinarian for treatment of animal bites as neutered cats
Let's Review!

**Speuter Cons:**
- Ruptured cruciate, hip Dysplasia, elbow dysplasia more common especially in males if neutered < 1 yr
  - Even when BCS controlled for
- Transitional cell carcinoma (1% - 2-4x) and bone cancer (0.2% - 1.5-2x) are significantly increased in speutered dogs, especially giant breeds < 1 yr
- Prostate cancer, lymphoma and mast cell tumor are mildly increased speutered dogs
  - Prostate cancer 0.2-0.6% (2-3x more likely in castrated dog)
- Goldens are at increased risk of cancers if speutered
  - Hemangiosarcoma (0.2% - 2.2-5x)

Let's Review!

**Speuter Pros:**
- Female Rottweilers live 2-3 years longer if spayed > 5 years; males live 1-2 years longer if castrated > 3.5 yrs
- Sterilized dogs & cats live 14-62% longer than intact dogs & cats
- Objectionable behaviors are reduced:
  - Urine marking, roaming, fighting, aggression
- Melanoma and mammary cancer are reduced
- Cancer of ovaries, uterus and testicles (0.9%) are virtually eliminated
- Urinary incontinence more common when female neutered < 12 weeks (Beauvais, 2012)
- Immune mediated disease and hypothyroidism more common in speutered dogs
- Some trainers think dogs and cats who undergo pediatric speuter remain prepubertal/adolescents and are more difficult to train
- Pediatric speuter changes conformation – legs grow longer before growth plates close, and some secondary sex characteristics never fully develop

Let's Review!

**Questions:**
- What is the likelihood of a puppy/kitten eventually dying of euthanasia at the local animal shelter, and how is that balanced against other causes of death?
- Breed predispositions for cancer are clearly different. What about mixed breed dogs? Does size matter?
- What about cats?
- Is there any evidence that leaving an ovary in females is the right thing to do?
- Should ovary sparing spay be done at a young age, and then the ovary removed prior to old age?

Let's Review!

**Speuter Pros:**
- Risk of some diseases are drastically reduced:
  - Degenerative and vascular diseases
  - Trauma and infectious disease
- Some medical conditions are improved or risk reduced
  - Demodocosis, Alopecia X
  - Prostatitis (BPH 50% at 2.5 yrs, 80% at 6 yrs, 95% at 9 yrs)
  - perianal tumors, mammary hyperplasia
- Potentially life threatening conditions are often cured:
  - seizures, diabetes
  - pyometra (24% of intact females)

Let's Review!

**Speuter Cons:**
- There is no increase in urethral obstruction in castrated cats compared to tom cats
- It is probably wise to allow dogs and cats to mature prior to performing gonadectomy
- But this must be weighed against local excess pet population and risk of death by euthanasia at a shelter
- The vet’s role – discuss options with the client, and come to the best solution for owner and pet
Summary

- PowerPoint Handout goes behind the green tab
- Vet Handouts
  - Banfield State of Pet Health 2013
  - Cooley Paper – Rottweiler Longevity
  - DeLaRiva Paper – Golden Cancer and Orthopedics
  - Hart Paper – Retriever Cancer and Orthopedics
  - Hoffman Paper – U of Georgia Longevity Study
  - Waters Paper – Rottweiler Longevity Study
  - Beauvais Papers – Mammary Tumors & Urinary Incontinence

Summary

- Client Handouts
  - Spaying Your Dog
  - Neutering Your Dog
  - Spaying Your Cat
  - Neutering Your Cat

Acknowledgements

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