

Countering the Pushback Against Spay/Neuter



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The Problem



- ➲ 4-6 million cats, dogs, puppies, and kittens are euthanized in shelters in the United States every year
- ➲ Although some are sick, the majority of these animals are healthy
- ➲ Shelter “euthanasia” is the leading cause of death in companion animals in the United States
- ➲ “Homelessness” is a more serious problem than any disease vets learn about in veterinary school!



The Pushback Against Spay/Neuter



From four different areas:

- ➲ The Public
- ➲ Breeders
- ➲ Animal Rights groups
- ➲ Private Practitioners

In today's talk we will...

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- ➲ Discuss possible reasons for a pushback
 - ➲ Discuss the Association of Shelter Veterinarians Guidelines for Spay/Neuter
 - ➲ Discuss how to tell “good” research from “bad” research
 - ➲ Discuss some of the research that has been published on the effects of neutering dogs and cats
 - ➲ Discuss the Golden Retriever study as well as the Georgia study



This also applies to pet overpopulation...

“Tremendous amounts of money are spent on finding cures, yet little is spent on prevention.”



So Why is there a pushback?

The Public

- ➲ Access to the internet has made experts of a lot of people!
- ➲ Opinion pieces, blogs, breeder sites, and other veterinary related sites have resulted in misinformation and confusion

So Why is there a pushback?

Breeders

- ☞ Concerned about the negative connotations that "buying" a dog has vs. adopting
- ☞ Concerned that early age spay/neuter may be causing musculoskeletal or other problems in their particular breed

So why is there a pushback?

Private Practitioners

- ☞ Increased numbers of HQHVSN clinics
- ☞ Many vets in private practice believe their livelihood is threatened, however:
 - 2002 Humane Alliance owner survey; 987 owners who came to HA for surgery for their pet
 - 88% of animals had not seen a vet in the last year
 - 87% did not have a regular veterinarian
 - 85% had not had their pet vaccinated against rabies
 - 92% said cost was a factor in deciding whether to neuter

So why is there pushback?

This is NOT what HQHVSN looks like!



So Why is there a pushback?

Animal Rights Groups

- ☞ Many believe that animals should not be spayed or neutered, since it isn't natural
- ☞ Many believe that animals should have a voice in whether they are surgically sterilized

So why is there pushback?

- ☞ Many veterinarians say the surgery done in high quality, high volume spay neuter clinics is sub-standard
- ☞ Argue that it is best done in their practices due to sterility, anesthetic safety, and one-on-one care for patient



ASV Guidelines for Spay/Neuter

- ☞ Published in 2008 by the Association of Shelter Veterinarians
- ☞ Authors were members of ASV's Spay/Neuter task force
- ☞ Veterinarians from shelters, academia, and HQHVSN clinics



ASV Guidelines for Spay/Neuter

- Sets stringent guidelines for spay/neuter, applicable to shelters, spay/neuter clinics, and private practice
- Focus is on the individual patient to ensure the best outcome



What do the guidelines say?

"Animal shelters should require that cats and dogs be spayed or neutered prior to adoption."



Why should shelter and rescue groups neuter before adoption?

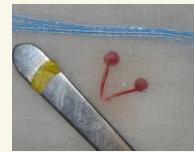
PetSmart Charities 2009 Pet Owner Survey

- 2000 online respondents
- 1/3 did not have their pets neutered in a timely fashion following adoption
- Confusion about appropriate age for neutering
- 10-20% said their pet had at least one litter following adoption!



What do the guidelines say?

"Surgical sterilization is the most reliable and effective means of preventing unwanted reproduction of dogs and cats."



The Value of Early Sterilization: Neutering Prior to Adoption

Proven Health Benefits

Females

- Virtually eliminates risk of mammary tumors
- Eliminates risk of uterine and ovarian cancer
- Eliminates nuisance behaviors associated with estrus
- Eliminates risk of pyometra

Males

- Decreases benign prostatic disease
- Decreases fighting, roaming, and spraying
- Eliminates "tom cat" odor
- Eliminates risk of testicular cancer

Why should shelter and rescue groups neuter before adoption?

PetSmart Survey (cont.)

- Of those who had not had their pet neutered, the most common reasons they gave were:
 - Too young (34%)
 - Too expensive (31%)
 - No time (24%)
 - Not necessary (11%)



The Reality

- ☞ 10-60% non-compliance in the US if not neutered prior to adoption
 - ☞ Even if 90% comply, 10% are still reproducing!
 - ☞ Difficult to follow up on
- Neutering *before* adoption...

- Puts the power in the shelter or rescue groups' hands
- Boosts compliance to 100%!



What do the guidelines say?

"Aseptic surgical technique is *required*, and separate sterile instruments should be used for **each** patient."

- No sharing of packs between littermates!



Increasing Spay-Neuter Programs

- ☞ Central to improving the welfare of all dogs and cats
- ☞ Must be accessible and widely available
- ☞ Must be targeted
- ☞ Timing is everything!



What do the guidelines say?

"Spaying and Neutering must be performed by veterinarians or veterinary students under direct supervision of a veterinarian in compliance with all legal requirements."



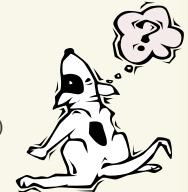
The Reality

What about the rest?



What is the ideal age to neuter animals?

- 8-12 weeks
- At least 3 months
- At least 4 months
- At least 6 months
- At least 8 months (after first heat)
- Over 1 year of age
- Over 3 years of age



What is the ideal age to neuter animals?

We don't know!

But we do know:

- There are pros and cons for animals of any age
- Early-age neutering is safe and effective
- Early-age neutering is one of the best ways to prevent unwanted or "oops!" litters
- Neutering prior to adoption results in 100% owner compliance!

The Myths Concerning Early-Age Neutering

- ☒ They will get fat
- ☒ It will stunt their growth
- ☒ Male cats will be prone to urinary obstruction
- ☒ They will be more prone to developing cancer
- ☒ They will develop bone and joint abnormalities
- ☒ Female dogs will be prone to urinary incontinence and urinary tract infections
- ☒ Anesthesia is too risky for pediatric patients to be done routinely in veterinary practice

Most of these "myths" have been disproven by current research!

Early-Age Neutering has been endorsed by:

- ☒ American Veterinary Medical Association
- ☒ American Animal Hospital Association
- ☒ American Kennel Club
- ☒ Cat Fanciers Association
- ☒ American Humane
- ☒ American Society for Prevention of Cruelty to Animals (ASPCA)
- ☒ Humane Society of the United States
- ☒ Association of Feline Practitioners
- ☒ Association of Shelter Veterinarians



American Veterinary Medical Association Position Statement

"The AVMA supports the concept of early (8-16 weeks of age) ovariohysterectomies/gonadectomies in dogs and cats, in an effort to stem the overpopulation problem in these species."



The Value of Early Sterilization: Neutering Prior to Adoption

Timing is Key! Neutering must be done:

- Prior to Adoption
- Before Puberty

Remember...

A large proportion of cats and dogs that are eventually spayed have a litter (or two) first!



Take cats, for example...

Onset of puberty depends on:

- Age
- Time of Year
- Geographical Location
- Social Activity

If they weigh 2 kg (4 pounds) and the days are long, they **WILL** cycle (especially if other cats are around)!



What about owned animals?

- For most dogs and cats in private practice, neuter before puberty
- Neuter at the time of final vaccination in a standard vaccination protocol (16-20 weeks of age)
 - Guaranteed compliance
 - No accidental litters
 - Weigh risk/benefit and do what is medically best for the *individual* animal



Risks vs. Benefits

All surgical procedures are associated with both risks and benefits...how does one decide if benefits of early age neutering outweigh the risks?

- Personal experience
- Experience of colleagues
- Scientific studies



Spectrum of Quality of Evidence from Scientific Studies

- Of all research studies, ones with more subjects are the most valid when assessing data
- When studies are repeatedly shown to have validity, the result is *multiple* studies supporting the original findings, which is the most valid of all

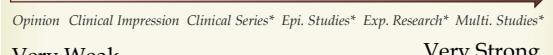


But in Europe they don't...

- Cultural differences in many European countries means most owned animals remain intact
- In many parts of the world, neutering animals is considered unethical
- Routine neutering is illegal in Germany!
- In Sweden, only 7% of female dogs are spayed, but almost 25% of these dogs develop pyometra before age 10 (Reichler, 2009)

Spectrum of Quality of Evidence from Scientific Studies

Quality of Evidence



Very Weak

Very Strong

* Peer reviewed

What does Peer-Reviewed Mean?

- Scientific studies undergo rigorous peer review prior to being published in reputable scientific journals
- This means that other scientists anonymously review the study to detect flaws in study design and in interpretation of results
- If the study passes this rigorous test, it is accepted for publication



The Problem Lately...

The Internet!



The Internet

- ❖ Veterinary Blogs
 - ❖ Veterinary Care Websites
 - ❖ Breeders/Breed Specific Websites



The Internet

- ❑ Peer-Reviewed Studies
 - ❑ Available online, but many journals require a subscription prior to viewing
 - ❑ Not easily accessible to the general public



The Internet

Public's access to computers and wealth of information available (most not properly validated) to anyone, anywhere with a computer!



The Internet

- ❑ Open Access Journals
 - ❑ Provides anyone unrestricted access and unrestricted reuse of journal material
 - ❑ Some are reputable and require peer-review; many are not and will publish anything for a price



How to Interpret Data

- ❑ Critically look at **numbers** of subjects used in the study (large studies are best)
 - ❑ Critically evaluate case selection for bias or omission
 - ❑ Evaluate statistical data and supported conclusions



Safety Studies

What does the evidence suggest?

Anesthetic complications: Fagella and Aronsohn (JAVMA, 1994)

- S/N surgery on **96**, 6-14 week old kittens and puppies
- Reported no serious complications



Safety Studies

What does the evidence suggest?

Post-operative complications: Howe (JAVMA, 1997)

- Evaluated major and minor complications in **775** cats and dogs with student surgeons
- Three age groups: <12 weeks, 12-23 weeks, and > 24 weeks
- No difference in mortality
- No difference in major complications
- Older cats had more minor complications (7.8%) than <12 weeks group (3.6%)

Epidemiological Studies

- ❖ Body weight
- ❖ Bone growth
- ❖ Urinary tract health
- ❖ Cancers



Obesity

- ❖ Can cause pre-disposition to other diseases like diabetes and cranial cruciate rupture



Obesity in Sterilized Dogs

Salmeri, et.al. (JAVMA, 1991)

- Purpose was to study incidence of obesity in **32** sterilized dogs
- After 15 months, no differences in those sterilized at 7 weeks or at 7 months

Spain, et. al. (JAVMA, 2004)

- Large retrospective study (**1800** dogs)
- Showed that incidence of obesity **decreased** with animals neutered before 5 months



Obesity in Sterilized Cats

Root, 1995 & 1996; Fettman, 1997; Nguyen, 2004:

- Neutering at any age lowers the metabolic rate and increases food intake in both male and female cats
- Weight gain can be prevented by feeding controlled portions and avoiding free choice



Effects on Skeletal Growth

FACT: Gonadal steroids stimulate cartilage growth, growth plate maturation and growth plate closure



Effects on Skeletal Growth

Growth plate closure in normal intact cats begins at 4-7 months of age and is complete by 14-20 months of age

- Cats may begin urine spraying after reaching puberty at 8-10 months of age; delaying surgery until after growth plate closure may not be feasible for most clients
- Limiting food intake to *prevent* obesity is key

Effects on Skeletal Growth

Cranial Cruciate Rupture

- Incidence is 1.8% in all dogs (18/1000 dogs)
- No studies to date that link delayed growth plate closure to abnormalities in joint formation that may lead to CCL rupture
- Heredity plays a major role, as does body weight and condition
- More prevalent in spayed female dogs (Root, 2007); more prevalent in neutered male dogs (Reichler, 2009)
- Breed Risk: German Shepherd, Golden Retriever, Mastiff, Rottweiler, American Staffordshire Terrier

Effects on Skeletal Growth

McNicholas, (JAVMA, 2002):

- Overweight male cats neutered prior to puberty and before growth plate closure are at greater risk for hip fractures
- 26 cats in the study
- Case series



Effects on Skeletal Growth

Hip Dysplasia

- In one study (Spain, et.al., 2004), 6.7% of dogs (67/1000) neutered before 5 months developed hip dysplasia, compared to 4.7% (47/1000) that were neutered at >5 months
- In many of these cases a diagnosis of hip dysplasia by a veterinarian was not obtained
- In another study (Howe, et.al., 2001), no significant association was found between age at neutering and frequency of musculoskeletal problems
- Breed Risk: German Shepherd, Golden Retriever, St. Bernard

Effects on the Urinary Tract

Urinary Tract Disorders

- Feline lower urinary tract disease
- Feline urolithiasis/obstruction
- Spay incontinence in female dogs
- Urinary tract infections



Effects on the Urinary Tract

Feline Lower Urinary Tract Disease

- Overall incidence is 0.6% (6/1000 cats)
- Numerous studies have shown no correlation between age of neutering and FLUTD, including obstruction



Effects on the Urinary Tract

Urinary Incontinence in Spayed Dogs

- Common; overall incidence is 5-20% (50-200/1000 dogs)
- Larger breed dogs are more likely to develop incontinence
- Breed Risk: Boxer, Doberman, Rottweiler, Springer Spaniel, Weimeraner



Effects on the Urinary Tract

Recessed Vulva

- Dogs spayed prior to 1 year of age may maintain a juvenile or recessed vulva
- Root, 2007: dogs spayed as adults will develop vulvar atrophy



Effects on the Urinary Tract

Stubbs, et. al., 1993; Root, 1996:

- Compared male cats neutered at 7 weeks, 7 months, and left intact
- 1 year study; measured urethral pressures and urethral diameter
- No differences between the three groups

Spain, et. al., 2004:

- Reviewed records of cats neutered between 6 weeks and 12 months of age (1,660 cats)
- Divided into three groups according to age at neuter: <3.5 months; 3.5-6 months; >6 months
- No differences in incidence of lower urinary tract disease or urethral obstruction among the three groups

Effects on the Urinary Tract

Urinary Incontinence in Spayed Dogs

- Thrusfield (1985): survey of the incidence of estrogen-responsive urinary incontinence; showed incidence higher in spayed dogs than intact
- Spain, et. al. (2004): retrospective study of 983 dogs; 49/983 developed urinary incontinence (5%)
- In this study, there was a significant difference between dogs spayed before 3 months and those spayed later:
 - Before three months: 12.9% incidence
 - After three months: 5.0% incidence

Effects on the Urinary Tract

Urinary Tract Infections in Spayed Dogs

- Dogs spayed at less than 5.5 months had a 1.38% incidence of developing a UTI (13.8/1000 dogs)
- Dogs spayed at greater than 5.5 months had a 0.43% incidence of developing a UTI (4.3/1000 dogs)
- No direct cause and effect relationship has been established between early spay and development of UTIs
- None of the dogs had chronic UTIs

Long -Term Studies

Howe (2000, 2001)

- 263 cats; 3 year follow up
- 269 dogs; 4 year follow up
- Spain, et.al. (2004)
- 1,660 cats; up to 11 years following surgery (median 3.9 years)
- 1,842 dogs; up to 11 years following surgery

Both studies concluded no serious long term medical or behavioral effects associated with early age sterilization in cats and dogs, with the exception of an increased incidence of urinary incontinence in female dogs



Cancer Risk

Mammary gland tumors

- ➲ Most common tumor of female dogs; overall incidence is 3.4% (34/1000; 51% will be malignant)
- ➲ In cats, incidence is 2.5% (>90% will be malignant)
- ➲ Sexually intact dogs have 7X increased risk of developing mammary cancer (238 / 1000 dogs)
- ➲ Dogs spayed before the first heat have 99.5% protection from risk of developing mammary cancer (1.7 / 1000 dogs)
- ➲ Increasing age = increasing risk (mean age at diagnosis: 10 years)
- ➲ Breed Risk: Boxer, Dachshund, German Shepherd, Yorkie

Cancer Risk

Prostatic tumors

- ➲ Incidence is 0.2%-0.6% in all male dogs (2-6/1000)
- ➲ Castrated dogs are 2.4-4.3X more likely to develop these tumors than intact dogs; almost all are malignant
- ➲ Brings incidence up to 5-26/1000 in castrated dogs
- ➲ Mean age at diagnosis is 10 years

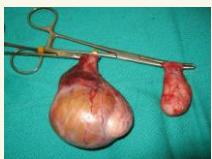
Cancer Risk

Bladder Cancer

- ➲ Overall incidence is 1.0% (10/1000)
- ➲ Neutered animals have 2-4X the risk of developing bladder cancer (20-40/1000 dogs)
- ➲ Breed Risk for bladder cancer: Beagle, Collie, Westie, Scottie, Airedale

Cancer Risk

Testicular tumors: eliminate risk with castration
Uterine/ovarian tumors: eliminate risk with spay



Cancer Risk

Hemangiosarcoma

- ➲ Most common cardiac tumor of dogs; overall incidence is 0.2% (2/1000 dogs)
- ➲ Spayed dogs have 2.2X increased risk of developing splenic hemangiosarcoma (4.4/1000 dogs)
- ➲ Spayed dogs have 5X increased risk of developing cardiac hemangiosarcoma (10/1000 dogs)
- ➲ Castrated dogs have 2.4X increased risk of developing hemangiosarcoma (5/1000 dogs)
- ➲ Breed Risk: Boxer, Golden Retriever, Great Dane, Husky

Cancer Risk

Osteosarcoma

- ❑ Highly malignant bone tumor; overall incidence is 0.2% in dogs (2/1000 dogs)
- ❑ Incidence increases with age and body weight (large breed dogs have increased risk)
- ❑ Neutered dogs have 1.3-2.0X increased risk for developing these tumors (2.6-4/1000 dogs)
- ❑ Breed Risk: Doberman, Great Dane, Irish Setter, Rottweiler

The Golden Retriever Study

- ❑ Published in online journal PLOS One in July, 2013
- ❑ Specifically looked at incidence of joint disorders and cancers in neutered Golden Retriever dogs



The Golden Retriever Study

Study Design

- ❑ 759 client-owned Golden Retriever dogs seen at UC Davis veterinary hospital
- ❑ Age range was limited to dogs 1-8 years of age: 145 intact males, 178 EN males, 72 LN males, 122 intact females, 172 EN females, and 70 LN females
- ❑ Data from dogs less than 1 year or greater than 9 years were not included
- ❑ Evaluated for hip dysplasia, cranial cruciate tears, lymphosarcoma, hemangiosarcoma, and mast cell tumors

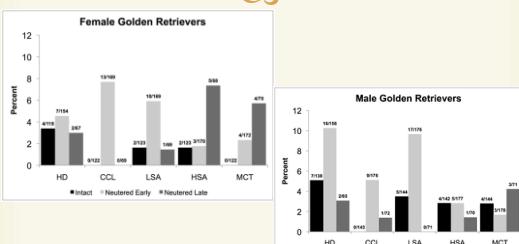
The Golden Retriever Study

Breed Disposition to Disease in Golden Retrievers*:

- ❑ Cardiac hemangiosarcoma
- ❑ Shoulder OCD
- ❑ Elbow dysplasia
- ❑ Hip dysplasia (11th worst breed; prevalence of 25.9%)
- ❑ Mast cell tumors
- ❑ Lymphosarcoma (high incidence in this breed)
- ❑ Atopy
- ❑ Muscular dystrophy
- ❑ Etc.

*From: *Breed Dispositions to Disease in Dogs and Cats*, by Alex Gough and Alison Thomas; Blackwell Publishing, 2004.

The Golden Retriever Study



The Golden Retriever Study

Results of the Study

Males with Hip Dysplasia:

- ❑ Intact: 5% (50/1000 dogs); mean age at dx 4.4yrs.
 - ❑ EN: 10% (100/1000 dogs); mean age at dx 3.6 yrs.
 - ❑ LN: 3% (30/1000 dogs); mean age at dx 4.7 yrs.
- No differences were found in female groups

Overall Incidence of Hip Dysplasia in this breed: 25.9% (259/1000 dogs)

The Golden Retriever Study

Results of the Study

Females with Cruciate Injuries:

- ❑ Intact: 0% (0/1000 dogs)
- ❑ EN: 7.6% (76/1000 dogs); age of onset 4.8 years
- ❑ LN: 0% (0/1000 dogs)

Males with Cruciate Injuries:

- ❑ Intact: 0% (0/1000 dogs)
- ❑ EN: 5% (50/1000 dogs); age of onset 3.6 years
- ❑ LN: 1.3% (13/1000 dogs)

Overall incidence of CCL rupture is 1.8% (18/1000 dogs)

The Golden Retriever Study

Results of the Study

Males with Lymphosarcoma

- ❑ Intact: 3% (30/1000 dogs); mean age at dx 5.3 yrs.
- ❑ EN: 9% (90/1000 dogs); mean age at dx 5.8 yrs.
- ❑ LN: 0% (0/1000 dogs)

We know that lymphosarcoma is a common cancer of Golden Retrievers, and most dogs are diagnosed at 6-7 years of age

The Golden Retriever Study

Results of the Study

Females with Hemangiosarcoma

- ❑ Intact: 1.6% (16/1000)
- ❑ EN: 1.7% (17/1000)
- ❑ LN: 7.3% (73/1000)

No differences were found in male groups

We know that cardiac hemangiosarcoma is common in this breed, and incidence increases with age

The Golden Retriever Study

Results of the Study

Females with Mast Cell Tumors

- ❑ Intact: 0% (0/1000)
 - ❑ EN: 2% (20/1000); mean age of onset 6.2 yrs.
 - ❑ LN: 6% (60/1000); mean age of onset 6.5 yrs.
- No differences found in male groups

We know that mast cell tumors are common in this breed, and incidence increases with age

The Golden Retriever Study

Problems with this Study:

- ❑ Only one breed studied
- ❑ Dogs from all groups were excluded from the study if over 9 years of age and under 1 year of age
- ❑ Only 759 dogs
- ❑ Referral Veterinary School Hospital population:
 - ❑ Are these owners more likely to spay/neuter?
 - ❑ Seek extensive veterinary care for their pet?

The Georgia Study

- ❑ Published in the journal PLOS One in April 2013
- ❑ Specifically examined causes of death in domestic dogs ages 1-17.5 years
- ❑ Used records from CVMs across the country between 1984-2004
- ❑ 24 breeds as well as mixed breeds were included
- ❑ A total of 40,000 dogs were included in the study



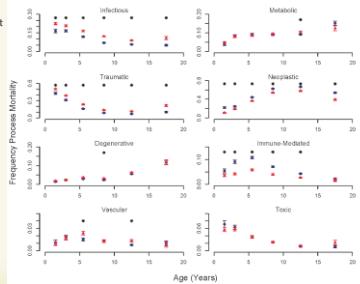
The Georgia Study

Findings:

- ❑ Sterilized dogs are less likely to die from infectious disease, trauma, vascular disease, and degenerative disease
- ❑ Sterilized dogs are more likely to die from cancer and immune-mediated disease
- ❑ Findings similar for males and females

The Georgia Study

Blue dot: represents sterilized dogs
 Red triangle: represents intact dogs
 Black asterisk: indicate significant difference between the two groups



The Georgia Study

Problems with this study:

- ❑ Age at time of spay/neuter could not be obtained
- ❑ Dogs in this study were also from veterinary college referral hospitals:
 - ❑ Are these owners more likely to spay/neuter?
 - ❑ Seek extensive veterinary care for their pet?

Conclusions: Early-Age Neutering

- ❑ When examining data, numbers are everything!
- ❑ A broad population will give you better ideas about disease incidence than a narrow population
- ❑ Multiple studies have shown early spay/neuter to be safe and with few risks of developing disease as a result of neutering

Conclusions: Early-Age Neutering



Pros:

- Easier and faster procedure (less fat, less bleeding)
- Less stress on patient and veterinarian
- Faster recovery
- No "oops!" litters
- Eliminates risk of testicular, uterine, and ovarian cancer
- Decreases risk of development of benign prostatic disease
- Significantly decreases risk of development of mammary carcinomas
- Significantly decreases territorial spraying in male cats
- Decreases fighting and roaming activity in male dogs and cats
- Kittens and puppies are the most likely animals to be adopted in a shelter, and neutering before adoption is key!

Conclusions: Early-Age Neutering

Cons:

- Increased incidence of developing urinary incontinence in early age spayed female dogs (<3 months)
- Delayed growth plate closure may result in hip fractures in obese male cats neutered prior to puberty



Risk-Benefit Ratio

- ❖ Nothing is risk free
- ❖ Do the risks outweigh the benefits?
- ❖ For most animals, the risk: benefit ratio is in favor of early spay/neuter!
- ❖ Particularly important if the major goal is to prevent pet overpopulation



Questions?

Whoever said that
diamonds are
a girl's best friend..

Never owned a dog..

