

# Harnessing the beast:

## CATS WITH CANCER





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**LOTUS**  
PET ONCOLOGY



# Today's Discussion

SCC

Nasal tumors

MCT

GILSA

MGT

Injection site sarcomas



YOU ARE NOT JUST A CAT.  
◇ YOU ARE MY SANITY, MY  
HAPPINESS, MY TEACHER, MY  
GUIDE. YOUR LOVE IS MY LIGHT.  
YOU ARE MY BEST FRIEND.

GO AWAY.

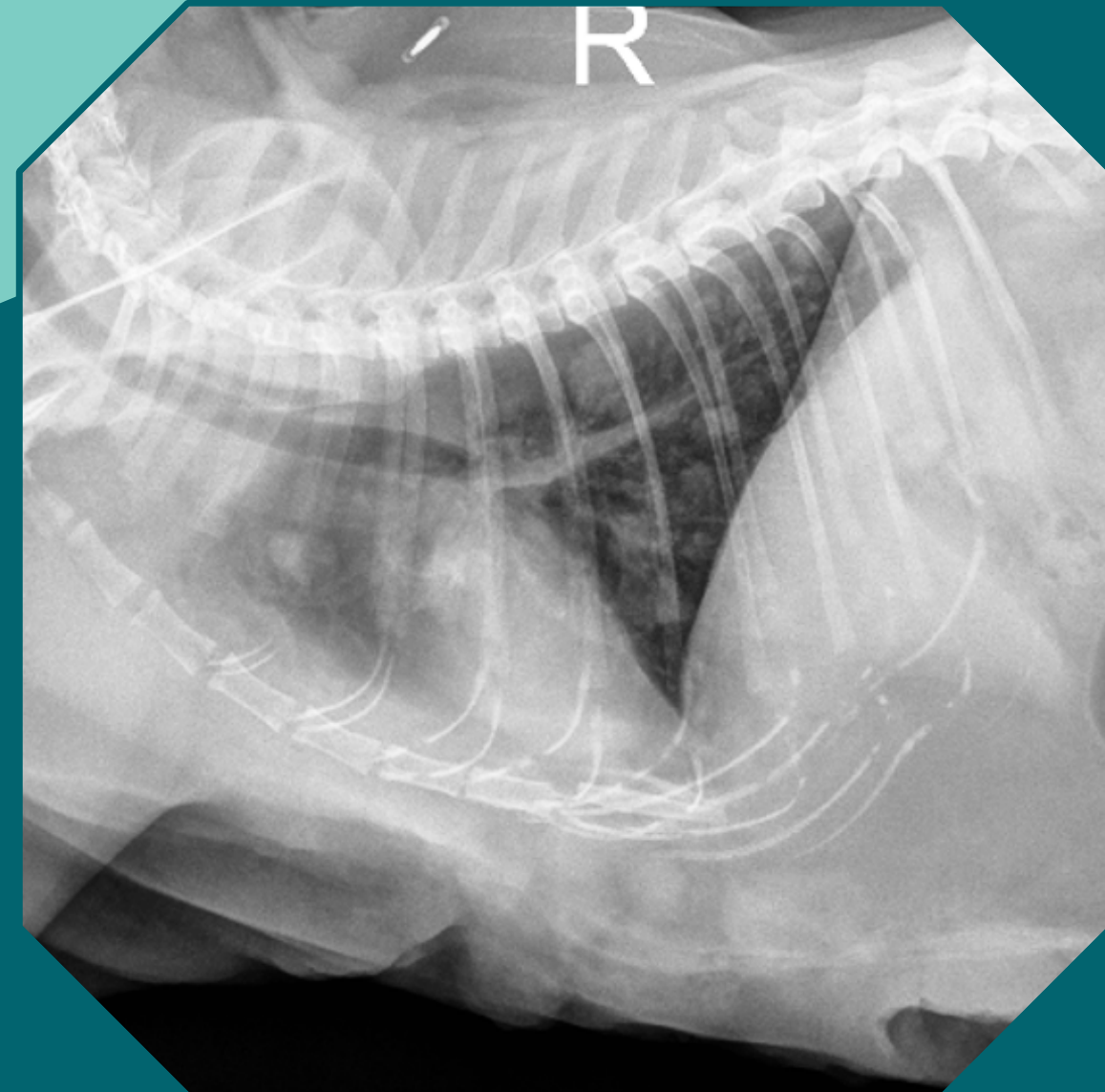


# BASIC THINGS TO KEEP IN MIND



# Some are good, some are bad

- Age of animal
- Size of tumor
- Location of tumor
- Comorbidities
- Catitude
- Presence of metastasis
- Low grade vs. high grade
  - Lymphoma
    - Small cell vs. large cell
- Some are more treatable



# Things to consider

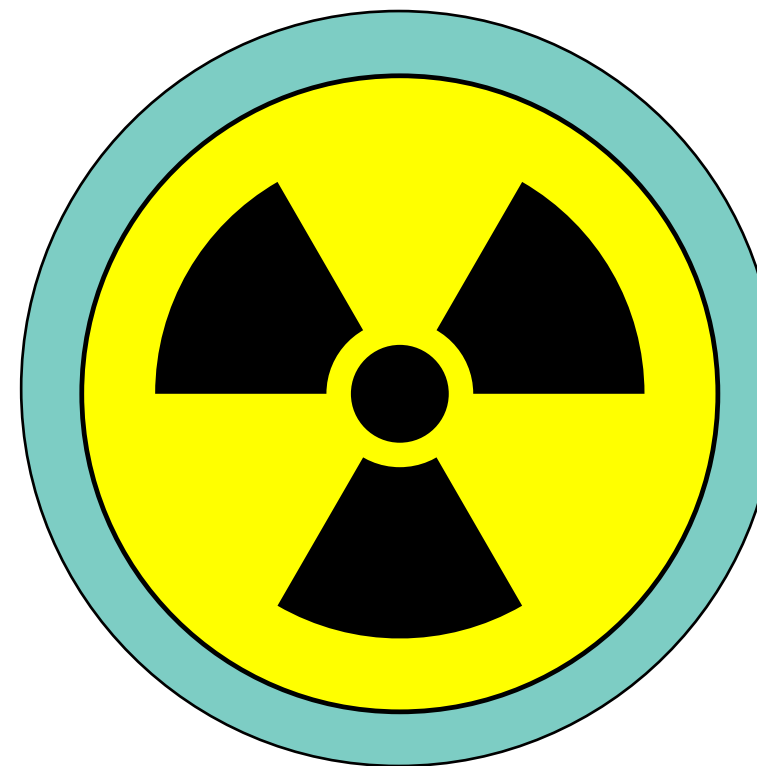
- Subjective things . . .
- Cost
- Life experiences
- Stigma of cancer
- Family life
- Time and distance to clinic





## SURGERY

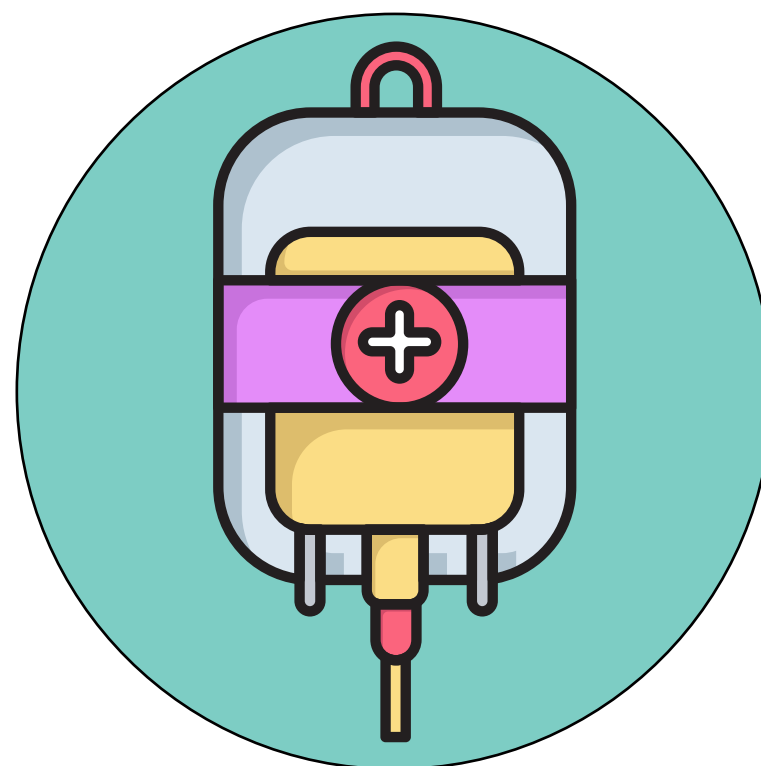
- Local tumor control
- Solid tumors
  - ISS, MCT, MGT



## RADIATION THERAPY

- Local tumor control
  - ISS
- Definitive vs. palliative

Definitive vs. palliative care?



## CHEMOTHERAPY

- Hematologic cancers
  - Lymphoma
- High risk for metastasis
  - MGT
- Local tumor control
  - SCC

# SIMPLE THINGS TO MAKE CATS FEEL BETTER

- Pain management
  - Buprenex, Zorbium
  - NSAIDs
    - It's ok - they're terminal
- Steroids
  - Reduce inflammation, tx LSA
- Appetite
  - Diet - give them anything
  - Medications
    - Mirataz, Elura, steroids
  - Feeding tube
    - Be cautious about offering this
- Symptom management
  - EX: antibiotics for oral SCC





# SQUAMOUS CELL CARCINOMA



# SCC

- Most common oral tumor in cats
- Risk factors
  - Flea collars
  - Canned food (fish)
  - Cigarette smoke
    - p53 mutation



# SCC

- Grow quickly
- Locally extensive
  - Including invasion of bone
  - Ulcerated w/secondary inflammation & infection
- Metastasis uncommon
  - ~10-30%
  - Incidence truly unknown d/t poor long-term outcome
- Paraneoplastic syndromes rare
  - Hypercalcemia (rare)



# SCC - Clinical signs

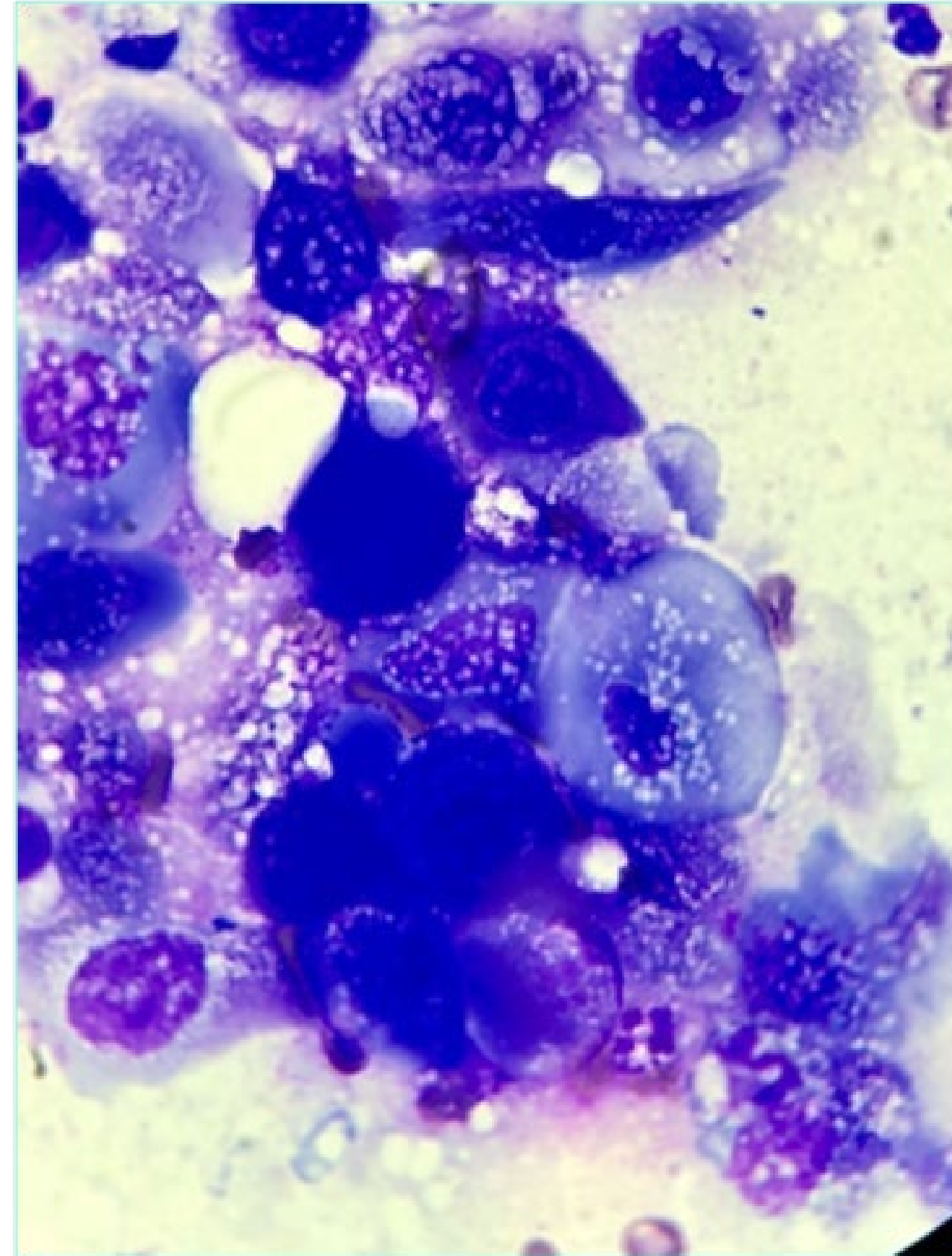
- Excessive salivation
- Weight loss
- Halitosis
- Dysphagia
- Bloody discharge
- Facial swelling
- Loose teeth
- Thickened/prominent jaw



# SCC - Diagnostics

- FNA or biopsy
- Lymph node cytology
- Thoracic radiographs
- CT scan

*doesn't matter*



# SCC - Treatment

- Surgery
- Chemotherapy
  - Palladia
    - 50% response rate
      - Stable disease
    - Survival 14 months
  - Metronomic chemotherapy
- Radiation therapy
  - Palliative protocol
    - May be combined with chemotherapy as a radiation sensitizer (carboplatin, gemcitabine)
  - **Benefit short lived**
    - <math>\leq</math> 3-4 months



# SCC Recap

- Palliative therapy is the mainstay of treatment
- Pain management
  - NSAIDs
  - Opioids
  - Magic mouthwash
    - Lidocaine / diphenhydramine / Maalox
- Antibiotics
- Canned, soft foods
- Prognosis grave
  - <10% at 1 year

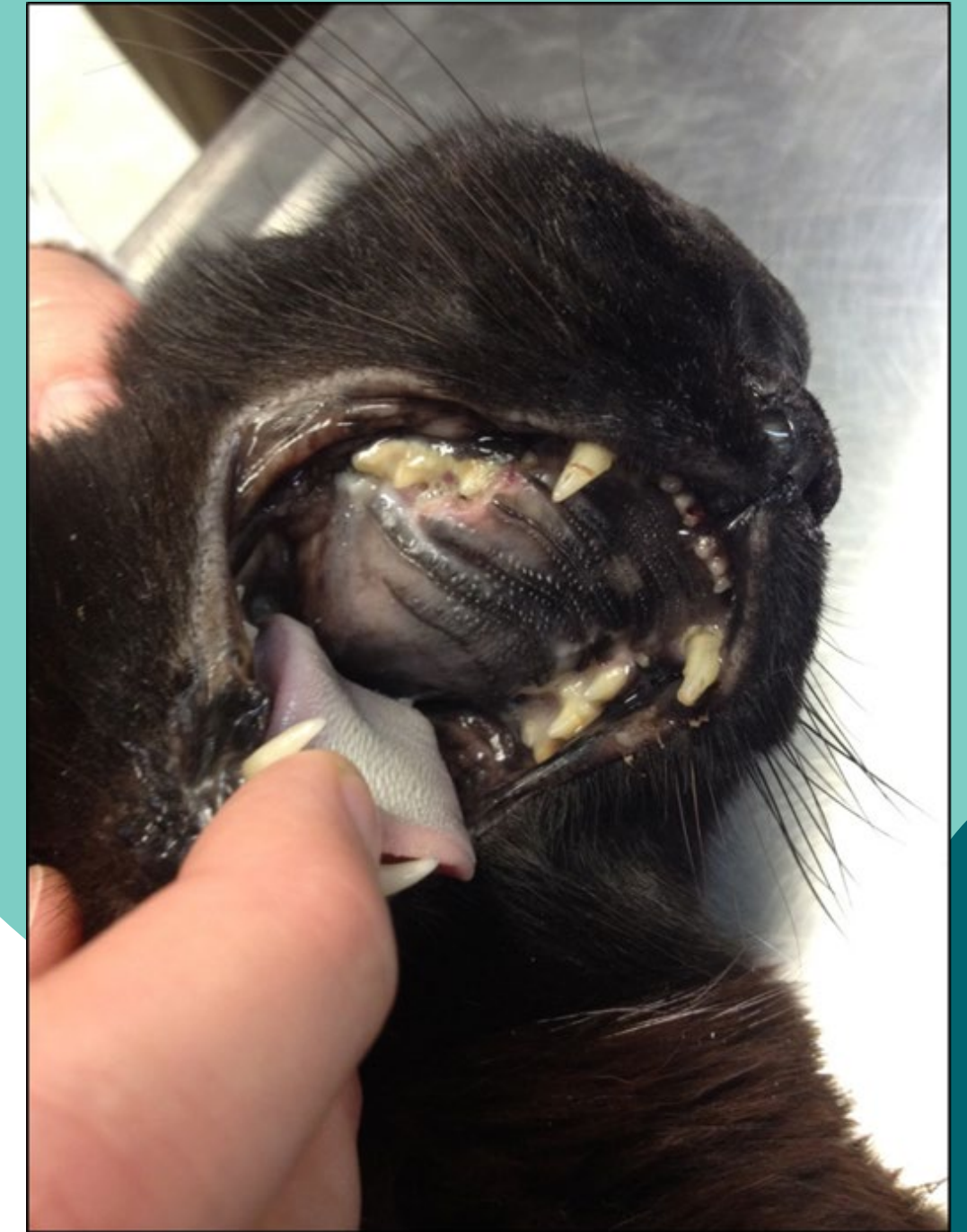
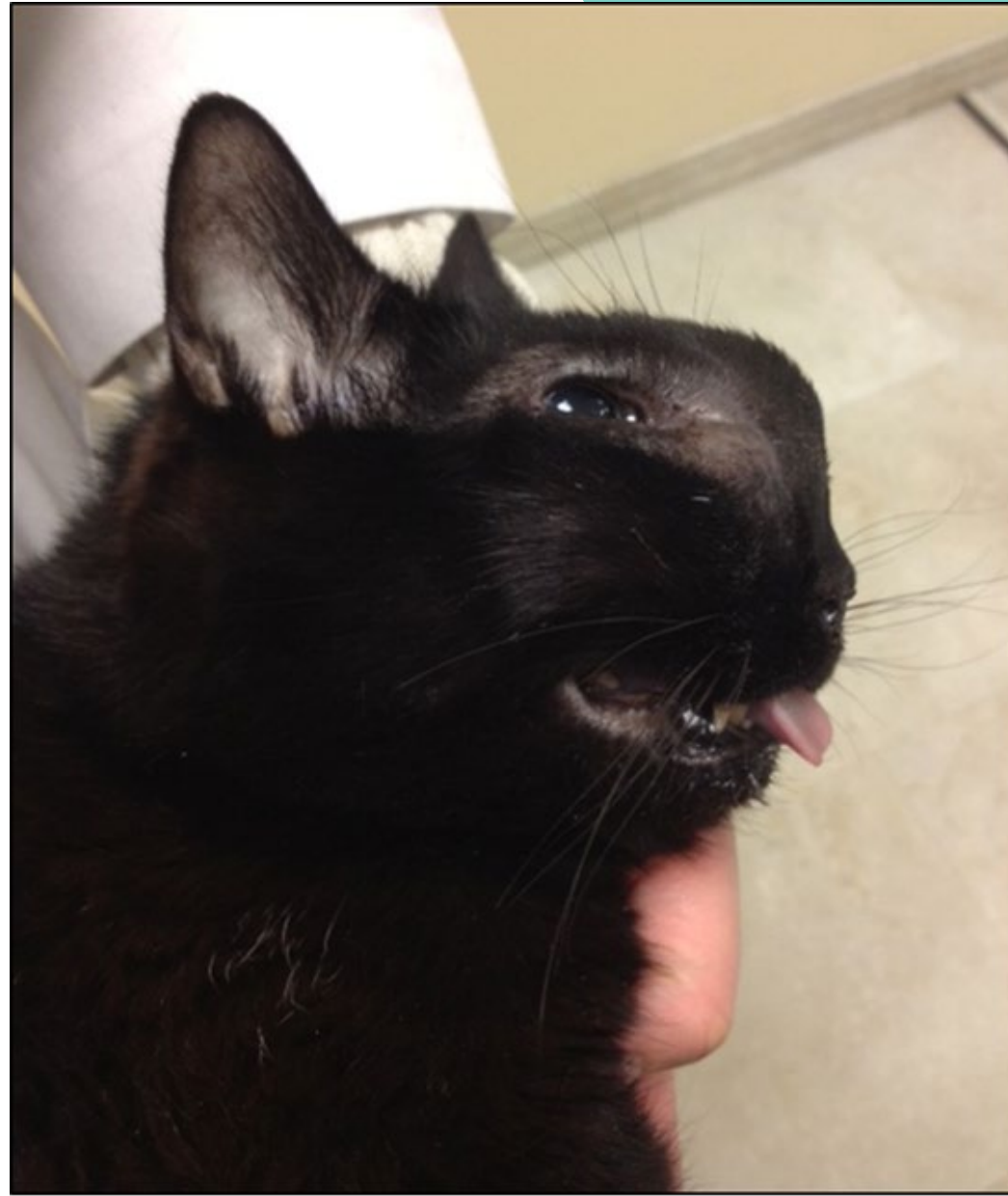


# NASAL TUMORS



# NASAL TUMORS

- >90% malignant
- Symptoms
  - Facial swelling
  - Epistaxis / discharge
  - Sneezing
  - Loud breathing
  - Chronic history (months)
  - Temporary improvement w/antibiotics, steroids
- DDX: rhinitis, foreign body, polyp, infection



# NASAL TUMORS

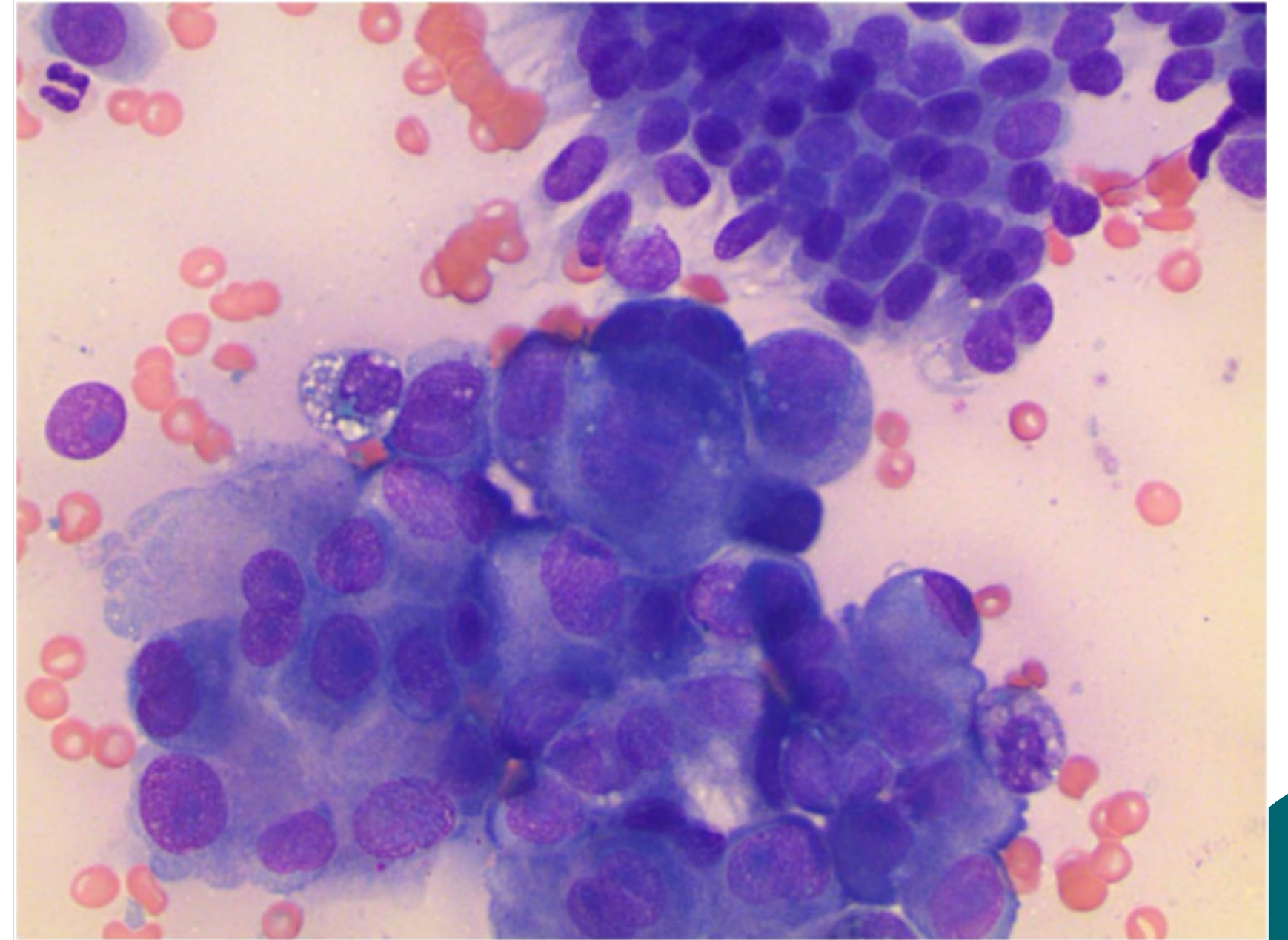
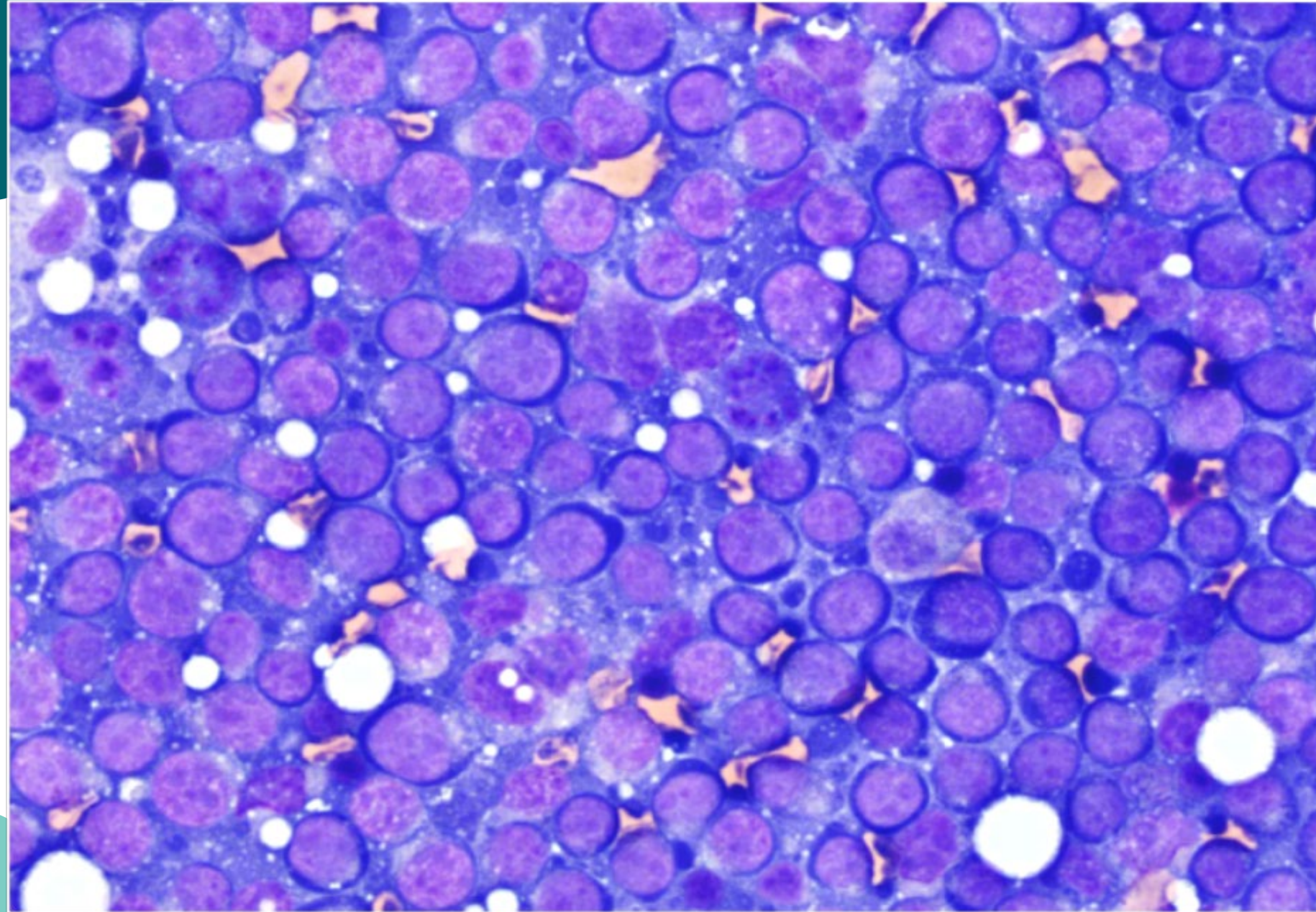
- **Lymphoma** is most common
  - Majority are B cell origin
- Other tumor types
  - Carcinomas
  - Sarcomas
  - Round cell tumors



# DIAGNOSTICS

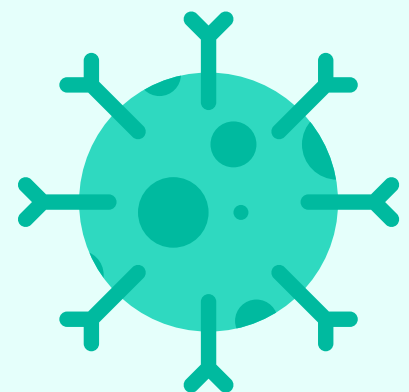
- Lab work
  - +/- Coagulation panel
- Cytology or biopsy
  - Transnasal, retroflex, flush
  - FNA external swelling
- CT scan
- Thoracic radiographs
- Lymph node cytology





# DIAGNOSTICS - CT SCAN

- Turbinate destruction
- Deviated septum
- Unilateral
- Soft tissue density (mass vs. fluid)
- Bony destruction
- Cribriform plate
- Calcification more common with no lymphoid tumors



Inflammatory lesions: less like to have bony changes

Se: 3/3  
Im: 45/78  
Ax: S4.0

Acc:  
2008 Dec 08

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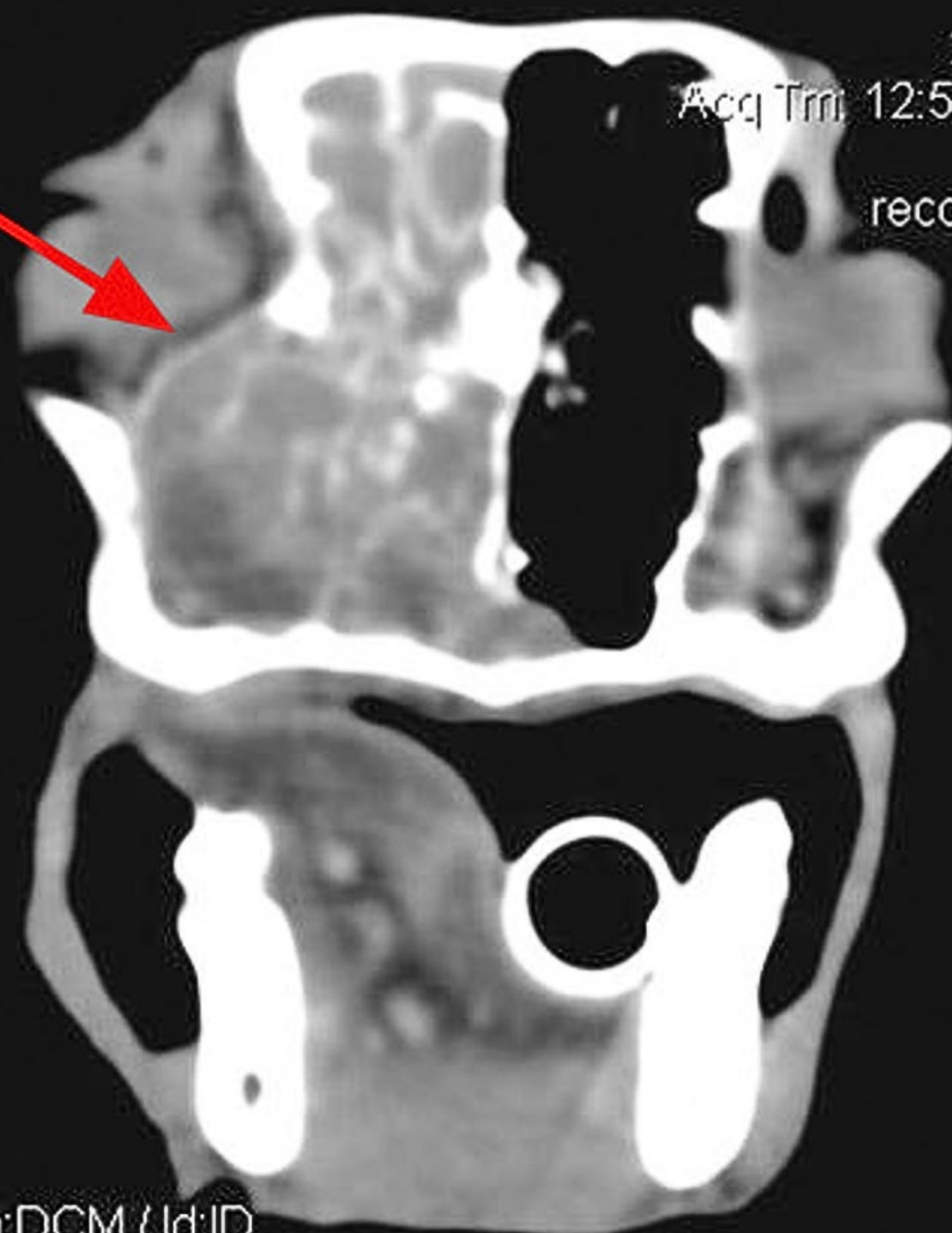
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DFOV: 11.6x11.6cm



# NASAL LYMPHOMA

- Multi-modality therapy best
- Up to 20% develop distant disease
- CHOP + definitive XRT = MST 955 days
- Radiation therapy
- High response rate (70 -90%)
- Prognosis better with higher total dose
- Palliative = MST 432 days
- Negative prognostic indicators: cribriform destruction, total dose of XRT, response



# NASAL LYMPHOMA

- Prednisolone
  - 5-10 m g/cat/day
- Chemotherapy
  - CHOP
    - MST 2 years if CR
  - Lomustine

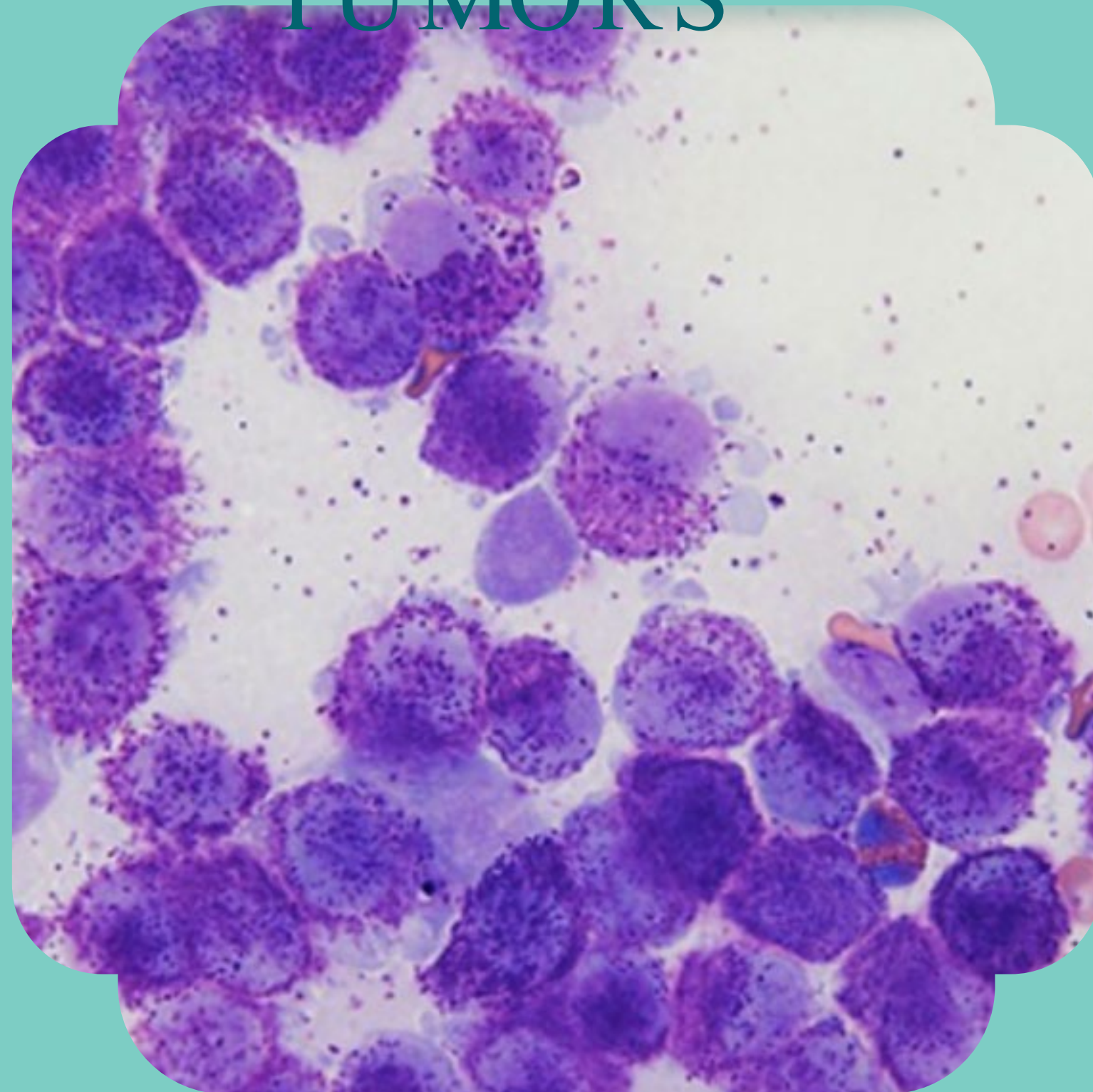


# OTHER NASAL TUMORS

- Carcinoma
- Sarcomas, round cell tumors
- Treatment
  - Chemotherapy
    - Carboplatin/doxorubicin?
      - Efficacy in dogs
  - Palliative care
    - Steroids, Cerenia nose drops, antibiotics
- Palliative radiation therapy
  - 86% clinical improvement
  - Median survival 14 months
  - Side effects
    - Acute: mucositis
    - Chronic: eye stuff, secondary tumors



# MAST CELL TUMORS



# FELINE MCTs

- 3 syndromes
  - Cutaneous
  - Spleen
  - Gastrointestinal
- Express KIT
  - Palladia may be useful
- Granules may contain serotonin
  - Cyproheptadine instead of Benadryl?
    - Blocks H1 receptors & serotonin



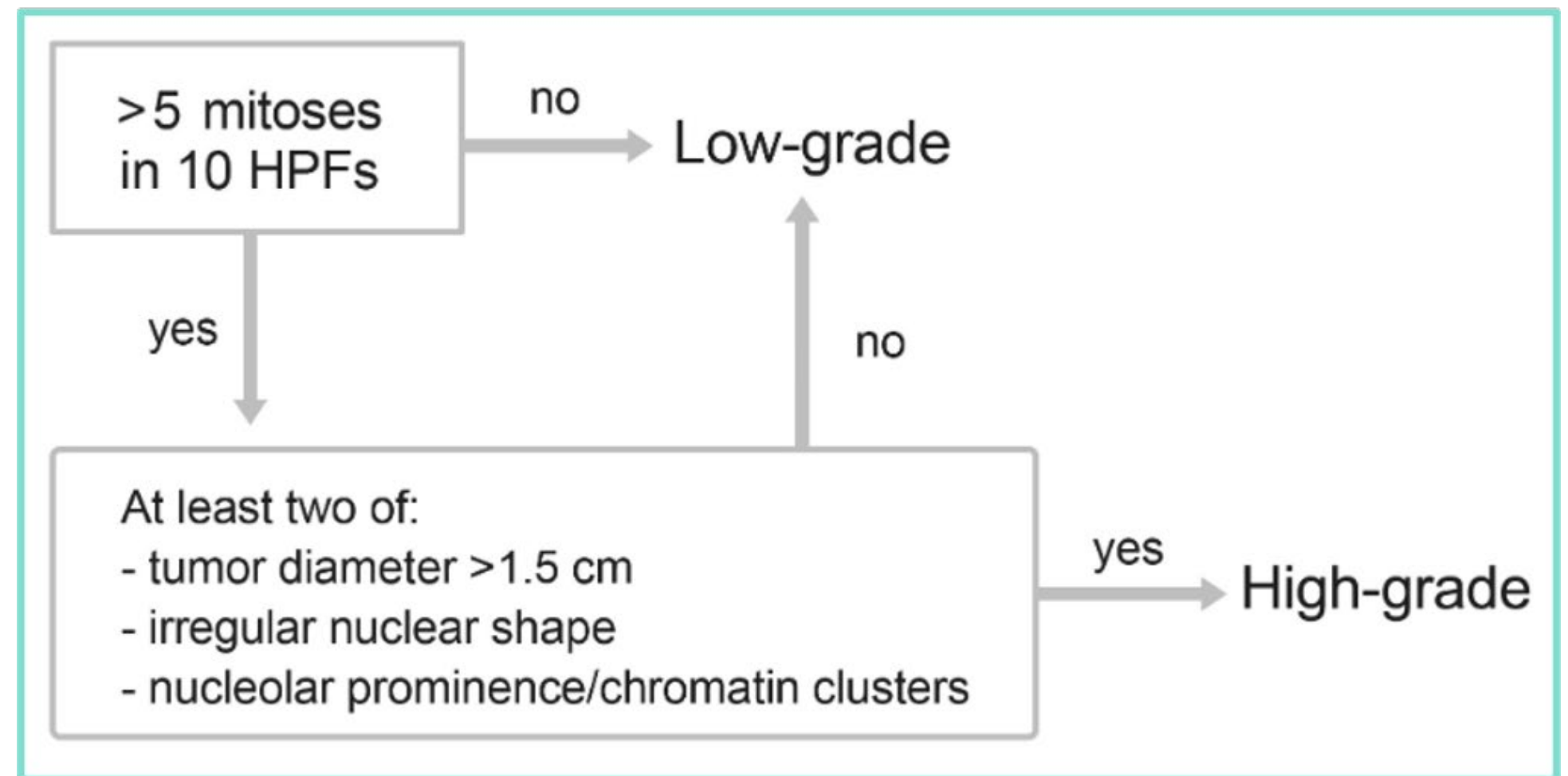
# CUTANEOUS MCTs

- Clinical appearance
  - Small
  - Fleshy
  - Hairless
- Staging
  - Regional LN cytology
  - AUS
    - Spleen involvement possible
      - Usually assoc. w/ multiple MCT
- Remove with narrow margin



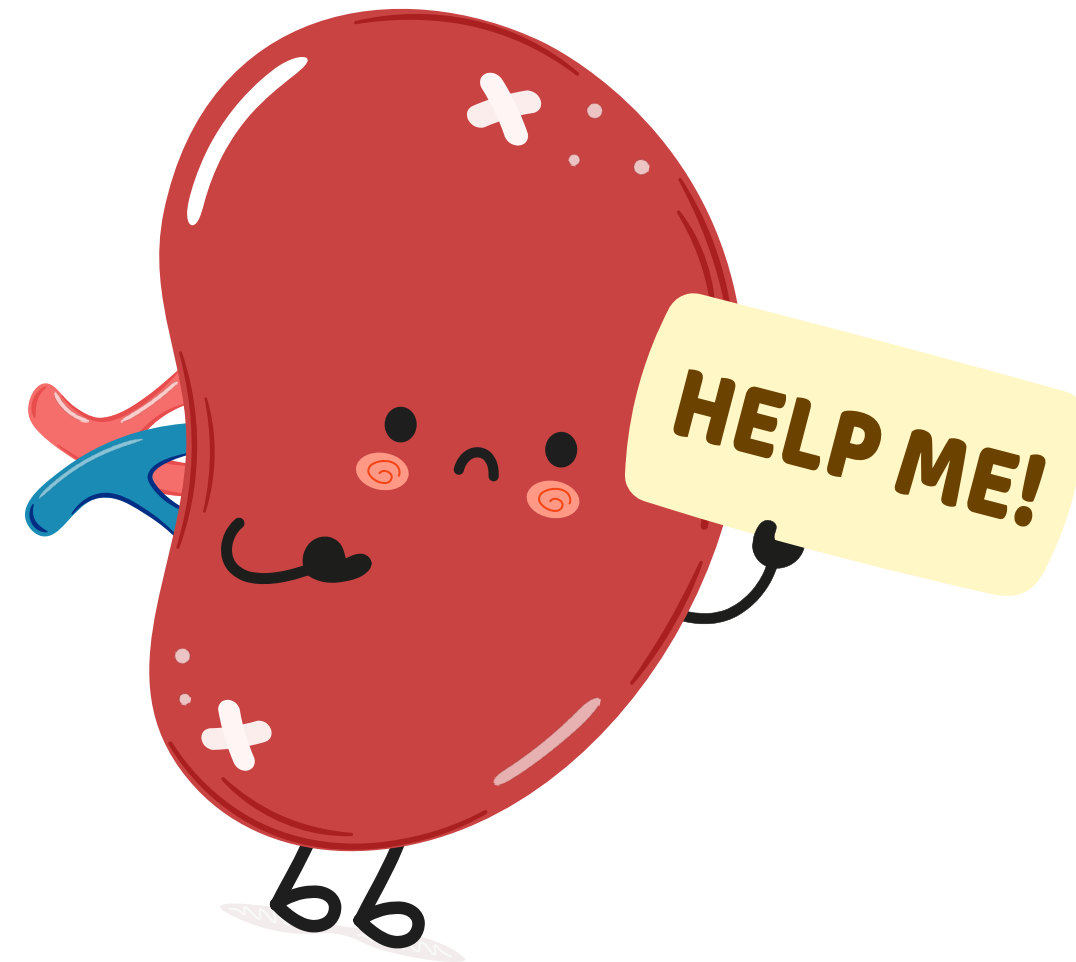
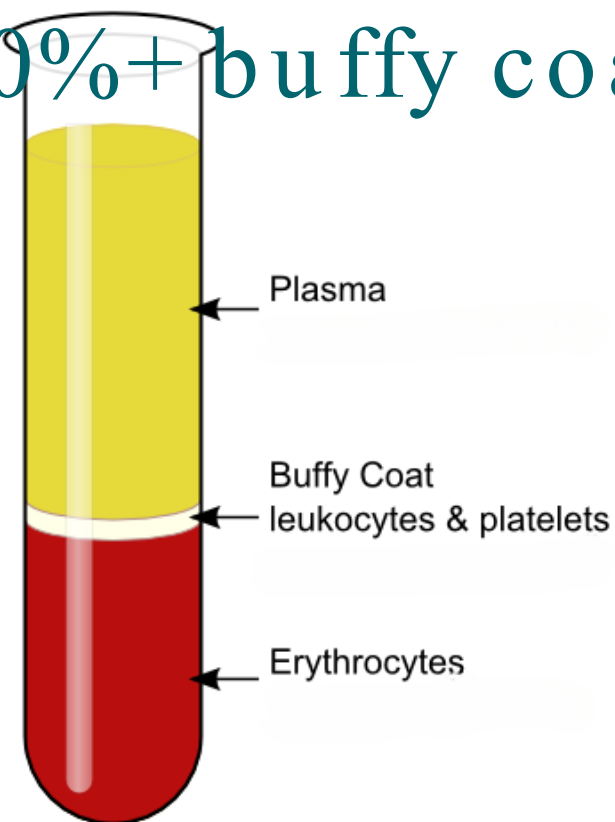
# CUTANEOUS MCTs

- Low vs. high grade
  - Mitotic index
    - MI > 5
  - Size
    - > 1.5 cm
  - Nuclear/nucleolar features
    - Irregular nuclear shape, nucleolar abnormalities
- 75% low grade vs. 25% high grade
  - Survival 13+ years vs. 1 year
  - Consider chemotherapy for high grade



# SPLENIC MCTS

- Clinical signs
  - Weight loss
  - Anorexia
- 30% concurrent skin lesions
- AUS
- 35-50% have mastocytosis
  - 50%+ buffy coat



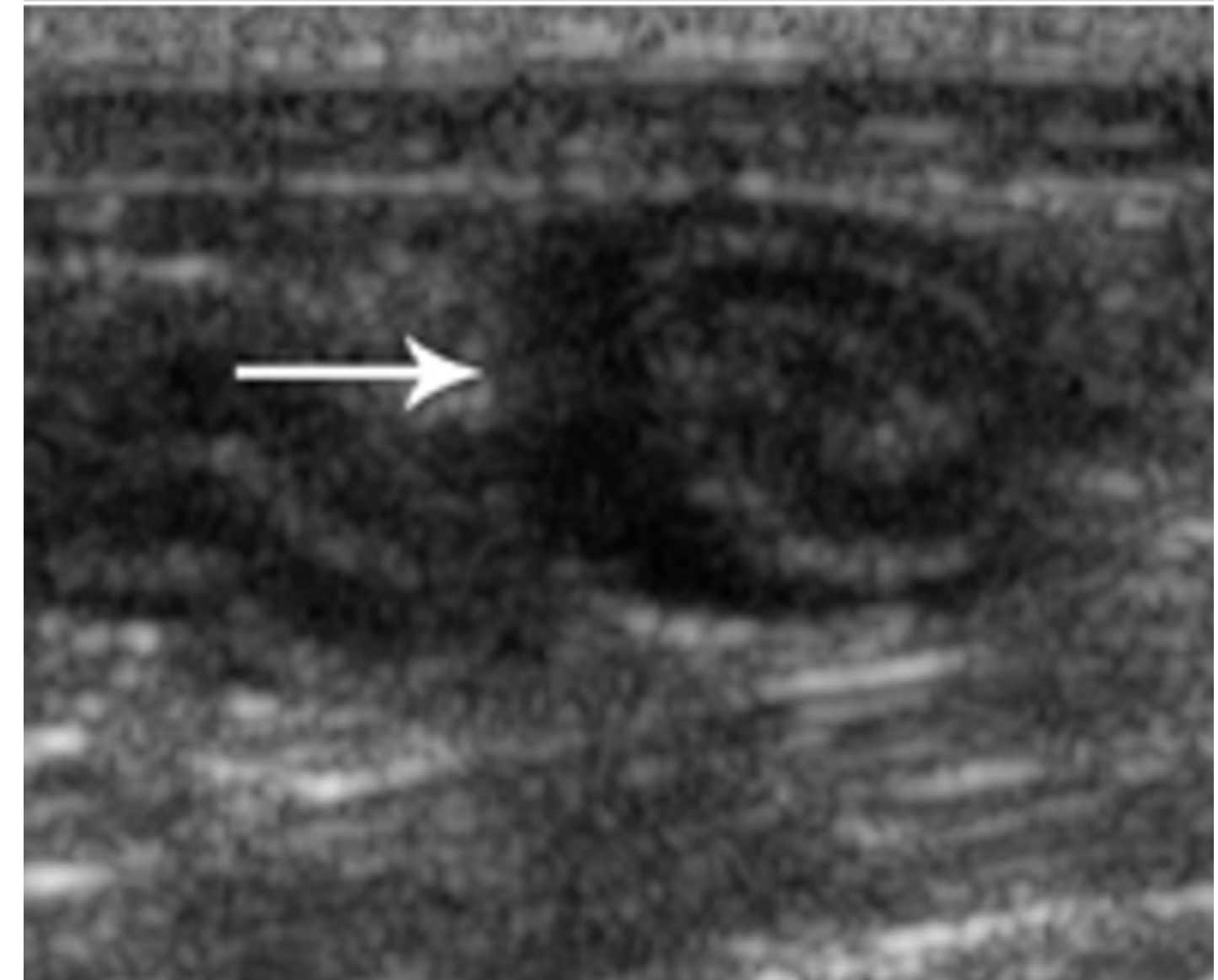
# SPLENIC MCTS

- Splenectomy
  - Improves outcome
  - MST reported from 390-856 days
  - Better vs. no surgery
  - May result in resolution of cutaneous masses
- Chemotherapy
  - Suggestion that it prolongs life
  - Variety of options



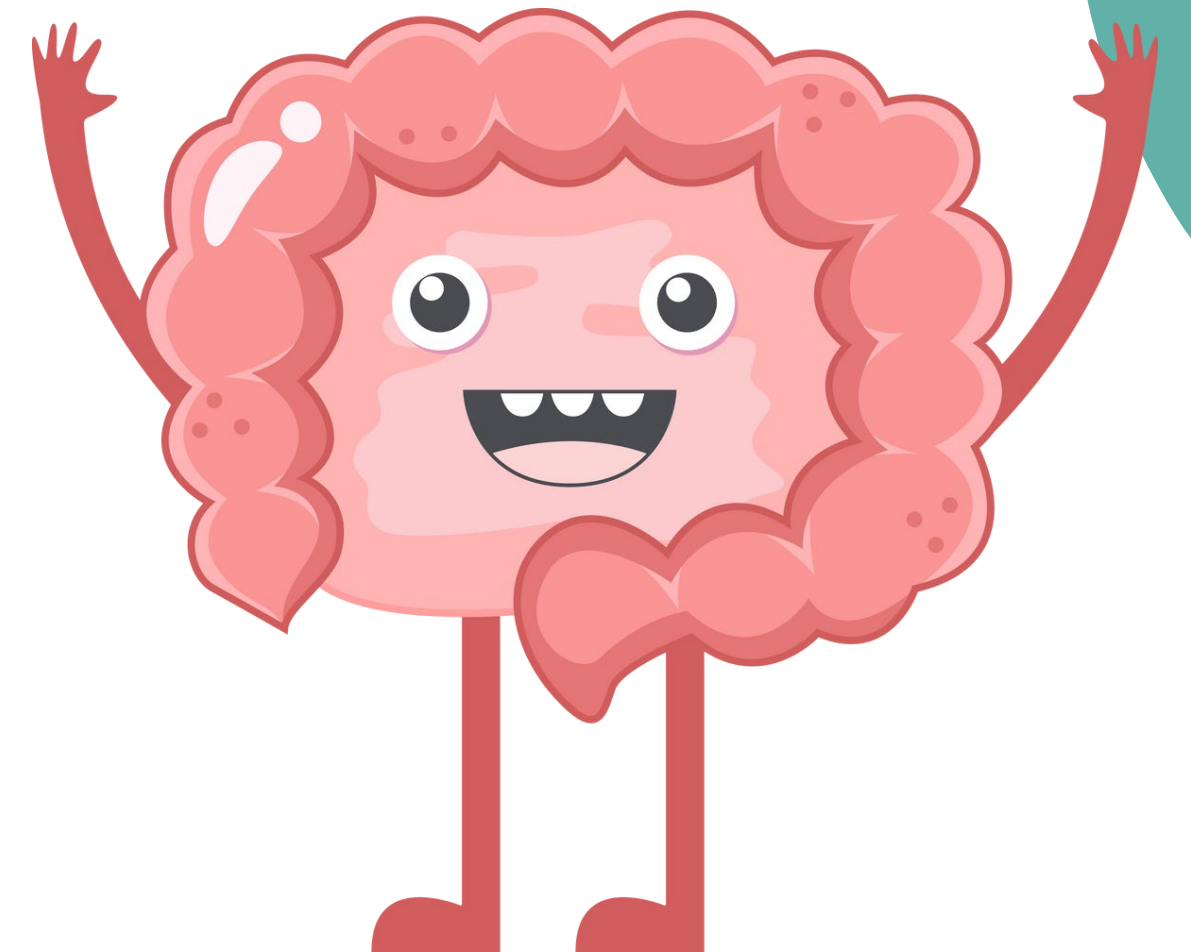
# GASTROINTESTINAL MCTs

- Clinical signs
  - V/D/anorexia
- AUS
  - Intestinal mass, enlarged LNs, effusion, etc.
  - Often located in small intestine
  - Focal, eccentric, hypoechoic mass
- Treatment
  - Surgery if no evidence of metastasis
    - 5-10 cm margins
  - Chemotherapy
    - Role not well defined



# GASTROINTESTINAL MCTs

- Prognosis historically poor
  - $\approx$  2 months reported
  - Sclerosing MCT worst
- Newer study shows better outcome
  - Median survival time of 2+ years
- Chemotherapy for high grade/metastatic MCT



# CHEMOTHERAPY for MCTs

## VINBLASTINE

- IV
- Every 1-2 weeks x 8
- Side effects: neutropenia, GI
- Price adds up
- Use safety equipment
- Nationwide back order

## LOMUSTINE

- PO in hospital
- Standard dose 10 mg/cat
- Every 3 weeks x 5
- Side effects: neutropenia (prolonged)
- Easy, cheap

## PALLADIA

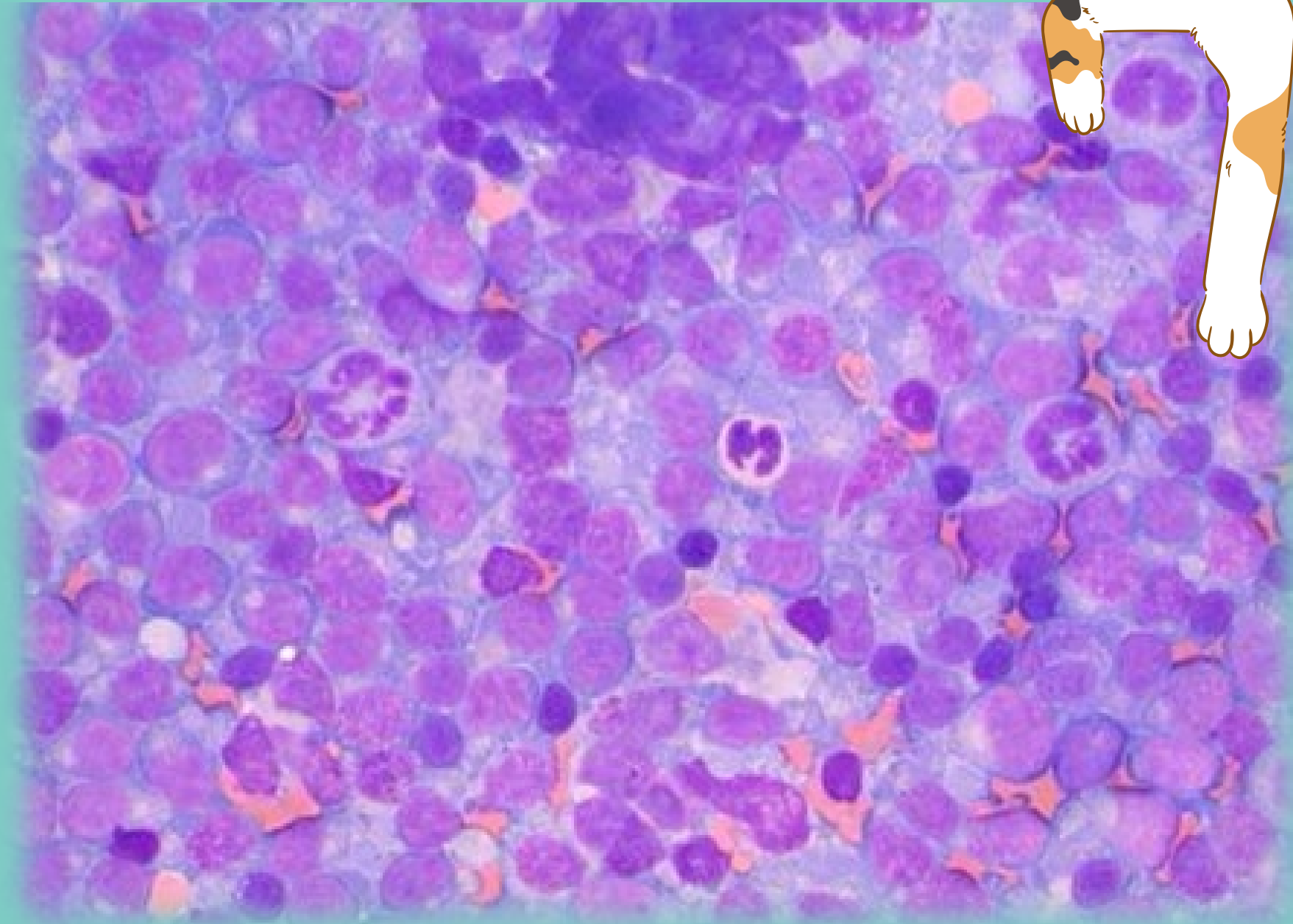
- PO at home
- 2.5 mg/kg MWF
- Side effects: Mild GI
- Easy, cheap
- Requires monitoring
- Ongoing tx

## CHLORAMBUCIL

- PO at home
- 20 mg/m<sup>2</sup> every 2 weeks
- Minimal side effects
- Easy, cheap
- Long term tx
- ? efficacy



# GASTROINTESTINAL LYMPHOMA



# GASTROINTESTINAL LYMPHOMA

- Older cats
- Advanced age
- FeLV –
- Siamese/oriental breeds
- Chronic inflammation/IBD
- SI, stomach, LI/colon



# TYPES OF GI LYMPHOMA IN CATS

## LOW GRADE

- Indolent
- Lymphocytic/small cell
- “Normal” AUS
  - Thickened GIT
  - Prominent LNs
- Diagnosis:
  - Histopathology
  - PARR
- 10% progress to high grade
- Prognosis: years



## HIGH GRADE

- Acute
- Lymphoblastic/large cell
- AUS changes
  - Mass
  - Wall thickening/loss of layering
- Cytologic DX
- Prognosis: 6 mo



# LSA

## DIAGNOSTICS

- Lab work
  - +/- FeLV/FIV
- Abdominal radiographs
- Ultrasound
  - Loss of layering
    - Excellent predictive value
  - Wall thickening
  - Lymphadenopathy
  - Free fluid
  - U/S guided aspirates



# LSA - CYTOLOGY OR BIOPSY?

## SMALL CELL LYMPHOMA

DX via **biopsy**

- Sometimes PARR on cytology - 60-70% sensitivity
- T cell

## LARGE CELL LYMPHOMA

DX via FNA & **cytology** of mass

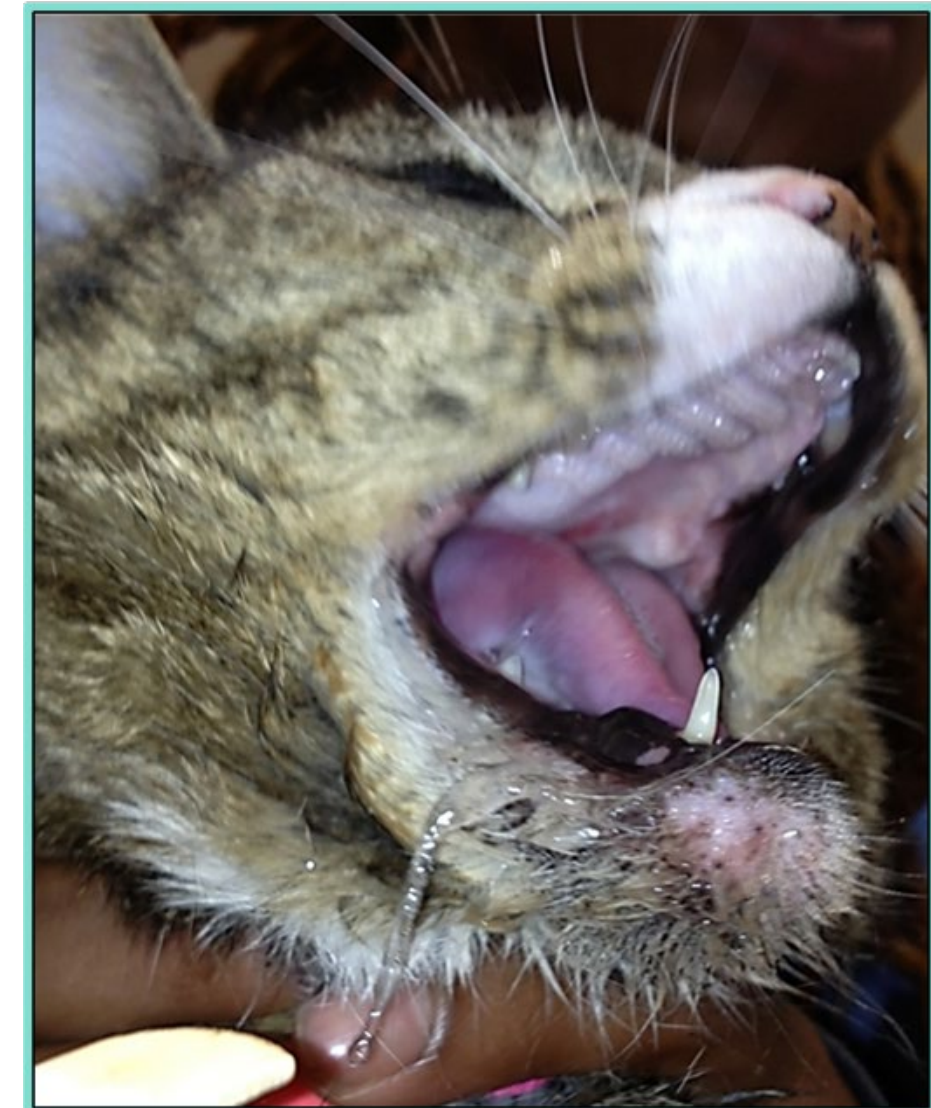
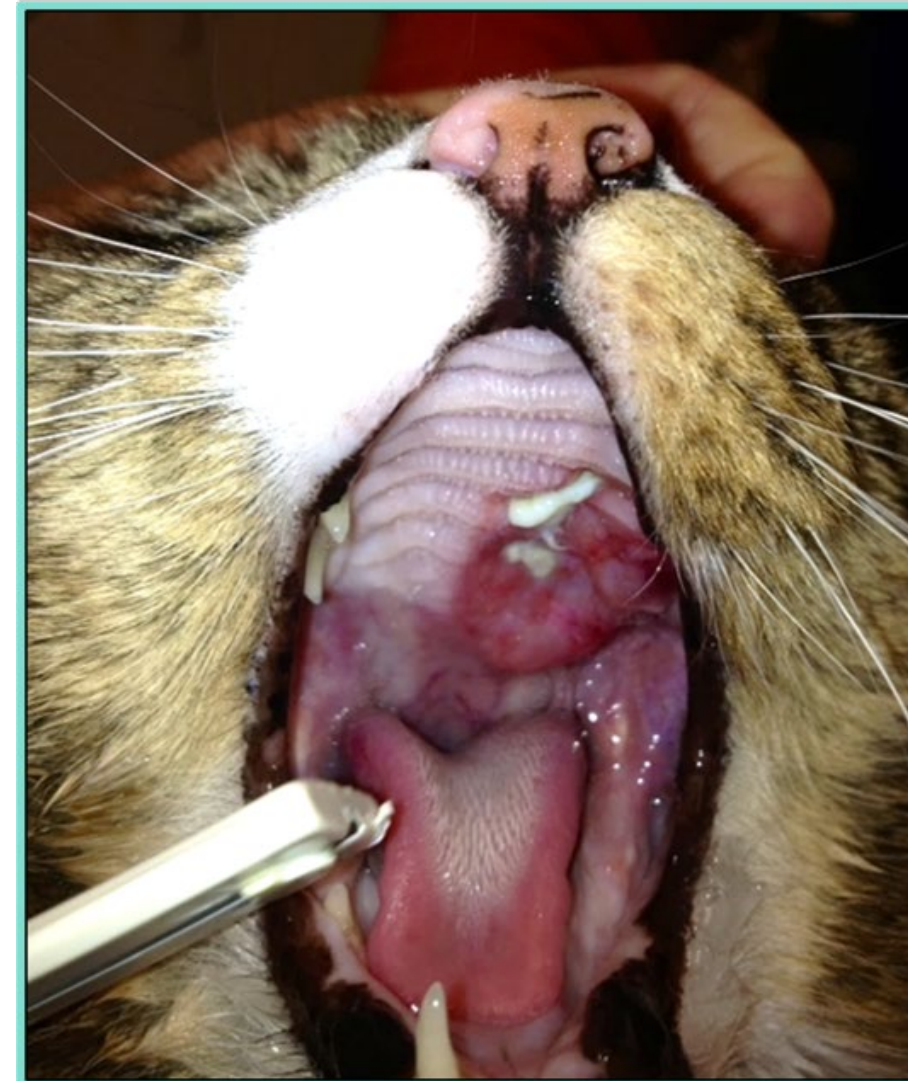
# LYMPHOBLASTIC LSA TREATMENT

- Not surgical
  - Only if obstructed
  - Consider if discrete lesion
    - MST longer?
- Symptom management
  - Antiemetics
  - B12
  - Appetite stimulants
  - Anti-diarrheal medications
  - +/- pain management, probiotics



# LYMPHOBLASTIC LYMPHOMA - CHEMO

- CHOP based protocol
  - 50-85% response rate
  - Survival 14-6 months
  - Depends on response
    - Can be years if CR
      - 15-20% of cats
- LOMSUTINE (CCNU)
  - 50% response rate



+ you  
can DO  
THIS +



# Treating LSA cats with chemo

- Chemotherapy side effects
  - Mostly they do great
  - GI upset
    - LSA vs. toxicity?
  - Febrile neutropenia is rare
- Perforation
  - 17%
- Sick cats don't eat
- Cats don't like to get chemo





# MAMMARY GLAND TUMORS



# MGTs

- Risk factors
  - Advanced age
  - Breed
    - Siamese
  - OHE status
    - No benefit if OHE  $\geq$  24 months
- Nearly always malignant (85-98%)
  - Need for cytology?
- High likelihood of metastasis



# MGTs

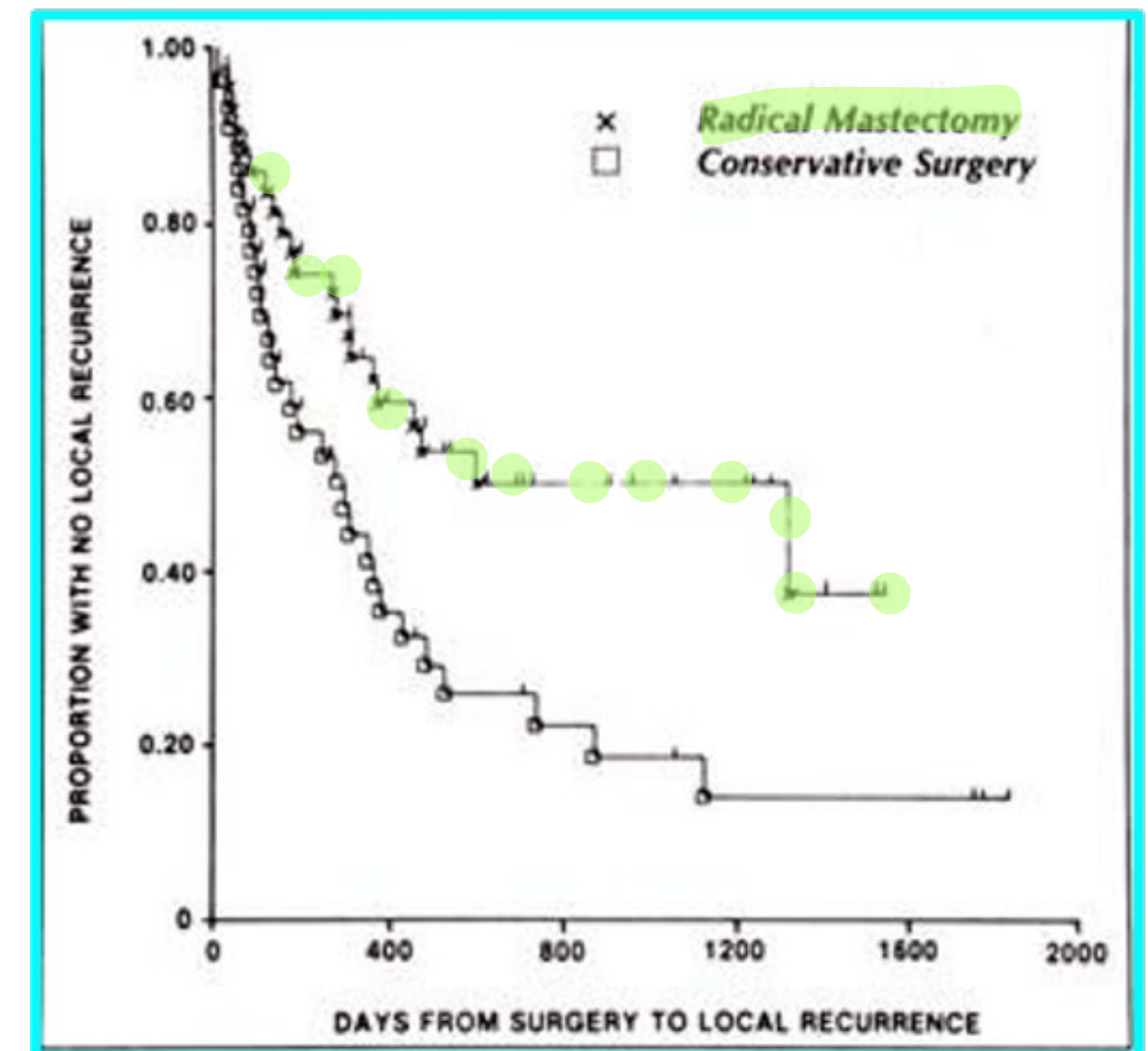
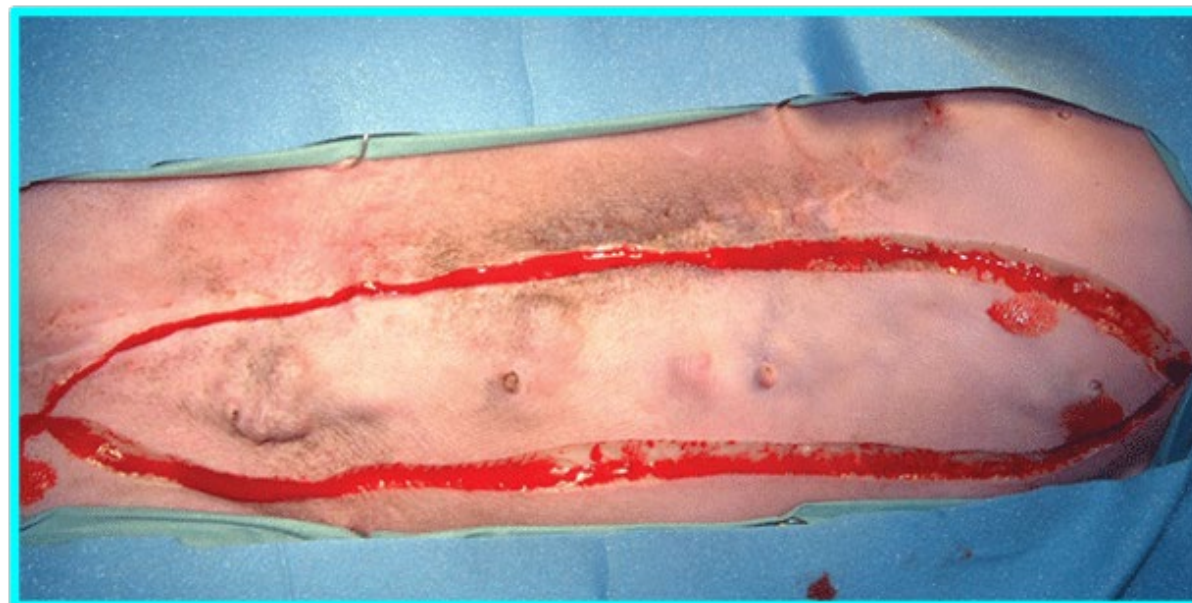
- Staging
  - CXR
  - +/- AUS
- Record size before removal
  - $\leq 2$  cm , 2-3 cm ,  $> 3$  cm



# MGT PROGNOSTIC FACTORS

- Extent of surgery
  - Bilateral radical mastectomy MST 2.5 years
  - Shorter survival if less aggressive SX
  - Local recurrence up to 50%
- Size
  - $\leq 2$  cm MST 3 years
  - 2-3 cm MST ~2 years
  - $>3$  cm MST ~6 months

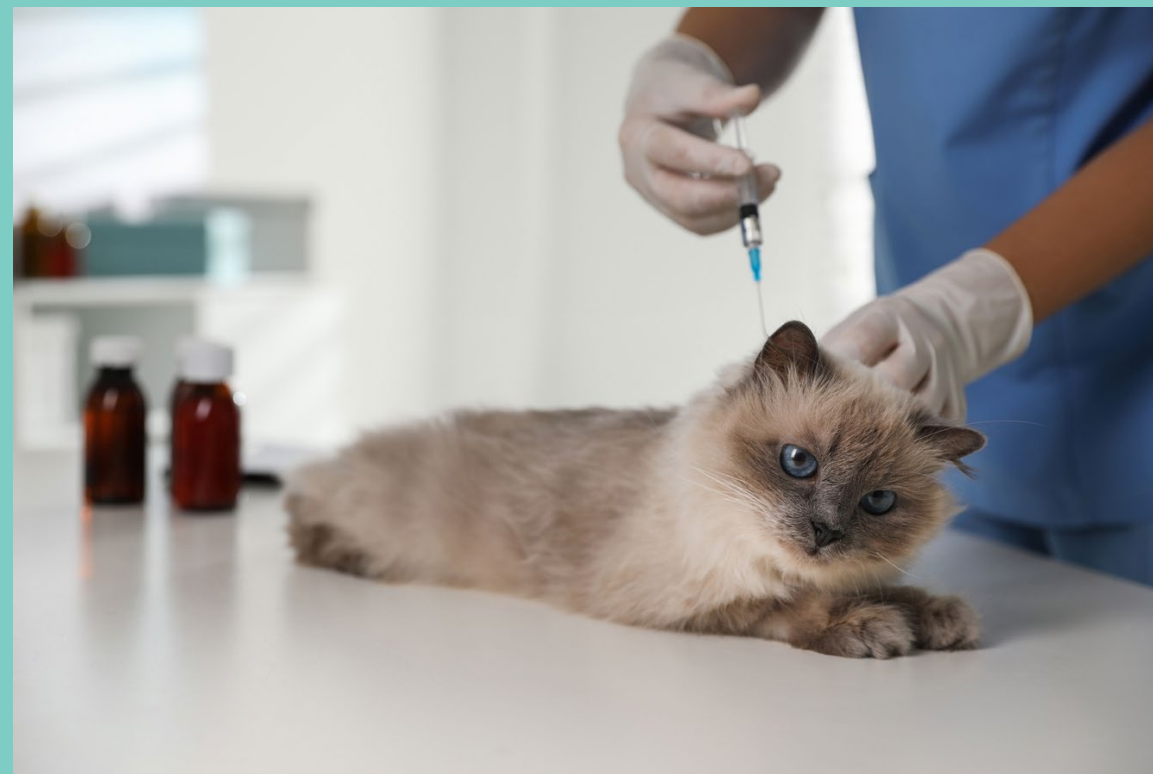
- Lymphatic or vascular invasion
  - Without MST 863 d vs 195 d with
- Lymph node metastasis
  - $\leq 9$  months
- Grade



# MGT CHEMOTHERAPY

- No good studies to prove benefit
  - Suggestion/trend in several
  - Ex: Unilateral radical mastectomy +/- dox: MST 1998 v 414 d
- Recommended in high-risk tumors
  - Large size, lymphatic invasion, lymph node metastasis, high grade
- Doxorubicin +/- cyclophosphamide
  - Up to 50% response rate in gross disease setting
  - Mitoxantrone, carboplatin, Palladia

# INJECTION SITE SARCOMAS



# ISS

- AKA vaccine associated sarcomas
- Law requiring rabies vaccination PA 1987
  - Increased incidence of sarcomas at vaccine sites
  - Adjuvant identified on pathology
- Killed rabies and FeLV vaccines
- Risk as high as 1/1000 cats



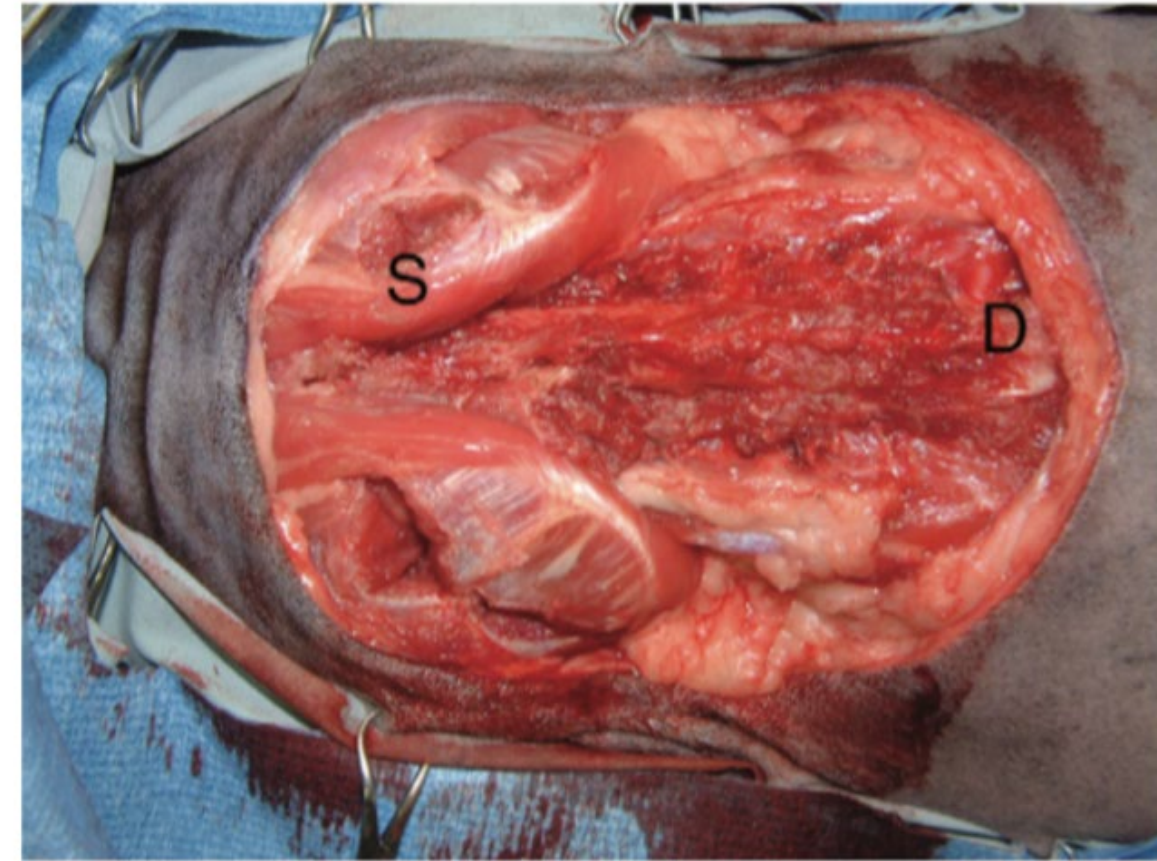
**CATS  
are  
WEIRD!**

# ISS

- Tumor development
  - 4 weeks – 10 years post injection
- Killed vaccines
  - Adjuvant
- Post-vaccination inflammatory reaction
  - Uncontrolled fibroblast growth
  - Malignant transformation
  - Supported by transition zones on histopathology
- Ocular sarcomas after trauma

# IS S

- Radical surgery
- Surgeon
  - Non-referral hospital 66 days
  - Referral hospital 274 days
- Time to 1st recurrence
  - 79 d – marginal
  - 325-419 d – radical
- Even w/aggressive sx only 50% completely excised
- Best outcome when on distal limb (amputation)



• **FIGURE 21-16** Aggressive resection of vaccine-associated sarcomas is required for prolonged local tumor control. In this cat, the vaccine-associated sarcoma was resected with 5-cm margins, including the dorsal spinous processes (*D*). The scapulae (*S*) were spared because the tumor could be resected with two fascial planes without involving the scapula.

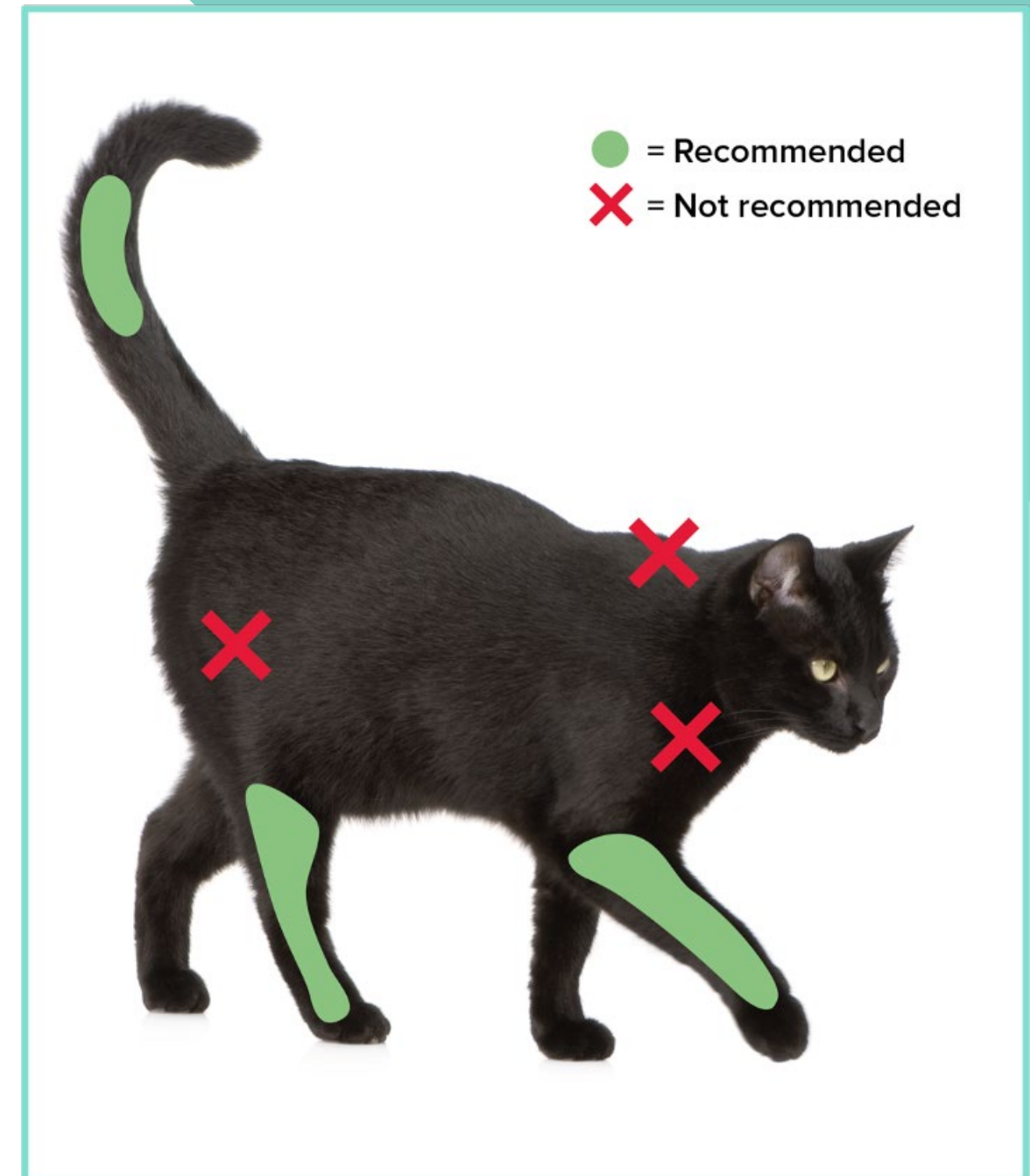
# ISS - ADJUVANT THERAPY

- Radiation therapy
  - Pre - or post-op
  - Start within 10-14 d post-op
  - MST 600-1300 d
  - 28-45% local recurrence even with SX + XRT
- Chemotherapy role unclear
  - Shorter MST in some studies
- Metastatic rate ~0-25%



# ISS - PREVENTION

- Non-adjuvanted vaccines
- No intrascapular vaccination
- Distal limbs
- Documentation
  - Vaccine type, manufacturer, serial #, location
- When to tx
  - Mass present  $\geq 3$  mo post-vax
  - $>2$ m diameter
  - $\uparrow$  in size after 4 wks



# WEIRD CAT STUFF



# TARSAL LYMPHOMA

- Older age
- FeLV –
- Non-epitheliotropic
- High grade
- Metastasis
  - 20% have popliteal LN metastasis
  - +/- distant disease at dx or in future
- MST 190 d



# LUNG DIGIT SYNDROME

- Primary lung tumors
  - Carcinomas
- Metastasis to digits
  - Single or multiple digits
  - Skin, muscle, bones, eyes
- Clinical signs
  - Lameness
  - Pain
  - Swelling of digit(s)
- Diagnostics
  - CXR
  - Limb radiographs
    - Extensive bony lysis
- Blood work
- Elevated CK
- MST  $\leq$  2 months



# FELINE SARCOID

- Very rare
- Young cats
- Linked to bovine papilloma virus
- Occur on rostral face
- Spindle cell tumor
- Do not metastasize
- TX is surgery





- Define your role
  - Figure out what's going on
    - Do testing & educate yourself first
    - Use your resources
  - Do you want to deal with it?
  - What are you comfortable with?
- Get organized, get help, make a plan
- Set realistic expectations



**LOTUS**  
PET ONCOLOGY

# WE WORK BEST TOGETHER!

- Client education
  - Myth busting
- Expectations
  - Set clients up for referral
  - Cost
  - Commitment
  - Side effects, etc
- Client goals
  - Go down swinging type
  - Palliative care
- Catitude?



# QUESTIONS?



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