FIU FLORIDA INTERNATIONAL UNIVERSITY

# Health Checks
# When is time to panic?

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# Health Checks

- Non-specific clinical signs (important to notice but won't pinpoint the problem)
  - Body Condition Score
  - Hydration
  - Posture & Gait
  - Weight Assessment
  - Appetite

# Health Checks

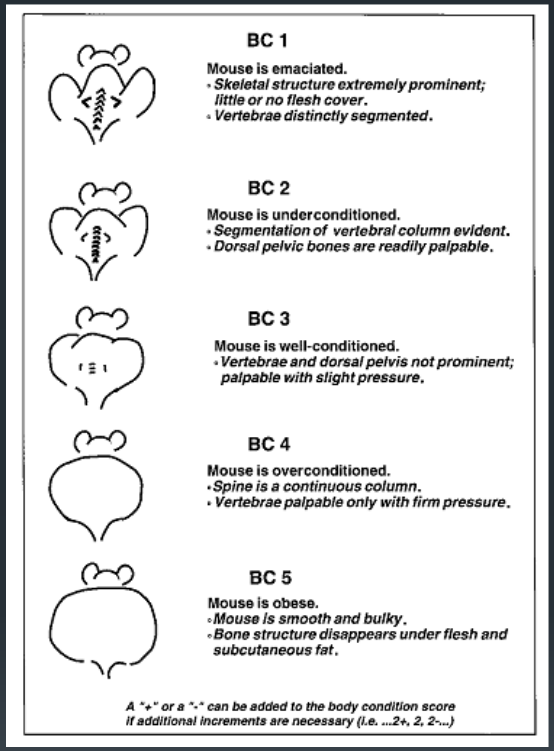
- Specific clinical signs
  - Head and Neck (EENT/Mouth)
  - Trunk and Limbs (INTEG, M/S, PLN)
  - Thorax (Respiratory)
  - Abdomen (ABD)
  - External Genitalia and Perineum

# Body Condition Score

The body condition can be evaluated by using a standardized scoring system from 1(emaciated) to 5 (obese)

Examples …

- BC1 = Requires immediate euthanasia
- BC 2 = Requires veterinary consultation
- BC 3 = Perfect!
- BC 4 = Over feeding? Disease? Wrong diet?
- BC 5 = Obese.



# Dehydration

- Dehydration is encountered when animal's body fluids are low.
- It is most frequently due to a problems with the water delivery.
- When dehydrated the skin on the back of the neck will tent up and stay like that if pulled gently and then released.

# Severe Dehydration?

Hairless Rhino
Normal phenotype for this strain

# Posture

- Main complaint by staff is that the animal is ADR (ain't doing right) - looks sick or depressed.

- Usually, rodents will present with a hunched posture (head down, feet close together) when in pain or feeling ill and will not move.

# Posture - examples

- Normal Posture

- Hunched

# Body Weight

- Acute weight loss:
  - always check the water bottle first. A rodent that does not drink will stop eating too.
  - Check for presence of food
  - Indication of disease
- Chronic weight loss:
  - Indication of disease or distress
  - Other causes:
    - Teeth
    - Study Protocol related
    - Age

# Head and Neck

# Harderian Gland

- Nearly encircles the globe, occupies the orbit, horseshoe shaped, function as a lubricant.
- Holocrine and apocrine function
- Secretes porphyrin in excessive amounts (chromodaeryorrhea) when the animal is stressed.


# Porphyrin staining

- Rat with M. pulmonis infection.

# Mouse - blepharoconjunctivitis

- Barrier mice with Staphylococcal abscesses.
- Staphylococcus sp. spreads easily therfore staff must follow strict husbandry procedures.

# Rabbit - Snuffles

- Rabbit with Pasteurellosis (Pasteurella multocida)

# Rabbit - Myxomatosis

- Endemic in brush rabbit (Sylvilagus bachmani) in US, Oryctolagus particularly susceptible often develop fatal disease - numerous mucinous skin lesions
- Transmission: Fleas, mosquitoes, & direct contact

# Rabbit (Shope) fibroma virus

- Transmissible to Oryctolagus and cottontails
- Benign, self-limiting in wildlife population
- Tramsmission: Arthropods

# Rabbit Treponematosis

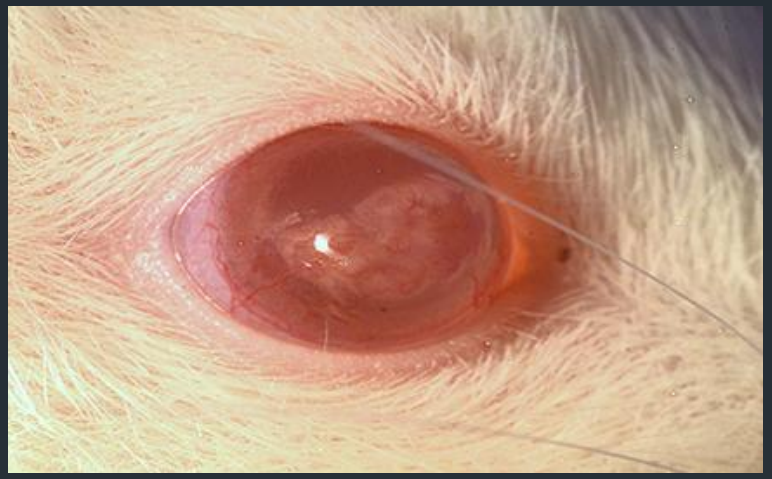
- Rabbit Syphillis
- Treponema paraluiscuniculi

# Rabbit - Buphthalmia

- Occurs most frequently in NZW, inherited as an autosomal recessive trait with incomplete penetrance
- Eye enlargement is first evident by 3-5 months of age due to absence or underdevelopment of the outflow channels for aqueous humor from the anterior chamber

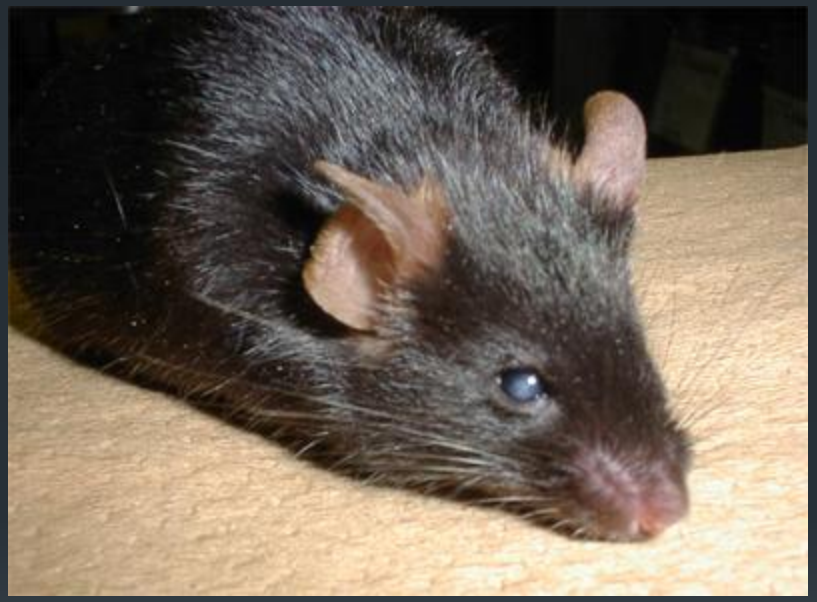
# Rat – Corneal lesion

- Susceptibility of rats to corneal lesions following anesthesia with Ketamine/Xylazine Combinations



# Mouse – Cataract

- Cataracts are a clouding of the lens of the eye, and make the eye appear cloudy and white.
- There is no indication of pain, discharge, or sensitivity to light.
- Old animals commonly develop cataracts but some strains have a genetic tendency to develop them at a young age.



# Mouse – Microphtalmia

- Some strains of mice (especially C57BL) have a genetic tendency to be born with a very small eye globe (microphthalmia) or no eye globe (anophthalmia).
- The eyelid slit is still present but remains closed since there is little or no eye globe behind it.
- Microphthalmia may be confused with ‘squinting’ due to bright lights

# Ectoparasites - Rabbit

Psoroptes cuniculi (Rabbit Ear Mite)

- Nonburrowing mite; psoroptic mange, ear mange, ear canker, or otoacariasis
- Inner surfaces of external ear, pruritic  scratching, head shaking, pain, self mutilation
- Crusty exudate accumulates in ears over lesions, can become quite extensive & thick

# Ectoparasites - Hamsters

- Mites
- Causes: Notoedres sp.
- Clinical signs:
  - Female:  affects only the ears
  - Male:  lesions observed on the nose, genitalia, tail and feet

# Dermatophytes

- Lesions are seen most often in young g.p.'s or in g.p.'s genetically predisposed, malnourished, or living in unsanitary or stressful conditions.
- Transmission: Contact w/ spores from the animal or on fomites
- Incubation period : 9-12 days
- ZOONOTIC

# Rabbit - Dewlap

Female

Male

# Abscesses

- Pseudomoniasis (P. aeruginosa)
- Hosts – mice, rats, rabbits, NHP, human.
- Usually not pathogenic unless immunosuppressed (irradiation, cortisone administration, burn studies)
- Ubiquitous organism in environment – commensal of the oropharynx, upper respiratory tract, and GIT. Found in water bottles and automatic watering systems.
- Transmission – direct contact, ingestion, fomites, human carriers (esp. ungloved hands)


Retro-orbital abscesses

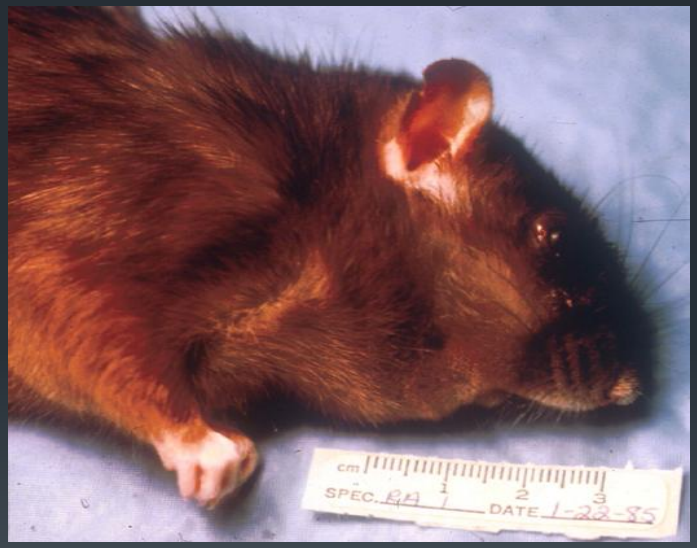
# Abscesses

Retro-orbital abscesses

- Pasteurellosis (P. pneumotropica) – opportunistic pathogen
- Infection usually asymptomatic
- Associated with suppurative and exudative lesions of the eye, conjunctiva, skin, mammary gland, especially in immunodeficient mice.

# Swelling

- Sialodacryoadenitis virus (coronavirus)




Cervical swelling

# Rat - Malocclusion

Incisors grow continuously

Can result in overgrowth → malocclusion

# Rabbit – Peg Teeth

# Rabbit - Malocclusion

- Most common inherited disease of domestic rabbits (autosomal recessive trait “mp/mp” with incomplete penetrance)
- Normally, lower incisors occlude with the large upper incisors and the peg teeth
- Grow over 20cm/yr
- Problem occurs if the maxilla is short relative to a mandible of normal length
- Overgrowth of the premolar and molar teeth occurs less frequently

# Dentition Rat - Ameliogenesis imperfecta


- Underdevelopment of enamel-forming ameloblasts
- Inherited through autosomal single recessive gene (ami)

# Dentition - Hamsters

Parvovirus

Causes disease in suckling and weanling hamsters
Marked discoloration, malformation and absence of incisors

# Hamsters – Cheek Pouch

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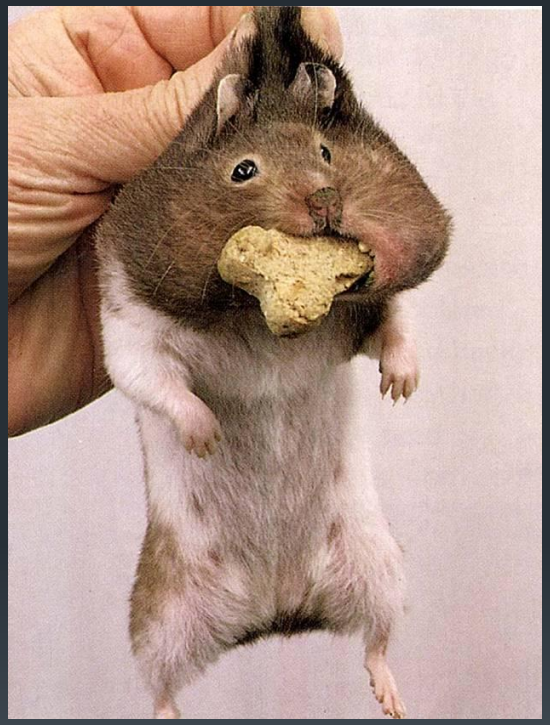
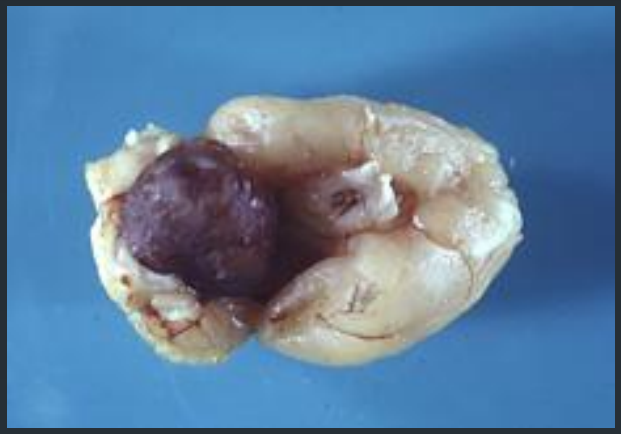


# Rat – Zymbal's Gland Tumor

- Occurs in holocrine gland at base of external ear
- Gross: circumscribed mass, frequently with ulceration of overlying skin
- Classified as adenoma or adenocarcinoma
- Locally invasive, but not metastatic

# Rat – Head Tilt, Pituitary Tumor



- Sprague-Dawley stocks often have an incidence of 50% in aged females.
- Most classified as chromophobe adenomas originating in the pars distalis
- Well circumscribed, often compress adjacent brain tissue due to size

# Rabbit – Head Tilt

- Head tilting can occur due to trauma, neurologic disease, parasites, etc.

# Trunk & Limbs

# Barbering

- Barbering occurs when animals chew on each other's hair. The skin is uninjured.
- Often all of the animals will be affected except the 'barber.'
- Cage mate barbering: Usually is seen on the back between the shoulder blades or on the top of the head.
- Auto-barbering: Usually seen along the flanks or low on the hind quarters.

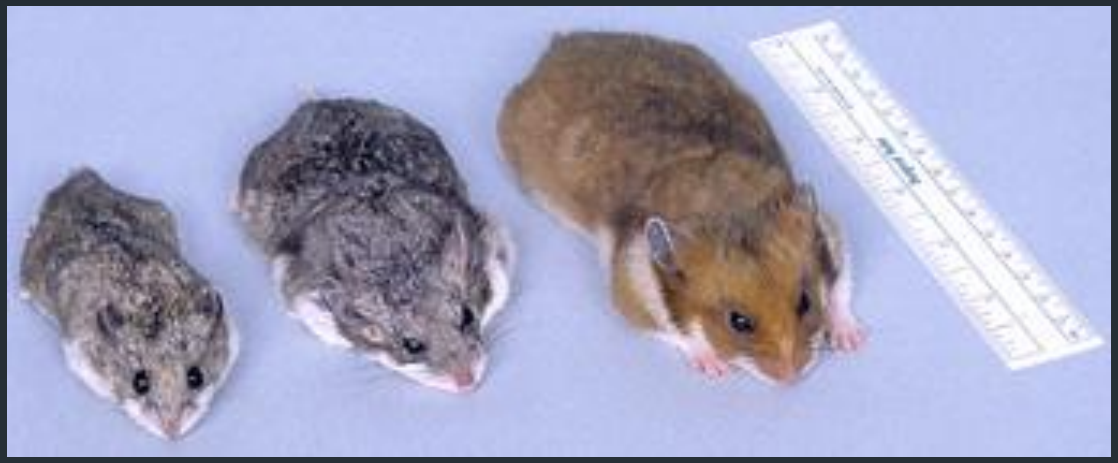
# Ectoparasites - GP

- Mites
- Causes: Trixacarus caviae

# Ectoparasites - Rabbit

- Causes: Cheyletiella parasitovorax
- Alopecia and scaliness in rabbits

# Hamsters



Chinese Armenian Syrian

European

Djungarian

# Hamsters – Flank Glands

- Dermal structures covered by coarse hair over darkly pigmented skin in the costovertebral area in males
- Produce secretions in response to androgen production
- Secretions are used for territorial marking
- Female also has flank glands – not easily identifiable, secretions associated with estrous cycle.
- Resistant to locally applied carcinogens

# Hamsters – Flank Glands

# What is it?

Brown Fat

Multiple locations

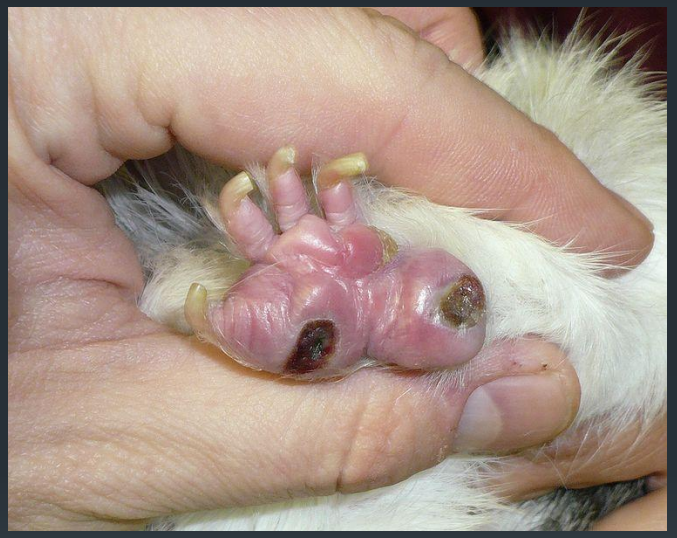
Known as “Hibernating gland”

Resembles an endocrine gland microscopically

Involved in “non-shivering thermogenesis”

# Rat – Pododermatitis

- Pododermatitis may develop in rats housed in wire-bottom cages or obese rats.
- Ulcerative dermatitis, associated with Staph. aureus and self-induced trauma from scratching.



# Rabbit – Pododermatitis

"Sore Hocks"

- Typically on the plantar aspect of the metatarsal bones and to a lesser extent, the metacarpal bones
- Predisposing factors
- Heavy animals, wire-floor housing, foot stomping, thin plantar fur pads

# Rabbit – Pododermatitis

# Rabbit - Traumatic Vertebral Fracture

- Posterior paralysis due to vertebral fracture or dislocation
- Most frequent site is L7 or its caudal articular processes
- Axial and appendicular skeleton fragile in proportion to muscle mass
- May see urinary or fecal incontinence and perineal staining

# Rabbit – Splay Leg

- Complete abduction of one or more legs and the inability to assume a normal standing position
- Right rear limb is most commonly affected
- May be due to an overall imbalance of development of the neural, muscular, and skeletal systems

# Nude Mouse with Ulcerated Tumor

- Tumors may be frequently observed in certain strains of mice.
- Tumors may appear as lumps under the skin, multiple swollen lymph
- nodes, or swelling of the belly if the cancer is internal.
- Cancer often can't be differentiated from an abscess or cyst unless opened, but tumors tend to grow slower.
- Tumor ulceration and Weight loss are appropriate endpoint criteria for animals on this type of studies.

# Scaly Skin Disease – Nude Mouse

Causes:

- Corynebacterium bovis
- Scaly skin , alopecia, associated with hair growth cycle
- Keratoconjunctivitis in aged B6
- It is very contagious and hard to get rid of.
- The skin is dry with small white or yellowish flakes.
- Dry skin may also occur on sick mice that don’t groom themselves

# Thorax

# Ectoparasites - Hamster

Causes:

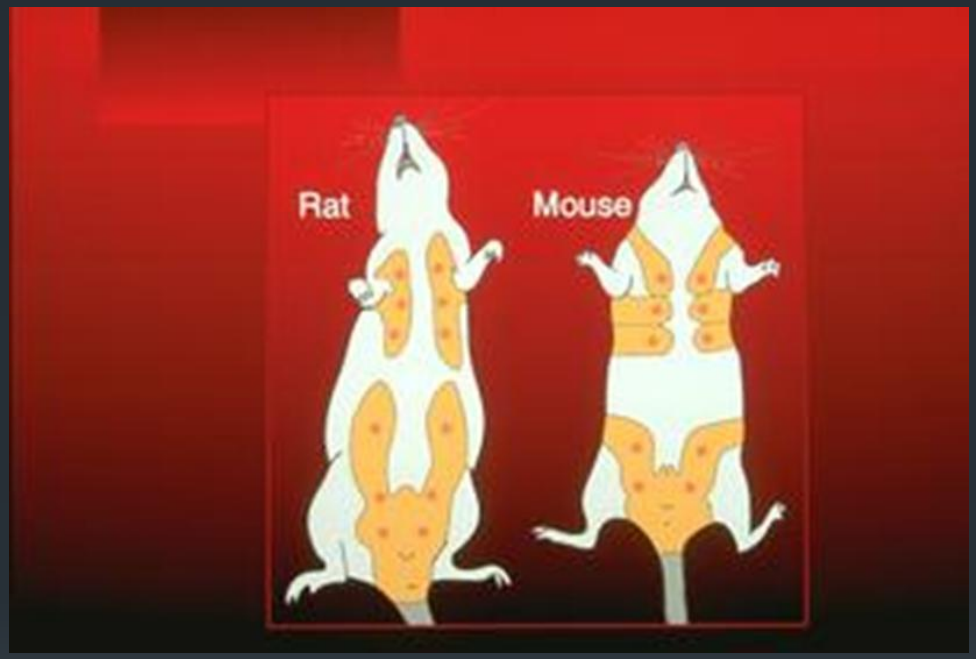
- Demodex criceti (found in epidermal pits) and D. aurati (occupies hair follicle)
- D. cricetuli (reported in Armenian hamster) – occupies hair follicle
- Clinical signs:  Alopecia on the rump and dorsum with dry, scaly skin

# Abdomen

# Mammary Glands

- Mice - five pairs of nipples and mammary glands
- Rats - six pairs of nipples and mammary glands
- The male has no nipples.

- GP – both males and females have a pair of abdominal mammary glands



# Rat – Mammary tumors

- Most tumors are fibroadenomas
- Sprague-Dawley stocks often have an incidence of 50% in aged females

# Mouse – Mammary tumors

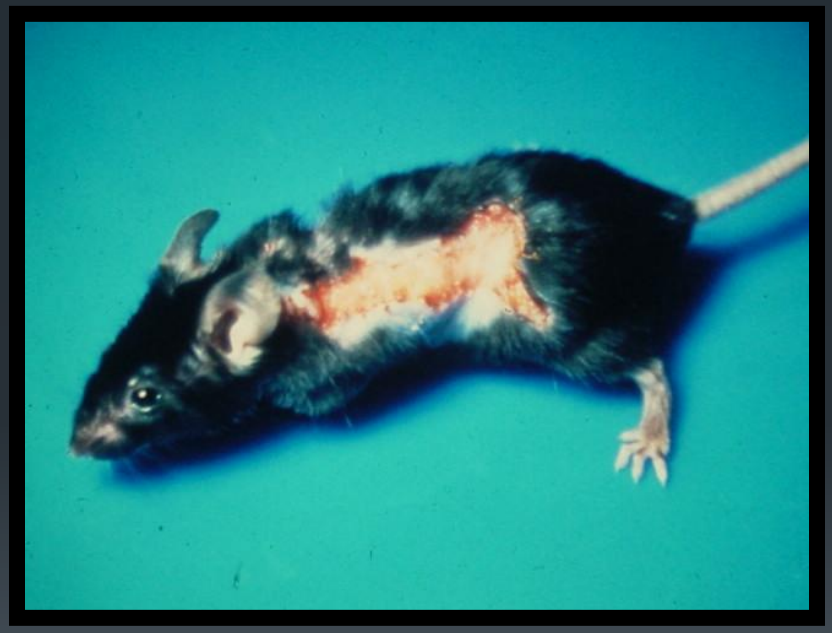
- Most tumors are induced by MMT virus
- Breast tumors in mice appear as moderately growing (not as fast as an abscess) lumps on the belly, shoulder, or flank of female mice.
- Some strains are much more likely to develop tumors than others.

# Mouse – Ulcerative Dermatitis

- Dermatitis is an inflammation of the skin.
- It may simply appear as a red rash, dry flakey skin or an open raw area (ulcerative dermatitis), maybe with a discharge.

# Mouse – Ulcerative Dermatitis

- C57BL/6 mice have a genetic tendency to develop severe dermatitis.



# Mouse – Pup

- Is this a happy pup?

# External Genitalia & Perineum

# Hamsters – Wet Tail

- Cause: Clostridium difficile, Lawsonia, Beta hemolytic E. coli
- Clinical signs:  profuse and watery to hemorrhagic diarrhea, high mortality

# Mouse – Rectal Prolapse

- A Rectal Prolapse is when tissue is protruding from the rectum of either sex.
- Cause: Helicobacter hepaticus-associated typhlocolitis, Citrobacter infection, parasites, constipation etc.
- Prolapsed tissue is often red and irritated and may bleed.

# Mouse – EDIM

- Cause: Epizootic Diarrhea of Infant Mice (Rotavirus)
- Clinical signs occur in infant mice less than 2 weeks old, irrespective of immune status.
- Infection in adults is subclinical.

# Rat – Ring Tail

- Low humidity of less than 40%, together with high temperature linked to ringtail

# Mice – Fight / Bite Wounds

- Males will bite each other around the genitals
- Bite wounds usually are the result of fighting between male mice post-weaning.
- Some strains are much more aggressive than others
- Overcrowding, environmental stresses, mixing new groups of mice together, and exposure to the odor of females all increase fighting.
- Wounds are primarily on the tail and back.

# Rat – Tail Tumor

- Tail keratoacanthoma

# Other Observations

# Why has the coat color in my mice changed over time?

Genetic drift. Your mouse genes have recombined.

Therefore, a different coat color means you are working with a different mouse.

A different mouse means your current data may not be comparable to your previous data.

# Runting

- A runt is visibly smaller and weaker than its littermates.
- This is not uncommon with large litters where not all pups get enough milk.
- If the whole litter is runted it usually is an indication of a problem with the mother or a disease.

Could be Dunkin-Hartley or Hartley
→ Outbred

IAF Hairless Guinea Pig (Crl:HA-*Hrhr*)
→ Outbred
→ Euthymic
→ Immunocompetent

Hairless (euthymic) - defective hair shaft and decreased #'s- different from hairless rat which develops hair and then loses it.

# What is wrong with this mouse?

# Need for a break???

# Condition of the animal - CRITICAL

- Moribund (dying)
- Severely distressed
- Very sick
- Barely able to move
- Badly injured
- Severe rectal prolapse

# Condition of the animal - CRITICAL

- Immediately
  - Call PI or contact person in the PI's lab for verbal permission to euthanize.
  - If you cannot reach PI immediately, call Attending Veterinarian for authorization to euthanize.
  - Euthanize as soon as you get permission.
  - No Health Action Form required as animal will be immediately euthanized.

# Condition of the animal - SEVERE

- Severe skin condition
- Large area of red, raw skin
- Severe bite wounds

# Condition of the animal - SEVERE

- Immediately
  - Call PI or contact person in the PI's lab for verbal permission to euthanize.
  - If you cannot reach PI immediately, call Attending Veterinarian for authorization to euthanize.
  - Euthanize as soon as you get permission.
  - No Health Action Form required as animal will be immediately euthanized.
  - If animal valuable – treatment can be attempted

# Condition of the animal - Moderate

- Diarrhea
- Abnormal, irregular, rough breathing
- Abnormal movement

# Condition of the animal - Moderate

- Immediately
  - Call Attending Veterinarian or fill Health Action Form.
- Usually, no effective treatments available.
- Euthanasia recommended in many situations.
- If animal valuable – treatment can be attempted.

# Condition of the animal – Multiple Dead or Dying

- More than 1 dead and/or dying animal in the same cage or study
  - Research-related
  - Husbandry-related
  - Cause unknown

# Condition of the animal – Multiple Dead or Dying

- Call Attending Veterinarian and the PI or contact person in the PI's lab.
- Fill an Health Action Form

# Condition of the animal – Other Ailments (Not Treatable)

- Tumor is infected, bleeding, abscessed or ulcerated
- Tumor is necrotic (dark, dead tissue) and open
- Face/muzzle swelling, abscess or lump
- Weight loss greater than 20%

# Condition of the animal – Other Ailments (Not Treatable)

- Call PI or contact person in the PI's lab to notify them that euthanasia is required.
- If you cannot reach PI within 1 hour, or you do not get permission to euthanize call Attending Veterinarian immediately.
- Euthanize as soon as you get permission.
- No Health Action Form needed. Euthanasia required.

# Condition of the animal – Other Ailments (Treatable)

- Hunched, but actively moving
- Eye lesion or injury
- Squinting or closed eye
- Medium-size areas of red, raw skin
- Moderately irritated skin or ears
- Weight loss (less than 20%)
- Moderate bite wounds on body or tail
- Mild rectal prolapse

# Condition of the animal – Other Ailments (Treatable)

- Call PI or contact person in the PI's lab for verbal permission to euthanize or treat.
- If you cannot reach PI within 4 hours, or you do not get permission to euthanize or treat, call the Attending Veterinarian immediately.
- Euthanize or begin treatment as per Attending Veterinarian’s instructions.
- Fill Health Action Form

# Treatment Options

- **Provide Wet food:** if approved by PI.
- Examples of animals that may need extra support include:
  - Weanlings
  - Mice with tumors
  - Post-surgical animals
  - Ascites animals
  - Animals receiving therapeutic agents/drugs
  - Neurologically impaired animals
  - Animals with phenotypes that may hinder their ability to feed

# Treatment Options

- Skin Lesions
  - Apply non-antibiotic topical medications twice daily (weekends and holidays included, if possible) for a minimum of 7-10 days, until healing is complete (ie. Aveeno Anti-Itch or Aveeno Diaper Rash, Chlorhexiderm).
  - The skin must appear normal to discontinue treatment.
  - If not improving contact AV

# Treatment Options

- Facial lesions - should be treated with an ophthalmic antibiotic formula. For muzzle lesions, remove the feeder and provide feed on the cage floor. Prominent swelling of the muzzle is indicative of an abscess, or pocket of infection.
- Euthanasia is recommended for rodents with abscesses on their muzzles or other places on their bodies.
- If not improving contact AV

# Treatment Options

- Bite Wounds in rodents with normal immune systems -use Chlorhexiderm to cleanse the wounds and aid in healing.
- Severe bite wounds, severe traumatic injuries, and all wounds in rodents without normal immune systems, like nudes and SCIDs, should be treated with an antibiotic topical ointment. To aid in healing, cleanse severe wounds with Chlorhexiderm before applying antibiotic ointment.
- If not improving contact AV

# Treatment Options

- Eye lesions in rodents may include those resulting from traumatic eye bleeds, (mice only), self-trauma, (rodent scratching skin lesion near eye), or any of a number of allergic conditions. Allergies affecting the eyes appear as redness and tearing of both eyes. Eye conditions are painful and likely to lead to secondary infection. If left untreated, the eye can be lost.
- Treatment ophthalmic antibiotic ointment applied b.i.d to t.i.d until the eye(s) appears normal.

# Treatment Options

- Severe Tail Bite Wounds
  - Separate the bully from the victim(s) so the biting does not continue.
- Treatment:
  - Betadine solution or Chlorhexiderm flush
  - Triple Antibiotic Ointment with Pain Reliever
  - Treatment is b.i.d for 7-10 days (or until completely healed).

# Treatment Options

- Necrotic Tails
  - Blackened tissue is dead tissue and needs to be surgically removed as soon as possible.
  - Call AV to perform procedure.

# Treatment Options

- Rectal Prolapse
- Mild: ≤1mm of moist, inflamed tissue protruding from the anus
- Moderate: ≤3mm of moist, inflamed tissue protruding from the anus, no active bleeding. Mouse is otherwise healthy and normal
- Severe: ≥3mm moist, inflamed tissue protruding from the anus, active bleeding, dried blood, dry tissue

# Treatment Options

- Treatment for Mild to Moderate Prolapse:
- Give "Wet Food"
- Treatment: Hemorrhoid Cream with Pramoxine
- PI should consider endpoint
- If the animal is a nursing female, allow her to finish with the litter. Do not rebreed

# The End