

University of Basrah  
Veterinary College



**BSVC - Basic Safety  
Training for Veterinary  
Clinic and laboratory  
animals**

# BSVC - Basic Safety Training for Laboratory Animals

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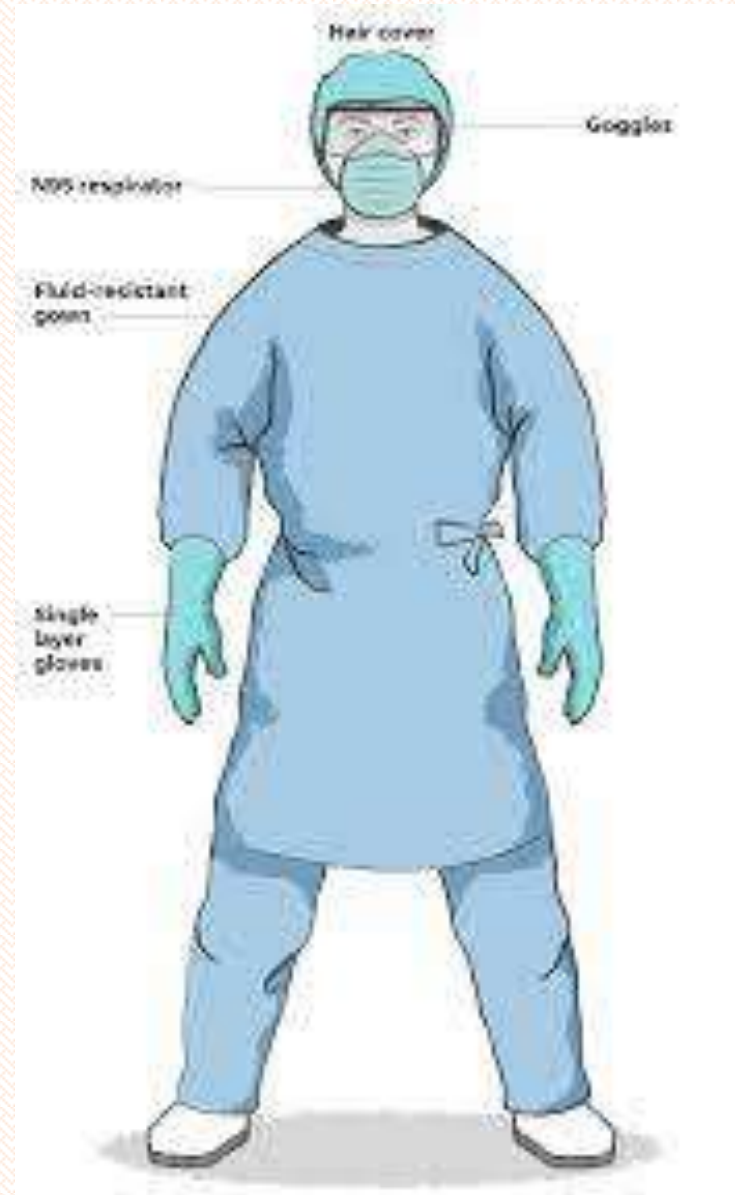
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# **Occupational Health and Safety in animals facilities**

# General Workplace Hazard

- Attire Dress appropriately for job
- hand Minimal jewelry,
- if any Dress appropriately for the job at hand.
- This includes protective footwear and minimal, if any, jewelry.



# General Workplace Hazard

Lifting Remember to keep your back straight and lift with your legs. Discuss Case Presentation .



# General Workplace Hazard

Clutter Lack of cleanliness



# General Workplace Hazard

Ineffective organization  
Improper storage  
Improper storage of materials can lead to serious injury.



# General Workplace Hazard

Break times Eating and drinking in designated area  
Away from clinic areas





# General Workplace Hazard

Machinery and equipment Proper operation  
Proper use Dangers in using Be aware of the dangers in using autoclaves, cautery devices, and branding irons.



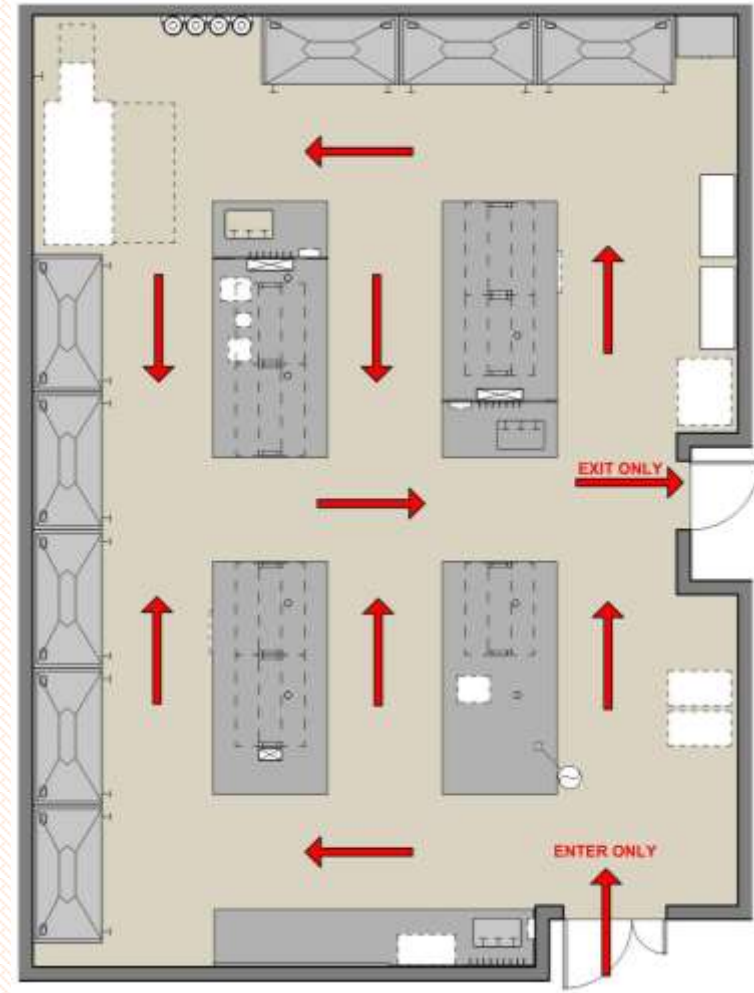
# General Workplace Hazard

Electricity Overloaded surge suppressors or extension cords can start a fire.



# General Workplace Hazard

Fire and evacuation Read and follow directions on your specific extinguisher. Most portable fire extinguishers work according to the PASS directions. P: Pull the pin (some extinguishers require some motion such as releasing a lock latch). A: Aim low (point extinguisher horn or hose at base of fire). S: Squeeze the handle (this releases extinguishing agent). S: Sweep from side to side at base of fire until it appears to be out. Watch fire area, and repeat use of extinguisher if needed. Remember the word PASS



# General Workplace Hazard

## Hazard

Violence Barriers  
Personal safety includes the diligent use of locks and barriers to deter unauthorized persons from entering the facility.



# General Workplace Hazard

Hazardous chemicals Most  
common chemicals used  
Cleaning and disinfecting  
agents Insecticides and  
pesticides Drugs and  
medications Sterilization  
agents Radiology  
processing fluids “Right to  
Know” law

# Zoonotic Diseases Common pathogens

Viruses Rabies is a serious viral disease.

Bacteria Bacterial pathogens include *Borrelia burgdorferi* (cause Lyme disease) as well as *Escherichia coli* and *Salmonella*, *Pasteurella*, and *Pseudomonas* species. Fungi Ringworm is caused by a fungus of the *Microsporum* species. Internal parasites Roundworms and hookworms are internal parasites.

External parasites An example of an external parasite is the irritating and itchy mite that causes sarcoptic mange.

Protozoans Toxoplasmosis is an infestation by a protozoan. Other zoonotic protozoans are *Giardia* and *Coccidia*.



## **Non-Zoonotic Diseases**

Not serious concern to human health  
Highly contagious

Examples Parvoviral enteritis in dogs  
Panleukemia in cats

Personal protection equipment

Protective measures



# Handling and Restraint

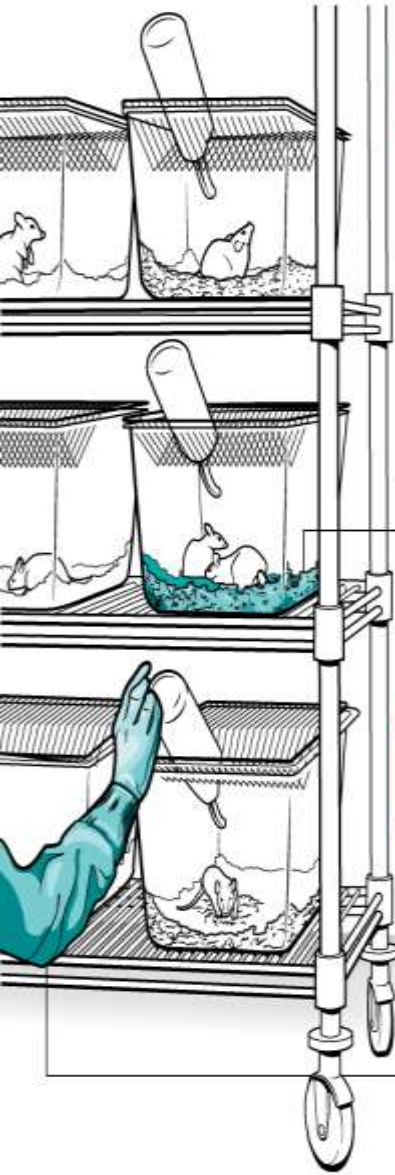
Laboratory animals





# The devilish details of rodent husbandry

Variation in an animal's microbiome is just one of a dizzying array of subtle factors that can affect the outcome of mouse experiments.



**Timing**  
Circadian rhythms influence how a mouse's immune system responds. Mice exposed to bacteria in the morning versus the evening might have different levels of inflammation.

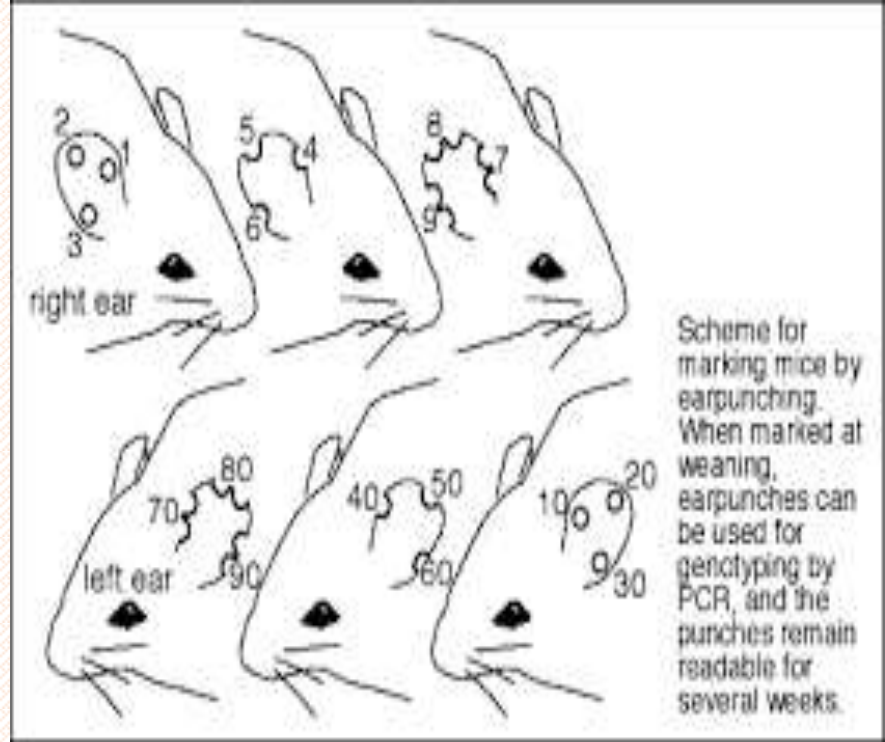


**Temperature**  
The typical 20°C–26°C in a lab puts mice into a state of mild cold stress, in which they ramp up their metabolism, making them more prone to inflammation and fostering the growth of tumors.

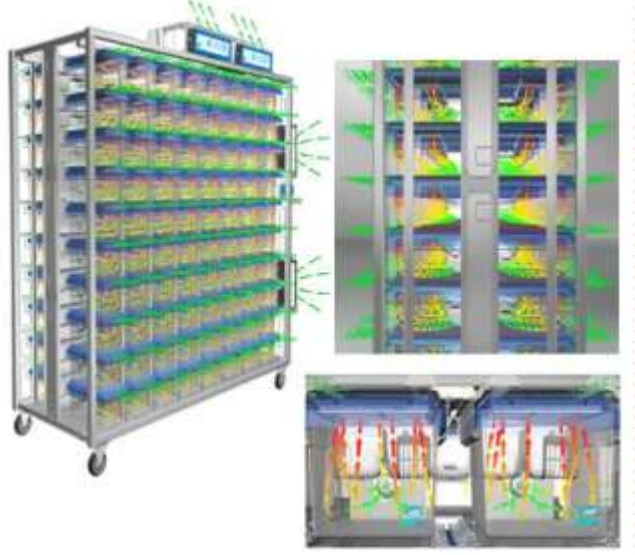
**Bedding**  
Rodent cages are filled with bits of wood, corncob, or paper. But corncob can inhibit estrogen signaling, and some types of wood may boost the activity of a drug-metabolizing enzyme in rats.

**Shelf level**  
Mice on the top shelf were more prone than their downstairs neighbors to develop degeneration of the retina in one study, and slower to develop certain tumors in another.

**Experimenter**  
Mice can distinguish their human visitors by smell. Mice given a painful injection in the presence of men rather than women had higher levels of stress hormones and a milder pain response.



Scheme for marking mice by earpunching. When marked at weaning, earpunches can be used for genotyping by PCR, and the punches remain readable for several weeks.



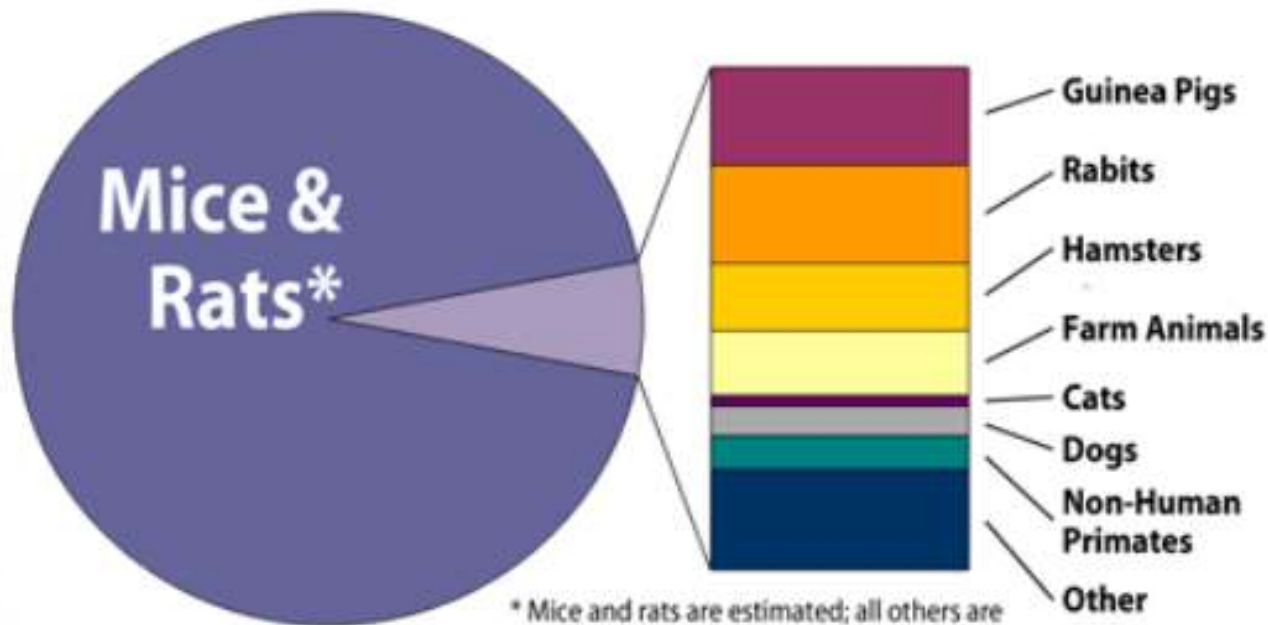
## • Lab Animals Uses

- General
- bioassay
- toxicity tests
- screening of new compounds
- cancer research
- behavior research
- Genetics
- Effect of drugs
- Psychological studies

# Lab Animals



# Mammals in Research



\* Mice and rats are estimated; all others are based on USDA animal use data for 2010.

Mice are generally easy to restrain, but their small size makes them especially vulnerable to physical injury, not least by the handler inadvertently dropping them when bitten. Some mice are also very active and may attempt to jump away from the handler.



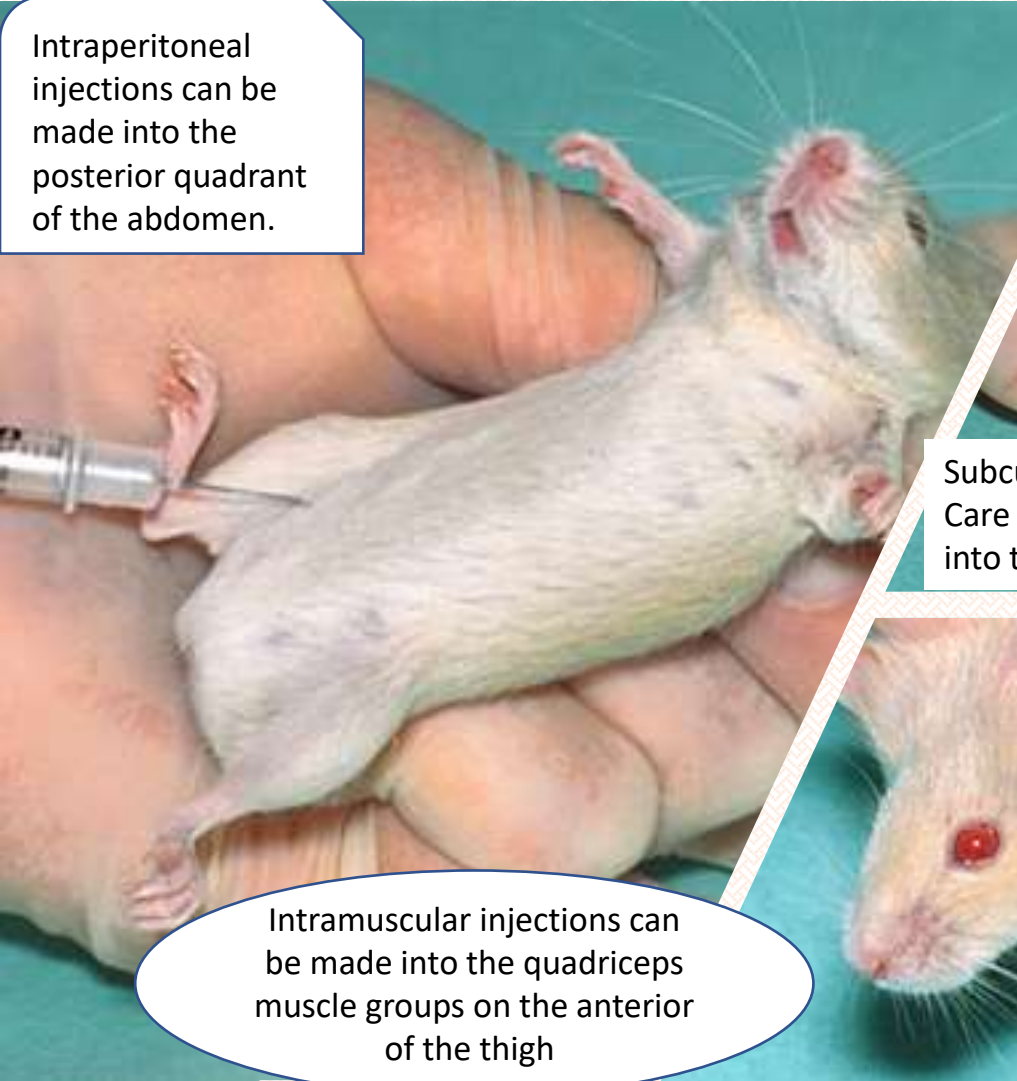
The animal should be grasped by the tail, preferably the proximal third and lifted clear of its cage. It should then be placed on a surface such as a cage top. If gentle trac is maintained on the tail, the animal will grip the cage top and attempt to pull away



The scruff can be grasped between the thumb and forefinger whilst maintaining a grip on the tail. The animal is then secure and can be examined or injected safely.



Intraperitoneal injections can be made into the posterior quadrant of the abdomen.



Subcutaneous injection can be made into the scruff of the neck. Care must be taken to direct the needle into the scruff and not into the handler's finger or thumb.



Intramuscular injections can be made into the quadriceps muscle groups on the anterior of the thigh

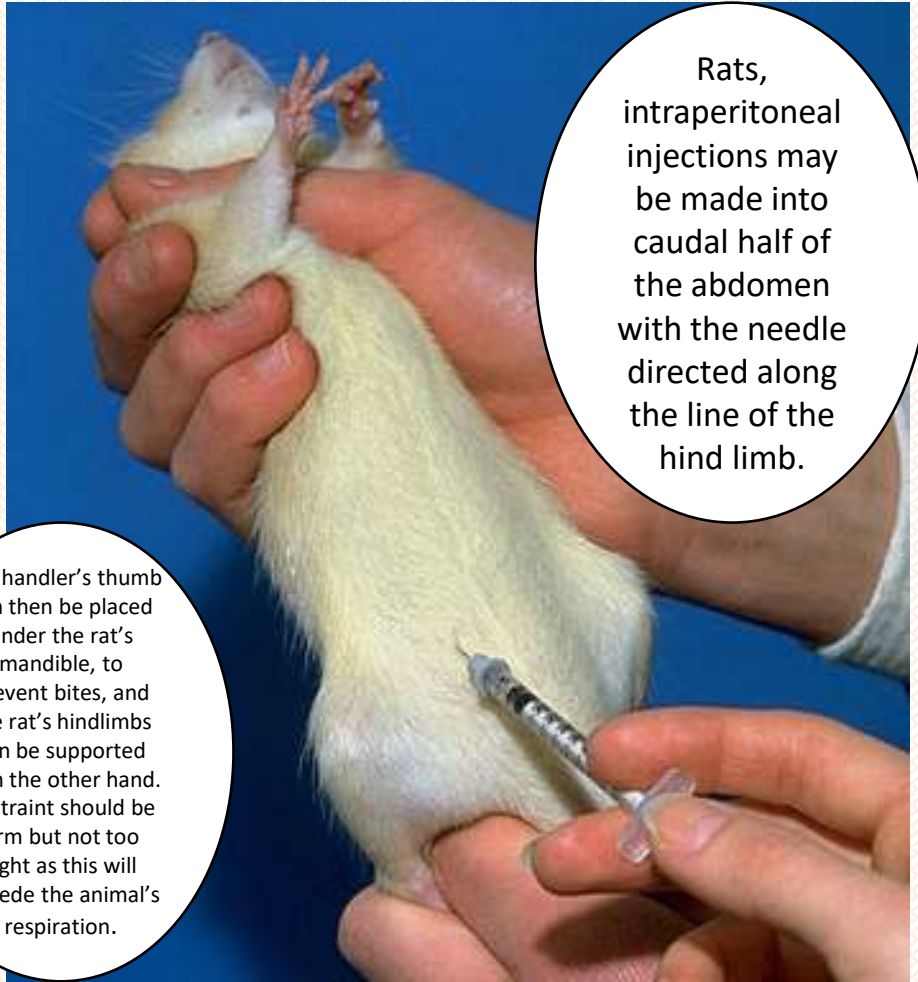




Rats are typically docile animals, particularly if they are routinely handled using appropriate techniques. Bites from rats are uncommon and will typically only occur if the animal is stressed or in pain. To initially restrain a rat, the handler should gently grasp it around the shoulders.



The handler's thumb can then be placed under the rat's mandible, to prevent bites, and the rat's hindlimbs can be supported with the other hand. Restraint should be firm but not too tight as this will impede the animal's respiration.



Rats, intraperitoneal injections may be made into caudal half of the abdomen with the needle directed along the line of the hind limb.



The handler is restraining the rabbit firmly by the scruff with the other hand ready to support the animal's hindquarters.



The rabbit should be held its head tucked under the handler's arm and with the back and hindquarters supported by the handler's forearms.



Rabbits may also be restrained for injection by wrapping the animal in a drape or towel. If the rabbit is securely wrapped, it will not struggle.



Intravenous injections into the rabbit's marginal ear vein can be readily made if the rabbit is restrained with a drape



[click to play video clip](#)



[click to play video clip](#)



Never restrain gerbils by the tail as the skin of the tail is delicate and tends to tear easily. Gerbils should be cupped using one or two hands, or can be scuffed.



click to play video clip

Common routes for injection include the intraperitoneal and subcutaneous routes. As with all small mammals, small hypodermic needle should be used for injection and the volume of substance should be minimized.



click to play video clip

Injection techniques for the hamster are similar to those previously discussed for the gerbil.



To initially restrain a hamster, the animal can be placed beneath the palm of one hand.



The hamster can then be restrained by the scruff starting with the skin near the front of the shoulders.





The handler's thumb is placed beneath the jaw of the guinea pig. The hindquarters of the guinea pig are supported by the handler's other hand.

[click to play video clip](#)



Intraperitoneal injections are made into the lower half of the abdomen.

[click to play video clip](#)

- References

Flecknell P (1991). Small Mammals. Chapter 16 in Practical Animal Handling (Editors R.S. Anderson and A.T.B. Edney), pp 177-187. Pergamon, Oxford.

Richardson VCG (2003). Diseases of Small Domestic Rodents, 2nd edition. Blackwell Publishing, Oxford.

- Ward ML (2006). Physical examination and clinical techniques. Chapter 2 in BSAVA Manual of Rabbit Medicine and Surgery (Editors A. Meredith and P.A. Flecknell), pp 18-36. BSAVA, Gloucester.

THANK YOU