

Part III - Animal Procedure Room Configuration within the Vivarium

Overview

The location of the animal procedure rooms (PR) in relation to the animal holding rooms (AHR) should be based on the user needs and how the facility is managed. This will vary depending on the institution. Clusters of AHRs may have a single adjacent PR. Other PRs may be highly specialized. The designer must work with the veterinarians and other technical staff to determine the best approach to the PR design and configuration within the vivarium.

Procedure Room Configuration Within the Vivarium

There are a variety of options for laying out PRs in relation to AHRs. First and foremost, the designer must be cognizant of the 'clean to dirty' traffic pattern in the facility. This automatically requires that rooms where terminal procedures are performed such as the necropsy room, must be at the terminal end of traffic flow. Carcass storage or areas of the facility where animals enter from another facility should also be located at the terminal end of traffic flow.^{1,3}

Figures 1a, 1b & 1c provide examples of possible design options for the AHRs with associated procedure space.² Figure 1a shows a suite in which a PR has dedicated access from several AHRs,



Figure 1a. A PR with dedicated access from several AHR.

accommodates up to about 20 investigators, and provides 324 sq. ft. of procedure space for 1350 sq. ft. (~1800 mouse cages) of animal care space. In Figure 1b, 4 single rack cubicles (~35 sq. ft.), open into a common procedure

space for 1-10 investigators, with 135 sq. ft. procedure space. Cubicle

rooms usually hold only a single rack. A 600/700 cage room with an associated PR is more desirable for operational efficiencies. Distributed in 5-7 AHRs, the same 600 cages produce more custodial duties. In Figure 1c, a small 120 sq. ft. PR is located within a large 2220 sq. ft. AHR with

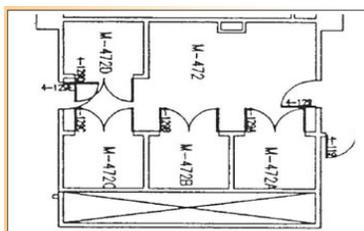


Figure 1b. Cubicles [4] opening into a common procedure space.

additional PRs, each at 120 sq. ft., accessed off an adjacent main hallway. There are 20 racks within the large room, providing ~2400 cages.²



Figure 1c. A PR located within a much larger AHR with additional PR accessed off an adjacent main hallway.

Specialty Procedure Room Requirements

Specialty PRs fall into any of the previously mentioned categories. Their status depends mostly on how the facility is managed. They may be used as shared facilities or core facilities or they might be 'owned' by an investigator or department.

Specialty PRs may include:

- Dedicated Imaging – Consider vibration & ferrous materials (Refer to Animal Imaging Series)
- Behavioral Testing for rodents or nonhuman primates – Consider noise abatement & vibration
- Aquatic Species Labs – Consider water weight, light & vibration (refer to Aquatic Facility Series)
- Biocontainment – Consider limited access, air locks, security, waste processing, gowning, HVAC
- Surgery – Consider animal prep, surgeon prep, instrument prep, operating room/suite and animal recovery
- Transgenics – Consider barrier design
- Necropsy – Consider location and ventilation
- Cryopreservation – Consider liquid nitrogen tank location and storage bank.^{2,3}

A surgical suite is a highly specialized PR that will not be detailed in this series. However, there are two very specialized PRs besides a surgery that are noted here. The first is the behavioral testing rooms (BTR) whose design will be driven by the species to be tested. BTRs should have the same HVAC as other AHR and PR. They should be light tight, acoustically protected, and have IT connections to data collection areas outside of the testing room. Rodent BTRs may include features such as deeper than normal countertops at different heights to hold special equipment; more than the usual shelving for storage of testing equipment; light cycle controls and a 'testing in progress' light or sign outside the entrance; a water tank with a sink and a drain.³ BTRs for nonhuman primate (NHP) testing may require specialized NHP equipment designated by the investigator, extra power lines, data and LAN lines for computers.³

The second specialty PR is the necropsy suite. Necropsy is potentially the most dangerous area of an animal facility due to possible exposure to agents of disease. An anteroom is recommended. Necropsy should have safety equipment such as surgery lamps, downdraft tables, washing facilities, emergency eyewash and emergency shower. Refrigeration is needed to store carcasses. A refrigerated chamber for storage of dead animals might be configured as a pass-through unit to a general purpose corridor.¹

Ventilation must be adequate to minimize aerosol concentrations and odors and the room(s) must have negative air pressure relative to all surrounding areas. The air exhaust system should be configured to move potentially hazardous air away from the persons performing necropsies and safely expel it from the building. Other considerations include use of exhaust vents at the back of the work surfaces; adjustable ambient lighting and task or exam light; ease of disinfection and possible fumigation and occasional washdown. If the necropsy room is designed for washdown, then all electrical outlets should have watertight covers and be ground fault interrupted.¹

¹ Canadian Council on Animal Care guidelines on:lab animal facilities- characteristics, design and development, (CCAC); D. Neil and D. McKay Ottawa ON Canada, 2003.

² McGarry, M.J., et.al. Animal Facility Procedure Rooms: Design and Use. ALN Sept 25, 2011 <http://www.alnmag.com/article/animal-facility-procedure-rooms-design-and-use?page=0>

³ NIH. Design Requirements Manual. Bethesda, MD. NIH, 2008.

<http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/DesignRequirementsManualPDF.htm>