

## Part IV - Animal Procedure Room Utilities, Equipment & Management

### Overview

The room(s) where animal procedures are performed require a host of design features unique to the type of procedure room and the fact that animals are the patients. In addition to functional utility, animal well-being, personnel safety, housekeeping, maintenance, cross contamination, security, HVAC and MEP must be addressed in the design. It is essential, as with the design of any highly technical facility, for all parties to communicate their needs and requirements, budget, and limitations that will all affect the final outcome.

### Equipment Requirements

Energy efficiency measures and technologies should be built into planning the equipment requirements for the procedure rooms. LEED™ recommendations should be applied whenever feasible. Some procedure rooms may be equipped with a fume hood and/or a biosafety cabinet (BSC). Ducted BSCs can be considered for areas that use small amounts of chemicals or radioisotopes. Class II, B1 or B2 BSCs may require increased exhaust and make-up air, which is more energy intensive. A sink with an eyewash, stainless steel counters; downdraft sinks/tables for rodent surgery, exam lights, refrigerator and wall-mounted or mobile cabinets and gas tank storage or central gas supply should be provided. Central gas (oxygen, carbon dioxide, etc.), a passive gas scavenger line, vacuum and high pressure air may be needed in some or all procedure rooms. A low bench top may be needed for either a desk surface or a microscope. There should be sufficient electrical outlets to support all anticipated equipment.<sup>2</sup>

### Utility Requirements

Utility systems must be capable of providing all the services necessary for scientists to conduct their research and for the animal husbandry staff to properly care for the animals. Utility services must accommodate unanticipated demands brought about with new technologies or through changes in research protocols.

A percentage of reserve capacity should be designed into the primary building systems to accommodate increased animal densities, additional equipment and other changes. All components of the utility systems should be planned and designed to allow all required access, maintenance and repairs without entering the animal holding or procedure rooms.

Utility services must be distributed to each individual space. The connection point of each service should be in a uniform position relative to the space and detailed to provide simple extension into the space without disruption of adjacent modules. These services may run in interstitial space, allowing animal holding or procedure space to change without increasing or upgrading capacity or location of central utility systems. Changes would be primarily to

terminal systems, i.e., piping and power connections to apparatus and equipment within the space.

HVAC units serving animal facilities should be designed with redundant heating, ventilating, and air conditioning system arrangements or with standby equipment with capability to ensure continuous operation during equipment failure, power outages, and scheduled maintenance outages. It is acceptable to have a common air intake system for both animal holding and other parts of the building. The animal area exhaust system must be independent of the non-animal exhaust systems of the building.<sup>2</sup>

Utilities and services including communication and information systems should be organized into specific zones, both horizontally and vertically, to provide distribution of systems and services that can be extended to each animal holding and procedure module.

The choice of design and locations of the utility distribution system(s) is a product of utility function, cost effectiveness and ease of access for maintenance, future services, and remodeling during the life of the animal research facility. A percentage of the holding and procedure rooms should be designed for interchangeability of use.

The percentage and locations of rooms with drains should be determined during programming.<sup>2</sup>

### Procedure Room Management

Procedure room management is something that should be discussed early in programming in order to design the most efficient facility. Each procedure room type and configuration has its own features and flaws when it comes to oversight and management.<sup>1</sup> Using procedure rooms or suites as core facilities, shared facilities or individually operated areas will impact location of the procedure rooms, amount of storage for racks and consumables, adjacent holding room space and traffic patterns. Some level of security and limited access control will almost always need to be addressed. New security technologies are being developed quickly. Current designs include electronic cards, finger print; retinal scan and eye movement to confirm identity. Some cabinets may need to be lockable for instruments and supplies used by specific individuals in a shared room. Anterooms and/or garb change rooms may be required. These areas may serve as storage areas as well.<sup>1</sup>

<sup>1</sup>McGarry, MJ, Huerkamp, AP, Percifield, J. Animal Facility Procedure Rooms: Design and Use. ALN September 25, 2011 <http://www.alnmag.com/article/animal-facility-procedure-rooms-design-and-use>

<sup>2</sup>National Institutes of Health (NIH). Design Requirements Manual. Bethesda, MD. NIH, Division of Technical Resources, 2008. <http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/DesignRequirementsManualPDF.htm>

