Some Common Prosection Techniques

Contrary to a common misconception, dissection is not just “cutting” into a specimen. **Dissection** is a term for the techniques used to carefully separate and expose internal structures of a specimen, plant or animal. Nevertheless, anatomy courses including medical school anatomy may use dissection techniques as a careful “search and destroy” mission, where by certain superficial structures that have been identified are removed to expose deeper structures. This is often the case, when a systematic approach is taken in anatomy (the study of one organ system at a time). For example, in a typical anatomy dissection where muscles are the topic of study, superficial blood vessels and nerves, as large as femoral vessels and nerves that are covering underlying muscles and making the muscles difficult to see might simply be cut back or removed completely.

**Prosection**, however, is a form of dissection that is done for demonstration purposes usually with human cadaver specimens. Scientists that perform prosection become experts in specific anatomical regions and make every effort to retain most internal structures of that region, unless the structure is too small or too superficial to maintain, or the structure is not identified in advanced anatomy texts. When studying anatomy through prosection, the relative structure and position of muscles, blood vessels, nerves and other regional structures (organs) are examined together.

Before any prosection is done, the scientist must learn about caring for the human cadaver. Cadaver specimens arrive from the UCI Willed Body Program in a heavy disaster bag. Inside of the bag, the cadaver is covered in a thin gauze cloth. To preserve the soft tissues of the body in their original state, the cadaver is infused with a dilute mixture of formalin for fixation and is preserved with a complex solution including phenol, other organic compounds and infutrace to neutralize the formalin vapor. Care must be taken to prevent drying of the muscles and internal structures by spraying the body with a “wetting solution” containing a mold inhibitor or with infutrace once prosection has begun. Infutrace, though important for reducing the amount of harmful formaldehyde vapors, negates the effect of the mold inhibitor phenol. Therefore, students should alternate using the “wetting solution” and infutrace.

Although “cutting” should be done sparingly during prosection, the most important tool of cadaver prosection is a good scalpel. Each individual performing prosection must be comfortable with safe attachment and removal of the scalpel blade to the handle. Scalpel blades are individually packaged and open from the “angled” blunt end of the blade. To apply the blade, open the package half-way, then insert the handle into the long opening of the blade so that the angle of the handle matches the angle of the blunt end of the blade. Handles come in two sizes (large and small). Only one size will fit into the opening of the blade. (See next three photos below)
There are two methods for removing a dull scalpel blade from a handle. The older method uses a hemostat to tightly clamp the blunt end of the blade. The blade must be pointed away from you or anyone else! The blade is gently lifted from the handle and slid away from you as shown in the next two photos.

The loose blade must be immediately disposed of in a clearly marked “biohazard sharps” container (see next photo).
The newer method for blade removal inserts the dull blade into a sharps container as the blade is removed. The blade still on the handle is inserted into the small container as shown below. When the button (see arrow) is pushed the blade is automatically and safely removed:

![Image of blade insertion]

Prosection techniques start with careful reflection of the skin, that is separation of the epidermis and dermis from the hypodermis. The blunt side of a scalpel blade is used for this purpose. Skin reflection is started on the posterior aspect of a cadaver where a small cross incision is made superficially to start the separation of the dermal and hypodermal layers, then the separation is done from a corner formed by the cross as shown in the diagram. Segments of skin are removed in this manner, but are then used to cover the specimen to prevent drying.

Before the hypodermis is removed, it is carefully probed for important superficial structures. According to your dissector, the hypodermis may be shaved in thin layers (in some areas “superficial fascial planes”) or removed all at once depending on the region. As deeper structures are exposed, fat and other forms of connective tissue are carefully cleared away using forceps and some type of a blunt probe (often a gloved finger works the best!).

To view deep muscles, superficial muscles may be bisected once well separated from deeper muscles (cut in half, in a direction that is perpendicular to the direction of their fascicles) or reflected from their origin.
The dissector chosen for this prosection project will describe specifically where to begin prosection of each body region, how to divide the skin segments as they are removed, which structures will be exposed through the prosection process, and which muscles should be bisected if any is needed.