Anesthesia of Pigs
TJ Doherty, 2011

General Comments

1. The pig is undoubtedly an awkward animal to restrain.
2. It will not allow itself to be handled & responds vociferously to the mildest restraint.
3. If the squealing can be ignored, manual restraint and local anesthesia can be used for selected procedures on small pigs.
4. Chemical restraint has its difficulties also:
   a. No readily accessible peripheral vein except that at the margin of the ear.
      i. Occasionally, abdominal vein accessible!
   b. Intended intramuscular injection may result in the drug being deposited in fat.
5. Difficulty of pre-anesthetic evaluation. Although the average pig is not particularly fit in comparison to the horse or cow they are relatively good subjects for anesthesia.
6. Susceptible to malignant hyperthermia. Although this is unlikely in pot-bellied pigs.
7. Respiratory System:
   a. High incidence of rhinitis in commercial pigs.
   b. High incidence of pneumonia and pleuritis in "commercial" pigs.
8. Endotracheal Intubation is Relatively Difficult:
   a. Jaws do not open widely
   b. Larynx and trachea lie at an angle to one another.
   c. Soft palate is long and floppy and obscures the epiglottis.
   d. Presence of large ventral saccules.
   e. Trachea is long and narrow.
   f. Tracheal bronchus may be occluded by a long endotracheal tube.
9. Airway Obstruction:
   The upper respiratory tract of the pig is easily obstructed, and obstruction can occur if the head is held in an abnormal position. Also, airway secretions may cause problems with patency, but this is not generally a problem.

10. Nevertheless, pigs are fairly good subjects for anesthesia!

Sedating Agents

Intramuscular Injections:

- Don't inject commercial pigs in the "hams" as this is the most valuable portion.
- Best to inject in the neck close to the base of the ear.
- This concern doesn't apply in the case of pet animals or Miss Piggy.

In general, compared with other domestic species, pigs are difficult to sedate. This is because their response to commonly used agents is less than in other species.

1. ***Xylazine***: Produces inconsistent results and is not as effective as in other species.
   Dose: 1 –2 mg/kg, IM.

2. ***Acepromazine***: Little effect when used alone. (0.05- 0.1mg/kg; IM)

3. ***Butorphanol***: No visible sedation when used alone. (0.1-0.2 mg/kg; IM)

4. ***Midazolam:*** Causes mild to moderate sedation at 0.1-0.4 mg/kg, IM, but pigs will become aroused when manipulated.

5. ***Ketamine***: Can produce light or deep sedation or a light or deep plane of anesthesia, depending on the dose. When used alone, muscle relaxation is poor and the recovery is prolonged and rough if large doses are given.

   - Thus, it is best to administer *ketamine* with a sedative such as *xylazine* or *midazolam*.

6. ***Ketamine*** *combinations* for mild to moderate sedation:

   a. *Ketamine* (3-5 mg/kg, IM) & *Xylazine* (1-2 mg/kg/, IM)

   b. *Ketamine* (3-5 mg/kg, IM) & *Midazolam* (0.2-0.4 mg/kg, IM)

   c. *Ketamine* & *Xylazine* & *Midazolam* – at above doses.

7. **Telazol®**: May be used alone or with *xylazine* for sedation or anesthesia. Dose depends on the degree of sedation required (1-2 mg/kg; IM). May cause excitement in recovery if used alone at a large dose.

Anti-cholinergics: These agents are often recommended when chemical restraint is practiced; this recommendation is based on the relatively narrow airway of the pig and the hope that anti-cholinergic will decrease the volume of tracheobrochial secretions.

- However, we rarely use anti-cholinergics at the UTCVM, and don't consider secretions to be an important issue.

Injectable Drug Regimens for General Anesthesia

A multitude of drug combinations have been suggested, indicating that none is entirely satisfactory.

IV injections are particularly difficult in pot-bellied pigs as the ears are especially small.

1. **Barbiturates**: In field anesthesia, *thiopental* may be used to induce anesthesia of short duration for operations such as hernia repair. The injection is usually given into the marginal ear vein. The use of a butterfly needle makes the administration easier. Due to their affordability, barbiturates were popular with practitioners who worked with commercial pigs. However, thiopental is no longer readily available.
   Dose of Thiopental: 10-15mg/kg; IV. In any case, it was not practical in pot-bellied pigs.

2. **Telazol®**: May be used alone, but works better in combination with other agents.

   Example 1: **Telazol** 4 mg/kg + *Xylazine* 4 mg/kg, IM

   Example 2: **Telazol** 4 mg/kg + *Xylazine* 2 mg/kg + *Ketamine* 4 mg/kg, IM

3. ***Ketamine*** (5-8 mg/kg) + *Xylazine* (2 mg/kg) + *Butorphanol* (0.2 mg/kg) IM.
   - Should produce deep anesthesia.
   - Reduce dose of *xylazine* & *ketamine* if a lighter plane of anesthesia is desired.
   - Whether *butorphanol* increases the potency of the mixture is uncertain!
   - *Xylazine* may be reversed (e.g., with *yohimbine* [0.05mg/kg, IV, or 0.2mg/kg, IM])

4. ***Ketamine*** (5-10 mg/kg) + *Xylazine* (1-2 mg/kg) + *Midazolam* (0.1-0.2 mg/kg, IM) **UTCVM REGIMEN**
   Midazolam is thought to smooth recoveries.