

ANESTHETICS

Alphadolone/alphaxalone—See Saffan

Avertin—See Tribromoethanol/amylen hydrate

Azaperone and ketamine (respectively)

- M 75 mg/kg BW IM and 100 mg/kg BW IM (duration of anesthesia approximately 1½ h) (Olson and Renchko, 1988)
- R 50 mg/kg BW IM and 87 mg/kg BW IM; give ¼ to 1½ times this dose depending on the length of anesthesia required (approximately 1–6 h) (Olson and Renchko, 1988)

Benzocaine

- Am Larvae: 50 mg/l bath (dissolve in ethanol first) (Crawshaw, 1993)
- Frogs and salamanders: 200–300 mg/l bath (Crawshaw, 1993)
- Fi 20–50 ppm in water (Green, 1982)
- 5–10 ml per 10 liters water for induction; 2 ml per 10 liters water for maintenance (Horsberg, 2002)

Carbon dioxide

- M Mix 1:1 CO₂:O₂ (Green, 1979)

Chloral hydrate

- Am 1–2 ml of a 10% solution injected into dorsal lymph sac (Kaplan, 1969)
- C 300 mg/kg BW IV (Borchard et al., 1990)
- D 125 mg/kg BW IV (Borchard et al., 1990)
- Go 50–300 mg/kg BW IV (Swindle and Adams, 1988)
- Gp 200–300 mg/kg BW IP of 10% solution (Green, 1982)
- H 270–360 mg/kg BW IP (Hughes, 1981)
- M 400 mg/kg BW IP (Borchard et al., 1990)
- R 200–300 mg/kg BW IP of 10% solution (Green, 1982)
- Sh 50–300 mg/kg BW IV (Swindle and Adams, 1988)
- Sw 100–300 mg/kg BW IV (Swindle and Adams, 1988)

Chloralose

- C 75 mg/kg IV (Borchard et al., 1990)
- D 80 mg/kg BW IV with 5 mg/kg BW IV thiopental sodium initially, then maintain anesthesia with additional chloralose (1 ml/s IV); respirator required at this dose of chloralose (Grad et al., 1988)
- Go 45–62 mg/kg BW IV (Swindle and Adams, 1988)
- M 114 mg/kg BW IP (Hughes, 1981)
- R 55 mg/kg BW IP (Borchard et al., 1990)
- Rb 80–100 mg/kg BW IV of 1% solution (Green, 1982)
- Sh 45–62 mg/kg BW IV (Swindle and Adams, 1988)
- Sw 55–86 mg/kg BW IV (Swindle and Adams, 1988)

Equithesin

Note: Combine 0.85 g chloral hydrate with 0.21 g sodium pentobarbital (4.2 ml Nembutal), 8.6 ml propylene glycol (4.2 ml Nembutal provides 1.68 ml of this amount), 2.2 ml 100% ethanol, and 6.7 ml water (for a total of 20 ml). Add ethanol and propylene glycol together, then add chloral hydrate, and last add Nembutal.

Ethyl alcohol

Am Frogs and toads: immerse in 10% solution (Kaplan, 1969)

Etomidate

- M** 30 mg/kg BW IP (Green et al., 1981)
5–10 mg/kg BW IV (Jurd et al., 2003)
- N** 1 mg/kg BW IV followed by 100 µg/kg BW/min continuous infusion (for nonpainful procedures only) (Fanton et al., 2000)
0.5–2 mg/kg BW IV (Horne, 2001)

Etomidate and carfentanil (respectively)

M 15 mg/kg BW IM and 3 µg/kg BW IM (Erhardt et al., 1984)

Etorphine (M-99)

- Re** Turtles: 0.5–5.0 mg total dose (for approximately 1.8-kg animal) (Marcus, 1981)
Snakes: 2–15 mg total dose IPP (Marcus, 1981)

Fentanyl and etomidate (respectively)

M 80 µg/kg BW IP and 18 mg/kg IP (Bertens et al., 1995)

Fentanyl and medetomidine (respectively)

R 300 µg/kg BW IP and 300 µg/kg BW IP (Flecknell, 1996)

Rb 8 µg/kg BW IV and 330 µg/kg BW IV (Flecknell, 1996)

Fentanyl and metomidate (respectively)

C 20 µg/kg BW IM and 20 mg/kg BW IM (Flecknell, 1996)

G 50 µg/kg BW SC and 50 mg/kg BW SC (Flecknell, 1996)

H 50 µg/kg BW IP and 50 mg/kg BW IP (Bertens et al., 1995)

M 2–6 µg/kg BW SC and 60 mg/kg BW SC (Green et al., 1981)

80 µg/kg BW IP and 60 mg/kg BW IP (Bertens et al., 1995)

Fentanyl/droperidol (Innovar-Vet)

Ch 0.20 ml/kg BW IM (Green, 1982)

F 0.5 ml/kg BW IM (Green, 1982)

Gp 0.66–0.88 ml/kg BW IM (Hughes, 1981)

0.5–1.0 ml/kg BW IM (CCAC, 1984)

H Not recommended (Thayer et al., 1972)

M 0.05 ml/g BW IM (Hughes, 1981)

N 1.0 ml/9 kg BW IM (Melby and Altman, 1976)

R 0.02–0.06 ml/100 g BW IP (Wixson et al., 1987)

0.3 ml/kg BW IM (Hughes, 1981)

Rb 0.10–0.50 ml/kg BW IM (Green, 1982)

0.4 ml/kg BW SC (González-Gil et al., 2003)

Sw 0.10 ml/kg BW IM (Swindle and Adams, 1988)

Fentanyl/droperidol (Innovar-Vet) and diazepam (respectively)

H 1 ml/kg BW IP and 5 mg/kg BW IP (Green, 1982)

Fentanyl/fluanisone (Hypnorm)

Gp 0.5 ml/kg BW IM

Note: Addition of 1–2 mg/kg BW IP or IM diazepam is advisable (Cooper, 1984).

M 0.5 ml/kg BW IM

Note: Addition of 1–2 mg/kg BW IP or IM diazepam is advisable (Cooper, 1984).

R 0.5 ml/kg BW IM (Cooper, 1984)

Fentanyl/fluanisone and diazepam (respectively)

G 0.3 ml/kg BW IM, IP and 5 mg/kg BW IP (Flecknell, 1996)

Gp 1 ml/kg BW IM, IP and 2.5 mg/kg BW IP (Flecknell, 1996)
1 mg/kg BW IM, SC and 2.5 mg/kg BW IM, IP (Arnemo et al., 2002)

H 1 ml/kg BW IM, IP and 5 mg/kg BW IP (Flecknell, 1996)
1 mg/kg BW IM, SC and 2.5 mg/kg BW IP (Arnemo et al., 2002)

M 0.4 ml/kg BW IP and 5 mg/kg BW IP (Flecknell, 1996)

R 0.6 ml/kg BW IP and 2.5 mg/kg BW IP (Flecknell, 1996)

Rb 0.3 ml/kg BW IM and 1–2 mg/kg BW IM, IP, IV (Flecknell, 1996)

Fentanyl/fluanisone and midazolam (respectively)

M 0.53 mg/kg, 17.5 mg/kg, and 8.75 mg/kg IP respectively (Jong et al., 2002)

- Rb 0.3 ml/kg IM and 1–2 mg/kg BW IP, IV (Flecknell, 1996)
0.3 ml/kg IM, SC and 2 mg/kg BW IM, SC (Arnemo et al., 2002)

Halothane

- Am Terrestrial species: 4–5% in anesthetic chamber to effect
(Crawshaw, 1993)

Hexobarbital

- Am 120 mg/kg BW intravascularly (Kaplan, 1969)
M 100 mg/kg BW IP (Taber and Irwin, 1969)
R 100 mg/kg BW IP (Ben et al., 1969)

Hypnorm—See Fentanyl/fluanisone

Inactin

- R 80 mg/kg BW IP (Flecknell, 1987)
100–110 mg/kg BW IP (Ellison et al., 1987)

Isoflurane

- Am Terrestrial species: 4–5% in anesthetic chamber to effect
(Crawshaw, 1993)

Ketamine (We have found that ketamine used alone in mammals is not usually adequate for deep anesthesia.—Eds.)

- Am 50–150 mg/kg SC, IM (Crawshaw, 1993)
Bi 10–50 mg/kg BW IM (Cooper, 1984; Fowler, 1978)

Note: Rarely used alone (Sinn, 1997)

- Bo 10 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Ch 44 mg/kg BW IM (Johnson-Delaney, 1996)
- F 20–30 mg/kg BW IM (Green, 1982)
20–30 mg/kg BW IM for immobilization (Flecknell, 1987)
20–35 mg/kg BW IM (Andrews and Illman, 1987)
- G 200 mg/kg BW IM for immobilization (Flecknell, 1987)
- Go 22–44 mg/kg BW IM (Swindle and Adams, 1988)
10 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Gp 44 mg/kg BW IM, atropine recommended (Weisbroth and Fudens, 1972)
100–200 mg/kg BW IM for immobilization (Flecknell, 1987)
- H 10–30 mg/100 g BW IP (Strittmatter, 1972)
200 mg/kg BW IP for immobilization (Flecknell, 1987)
- M 44 mg/kg BW IM for sedation (Weisbroth and Fudens, 1972)
100–200 mg/kg BW IP (Hughes, 1981)
200 mg/kg BW IM for immobilization (Flecknell, 1987)
50 mg/kg BW IV (Hughes, 1981)
- N 10–30 mg/kg BW IM (Welshman, 1985)
African green (*Cercopithecus* spp.): 25–30 mg/kg BW IM (Cramlet and Jones, 1976)
Baboon (*Papio* spp.): 7.5–10 mg/kg BW IM (Cramlet and Jones, 1976)
Chimpanzee (*Pan troglodytes*): 10–15 mg/kg BW IM (Cramlet and Jones, 1976)
Cynomolgus macaque (*Macaca fascicularis*): 20–25 mg/kg BW IM (Cramlet and Jones, 1976)
Gorilla (*Gorilla gorilla*): 12–15 mg/kg BW IM (Cramlet and Jones, 1976)
Patas (*Erythrocebus patas*): 5–7.5 mg/kg BW IM (Cramlet and Jones, 1976)
Rhesus macaque (*Macaca mulatta*): 20–25 mg/kg BW IM (Cramlet and Jones, 1976)
Squirrel monkey (*Saimiri sciureus*): 25–30 mg/kg BW IM (Cramlet and Jones, 1976)

- R** 44 mg/kg BW IM (Weisbroth and Fudens, 1972)
100 mg/kg BW IM for immobilization (Flecknell, 1987)
75 mg/kg BW IP (Waterman and Livingston, 1978)
- Rb** 44 mg/kg BW IM (Weisbroth and Fudens, 1972)
50 mg/kg BW IM for immobilization (Flecknell, 1987)
25 mg/kg BW intranasally for light surgical anesthesia
(Robertson and Eberhart, 1994)
- Rc** 5–27 mg/kg BW IM (use higher doses for longer anesthetic
duration) (Evans and Evans, 1986)
- Re** Snakes: 88–110 mg/kg BW IM (for 3.6- to 4.5-kg animals)
(Marcus, 1981)
22–44 mg/kg BW IM (for <0.9-kg animals) (Marcus, 1981)
50–130 mg/kg BW IM (Page, 1993)
Tortoises and turtles: 15–60 mg/kg BW IM (Fowler, 1978)
Tortoises: 20–80 mg/kg BW IM (Page and Mautino, 1990)
Chelonians: 20–60 mg/kg BW IM (Page, 1993)
- Sh** 22–44 mg/kg BW IM (Swindle and Adams, 1988)
10 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Sw** 15–25 mg/kg BW IM (Swindle and Adams, 1988)
15–20 mg/kg BW IV (Swindle and Adams, 1988)

Ketamine and acepromazine (respectively)

- Bi** 10–25 mg/kg BW IM and 0.5–1 mg/kg BW IM (high-end
dose for <250-g bird) (Curro, 1998)
- C** 20 mg/kg BW IM and 0.11 mg/kg BW IM (Flecknell, 1996)
- Ch** 40 mg/kg BW IM and 0.5 mg/kg BW IM (Morgan et al.,
1981)
- F** 20–35 mg/kg BW IM, SC and 0.2–0.35 mg/kg BW IM, SC
(Morrisey et al., 1996)
- G** 75 mg/kg BW IM and 3 mg/kg BW IM (Flecknell, 1987)
- Gp** 125 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1987)
- H** 150 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1987)
- M** 100 mg/kg BW IM and 2.5 mg/kg BW IM (Flecknell, 1987)

- N *Varecia* and *Propithecus* (not *Lemur*): 4 mg/kg BW IM and 0.4 mg/kg BW IM (Feeser and White, 1992)
- R 75 mg/kg BW IM and 2.5 mg/kg BW IM (Flecknell, 1987)
30 mg/kg BW IM and 3 mg/kg BW IM (Roman and Osborn, 1987)
- Rb 75 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1987)
50 mg/kg BW IM and 1 mg/kg BW IM (Flecknell, 1996)
- Rc 8–10 mg/kg BW IM and 2.2 mg/kg BW IM (Evans and Evans, 1986)

Ketamine and azaperone—See Azaperone and ketamine

Ketamine and butorphanol (respectively)

- C 15 mg/kg BW IM, SC and 0.2–0.5 mg/kg BW IM, IV (Jaffe et al., 2003)
6 mg/kg BW IV and 0.2–0.5 mg/kg BW IM, IV (Jaffe et al., 2003)

Ketamine and detomidine (respectively)

- R 60 mg/kg BW IM and 10 mg/kg BW IM in males (Cox et al., 1994)
40 mg/kg BW IM and 5 mg/kg BW IM in females (Cox et al., 1994)

Ketamine and diazepam (respectively)

- Bi 10–50 mg/kg BW IM and 0.5–2 mg/kg BW IM (high-end dose for <250-g bird) (Curro, 1998)
5–30 mg/kg BW IM and 0.5–2 mg/kg BW IM, IV (Sinn, 1997)
2.5–5 mg/kg BW IV and 0.5–2 mg/kg BW IM, IV (Sinn, 1997)

- 10–30 mg/kg BW IV and 1–1.5 mg/kg BW IM (Joint Working Group, 2001a)
- Bo** 2.2–7.5 mg/kg BW IV and 0.1–0.375 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Ch** 20 mg/kg BW IM, IP and 5 mg/kg BW IM, IP (Flecknell, 1987)
20–40 mg/kg BW IM and 1–2 mg/kg BW IM (Johnson-Delaney, 1996)
- F** 25 mg/kg BW IM and 2 mg/kg BW IM (Flecknell, 1987)
25–35 mg/kg BW IM and 2–3 mg/kg BW IM (Morrisey et al., 1996)
- G** 50 mg/kg BW IM and 5 mg/kg BW IP (Flecknell, 1987)
- Go** 2.2–7.5 mg/kg BW IV and 0.1–0.375 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Gp** 100 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1987)
- H** 70 mg/kg BW IP and 2 mg/kg BW IP (Flecknell, 1996)
- M** 200 mg/kg BW IM and 5 mg/kg BW IP (Flecknell, 1987)
- N** 15 mg/kg BW IM and 1 mg/kg BW IM (Flecknell, 1996)
- R** 40–80 mg/kg BW IP and 5–10 mg/kg BW IP (Wixson et al., 1987)
- Rb** 25 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1987)
30–40 mg/kg BW IM and 2–5 mg/kg BW IM (Carpenter et al., 1995)
20–30 mg/kg BW IM and 1–3 mg/kg BW IM when used with isoflurane (Carpenter et al., 1995)
10 mg/kg BW IV and 2 mg/kg BW IV (González-Gil et al., 2003)
- Sh** 2.2–7.5 mg/kg BW IV and 0.1–0.375 mg/kg BW IV (Dunlop and Hoyt, 1997)
4–7 mg/kg BW IV and 0.1–0.5 mg/kg BW IV (Arnemo et al., 2002)

Ketamine and medetomidine (respectively) (not for major surgical procedures)

- Bi** 10–30 mg/kg BW IV and 20 µg/kg BW IM, SC (Joint Working Group, 2001a)
- Bo** 0.5 mg/kg BW IV and 20 µg/kg BW IV (Dunlop and Hoyt, 1997)
- C** 7 mg/kg BW IM and 80 µg/kg BW IM (Flecknell, 1996)
2–3 mg/kg BW IV and 30–50 µg/kg BW IV (Ko et al., 1997)
3–5 mg/kg BW IM and 40–80 µg/kg BW IM (Ko et al., 1997)
5–7.5 mg/kg BW IM and 80 µg/kg BW IM (Arnemo et al., 2002)
- D** 1–3 mg/kg BW IV and 10–20 µg/kg BW IV (Ko et al., 1997)
3–5 mg/kg BW IM and 30–40 µg/kg BW IM (Ko et al., 1997)
2.5–7.5 mg/kg BW IM and 40 µg/kg BW IM (Flecknell, 1996)
5 mg/kg BW IM and 40 µg/kg BW IM (Arnemo et al., 2002)
- F** 5 mg/kg BW IM and 80 µg/kg BW IM (Ko et al., 1997)
4–8 mg/kg BW IM and 50–100 µg/kg BW IM (Wolfensohn and Lloyd, 1994)
2.5–5 mg/kg BW IM and 60–100 µg/kg BW IM (Arnemo et al., 2002)
- G** 75 mg/kg BW IP and 500 µg/kg BW IP (Flecknell, 1996)
- Go** 1 mg/kg BW IM and 25 µg/kg BW IM (Flecknell, 1996)
0.5 mg/kg BW IV and 20 µg/kg BW IV (Dunlop and Hoyt, 1997)
1 mg/kg BW IM and 20 µg/kg BW IM (Arnemo et al., 2002)
- Gp** 40 mg/kg BW IP and 500 µg/kg BW IP (Flecknell, 1996)
- H** 100 mg/kg BW IP and 250 µg/kg BW IP (Flecknell, 1996)
- M** 50 mg/kg BW IP and 1 mg/kg BW IP in males (Cruz et al., 1998)
75 mg/kg BW IP and 1 mg/kg BW IP in females (Cruz et al., 1998)

- 100 mg/kg BW IP and 1 mg/kg BW IP (Arras et al., 2001)
- Mi 5–7.5 mg/kg BW SC and 100 µg/kg BW SC (Arnemo et al., 2002)
- N Callithricidae: 5–7.5 mg/kg BW IM and 100–150 µg/kg BW IM (Jalanka, 1993)
Pongidae: 3–5 mg/kg BW IM and 70 µg/kg BW IM (Jalanka, 1993)
Rhesus: 3 mg/kg BW IM and 150 µg/kg BW IM (Sun et al., 2003)
2 mg/kg BW IM, IV and 50–10 µg/kg BW IM (Horne, 2001)
- R 75 mg/kg BW IP and 0.5 mg/kg BW IP (Flecknell, 1996)
60–75 mg/kg BW IP and 250–500 µg/kg BW IP (Arnemo et al., 2002)
- Rb 5 mg/kg BW IV and 350 µg/kg BW IM; use with supplemental oxygen (Hellebrekers et al., 1996)
25 mg/kg BW IM and 500 µg/kg BW IM (Flecknell, 1996)
- Re 5 mg/kg BW IM and 100 µg/kg BW IM for minor procedures (Greer et al., 2001)
10 mg/kg BW IM and 200 µg/kg BW IM for minor surgery (Greer et al., 2001)
- Sh 1 mg/kg BW IM and 25 µg/kg BW IM (Flecknell, 1996)
0.5 mg/kg BW IV and 20 µg/kg BW IV (Dunlop and Hoyt, 1997)
1–1.5 mg/kg BW IM and 25–50 µg/kg BW IM (Arnemo et al., 2002)
- Sw 10 mg/kg BW IM and 80 µg/kg BW IM (Flecknell, 1996)

Ketamine and midazolam (respectively)

- Bi 10–40 mg/kg BW IM and 0.5–1.5 mg/kg BW IM (high-end dose for <250-g bird) (Curro, 1998)
- C 10 mg/kg BW IM and 0.2 mg/kg BW IM (Flecknell, 1996)

- Mi** 50 mg/kg BW/h IV and 2 mg/kg BW/h IV (4 mmol/(kg·h) sodium bicarbonate also required) (Wamberg et al., 1996)
- R** 75 mg/kg BW IP and 5 mg/kg BW IP (Flecknell, 1996)
- Rb** 30 mg/kg BW IM and 0.2 mg/kg BW IM (Vachon et al., 1999)
- Sw** 10–15 mg/kg BW IM and 0.5–2 mg/kg BW IM (Flecknell, 1996)

Ketamine and xylazine (respectively)

- Bi** 10–50 mg/kg BW IM and 1–10 mg/kg BW IM (high-end dose for <250-g bird) (Curro, 1998)
40 mg/kg BW IM and 10 mg/kg BW IM (Heaton and Brauth, 1992)
5–30 mg/kg BW IM and 1–4 mg/kg BW IM (Sinn, 1997)
2.5–5 mg/kg BW IV and 0.25–0.5 mg/kg BW IV (Sinn, 1997)
- Bo** 2.2–7.5 mg/kg BW IV and 0.1 mg/kg BW IV (Dunlop and Hoyt, 1997)
Calves: 5–10 mg/kg BW IM and 0.1–0.2 mg/kg BW IM (Arnemo et al., 2002)
- C** 10 mg/kg BW IM and 1 mg/kg BW IM (Arnemo et al., 2002)
- Ch** 35 mg/kg BW IP and 5 mg/kg BW IP (Johnson-Delaney, 1996)
- D** 10 mg/kg BW IM and 2 mg/kg BW IM (Arnemo et al., 2002)
- F** 25 mg/kg BW IM and 2 mg/kg BW IM (Moreland and Glaser, 1985)
20–30 mg/kg BW IM and 4–6 mg/kg BW IM (Arnemo et al., 2002)
- G** 50 mg/kg BW IM and 2 mg/kg BW IM (Flecknell, 1987)
- Go** 2.2–7.5 mg/kg BW IV and 0.1 mg/kg BW IV (Dunlop and Hoyt, 1997)
5–10 mg/kg BW IM and 0.1–0.2 mg/kg BW IM (Arnemo et al., 2002)

- Gp** 40 mg/kg BW IM and 5 mg/kg BW SC (Flecknell, 1987)
50 mg/kg BW IP and 5 mg/kg BW IP (Strother and Stokes, 1989)
25–40 mg/kg BW IM, SC and 5 mg/kg BW IM, SC (Arnemo et al., 2002)
- H** 200 mg/kg BW IP and 10 mg/kg BW IP (Flecknell, 1987)
50–150 mg/kg BW IM, SC and 10 mg/kg BW IM, SC (Arnemo et al., 2002)
- M** 200 mg/kg BW IM and 10 mg/kg BW IP (Flecknell, 1987)
- Note:** High mortality possible
- 90–120 mg/kg BW IM and 10 mg/kg BW IM (Harkness and Wagner, 1989)
50 mg/kg BW IM and 50 mg/kg BW IM (Arnemo et al., 2002)
100–150 mg/kg BW IP and 50–100 mg/kg BW IP (Arras et al., 2001)
- Mi** 5–7.5 mg/kg BW IM and 2 mg/kg BW IM (Arnemo et al., 2002)
- N** 10 mg/kg BW IM and 0.5 mg/kg BW IM (Flecknell, 1996)
- R** 40–80 mg/kg BW IP and 5–10 mg/kg BW IP (Wixson et al., 1987)
37 mg/kg BW IM and 7 mg/kg BW IM followed by 1–1¼ mg/kg BW/min IV and 32–40 µg/kg BW/min IV for up to 12 h (Simpson, 1997)
90 mg/kg BW IM and 10 mg/kg BW IM (Flecknell, 1987)
30–80 mg/kg BW IM and 10–15 mg/kg BW IM (Arnemo et al., 2002)
- Rb** 50 mg/kg BW IM and 10 mg/kg BW IM (Lipman et al., 1987)
10 mg/kg BW IV and 3 mg/kg BW IV (Flecknell, 1987)
10 mg/kg BW intranasally and 3 mg/kg BW intranasally (Robertson and Eberhart, 1994)
35 mg/kg BW IM and 5 mg/kg BW IM (Flecknell, 1996)

- 20–40 mg/kg BW IM, SC and 3–5 mg/kg BW IM, SC (Arnemo et al., 2002)
- Rc 5–8 mg/kg BW IM and 1.5–3 mg/kg BW IM (Evans and Evans, 1986)
5.5 mg/kg BW IM and 5.5 mg/kg BW IM (Evans and Evans, 1986)
- Sh 2.2–7.5 mg/kg BW IV and 0.1 mg/kg BW IV (Dunlop and Hoyt, 1997)
5–10 mg/kg BW IM and 0.2 mg/kg BW IM (Arnemo et al., 2002)

Ketamine, butorphanol, and diazepam (respectively)

- Bo 5 mg/kg BW IV (given 5 min after the other two drugs), 0.1–0.2 mg/kg BW IV, and 0.2 mg/kg BW IV (Arnemo et al., 2002)
- Sw 10–15 mg/kg BW IM, 0.1–0.2 mg/kg BW IM, and 1–2 mg/kg BW IM (Arnemo et al., 2002)

Ketamine, medetomidine, and buprenorphine (respectively)

- Rb 35 mg/kg BW IM, 0.5 mg/kg BW IM, and 0.03 mg/kg BW IM for induction (Difilippo et al., 2004)

Ketamine, medetomidine, and butorphanol (respectively)

- C 5 mg/kg BW IM, 80 µg/kg BW IM, and 400 µg/kg BW IM (Arnemo et al., 2002)
- D 5 mg/kg BW IM (15 min after giving the other two drugs), 25 µg/kg BW IM, and 100 µg/kg BW IM (Arnemo et al., 2002)

- Sw 10 mg/kg BW IM (15 min after giving the other two drugs),
80 µg/kg BW IM, and 200 µg/kg BW IM (Arnemo et al.,
2002)

Ketamine, medetomidine, and diazepam (respectively)

- Rb 20 mg/kg BW IM, 300 µg/kg BW IM, and 0.75–1.5 mg/kg
BW IM (Ko et al., 1997)

Ketamine, midazolam, and xylazine (respectively)

- Rb 30 mg/kg BW IM, 0.2 mg/kg BW IM and 3 mg/kg BW IM
(Vachon et al., 1999)

**Ketamine, tiletamine/lorazepam, and xylazine
(respectively)**

- Sw 2.2 mg/kg BW IM, 4.4 mg/kg BW IM, and 2.2 mg/kg BW
IM (Ko et al., 1993)

Ketamine, xylazine, and acepromazine (respectively)

- M 30 mg/kg BW IM, 6 mg/kg BW IM, and 1 mg/kg BW IM
(O'Rourke et al., 1994)
65 mg/kg BW IP, 13 mg/kg BW IP, and 2 mg/kg BW IP
(Arras et al., 2001)
Rb 35 mg/kg BW IM, 5 mg/kg BW IM, and 0.75 mg/kg BW IM
(Marini et al., 1989).

Note: This provides approximately 30% longer anesthesia and recovery than ketamine-xylazine alone. 35 mg/kg BW IM, 5 mg/kg BW IM, and 1 mg/kg BW IM, SC (Flecknell, 1996)

Ketamine, xylazine, and azaperone (respectively)

M 100 mg/kg BW IP, 20 mg/kg BW IP, and 3 mg/kg BW IP
(considered high-end dose) (Arras et al., 2001)

Ketamine, xylazine, and butorphanol (respectively)

Rb 35 mg/kg BW IM, 5 mg/kg BW IM, and 0.1 mg/kg BW IM
(Marini et al., 1992)

Ketamine, xylazine, and guaifenesin (respectively)

Sh 1 mg/ml, 0.1 mg/ml, and 50 mg/ml in 5% dextrose IV;
induction use 1.2 ml/kg; maintenance use 2.6 ml/(kg-h)
(Lin et al., 1993)

Ketamine, xylazine, and oxymorphone (respectively)

Sw 2 mg/kg BW IV, 2 mg/kg BW IV, and 0.075 mg/kg BW IV
for minor surgery (Breese and Dodman, 1984)

M-99—See Etorphine**Medetomidine and butorphanol (respectively) (not for major surgical procedures)**

- C 30–50 μ g/kg BW IV and 0.1–0.2 mg/kg BW IV (Ko et al., 1997)
40–80 μ g/kg BW IM and 0.1–0.2 mg/kg BW IM (Ko et al., 1997)
- D 10–20 μ g/kg BW IV and 0.1–0.2 mg/kg BW IV (Ko et al., 1997)
30–40 μ g/kg BW IM and 0.1–0.2 mg/kg BW IM (Ko et al., 1997)

- F 80 µg/kg BW IM and 0.1–0.2 mg/kg BW IM (Ko et al., 1997)

Medetomidine and morphine (respectively) (not for major surgical procedures)

- D 10–20 µg/kg BW IV and 0.07–0.1 mg/kg BW IV (Ko et al., 1997)
30–40 µg/kg BW IM and 0.2–0.3 mg/kg BW IM (Ko et al., 1997)

Medetomidine and oxymorphone (respectively)(not for major surgical procedures)

- D 10–20 µg/kg BW IV and 0.01–0.02 mg/kg BW IV (Ko et al., 1997)
30–40 µg/kg BW IM and 0.05–0.1 mg/kg BW IM (Ko et al., 1997)

Medetomidine and propofol (respectively)

- Rb 350 µg/kg BW IM and 3 mg/kg BW IV (Hellebrekers et al., 1996)
250 µg/kg BW IM and 4 mg/kg BW IV (Ko et al., 1992)

Medetomidine, midazolam, and propofol (respectively)

- Rb 0.25 mg/kg BW IM, 0.5 mg/kg BW IM, and 2 mg/kg BW IV (Ko et al., 1992)

Metacaine

- Fi 0.5–0.8 g per 10 liters water (Horsberg, 2002)

Methohexital (methohexitone)

- Gp 31 mg/kg BW IP (Flecknell, 1987)
- M 6 mg/kg BW IV (Flecknell, 1987)
44 mg/kg BW IP (Dorr and Weber-Frisch, 1999)
- N 10 mg/kg BW IV (Flecknell, 1987)
- R 7–10 mg/kg BW IV (Flecknell, 1987)
10–15 mg/kg BW IV (Flecknell, 1996)
- Rb 10 mg/kg BW IV (Flecknell, 1987)

Methoxyflurane

- C 3% for induction; 0.5% by inhalation for maintenance (Kinsell, 1986)
- D 3% for induction; 0.5% by inhalation for maintenance (Kinsell, 1986)

Metomidate

- M 30–50 mg/kg BW IP (Green et al., 1981)

Pentobarbital and chlorpromazine (respectively)

- M 40–60 mg/kg BW IP and 25–50 mg/kg IM (Harkness and Wagner, 1989)

Pentobarbital and xylazine

- Gp 45 mg/kg BW pentobarbital IP followed by 7 mg/kg BW xylazine IM. Supplement with pentobarbital at 3.25–6.5 mg/kg BW IP or IV as needed (Rhodes et al., 2001)

Pentobarbital sodium

- Am Frogs and toads: 60 mg/kg in dorsal lymph sac (Kaplan, 1969; Marcus, 1981)

- Bo** 12–28 mg/kg BW IV (Schultz, 1989)
20–30 mg/kg BW IV (Dunlop and Hoyt, 1997)
- C** 30 mg/kg IV to effect for anesthesia (Kinsell, 1986)
- Ch** 40 mg/kg BW IP (Mason, 1997)
30 mg/kg BW IV (Mason, 1997)
- D** 30 mg/kg IV to effect for anesthesia (Kinsell, 1986)
- F** 36 mg/kg BW IP (Andrews and Illman, 1987)
30 mg/kg BW IV (Green, 1982)
- G** 6 mg/100 g BW IP up to 6 mg maximum (Norris, 1987)
- Go** 25–30 mg/kg BW IV (Swindle and Adams, 1988)
20–30 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Gp** 28 mg/kg BW IP (Croft, 1964)
- H** 9 mg/100 g BW IP, boost with 1.2 mg/100 g BW (Whitney, 1963)
- M** 40–85 mg/kg BW IP (Cunliffe-Beamer, 1981)
50 mg/kg BW IP followed by a dose of 25 mg/kg BW SC for longer procedures (45–50 min) (Taber and Irwin, 1969)
Neonates (1–4 days): 5 mg/kg BW IP (Taber and Irwin, 1969)
40–70 mg/kg BW IV (Hughes, 1981)
- N** 5–15 mg/kg BW IV (Flecknell, 1987)
- R** 30–40 mg/kg BW IP (Wixson et al., 1987)
40–50 mg/kg BW IP (Flecknell, 1996)
- Rb** 28 mg/kg BW IV, IP (Croft, 1964)
- Rc** 30 mg/kg BW IP (Evans and Evans, 1986)
- Re** Turtles: 16 mg/kg BW IC, IP (Marcus, 1981)
Snakes: 15–30 mg/kg BW IPP (Marcus, 1981)
- Sh** 25–30 mg/kg BW IV (Swindle and Adams, 1988)
15–30 mg/kg BW IV, lower dose for castrated animals (NCSU, 1987)
20–30 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Sw** 25–35 mg/kg BW PO (Swindle and Adams, 1988)
30 mg/kg BW IP (Swindle and Adams, 1988)
20–30 mg/kg BW IV (Swindle and Adams, 1988)

Propofol

- Bi** 1.33–14 mg/kg BW IV (Joint Working Group, 2001a)
- Bo** 4–6 mg/kg BW IV (Dunlop and Hoyt, 1997)
- C** 8 mg/kg BW IV (Arnemo et al., 2002)
- D** 6–7 mg/kg BW IV (Arnemo et al., 2002)
1 mg/kg BW IV for induction (Martin et al., 2001)
- F** 5–8 mg/kg BW IV (Cantwell, 2001)
- Go** 4–6 mg/kg BW IV (Dunlop and Hoyt, 1997)
3–7 mg/kg BW IV (Arnemo et al., 2002)
- M** 20–30 mg/kg BW IV (Mason, 1997)
- N** 7.5–12.5 mg/kg BW IV (Flecknell, 1996)
2 mg/kg BW IV followed by 200 µg/kg BW/min continuous infusion (for nonpainful procedures only) (Fanton et al., 2000)
2–6 mg/kg BW IV followed by 200–600 µg/kg BW/min continuous infusion (Horne, 2001)
- R** 10 mg/kg BW IV (Flecknell, 1996)
- Rb** 7.5–15 mg/kg BW IV (Adam et al., 1990)
1.5 mg/kg BW IV bolus followed by 0.2–0.6 mg/(kg·min) continuous infusion (Blake et al., 1988)
- Re** 5–15 mg/kg BW IV (Boyer, 1998)
- Sh** 4–6 mg/kg BW IV (Dunlop and Hoyt, 1997)
3–7 mg/kg BW IV (Arnemo et al., 2002)

Saffan (alphadolone and alphaxalone)

- Bi** 8.0 mg/kg BW IV, with incremental doses up to 25 mg/kg BW maximum (Cooper, 1984)
- C** 9 mg/kg BW IV initially, followed by multiple 3 mg/kg BW IV doses as needed to maintain anesthesia (from product information)
18 mg/kg BW IM initially, followed by multiple 3 mg/kg BW IV doses as needed to maintain anesthesia (from product information)

- Ch** 20–30 mg/kg BW IM (Green, 1982)
- D** Not suitable for use in dogs (Glaxovet guide to Saffan)
- F** 12–15 mg/kg BW IM initially, followed by multiple 6–8 mg/kg BW IV doses as needed to maintain anesthesia (Green, 1982)
- G** 80–120 mg/kg BW IP (Flecknell, 1987)
- Gp** 10–20 mg/kg BW IV (Green, 1982)
40 mg/kg BW IP (Flecknell, 1987)
- H** 150 mg/kg BW IP (Flecknell, 1987)
- M** 5 mg/kg BW IV, with incremental doses up to 20 mg/kg maximum (Cooper, 1984)
90 mg/kg BW IP (Green, 1982)
8–20 mg/kg BW IV (Jurd et al., 2003)
- N** 6–9 mg/kg BW IV initially, followed by supplemental doses to effect as needed to maintain anesthesia (from product information)
12–18 mg/kg BW IM initially, followed by multiple 6–9 mg/kg BW IV doses as needed to maintain anesthesia from product information)
- R** 5 mg/kg BW IV, with incremental doses up to 20 mg/kg maximum (Cooper, 1984); has been given by slow IV drip for periods up to 10 h without tolerance or cumulation developing (Green, 1982)
10–12 mg/kg BW IV (Flecknell, 1996)
- Rb** 6–9 mg/kg BW IV (Green, 1982); high mortality possible (Flecknell, 1987)
- Re** 9 mg/kg BW IV (Frye, 1981)
12–18 mg/kg BW IM (Cooper, 1984)
Chelonians: 9–18 mg/kg BW IM (Page, 1993)
Lizards: 9–18 mg/kg BW IM (Page, 1993)
- Sw** 12 mg/kg BW IM, then 6–8 mg/kg BW IV every 30 min (Tong et al., 1995)

Telazol—See Tiletamine and zolazepam**Thiamylal**

N 25 mg/kg BW IV (Hughes et al., 1975)

Thiopental

Bo 25 mg/kg BW IV (Dunlop and Hoyt, 1997)

D 6–12 mg/lb BW IV; lower dose with preanesthetic tranquilization (Kinsell, 1986)

Go 20–25 mg/kg BW IV (Swindle and Adams, 1988)

M 25–50 mg/kg BW IV (Taber and Irwin, 1969)

25 mg/kg BW IV (Hughes, 1981)

50 mg/kg BW IP (Williams, 1976)

N 15–20 mg/kg BW IV (Flecknell, 1987)

22–25 mg/kg BW (Hatch, 1966)

R 30 mg/kg BW IV (Flecknell, 1987)

Rb 28 mg/kg BW IV, IP (Croft, 1964)

Re Snakes: 15–25 mg/kg BW IPP (Marcus, 1981)

Sh 20–25 mg/kg BW IV (Swindle and Adams, 1988)

Sw 24–30 mg/kg BW IP (Swindle and Adams, 1988)

5–19 mg/kg BW IV (Swindle and Adams, 1988)

Tiletamine

Rc 10–12 mg/kg BW IM (Evans and Evans, 1986)

Tiletamine/zolazepam (Telazol)

Note: We recommend that users obtain the reference by Schobert, 1987, for the use of Telazol in 52 primate species, 21 cat species, 10 bear species, 8 dog species, 13 members of the *Vierridae* family, 9 reptile species, 10 species of the *Bovidae*

family, 33 species of the Cervidae family, 36 bird species, and a table of various miscellaneous species.

- Bi** 7.7–26 mg/kg BW IM (Curro, 1998)
5–10 mg/kg BW IM (Joint Working Group, 2001a)
- Bo** 4 mg/kg BW IV (Dunlop and Hoyt, 1997)
- C** 7.5 mg/kg BW IM and 7.5 mg/kg BW IM (Flecknell, 1996)
5–7.5 mg/kg BW IV (Arnemo et al., 2002)
10–15 mg/kg BW IM (Arnemo et al., 2002)
- D** 4–10 mg/kg BW IV (Arnemo et al., 2002)
7.5–25 mg/kg BW IM (Arnemo et al., 2002)
- F** 22 mg/kg BW IM (Payton and Pick, 1989)
12–22 mg/kg BW IM (Morrisey et al., 1996)
- G** 60 mg/kg BW IM (Hrapkiewicz et al., 1989)
- Go** 4 mg/kg BW IV (Dunlop and Hoyt, 1997)
- Gp** 10–30 mg/kg IM (Fowler, 1978)
- H** Not recommended (Silverman et al., 1983)
- M** Not recommended (Silverman et al., 1983)
- Mi** 5–10 mg/kg BW IM (Arnemo et al., 2002)
- N** 2–6 mg/kg BW IM (Ialeggio, 1989)
Lemurs: 20 mg/kg BW IM (immobilization by dart) (Glander et al., 1992)
- R** 20–40 mg/kg BW IP (Silverman et al., 1983)
- Rb** Not generally recommended (except intranasally); nephrotoxicity (Doerning et al., 1990, 1992)
10–25 mg/kg BW IM (Fowler, 1978)
10 mg/kg BW intranasally (no renal compromise) (Robertson and Eberhart, 1994)
- Re** Chelonians: 10–20 mg/kg BW IM (Page, 1993)
Snakes: 22 mg/kg BW IM (Marcus, 1981)
Snakes: 10–20 mg/kg BW IM (Page, 1993)
Lizards: 30 mg/kg BW IM (Page, 1993)
- Sh** 2.2 mg/kg BW IM (Schultz, 1989)
4 mg/kg BW IV (Dunlop and Hoyt, 1997)

- Sw 6.6–11 mg/kg BW IM following xylazine 2 mg/kg BW IM (Schultz, 1989)
6–8 mg/kg BW IM (Flecknell, 1996)

Tiletamine/zolazepam and detomidine (respectively)

- Gp 40 mg/kg BW IM and 5 mg/kg BW IM (Buchanan et al., 1999)

Tiletamine/zolazepam and medetomidine (respectively)

- Rb 2.5–5 mg/kg BW IM, SC and 500 µg/kg BW IM, SC (Arnemo et al., 2002)

Tiletamine/zolazepam and xylazine (respectively)

- Bo 4 mg/kg BW IM and 0.1 mg/kg BW IM (Arnemo et al., 2002)
C 10 mg/kg BW IM and 1 mg/kg BW IM (Arnemo et al., 2002)
D 10 mg/kg BW IM and 1 mg/kg BW IM (Arnemo et al., 2002)
Go 4 mg/kg BW IM and 0.1 mg/kg BW IM (Arnemo et al., 2002)
Gp 40 mg/kg BW IM and 5 mg/kg BW IM (Buchanan et al., 1999)
H 30 mg/kg BW IP and 10 mg/kg BW IP (Forsythe et al., 1992)
M 80 mg/kg BW IP and 20 mg/kg BW IP (considered high-end dose) (Arras et al., 2001)
Rb 15 mg/kg BW IM and 5 mg/kg BW IM (Popilskis et al., 1991)
15 mg/kg BW IM, SC and 5 mg/kg BW IM, SC (Arnemo et al., 2002)
20 mg/kg BW IM and 3 mg/kg BW IM (Vachon, et al., 1999)
Sh 4 mg/kg BW IM and 0.1 mg/kg BW IM (Arnemo et al., 2002)

- Sw 4.4 mg/kg BW IM and 2.2 mg/kg BW IM (Ko et al., 1993)
6 mg/kg BW IM and 2.2 mg/kg BW IM (Braun, 1993)
2–7 mg/kg BW IM and 0.2–1 mg/kg BW IM (Flecknell, 1996)

Tiletamine/zolazepam, butorphanol, and xylazine (respectively)

- C Make the following cocktail: To 250 mg powder tiletamine/zolazepam (125 mg each), add 0.5 ml (10 mg/ml) butorphanol, and add 10 ml (20 mg/ml) xylazine. Dose at 0.05–0.1 ml total dose IM. Can be redosed at 1/4–1/3 the initial dose. Cat must not be premedicated. Keep cold and protected from light for up to 8 weeks (Arnemo et al., 2002)
- Gp 60 mg/kg BW IP, 0.1 mg/kg BW IM, and 5 mg/kg BW IP (Jacobson, 2001)

Tiletamine/zolazepam, ketamine, and xylazine (respectively)

- F 3 mg/kg BW IM, 2.4 mg/kg BW IM, and 0.6 mg/kg BW IM (Ko et al., 1996)

Tribromoethanol

- G 250–300 mg/kg BW IP (1.25% solution) (Flecknell, 1987)
- M 125 mg/kg BW IP (0.25% solution) (Flecknell, 1987)
250 mg/kg BW IP (Taber and Irwin, 1969)
0.2 ml/10 g BW IP (1.2% solution) (Papaioannou and Fox, 1993)
- R 300 mg/kg BW IP (Flecknell, 1987)

Tribromoethanol/amylen hydrate (Avertin)

Note: No longer available commercially but can be made. For concentrated solution (66 $\frac{2}{3}$ %), dissolve 1 g 2,2,2-tribromoethanol in 0.5 g amylen hydrate. Take 0.5 ml concentrate and mix with 39.5 ml sterile saline (this is now a 1.25% solution). If solution falls below pH 5.0, discard. **Warning:** Stored solutions are known to be unstable and potentially hepatotoxic. Frequent use may induce chemical peritonitis.

- G** 250–300 mg/kg BW IP of 1.25% solution (Flecknell, 1987)
M 0.2 ml/10 g BW IP of 1.25% solution (The Jackson Laboratory)
R 300 mg/kg BW IP (Flecknell, 1987)

Tricaine methanesulfonate (MS 222)

- Am** Immerse in 0.1% solution (Kaplan, 1969)
 50–150 mg/kg BW SC, IM (Crawshaw, 1993)
 Tadpoles and newts: 200–500 mg/l bath to effect (Crawshaw, 1993)
 Frogs, salamanders: 500–2000 mg/l bath (buffer with NaHCO₃) (Crawshaw, 1993)
 Toads: 1–3 g/l bath (buffer with NaHCO₃) (Crawshaw, 1993)
Fi Immerse in 25–100 mg/l water (Klontz, 1964)
Re Snakes: 200–300 mg/kg BW IPP (Marcus, 1981)

Urethane

- Am** Frogs and toads: Immerse in 1–2% solution (Kaplan, 1969)
 Frogs and toads: Inject 0.04–0.12 ml/g BW of 5% solution into dorsal lymph sac (Kaplan, 1969)
F 1500 mg/kg BW IP for acute use only (Andrews and Illman, 1987)

- Fi Immerse in 5–40 mg/l water (Klontz, 1964)
- Gp 1500 mg/kg BW IV, IP (Flecknell, 1987)
- H 1–2 g/kg BW IP (Flecknell, 1996)
- R 1000 mg/kg BW IP (Flecknell, 1987)
- Rb 1000 mg/kg BW IV, IP (Flecknell, 1987)
- Re Turtles: 2.8 g/kg PO (Marcus, 1981)
2.4 g/kg IV (Marcus, 1981)
1.7 g/kg IC (Marcus, 1981)
2.8 g/kg IP (Marcus, 1981)