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| **Anesthetic agent** | **Dose** | **Comments** |
| MS-222 (tricaine methanesulfonate) | 75-125 mg/l (induction) and 50-75 mg/l (maintenance) | Sodium bicarbonate should be added to stock solution to maintain neutral pH.  Only FDA approved anesthetic for fish (21 day withdrawal). |
| Clove oil | 40-100 mg/l (depending on fish species and anesthetic depth) | Active ingredient is eugenol. Clove oil stock solution (100mg/ml) made with 95% ethanol. Stock solution is added to induction chamber at 40-100 mg/l. |
| Benzocaine hydrochloride | 25-100 mg/l | Sodium bicarbonate may need to be added to stock solution to maintain neutral pH.  Small margin of safety between effective and lethal doses. |

**Fish Anesthesia**

Note that all of these doses are approximations and must be titrated to the animal’s strain, age, sex and individual responses. Significant departures from these doses should be discussed with a veterinarian. Doses will also vary depending on what other drugs are being administered concurrently. Modified from Penn State University

For additional information regarding anesthetic use in fish please see the following references.

1. Stetter MD: Fish and Amphibian Anesthesia. *In* Veterinary Clinics of North America: Exotic Animal Practice 4(1), January 2001; pp. 69-82.
2. Burka JF, et al: Drugs in Salmonid Aquaculture - A Review. J. Vet Pharmacol. Therap. 20, 1997; pp. 333-349.
3. Bowser PR: Anesthetic Options for Fish. *In* Recent Advances in Veterinary Anesthesia and Analgesia: Companion Animals, 2001. International Veterinary Information Service, Ithaca, NY.