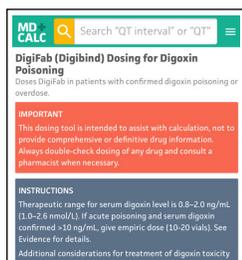


Clinical Decision Support for *Emergency Medicine Practice* Subscribers



Click the thumbnail above to access the calculator.

DigiFab® (Digibind®) Dosing for Digoxin Poisoning

The DigiFab® dosing calculator provides dosing for digoxin immune Fab in patients with confirmed digoxin poisoning or overdose.

Points & Pearls

- Cardioactive steroid toxicity can cause nearly any dysrhythmia except rapidly conducted supraventricular tachydysrhythmia.
- Consider the serum digoxin level in the context of the patient's clinical presentation; a reliable serum digoxin level must be obtained at steady state (ie, obtained ≥ 6 hours after ingestion). The serum digoxin level may be misleadingly high if obtained < 6 hours after ingestion.
- Digoxin levels measured after administration of digoxin immune Fab will be falsely elevated. If required, free digoxin levels will need to be measured (this is not readily available at all labs).
- Hyperkalemia acts as a marker of poisoning severity in acute digoxin overdose. Correcting mild elevations in serum potassium without administering digoxin immune Fab will not improve survival.
- Impaired creatinine clearance and aging (associated with decreased function of renal, hepatic, and cardiac systems) may result in clinical toxicity at lower serum digoxin levels.
- Electrolyte abnormalities (specifically hypokalemia, but including hypomagnesemia, hypercalcemia, hypernatremia) may result in dysrhythmias at lower serum digoxin levels.
- Certain medications, including quinidine, verapamil, diltiazem, carvedilol, amiodarone, and spironolactone, will result in decreased digoxin protein binding, thereby increasing free digoxin levels.

Tips from the creator:

- The calculator is appropriate for vials containing approximately 40 mg of antibodies.
- Slow infusion (ie, 2 hours) improves digoxin immune Fab efficacy. This method of infusion is preferable when rhythm disturbances are not life threatening.
- In the case of chronic overdose (eg, digoxin level in prehospital setting is missing), a dose of 3 vials is appropriate; this is an experience-based recommendation.

Advice

Frequent premature ventricular complexes may be closely followed by ventricular dysrhythmias.

Critical Actions

Potassium abnormalities, specifically hypokalemia, may worsen digoxin toxicity, even at therapeutic digoxin levels. If hyperkalemia is mild, correction is not advised, as treatment with digoxin immune Fab will decrease potassium concentrations. Treatment to lower serum potassium concentrations should be performed prior to digoxin immune Fab administration only if (1) hyperkalemia is believed to be worsening atrioventricular nodal block and bradycardia, and (2) digoxin immune Fab is not immediately available. If hypokalemia is present, cautious correction should be performed prior to the administration of digoxin immune Fab. If there is worsening toxicity/dysrhythmia, or if toxicity does

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not improve with correction of hypokalemia, digoxin immune Fab should be immediately administered. Do not administer calcium salts to patients with hyperkalemia secondary to digoxin toxicity. Transcutaneous and especially transvenous pacing should be avoided in patients with digoxin toxicity due to risk for precipitating dysrhythmias.

Instructions

The therapeutic range for serum digoxin level is 0.8 to 2.0 ng/mL (1.0-2.6 nmol/L). In the case of acute poisoning with serum digoxin level confirmed at > 10 ng/mL, an empiric dose (10-20 vials) should be administered. Additional considerations for treatment of digoxin toxicity include:

- Atropine 0.5 mg administered intravenously for acute toxicity if there are bradydysrhythmias or a high-degree atrioventricular block.
- Cautious correction of electrolyte abnormalities, specifically hypokalemia and hypomagnesemia, which may result in dysrhythmias at lower serum digoxin levels.

Evidence Appraisal

The relationship between serum potassium concentrations and mortality in patients treated for digoxin toxicity was investigated at the Fernand Widal Toxicology Center in Paris between 1967 and 1972.

Among patients with digitoxin toxicity, the majority of whom (81 of 91 patients) took digitoxin with suicidal intent, all patients with an initial serum potassium level > 5.5 mEq/L died, whereas all patients with an initial serum potassium level < 5 mEq/L survived (Bismuth 1973).

In 1990, Antman et al conducted a nationwide, prospective, open-label, multicenter clinical trial of 148 patients with potentially life-threatening digitalis intoxication who were treated with purified digoxin-specific Fab fragments. Resolution of all signs and symptoms of digitalis toxicity occurred in 119 patients (80%), 14 patients (9%) showed improvement, and 15 patients (10%) showed no response, though this group included moribund patients and patients who were retrospectively believed to not be suffering from digitalis toxicity. Among the 56 patients with cardiac arrest who were treated with Fab fragments, 30 patients (54%) survived hospitalization.

Use the Calculator Now

[Click here to access the DigiFab dosing calculator on MDCalc.](#)

Calculator Creator

Frédéric Lapostolle, MD

[Click here to read more about Dr. Lapostolle.](#)

Why to Use

Digoxin immune Fab (DigiFab[®], Digibind[®]) is an effective antidote for acute, acute on chronic, and chronic digoxin toxicity. It is also indicated for poisoning from other cardioactive steroids.

When to Use

General Indications

- Acute, acute on chronic, or chronic digoxin toxicity
- Poisoning with cardioactive steroid

Specific Indications

- Any digoxin-related, life-threatening dysrhythmia (independent of digoxin level)
- Potassium concentration > 5 mEq/L in acute digoxin poisoning
- Elevated serum digoxin level, chronic digoxin toxicity associated with dysrhythmias, significant gastrointestinal symptoms, or altered mental status
- Serum digoxin level > 15 ng/mL (19.2 nmol/L) at any time, or >10 ng/mL (12.8 nmol/L) 6 hours post ingestion (independent of symptoms)
- Acute ingestion of > 10 mg digoxin in an adult
- Acute ingestion of > 4 mg digoxin in a child
- Poisoning with a nondigoxin cardioactive steroid (eg, plants like foxglove and lily of the valley)

Next Steps

The DigiFab[®] dosing tool is intended to assist with dose calculation for digoxin immune Fab, and does not provide comprehensive or definitive drug information. Always check dosing of any drug and consult a pharmacist when necessary.

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