Atracurium Besylate Injection, USP

(For Intubation use)

This drug should be used only by adequately trained individuals with its characteristics and hazards.

DESCRIPTION
Atracurium besylate is a synthetic compound resulting from the reaction of 1,2,3,4-tetrahydro-2-naphthol with 1-phenyl-2-piperidone. It has the empirical formula C₂₃H₂₃NO₂S₃, is white to off-white, odorless, water-soluble crystals or a white powder. It has an assymetric carbon atom and exists as a racemic mixture with four possible stereoisomers. The manufacture of atracurium besylate results in these possible stereoisomers being present but the concentration must be determined with a constant 0.11% of the potential bronchial asthma.

Atracurium besylate is a non-depolarizing muscle relaxant available for IV injection as a 10 mg/mL solution. It relaxes skeletal muscle by blocking the neuromuscular transmission and producing muscle paralysis. Atracurium is an ester-type muscle relaxant, whose action is terminated by being hydrolyzed to allow for the intrinsic action to take place. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. The duration of action of atracurium is approximately one-third to one-half the duration of d-tubocurarine chloride. Atracurium is a short-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 10 mg/mL of atracurium besylate in 0.9% sodium chloride (NaCl) injection.

Intramuscular administration is not recommended.

DO NOT GIVE ATRACURIUM BESYLATE BY INTRAMUSCULAR ADMINISTRATION.

RELATIONSHIPS
Atracurium is a competitive muscle relaxant possessing a long duration of action. The muscle relaxant effect is not potentiated by the catecholamine agonists. It is inactivated by plasma cholinesterase. This is a rapid-acting muscle relaxant which produces a readily reversible paralysis. It is quickly hydrolyzed to allow for the return of the intrinsic action. It is supplied as a sterile, non-pyrogenic, frozen solution containing 0.11% of the potential bronchial asthma.

Atracurium besylate injection, 10 mg/mL solution, is a non-depolarizing muscle relaxant available for IV injection as a 10 mg/mL solution. It relaxes skeletal muscle by blocking the neuromuscular transmission and producing muscle paralysis.
Uncommon (approximately 0.01% to 0.02%). The following adverse reactions are among the most commonly observed in clinical practice:

- **Allergic reactions** (anaphylactic or anaphylactoid responses) which, in rare instances, were associated with anaphylactic shock during administration of atracurium to support mechanical ventilation. There are insufficient data to determine the incidence of this adverse reaction. The diagnosis of anaphylactic shock should be confirmed with an appropriate skin test or with a control test. There have been case reports of anaphylactic shock following rechallenge with atracurium. Therefore, a skin test should be performed if atracurium is being considered for a rechallenge after a previous reaction. For suspected cases of anaphylactic shock, the rate of atracurium infusion should be decreased by 50% or the drug discontinued. In patients with a history of allergy to atracurium or other nonpolarized muscle relaxants, the use of alternative agents is suggested. The use of prior nonpolarized muscle relaxants is not a contraindication to the use of atracurium.

- **Seizures** in ICU patients following long-term infusion of atracurium, especially in patients who received doses of 2 mg/kg or higher per day. The incidence of seizures in patients receiving atracurium for long-term maintenance is rare and may be due to doses greater than 2 mg/kg daily. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Seizures have been reported on occasions in ICU patients following atracurium administration for general surgical procedures, particularly when patients received doses greater than 2 mg/kg daily for more than five consecutive days. Reduction of atracurium dosages is recommended if seizures occur, or if seizures are likely to occur. If seizures do occur, they are usually self-limited and do not require further treatment. In patients with a history of epilepsy, it is possible that seizures may occur, and monitoring of such patients is suggested.

### Table 2: Percent of Patients Reporting Adverse Reactions

<table>
<thead>
<tr>
<th>Reactions</th>
<th>Allergic</th>
<th>Anaphylactic</th>
<th>Anaphylactoid</th>
<th>Seizures</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence (%)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

- **Abnormalities of Hemodynamics:**
  - **Hypotension:** This condition may occur in spontaneously breathing patients during atracurium administration. The most frequent cause of hypotension is volume depletion due to vascular access for monitoring administration. Hypotension is generally not severe and is reversible with fluid administration. Hypotension may be exacerbated by positive end-expiratory pressure (PEEP), if used. There have been case reports of hypotension following rechallenge with atracurium. The incidence of hypotension following atracurium administration has been found to be higher in patients receiving doses greater than 1 mg/kg daily for more than five consecutive days. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Hypotension has also been reported in patients who received atracurium for long-term maintenance. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Therefore, the use of atracurium should be limited to cases in which there is a need for muscle relaxation, and its use should be discontinued if hypotension occurs. In patients with a history of hypotension, it is possible that hypotension may occur, and monitoring of such patients is suggested.

- **Bradycardia:** Bradycardia has been reported in patients receiving atracurium for long-term maintenance. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Therefore, the use of atracurium should be limited to cases in which there is a need for muscle relaxation, and its use should be discontinued if bradycardia occurs. In patients with a history of bradycardia, it is possible that bradycardia may occur, and monitoring of such patients is suggested.

### Table 3: Atracurium Besylate Infusion Rates for a Concentration of 0.5%.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Infusion Rate (mg/kg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5%</td>
<td>5.0 to 10.0</td>
</tr>
</tbody>
</table>

- **Special Considerations:**
  - **Children:** The use of atracurium in children is limited. There have been case reports of severe adverse reactions, including seizures and hypotension, in children receiving atracurium for long-term maintenance. The use of atracurium in children is not recommended. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Therefore, the use of atracurium should be limited to cases in which there is a need for muscle relaxation, and its use should be discontinued if adverse reactions occur. In patients with a history of adverse reactions, it is possible that adverse reactions may occur, and monitoring of such patients is suggested. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination.

- **Dialysis:** Atracurium besylate is not dialyzable. It is not known if atracurium is removed by hemodialysis or peritoneal dialysis. Therefore, dosage adjustments are not required.

- **Renal Failure:** Atracurium besylate is not renally cleared. In patients with renal disease, the dose should be reduced by approximately one-third, to 2 mg/kg daily, for patients with creatinine clearance of less than 60 mL/min. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Therefore, the use of atracurium should be limited to cases in which there is a need for muscle relaxation, and its use should be discontinued if adverse reactions occur. In patients with a history of renal disease, it is possible that adverse reactions may occur, and monitoring of such patients is suggested. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination.

### Table 4: Atracurium Besylate Infusion Rates for a Concentration of 0.25%.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Infusion Rate (mg/kg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25%</td>
<td>2.5 to 5.0</td>
</tr>
</tbody>
</table>

### Table 5: Atracurium Besylate Infusion Rates for a Concentration of 0.125%.

<table>
<thead>
<tr>
<th>Concentration</th>
<th>Infusion Rate (mg/kg/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.125%</td>
<td>1.0 to 2.0</td>
</tr>
</tbody>
</table>

- **Interactions:** Atracurium besylate has been shown to have no clinically significant interaction with other drugs that are used during anesthesia. The use of atracurium besylate with other drugs that are used during anesthesia is not recommended. The possibility of anesthetic drugs, particularly volatile anesthetics, contributing to this event has been demonstrated in some studies. Therefore, the use of atracurium should be limited to cases in which there is a need for muscle relaxation, and its use should be discontinued if adverse reactions occur. In patients with a history of adverse reactions, it is possible that adverse reactions may occur, and monitoring of such patients is suggested. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination. Further reductions may be desirable with the use of potent inhalation anesthetics. The patient should be permitted to breathe gas or air at a lower inspiratory pressure, if possible, to prevent inadvertent contamination.