**Guidelines for the management of paracetamol overdose**

**General Information**
1. Paracetamol overdose is a significant cause of hospital admission, but less than 10% of patients are admitted and even when it occurs the prognosis is usually good.
2. Signs consistent with paracetamol poisoning include repeated vomiting, abdominal tenderness in the right upper quadrant of mental status change.
3. Any patient should be considered to be at risk of severe liver injury if they have ingested paracetamol within 24 hours of an episode of severe nausea and vomiting.

**TABLE 1. Paracetamol dosing that may be associated with hepatic injury**

<table>
<thead>
<tr>
<th>Paracetamol dose (g)</th>
<th>Adult children over 8 years of age</th>
<th>Children aged 6-8 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 200 mg/kg or 15 g</td>
<td>&gt; 300 mg/kg or 10 g, whichever is less</td>
<td>&gt; 300 mg/kg or 10 g, whichever is less</td>
</tr>
<tr>
<td>&gt; 150 mg/kg or 10 g</td>
<td>&gt; 150 mg/kg or 10 g, whichever is less</td>
<td>&gt; 150 mg/kg or 10 g, whichever is less</td>
</tr>
<tr>
<td>&gt; 40 mg/kg or 3 g</td>
<td>&gt; 40 mg/kg or 3 g, whichever is less</td>
<td>&gt; 40 mg/kg or 3 g, whichever is less</td>
</tr>
</tbody>
</table>

**For further details, please refer to the full guidelines.**

**For Poisons Information Call**
Australia 13 11 26
New Zealand 0800 764 766

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**Management of Acute Single Ingestions**

**Acute Ingestion Management Flow-chart**

- Decontamination
  - Activated charcoal is indicated in co-ingestants
  - Immediate-release paracetamol preparations: if the initial paracetamol concentration is greater than 8 g/kg or 400 mg/kg (whichever is less).
  - Modified-release paracetamol preparations: if the initial paracetamol concentration is greater than 8 g/kg or 400 mg/kg (whichever is less).
- Administration of activated charcoal: administer within 4 hours ingestion greater than 10 g or 500 mg/kg (whichever is less).
- Administration of activated charcoal: administer 4 hours ingestion greater than 10 g.
- Administration of activated charcoal: administer 8 hours ingestion greater than 10 g.
- Administration of activated charcoal: administer 24 hours ingestion greater than 10 g.
- Following acute overdose, the most important factor that determines prognosis is the delay before 6 hours after the ingestion of acetyl cysteine.
- Acetyl cysteine is an effective antidote that prevents mortality if administered within 8 hours of ingestion. It has also been shown to improve prognosis if administered at any time (eighth or 7 hours) following overdose.

**Paracetamol Treatment Nomogram**

- Treat ALL patients with serum paracetamol concentration above the treatment line.
- Ensure that correct units are used (ie. mg/kg or g).
- TREATMENT TIMES

**Liquid Paracetamol Ingestion**

**Pediadric (< 6 years) liquid paracetamol ingestion**

- In children suspected of ingesting > 300 mg/kg, measure serum paracetamol level at least 2 hours post-ingestion.
- If the concentration 24 hours after ingestion is > 150 mg/L (100μmol/L), acetylcysteine is not required.
- If the concentration 24 hours after ingestion is > 150 mg/L (100μmol/L), acetylcysteine therapy should be continued as per the Paracetamol Ingestion Management Flow-chart.
- In all cases, other than those with isolated accidental paracetamol ingestion (*ie* ≤ 1 g, refer to the Paracetamol Ingestion Management Flow-chart.

**What To Do When The Nomogram Does Not Apply**

**Staged Overdose**

- A staged overdose comprises several ingestions over a period of less than 24 hours. The paracetamol concentration should be plotted on the nomogram from the earliest time of ingestion.
- If the patient has taken a staged overdose of paracetamol, it is a multi-time interval within the last 6 hours, treat the patient as per the > 8 hours scenario in the Acute Ingestion Management Flow-chart.
- If it has been MORE than 8 hours since the first dose, treat the patient as per the > 8 hours scenario in the Acute Ingestion Management Flow-chart.

**Unknown Time of Paracetamol Ingestion**

- If the time of ingestion is unknown, it is subject to the patient's history, physical examination and presentation and confirm if acetaminophen and acetylcysteine
- If the serum paracetamol concentration is > 10 mg/L (6 μmol/L), or the ALT is elevated > 50 U/L, acetylcysteine treatment should be continued. Further history becomes available and the serum paracetamol concentration can be accurately plotted on the nomogram, this should be done and acetylcysteine discontinued if the paracetamol concentration is below the treatment line.
- Prune the time of ingestion and replot the concentration on the nomogram.
- If the patient's paracetamol concentration is > 10 mg/L (6 μmol/L), and the ALT is elevated > 50 U/L, the patient should be monitored and acetylcysteine discontinued if the paracetamol concentration is below the treatment line.

**Repeated Superparacetamol Ingestion Management**

- Do not give acetaminophen and acetylcysteine
- If the patient’s paracetamol concentration is > 10 mg/L (6 μmol/L), and the ALT is elevated > 50 U/L, the patient should be monitored and acetylcysteine discontinued if the paracetamol concentration is below the treatment line.

**Liquid Paracetamol Ingestion**

- For children, the body weight used for calculations should be ideal body weight.

**Administration of Acetylcysteine**

- When required, acetylcysteine is infused in a 3 stage intravenous infusion giving a total dose of 300 mg/kg over 24 hours.
- First Infusion: the dose (150 mg/kg) is divided into 200 mL of 5% glucose and infused over 60 minutes under close medical supervision due to the incidence of anaphylactic reactions.
- Second Infusion: the second dose (50 mg/kg) is diluted in 500 mL of 5% glucose and infused over the next 4 hours.
- Third Infusion: the third dose (100 mg/kg) is diluted in 1000 mL of 5% glucose and infused over the next 24 hours.
- Acetylcysteine is usually well tolerated. A non-IgE mediated anaphylactic (anaphylactoid) reaction can occur during the initial infusion in 10-15% of patients, may be mediated by mast cells, bronchospasm, and rarely, hypotension. Management is supportive, including: bronchodilator or stopping the infusion and administration of antihistamines and bronchodilators if required. Severe anaphylactic reactions are rare and should be treated with adrenaline as required. Once the symptoms settle acetylcysteine can be recommenced.
- Patients who have severe paracetamol concentrations more than double the nomogram line may benefit from doubling the concomitant fluid and paracetamol dose infusion. Check serum paracetamol every 4 hours. Serum ALT and paracetamol levels should be checked near the completion of acetylcysteine administration. Acetylcysteine should be discontinued if the ALT level is increasing (greater than 50 UL/L) or the paracetamol concentration is greater than 500 mg/L (300 μmol/L).
- Thematic injury is suspected after the third infusion, acetylcysteine is continued at the rate of the last infusion stage (100 mg/kg acetylcysteine over 16 hours or 150 mg/kg/hours) until there is clinical and biochemical evidence of improvement.

**Acetylsalicylic Intravenous Infusion Guidance dose**

- Acetylsalicylic is packed for infusion in intravenous in ampoules, each containing 250 mg (acetylsalicylic acetylsalicylic).
- For prescription errors can occur when calculating the dose of acetylsalicylic for children: *see* note below.
- Then, use this nomogram to calculate the dose (see above).
- *Table 2 shows the calculation of the dose and volume required for each infusion. Patient actual weight is estimated to the nearest 5 kg.
- *The occurrence of a previous dose does not predict the use of acetylsalicylic on another occasion if indicated.

**Recomended of whether to call the Poisons Information Centre**

- *Any injury or unexplained death/illness requiring medical attention or if no one has been notified.*
- *High exposure occurred.*
- *Injurious consumer products.*
- *Emergency medical management.*
- *Legal matters.*
- *For further assistance please refer to the complete guidelines.*

**TABLE 2. Adult Acetylsalicylic Intravenous Infusion Guidance Dose**

<table>
<thead>
<tr>
<th>Body weight (kg)</th>
<th>Initial acetylsalicylic dose (mg)</th>
<th>Second (mg)</th>
<th>Total acetylsalicylic dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-60</td>
<td>70 x (body weight - 40)</td>
<td>35 x 2</td>
<td>70 x (body weight - 40) + 35 x 2</td>
</tr>
<tr>
<td>61-80</td>
<td>70 x (body weight - 40)</td>
<td>35 x 2</td>
<td>70 x (body weight - 40) + 35 x 2</td>
</tr>
<tr>
<td>&lt; 40</td>
<td>70 x (body weight - 40)</td>
<td>35 x 2</td>
<td>70 x (body weight - 40) + 35 x 2</td>
</tr>
<tr>
<td>&gt; 80</td>
<td>70 x (body weight - 40)</td>
<td>35 x 2</td>
<td>70 x (body weight - 40) + 35 x 2</td>
</tr>
</tbody>
</table>

*Note: All patients weighing greater than 110 kg should be dosed according to a bodyweight of 110 kg.

**Recommendations of whether to call the Poisons Information Centre**

<table>
<thead>
<tr>
<th>Body weight (kg)</th>
<th>Initial dose (mg)</th>
<th>Additional (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 100</td>
<td>250</td>
<td>150</td>
</tr>
<tr>
<td>&gt; 150</td>
<td>300</td>
<td>200</td>
</tr>
</tbody>
</table>

*For further details, please refer to the full guidelines.*