Ballarat Health Services

DRUG GUIDELINE

PARACETAMOL (Intravenous Infusion)

SCOPE (Area): **FOR USE IN:** All Wards excluding neonates
EXCLUSIONS: neonates (see DRG0037 Neonatal Drug Guideline-Paracetamol)
SCOPE (Staff): Medical, Nursing and Pharmacy

BRAND NAMES
Various brands of IV paracetamol are available.

PHARMACOLOGY AND PHARMACOKINETICS
Paracetamol has analgesic and antipyretic actions in the central nervous system. It inhibits prostaglandin synthetase in the hypothalamus, prevents synthesis of spinal prostaglandin, and inhibits inducible nitric oxide synthesis in macrophages. In therapeutic doses, inhibition of prostaglandin synthesis is not significant in peripheral tissues, so paracetamol has minimal anti-inflammatory action.
Intravenous paracetamol infusion provides onset of pain relief within five to ten minutes after the start of administration. The peak analgesic effect is obtained in one hour and the duration of this effect is usually four to six hours. Fever is reduced within 30 minutes after the start of administration, with a duration of the antipyretic effect of at least six hours. Oral paracetamol has a high bioavailability and can be regarded as interchangeable with intravenous. Paracetamol has an elimination half-life of 1 to 3 hours and undergoes extensive first-pass metabolism in the liver, with the kidneys excreting its metabolites.

INDICATIONS
- For the relief of mild to moderate pain (and in an opioid sparing capacity) **where the enteral route of administration is not clinically appropriate** (e.g. lack of gastrointestinal form/function such as ileus, vomiting, severe diarrhoea, nil by mouth).

CONTRAINDICATIONS
- **Hypersensitivity to paracetamol or to any of the excipients.**
- **Patients with severe hepatocellular insufficiency, hepatic failure or decompensated active liver disease.**

PRECAUTIONS
- **Chronic liver disease or non-severe hepatocellular insufficiency** - these patients may be at increased risk of hepatic damage following therapeutic dose or overdose of paracetamol, although evidence is lacking. Consider giving doses no more often than every 6 hours.

Note: Hepatotoxicity can occur following paracetamol overdose (acute or chronic). Although a number of factors have been proposed to increase the risk of liver toxicity following acute overdose, evidence to support them is weak; they include depleted glutathione stores (e.g. prolonged fasting or malnutrition), treatment with hepatic enzyme inducers, severe renal, hepatic or cardiac impairment, dehydration and chronic alcohol intake. There is no evidence that these factors increase risk of liver toxicity following therapeutic doses of paracetamol.

PREGNANCY AND BREASTFEEDING

Seek specialist advice before prescribing, information may update regularly.

DRUG INTERACTIONS

- **Dasatinib, imatinib, isoniazid, sorafenib** - paracetamol increases the hepatotoxicity of these drugs, avoid paracetamol where possible.
- **Probenecid** - can increase paracetamol levels and levels of its toxic metabolite, avoid paracetamol where possible.
- **Carbamazepine, ethanol, phenobarbitone, phenytoin, primidone** - these liver enzyme inducing drugs can increase the metabolism of paracetamol both reducing effectiveness and increasing the level of toxic metabolite leading to an increased risk of hepatotoxicity. Avoid large or chronic doses of paracetamol with patients taking these drugs.
- **Busulfan** - paracetamol may increase busulfan levels if used in the 72 hours prior to dosing.
- **Lamotrigine** - paracetamol may decrease the serum concentration of lamotrigine with higher doses longer than several days.
- **Warfarin** - weak and conflicting evidence suggests that regular use of paracetamol may increase the INR, increasing the risk of bleeding; consider monitoring the INR and decrease warfarin dose if needed.

DOSAGE AND ADMINISTRATION

Paracetamol is generally considered a safe analgesic with a low incidence of adverse effects compared with other drugs.

Intravenous and enteral doses are equivalent (providing absorption is adequate). Enteral is the preferred route of administration and should be given wherever possible/practicable. Where both enteral and intravenous routes are ordered, Nursing Staff are required to record which route was administered for each dose. When intravenous paracetamol is ordered, the Prescriber must review after every 48 hours of therapy to determine when a change to enteral dosing is appropriate.

Always ensure the patient is not receiving any other paracetamol containing products, and the 24 hour maximum dose of paracetamol for each patient is not exceeded.

IV infusion:

Use pre-filled vial 1000 mg/100 mL, no dilution is required.
Infuse dose (as calculated in table below) intravenously over 15 minutes.
Where doses less than a full vial are required (i.e. weight less than 50 kg), draw up the exact dose from the vial for administration via a syringe attachment OR if a syringe attachment is not practical (e.g. volume above 50 mL) withdraw and discard the amount not required from the vial before administration.
Concentration: 10 mg/mL.

Note: There is sometimes pain noted at the site of the infusion (2%). This is usually quite minor and should be managed by slowing the infusion. If it is a major concern, the Acute Pain Service should be called.

ADULT INTRAVENOUS PARACETAMOL DOSING CALCULATION TABLE **Dosing is based on actual body weight** Doses should be prescribed in milligrams (mg) The maximum daily dose includes **all medicines containing paracetamol**			
PATIENT WEIGHT	**PARACETAMOL DOSE per administration**	**Minimum interval between each administration - or dose interval**	**Maximum Total Dose in 24 hours (exceeding this dose may result in severe hepatic injury)**
50 kg or greater	1000 mg	6 hours Maximum 4 doses in 24 hours	4000 mg
Less than 50 kg	15 mg/kg	6 hours Maximum 4 doses in 24 hours	60 mg/kg

PAEDIATRIC (1 month to less than 18years[#]) INTRAVENOUS PARACETAMOL DOSING CALCULATION TABLE **Dosing is based on actual body weight, except in obese children*** Doses should be prescribed in milligrams (mg) The maximum daily dose includes **all medicines containing paracetamol**			
PATIENT WEIGHT	**PARACETAMOL DOSE per administration**	**Minimum interval between each administration - or dose interval**	**Maximum Total Dose in 24 hours (exceeding this dose may result in severe hepatic injury)**
50 kg or greater*	1000 mg	6 hours Maximum 4 doses in 24 hours	4000 mg
Less than 50 kg*	15 mg/kg	6 hours Maximum 4 doses in 24 hours	60 mg/kg
* If the child is obese, use ideal weight or the average weight-for-age dose recommendation on the product label [#]For neonates see DRG0037 Neonatal Drug Guideline - Paracetamol			

General Administration Information

- **Infusion pump:** Alaris™ LVP or syringe attachment with Guardrails
- **Routes of administration:**

IV injection:	No
IV intermittent infusion:	Yes (over 15 minutes)
IV continuous infusion:	No
IM injection:	No
Subcut injection:	No

- **Compatible/incompatible IV drugs/fluids:**
  Consult the Australian Injectable Drugs Handbook ('Yellow book') in your ward area. **Assume all unlisted drugs and IV fluids are incompatible – contact Pharmacy for further advice.**

MONITORING (INCLUDING BLOOD TESTS)

- Nil.

NURSING PRACTICE POINTS

- As intravenous paracetamol comes in a glass bottle, a vented administration set should be used, or a long airway needle inserted into the bung.
- There is a plastic bottle hanger fixed to the plastic label of the paracetamol bottle, which can be peeled away to hang the bottle.
- Paracetamol should not be infused whilst other drugs are being administered or be mixed with other drugs.
- Paracetamol is compatible with sodium chloride 0.9%, glucose 5% or compound sodium lactate (Hartmann's solution) - either infuse through a separate IV line, or via the sideline of a sodium chloride 0.9%, glucose 5% or compound sodium lactate infusion. (Note: the Australian Injectable Drugs Handbook ('Yellow book') does not list paracetamol as being compatible with compound sodium lactate, but other references do).
- Ensure bung is pierced at the area where the bung is thinnest to help prevent the bung becoming fragmented or pushed into the vial.

ADVERSE EFFECTS

- **Common** - administration site reaction (especially in children), administration site pain, increased aminotransferases (especially if doses of 4 g/day are used for longer than 4 days).
- **Rare** - nausea, vomiting, tachycardia, hypersensitivity reactions (e.g. rash, fixed drug eruption, toxic epidermal necrolysis and Stevens-Johnson syndrome), neutropenia, thrombocytopenia, pancytopenia, acute hepatitis, hypotension

---

DRUG PRESENTATIONS, LOCATION AND STORAGE

Paracetamol 1000 mg/100 mL vials.
Store below 25°C.
