

## Appendix 4 Alcohol and drug interactions

Alcohol interacts with many other drugs, including prescription, over-the-counter medications and herbal preparations (Izzo & Ernst 2001; Koski et al. 2005; Pringle et al. 2005; Weathermon & Crabb 1999). The effects of combining alcohol and medication depend on the type, route and dosage of medication, the volume of alcohol consumed, and also on personal factors, such as genetics, gender and comorbid health conditions (Weathermon & Crabb 1999). The potential for drug interactions increases with the number of medications being used.

Alcohol can exert direct effects on the absorption of medications. Alcohol can increase drug absorption by enhancing the gastric solubility of medications and by increasing gastrointestinal blood flow. However, high alcohol concentrations induce gastric irritation causing pyloric spasm, which in turn may delay drug absorption and/or reduce bioavailability.

Alcohol is not extensively bound to plasma proteins sufficient to modify drug distribution. However, serum albumin levels in chronic alcoholics may be abnormally low so that some drugs, such as diazepam, have an increased volume of distribution.

Short-term alcohol intake can inhibit the hepatic metabolism of many drugs (primarily through cytochrome enzyme systems). Long-term heavy alcohol use however can induce liver enzymes to metabolise drugs more efficiently.

These pharmacokinetic interactions may result in:

- increased effects of alcohol, with greater levels of intoxication and sedation
- increased or decreased effects of other medications, which may result in greater adverse events (side effects), or reduced effectiveness of medication.

Alcohol can also have pharmacodynamic interactions with other psychoactive drugs, such as benzodiazepines, opioids and other sedating medications (for example, some antihistamines, tricyclic antidepressants), typically resulting in greater sedation and intoxication, and increased risk of respiratory depression, coma and death.

Interactions between alcohol and medications can have serious implications for people undertaking activities requiring concentration, such as driving a motor vehicle or operating heavy machinery.

Commonly prescribed classes of medications, such as benzodiazepines, opiate analgesics, antidepressants, antibiotics, antihistamines, anti-inflammatories, hypoglycaemic agents and anti-coagulants have known interactions with alcohol (see 'Drugs with the potential to interact with alcohol' below).

Alcohol use can also result in poor adherence with other medications (patients not taking their medication as indicated), with potential for adverse consequences. This may be more likely to occur in heavy drinkers, in those with alcohol-related cognitive impairment, and in those taking multiple medications in complex regimes.

People who drink alcohol and are using prescribed or over-the-counter medications should discuss the possibility of interactions with their medical practitioner or pharmacist, and read any information on alcohol interactions included in the packaging. Temporary or permanent abstinence from alcohol may be necessary, particularly for people taking multiple medications.

Health practitioners should, where relevant, caution patients against using alcohol in combination with medication. Patients on multiple medications (such as those older adults, and/or those with complex medical problems) should regularly have their medications reviewed and rationalised by their general practitioner and pharmacist, as individual specialists may not be aware of other medications the patient is using.

Further information can be obtained by contacting the National Poisons Information Hotline on **13 11 26** (24 hours, 7 days), for all States and Territories.

For urgent attention in case of accidental poisoning, especially children:

<b>New South Wales</b>	The Children's Hospital Westmead Hawkesbury Road and Hainsworth Street Westmead NSW 2145 Ph (02) 9845 0000
<b>Victoria</b>	Austin Hospital Studley Road Heidelberg Vic. 3084 Ph (03) 9496 5000
<b>Queensland</b>	Royal Children's Hospital Herston Qld 4006 Ph (07) 3636 8111
<b>South Australia</b>	Women's and Children's Hospital King William Rd North Adelaide SA 5006 Ph (08) 8222 4000
<b>Western Australia</b>	Poisons Information Centre Sir Charles Gairdner Hospital Hospital Avenue Nedlands WA 6009 Ph (08) 9346 3333
<b>Tasmania</b>	Royal Hobart Hospital Liverpool St Hobart Tas. 7000 Ph (03) 6222 8308
<b>Northern Territory</b>	Royal Darwin Hospital Rocklands Drive, Casuarina Darwin NT 0800 Ph (08) 8922 8888
<b>Australian Capital Territory</b>	The Canberra Hospital Yamba Drive Garran ACT 2605 Ph (02) 6244 2222

## Drugs with the potential to interact with alcohol

Medication	Type of interaction
<b>Sedative–hypnotics:</b> <ul style="list-style-type: none"> <li>• benzodiazepines</li> <li>• barbiturates</li> </ul>	<p>Acute alcohol consumption potentiates the central nervous system depressant effects of benzodiazepines and barbiturates.</p> <p>Risk of cognitive impairment, respiratory depression and overdose is increased.</p> <p>Chronic alcohol consumption decreases availability of barbiturates through hepatic enzyme induction, decreasing their effect.</p>
<b>Anaesthetic agents</b>	<p>Chronic alcohol consumption:</p> <ul style="list-style-type: none"> <li>• increases the dose of propofol required to induce anaesthesia</li> <li>• increases the risk of liver damage by anaesthetic gases enflurane and halothane.</li> </ul>
<b>Opioid analgesics</b>	<p>Alcohol increases sedative effect.</p> <p>Risk of cognitive impairment, respiratory depression and opioid overdose is increased.</p>
<b>Tricyclic antidepressants</b>	<p>Acute alcohol consumption increases risk of sedation and orthostatic hypotension (sudden drop in blood pressure upon standing up).</p>
<b>Antihistamines</b>	<p>Alcohol potentiates the central nervous system depressant effect of sedating antihistamines, especially in elderly people.</p>
<b>Antipsychotic medication:</b> <ul style="list-style-type: none"> <li>• phenothiazines</li> <li>• olanzapine</li> </ul>	<p>Acute alcohol consumption increases sedative effects, impairs coordination and may result in liver impairment.</p> <p>Alcohol increases sedation and risk of hypotension.</p>
<b>Oral hypoglycaemic agents:</b> <ul style="list-style-type: none"> <li>• sulfonylurea compounds</li> </ul>	<p>Diabetics on sulfonylureas should be advised not to drink.</p> <p>Acute alcohol ingestion prolongs availability of hypoglycaemic agents leading to hypoglycaemia.</p> <p>Hypoglycaemia may also occur if there is malnutrition or depletion of glycogen stores.</p> <p>Chronic alcohol administration decreases the availability of hypoglycaemic agents with risk of hyperglycaemia.</p>
<b>Anticonvulsants:</b> <ul style="list-style-type: none"> <li>• Phenytoin</li> </ul>	<p>Acute alcohol consumption increases availability of Phenytoin increasing risk of side effects.</p> <p>Chronic alcohol consumption decreases anticonvulsant effect of Phenytoin.</p>
<b>Histamine H2 receptor antagonists:</b> <ul style="list-style-type: none"> <li>• Cimetidine</li> <li>• Ranitidine</li> </ul>	<p>These drugs inhibit gastric alcohol dehydrogenase and increase the rate of gastric emptying. This may increase blood alcohol concentration.</p>
<b>Oral anticoagulants:</b> <ul style="list-style-type: none"> <li>• Warfarin</li> </ul>	<p>Acute alcohol consumption increases Warfarin's availability, increasing risk of haemorrhages.</p> <p>Chronic alcohol consumption reduces availability of Warfarin, decreasing its anticoagulant effect.</p>
<b>Non-narcotic analgesics:</b> <ul style="list-style-type: none"> <li>• Aspirin, NSAIDs</li> <li>• Paracetamol</li> </ul>	<p>Alcohol increases the risk of gastrointestinal bleeding.</p> <p>Chronic alcohol consumption increases risk of liver damage with paracetamol overdose.</p>

Source: Modified with permission from Latt N, Conigrave, K, Saunders, JB, Marshall EJ & Nutt, D 2008, *Handbook of Addiction Medicine*, Oxford University Press, Oxford.