

# RGH Pharmacy E-Bulletin

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A joint initiative of the Patient Services Section and the Drug and Therapeutics Information Service of the Pharmacy Department, Repatriation General Hospital, Daw Park, South Australia. The RGH Pharmacy E-Bulletin is distributed in electronic format on a weekly basis, and aims to present concise, factual information on issues of current interest in therapeutics, drug safety and cost-effective use of medications.

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## Caffeine

Caffeine is a methylxanthine compound used medicinally to stimulate the central nervous system in combating fatigue and drowsiness. Caffeine also stimulates skeletal muscle contraction and gastric secretion. Caffeine has a medical indication for the management of neonatal apnoea, and may also have a role in sports medicine with ongoing research on its use to enhance endurance in elite athletes. Caffeine occurs naturally in the leaves, nuts and seeds of plants. Guarana derivatives, available in many forms in Australia, are produced from the guarana plant seeds (which contain 3.6-5.8% caffeine). In Australia, if caffeine (or guarana) is added to a product then the food must be labeled to indicate that it contains caffeine. Major dietary sources such as tea, coffee, chocolate and cola drinks typically provide 30-100 mg of caffeine per serve. The caffeine content of some products available in Australia is provided below - a more exhaustive list is available at: [http://www.ausport.gov.au/ais/nutrition/supplements/supplement\\_fact\\_sheets/group\\_a\\_supplements/caffeine](http://www.ausport.gov.au/ais/nutrition/supplements/supplement_fact_sheets/group_a_supplements/caffeine)

<u>Food or Drink</u>	<u>Serve</u>	<u>Caffeine content (approx mg)</u>
Instant coffee	250ml cup	60
Brewed coffee	250ml cup	80
Short black/espresso	1 standard serve	107
Iced Coffee	500ml Bottle	30-200
Tea	250ml cup	27
Chocolate (dark)	60 g	10-50
Red Bull® energy drink	250 ml	80
No Doz (caffeine tablets)	1 tablet	100
Cola	375mL can	Pepsi-40, Coke-49
Spike Shotgun energy drink	500mL can	350

### *Adverse effects*

There is debate over the association between caffeine intake and cardiovascular disease. The literature reports increased risk of a cardiovascular event in both men and women who drink more than six cups of coffee a day (or greater than 680mg caffeine). Nervous system effects including insomnia, anxiety, tachycardia and tremor are the most commonly reported adverse effects of caffeine. Other adverse effects reported include nausea and vomiting and diuresis. Caffeine has also been reported to cause urticaria and myopathy. In relation to overdose, doses of caffeine greater than 1000mg can cause serious central nervous effects including organic brain syndrome. Oral doses that cause death range from 3-50 grams but death from overdose is rare due to the emetic effect of caffeine.

### *Tolerance and withdrawal*

Tolerance to the stimulating effects of caffeine occurs rapidly at doses as low as 150 mg per day. If stopped abruptly physical signs of withdrawal include headache, irritability and lethargy

### *Interactions*

Caffeine is reported to interact with many other drugs. Of note is an interaction with tobacco which inhibits CYP450 1A2. When smoking is ceased, caffeine levels rise accordingly and the CNS related adverse effects of increased caffeine are often attributed to smoking cessation. The antidepressant fluvoxamine significantly inhibits the activity of CYP1A2 and therefore may accentuate the effects of caffeine because of reduced metabolic clearance.

This E-Bulletin is based on work by Ruth Wilton, Senior Clinical Pharmacist, DATIS, RGH

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