providing a Pacific-specific clinical training and support programme for Pacific registrars in The Royal New Zealand College of General Practitioners' (RNZCGP's) General Practice Education Programme (GPEP 1 and 2). This programme is run in partnership with the RNZCGP and the Ministry of Health. Our mission is to '...increase Pacific workforce in primary care by establishing a workforce training network of Primary Care training organisations'.

At Bader Drive Healthcare (see www.bdhclinicaltrainingsupport.co.nz) we deliver both GP services and community health services to Pacific people because we believe in delivering services in a holistic and integrated fashion. We have 26 staff in total delivering services from Mangere and Manurewa clinics. The majority of our staff is of Pacific ethnicity and 90% of our enrolled population are Pacific. We are accredited by Te Wana and CORNERSTONE and we are an RNZCGP accredited teaching practice. Visit our website for more information about the Bader Drive Clinical Training Support Programme.

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Guarana

Paullinia cupana, *P. sorbilis*

Also known as Brazilian cocoa and 'Zoom'

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Guarana is a berry that grows in Venezuela and the northern parts of Brazil. The name 'guarana' comes from the Guarani tribe that lives in Brazil. Guarana plays a very important role in their culture and medical folklore. The herb is believed to be a magical cure for a range of complaints and a way to regain strength. Guarana's biological name, *Paullinia cupana*, was taken from the German medical botanist CF Paullini, who discovered the tribe and the plant in the eighteenth century.

PREPARATIONS: Guarana can be purchased as capsules, often in combination with ginseng. It is also present in stimulant energy drinks that are now commonplace, and in some teas and infusions. These drinks often make a point of highlighting the inclusion of guarana in addition to caffeine.

Guaraná Antarctica, which contains its namesake, is an iconic and best-selling soft drink in Brazil due to its distinctive and unique taste. The caffeine content of guarana products is variable but, as a rough guide, energy drinks on average contain about 90 mg caffeine per 250 mL which is about the same as a regular cup of coffee, and capsules commonly contain 20–30 mg caffeine.

ACTIVE CONSTITUENTS: Initially the active ingredient was called tetra methylxantine but it was later discovered that it is actually caffeine. The guarana plant and berry has one of the highest naturally occurring levels of caffeine at around 7–8%, and there are also traces of theophylline and theobromine. Instead of referring to caffeine, many companies and websites market their products using the term 'guaranine' when describing the active ingredient. Other companies clearly label their products with the caffeine content, but the impression may be given to consumers that there is something additionally special about guarana.

MAIN USES AND CLAIMS: Amongst a range of possible uses, guarana products are claimed to:

- improve concentration, endurance, vitality, immunity, stamina in athletes and sexual performance
- slow the effects of ageing
- alleviate migraine, rheumatic disease, diarrhoea, constipation and tension
- cure hangovers
- suppress appetite and facilitate weight loss.

None of the above effects have been proven other than those possibly at-

Herbal medicines are a popular health care choice, but few have been tested to contemporary standards. **POTION OR POISON?** summarises the evidence for the potential benefits and possible harms of well-known herbal medicines.

tributed to the effects of caffeine. There is no good evidence that guarana improves stamina in athletes. Some recent trials have suggested that guarana improves fatigue in cancer patients, but again this can be explained by the CNS stimulant effects of caffeine.

ADVERSE EFFECTS: These are due to the caffeine content of the product. Excessive intake of guarana can cause nausea, nervousness, tremor, irritability, diuresis, gastric irritation and palpitations. These effects will be additive to any concurrent intake of other sources of caffeine. Many people appear to be doubling up on their intake of caffeine without realising it and there are several cases of 'caffeine overdose' in the literature that have involved the ingestion of large quantities of guarana-containing energy drinks, usually in children.

People may experience caffeine withdrawal effects if they suddenly reduce or stop a high intake of guarana-containing products. Because of the high caffeine content, guarana products, for example energy drinks, are best avoided in pregnancy.

DRUG INTERACTIONS: No specific drug interactions have been attributed to guarana, but due the caffeine content, the following interactions associated with caffeine appear possible:

- Increased plasma clozapine levels—caffeine inhibits the metabolism of clozapine
- Decreased plasma lithium levels—caffeine appears to increase the renal excretion of lithium
- Additive effects with therapeutic intake of theophylline or aminophylline
- Antagonism of anxiolytic and hypnotic agents
- Increased blood pressure with pseudoephedrine and similar drugs
- Reduced effect of antihypertensive agents.

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Summary Message

The main constituent of guarana is caffeine, with smaller quantities of theophylline and theobromine. There is no evidence that the berries or extracts contain anything else that is therapeutically useful.

Guarana is associated with many therapeutic properties, but there is no evidence to support these other than effects that can be attributed to caffeine.

Guarana is widely available in herbal products and energy drinks. Excessive intake can cause the same effects as too much caffeine. It is not widely recognised that guarana has a high caffeine content and the labelling on some products is misleading.

Although not specifically studied, guarana would be expected to exhibit the same range of adverse effects and drug interactions as those associated with caffeine.

References (further reading)

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