2,4-Dinitrophenol exposures and deaths in Australia after the 2017 up-scheduling

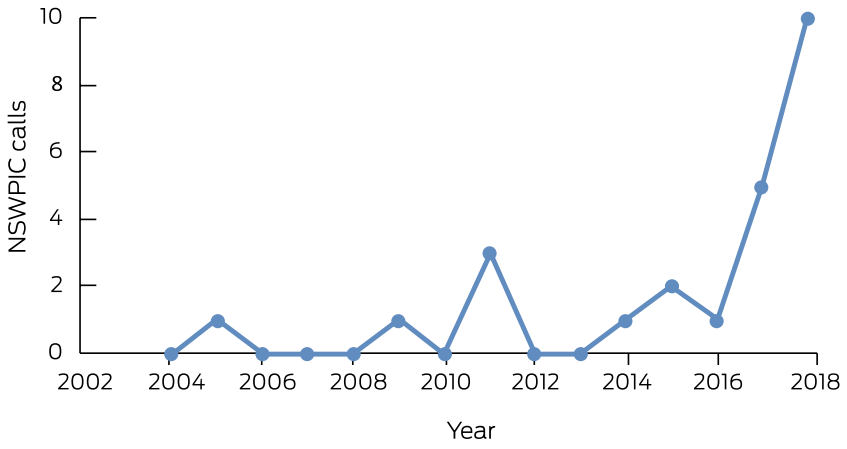
To the Editor: Rising obesity rates in high income countries have resulted in a growing demand for weight-loss products.[1] Unfortunately, drugs that increase energy expenditure often have severe adverse effects. 2,4-Dinitrophenol (DNP) uncouples oxidative phosphorylation, inducing a hyper-metabolic state. It was first used for weight loss in the 1930s but was banned due to deaths.[2] It has recently had a resurgence in popularity in the body building/body sculpting arena as a "fat burner" and "pre-event shredder", and is available online and as an undeclared ingredient in supplements.[1]

DNP was up-scheduled in Australia in 2017 to Schedule 10 ("substances of such danger to health as to warrant prohibition of sale, supply and use").[3] We used data from the New South Wales Poisons Information Centre (NSWPIC) and the National Coronial Information System (NCIS) to evaluate effects of up-scheduling. Ethics approval was granted from the Sydney Children's Hospitals Network (LNR/16/SCHN/44) and from the Victorian Department of Justice (CF/15/18367) human research ethics committees.

There were 24 DNP exposures reported to NSWPIC between 2004 and 2018, with an increasing trend (Box). Most patients (71%, $n = 17$) were male, 83% ($n = 20$) were adults aged 20–74 years, and 92% ($n = 22$) were in hospital or were referred to hospital by NSWPIC.

The NSWPIC database showed one death — an adult man who had a cardiac arrest after taking four DNP capsules — and NCIS recorded three more deaths from DNP. All deaths occurred since 2015, with two occurring since the 2017 rescheduling.

Time trends in 2,4-dinitrophenol exposures reported to the New South Wales Poisons Information Centre (NSWPIC) in 2004–2018. Up-scheduling to Schedule 10 was announced in September 2016 and implemented in February 2017. The timing of deaths is censored due to low numbers; however, all deaths occurred since 2015, including two since the 2017 scheduling



Despite up-scheduling, we have identified rapidly increasing harms from DNP, which suggest a resurgence of DNP use. Increasing use and deaths have also been reported in the United Kingdom[4] and the United States.[5]

This highlights the need for urgent action by state and federal law enforcement agencies and awareness campaigns targeting high risk groups. It is important to note that the Therapeutic Goods Administration makes scheduling changes but does not enforce non-medicinal product restrictions, which is the role of police and Fair Trading. It is likely that DNP is frequently obtained online and often disguised for shipping (eg, labelled as turmeric), thus complicating detection.[1] Increased incoming mail screening and awareness and education at gyms may be an option to restrain the use of DNP. Medical practitioners should warn patients of the dangers of illicit weight-loss supplements.

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Acknowledgements: This work was supported by a National Health and Medical Research Council Program Grant (ID: 1055176). Jared Brown is a recipient of a UNSW Scientia PhD scholarship. The funders had no role in planning, design, data collection, analysis or interpretation, reporting or publication. We thank staff at the NSWPIC and the NCIS for providing data. The NCIS is managed by the Victorian Department of Justice and Community Safety.

Competing interests: No relevant disclosures. ■

doi: 10.5694/mja2.50528

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