Press release from the Florey Institute of Neuroscience and Mental Health

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Petrol sniffing stunts the growth of children

Key messages from the research:

- Adolescents were sniffing a cup (250 mL) of petrol every night
- Petrol sniffing during adolescence results in reduced body weight and height
- Weight impairments are so severe that it can result in Failure to Thrive
- Changes in growth are a good way of identifying petrol sniffing
- If petrol sniffing stops, body weight recovers, but this might not be a healthy weight gain and may lead to subsequent health issues
- If petrol sniffing stops, height **does not** recover, and individuals remain on average 6 cm shorter than non-petrol sniffing peers

"Petrol sniffing makes you shorter, and there's no way to catch up even after you stop sniffing" says Professor Andrew Lawrence at the Florey Institute of Neuroscience and Mental Health, discussing the latest research findings from his group which were published this week in the journal *Addiction Research and Theory*.

The research published today will help health workers determine whether teens are abusing inhalants, and was a joint effort from the Florey Institute of Neuroscience and Mental Health in Melbourne, Flinders University, Ninti One Ltd, Menzies School of Health Research and the University of Adelaide.

Rose Crossin, a PhD student at the Florey, and her supervisor Dr Jhodie Duncan who heads the Florey's Inhalant Addiction laboratory, analysed data that was collected from Indigenous males in the Northern Territory by a team from the Menzies School of Health Research. Of the 118 males, 86 chronically inhaled petrol during their teenage years, starting at an average age of 13. The researchers followed these individuals for two years, analyzing data from a subset of 40 boys, of which 30 had sniffed petrol during their adolescence. All the young men had since remained abstinent, as confirmed by Aboriginal health workers and biochemical measurements.

Adolescence is a crucial period of brain and body growth. Strikingly, Rose discovered that sniffing petrol effectively pressed the pause button on their growth trajectory. This meant that in the study, individuals who had a history of sniffing but were now abstinent were an average 6cm shorter than their non-sniffing mates from the same community.

The research also showed that normal weight gain was also affected in the study participants, who were an average 7 kg lighter than non-sniffing community members before ceasing the inhalation behaviours. Failing to gain the appropriate amount of weight even resulted in a growth condition known as 'Failure to Thrive' in some cases. Unlike height however, a prolonged period of abstinence from inhalants did allow individuals to recover

to normal weight levels, although the researchers noted
that this might not be a 'healthy' weight gain, and could possibly lead to subsequent health issues like Type II diabetes.

Petrol- or solvent-sniffing addiction is a serious and widespread phenomenon amongst adolescent populations. These substances are relatively easy to obtain, both over the counter and illegally. In the study, adolescents were sniffing around 250 mL – a standard cup – of petrol every night.

The worst-case short-term consequence from inhaling is sudden death from a lack of oxygen. Beyond that, inhalants have been classed as more physically harmful than GHB, ecstasy, cannabis and LSD, and just as harmful as tobacco.

The rush obtained after sniffing comes on almost immediately, and also wears off quickly, meaning that it is easy for young people to hide sniffing behaviour from their parents and the community. Unfortunately, adolescents and their communities are unaware of the short-term and long-term harms that can arise from "sniffing".

Mrs Crossin is hopeful that her research may point to new ways for GPs, nurses or community health workers to diagnose inhalant abuse in their patients. "If someone notices that their patient, nephew, or star footy or basketball player is not going through the usual growth spurts you normally see in teenagers, or if they're failing to gain weight appropriately, it might be a sign that they are hiding inhalant abuse. That would be the point to start a crucial conversation that eventually allows them to reach their full potential, or even save their life."

The issue has come to prominence again after a spate of recent break-ins to regional airfields around the Northern Territory in which aviation fuel, or AvGas, has been stolen for abuse by local young people.

Inhalant abuse is strongly associated with social disadvantage, so the issue affects people who are already vulnerable from a multitude of other factors, like poor nutrition, and a lack of educational and social support.

Dr. Lucas de Toca, the Chief Health Officer at Miwatj Health in the Northern Territory is leading the crisis response team to the latest outbreak of AvGas sniffing. Dr de Toca, who was not involved in the current study, says, "This piece of research will be useful to better inform effective messaging within our health promotion strategy. Telling young people that sniffing practices could have a permanent impact on their height can help drive the concept home."

The study was funded by the National Health and Medical Research Council.

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About the Florey

The Florey Institute of Neuroscience and Mental Health is the largest brain research group in the Southern Hemisphere. Our teams work on a range of serious diseases including stroke, epilepsy, Alzheimer's disease, Parkinson's disease, multiple sclerosis, Huntington's disease, motor neurone disease, traumatic brain and spinal cord injury, depression, schizophrenia, mental illness and addiction. We are world leaders in imaging technology, stroke rehabilitation and epidemiological studies. Research of the brain and its diseases has gained considerable momentum internationally. Many scientific and technological advancements have been made, and much of our work has been centre stage. Our scientific home is a hive of activity with researchers coming from around the globe to work at the Florey. State and Federal Governments, major philanthropic foundations and many generous private benefactors have recognised the importance of neuroscience as the final frontier in medical research.

About Menzies School of Health Research

Menzies School of Health Research is one of Australia's leading medical research institutes dedicated to improving Indigenous, global and tropical health. Menzies has a history of over 30 years of scientific discovery and public health achievement. Menzies works at the frontline, joining with partners across the Asia-Pacific as well as Indigenous communities across northern and central Australia. Menzies collaborates to create new knowledge, grow local skills and find enduring solutions to problems that matter.

Menzies' work in tropical health is funded by the National Health Medical Research Council and Department of Foreign Affairs and Trade, building translational research capacity in the north of Australia and with collaborative partners across the Asia-Pacific.