

development and this may represent an important period for intervention.<sup>14</sup> The premise of cognitive training is that repeated practice of a cognitive skill will result in gains for that skill. All assessments will occur at the Monash University Turner Psychology Clinics, Clayton, Victoria, Australia. TALI Train has been shown to improve cognitive attention and numeracy outcomes in children with intellectual delay due to conditions such as, autism spectrum disorder and Down syndrome.<sup>24 25</sup> Further, for children with intellectual delay, TALI train has been found to be more beneficial for those with lower adaptive functioning and higher pre-intervention attention abilities.<sup>27</sup> When delivered in the classroom to primary school children, TALI Train has been shown to improve inattentive and/ or hyperactive behaviours in the classroom and at home.<sup>26</sup> Objectives For children with ADHD, this study aims to assess: (1) whether TALI Train improves core attention and inhibitory control abilities (selective attention, sustained attention, response inhibition and interference control); (2) whether TALI Train improves performance on the following untrained domains: working memory, behavioural attention, functional impairment, executive and social functioning; (3) the long-term effects of TALI Train; and (4) predictors of the training outcomes. Cognitive training is theoretically based on the concept of neuroplasticity, the brain's capacity to alter structure and function in response to environmental factors.<sup>15</sup> Meta analyses have shown that there are robust performance deficits in psychological processes for people with ADHD.<sup>4</sup> Specifically, for children and adolescents with ADHD, moderate impairments in the domains of attention and inhibitory control are common.<sup>4</sup> Cognitive training aims to strengthen neurocognitive functioning by external stimulation.<sup>17</sup> The focus of most cognitive training approaches has been to achieve improvements in both directly trained domains but also in other untrained domains. These RCTs demonstrate targeting attention and inhibitory control can improve performance on objective measures for children with ADHD, including the Test of Variable Attention (TOVA) a validated, continuous performance test that measures attention and inhibitory control.<sup>9 10</sup> For both RCTs however, there was no difference between the intervention and control conditions, on a range of secondary outcomes including parent and clinician ratings of ADHD symptoms, academic outcomes and functional impairment.<sup>9 10</sup> These studies indicate that cognitive training may be useful in improving aspects of cognitive functioning for children with ADHD, but that further research is required to understand the lack of improvement for parent or clinician reported outcomes. The efficacy of TALI Train (here referred to as the intervention) compared with the placebo control programme will be evaluated at baseline, immediately postintervention, and at 3-month follow-up. Protected by copyright.