Neural mechanisms underlying the therapeutic actions of guanfacine treatment in youth with ADHD: A pilot fMRI study

Anne-Claude V. Bédard1, Kurt P. Schulz, Beth Krone, Juan Pedraza, Stephanie Duhoux, Jeffrey M. Halperin, Jeffrey H. Newcorn

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Highlights
• 25 youth with ADHD were treated for 8 weeks with guanfacine extended release or placebo, and scanned with fMRI while performing a go/no-go task before and after treatment.
• Guanfacine therapy produced greater clinical improvement than placebo.
• Clinical improvement was differentially associated with reduced midcingulate activation for guanfacine compared to increased activation for placebo.
• Beneficial effects of guanfacine for ADHD involve effects beyond prefrontal cortex.
• Activation change in midcingulate cortex may represent a common mechanism of action for ADHD medications.

Abstract
Twenty-five youth with attention-deficit/hyperactivity disorder (ADHD) were scanned with functional magnetic resonance imaging while performing a Go/No-go task before and after 6 to 8 weeks of randomized once-daily treatment with either the α2A-adrenergic receptor agonist guanfacine or placebo. Clinical improvement was greater for guanfacine than placebo and was differentially associated with reduced activation for guanfacine compared with placebo in the right midcingulate cortex/supplementary motor area and the left posterior cingulate cortex.