

## Dexmethylphenidate A Viewpoint by Mark A. Stein

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Dexmethylphenidate is another addition to the increasing armamentarium of pharmacological treatments for attention deficit hyperactivity disorder (ADHD), one of the most common psychiatric disorders which begins in childhood. It is believed that the pharmacological action of dexmethylphenidate is due to its ability to increase dopamine levels in the striatum, which is consistent with most recent neurobiological research on the aetiology and pathophysiology of ADHD. Treatment with short-acting stimulants, such as methylphenidate or dextroamphetamine is quite effective, often reducing ADHD symptoms in 75% of subjects. Newer, longer-acting stimulants have several advantages for what is now recognised as an often chronic disorder that affects multiple areas of functioning, beyond a school day. So what is the role for another short-acting stimulant, albeit a refined single isomer form of methylphenidate? As yet, it is unclear although there are several potential uses for this new agent.

1. Approximately 20% of children display an adverse effect of stimulant medication, and often these contribute to noncompliance. In addition to the commonly reported adverse effects associated with stimulants (such as loss of appetite or insomnia), there are also more subtle adverse effects, including irritability and affective let down or rebound, which occur as the stimulant wears off. These effects may occur less often with the longer acting stimulants. Although poorly understood, these untoward effects undoubtedly contribute to the high discontinuation rate of stimulants in clinical practice. The availability of the pharmacologically active isomer of methylphenidate, dexmethylphenidate, may help contribute to our understanding of these stimulant adverse effects and rebound. Theoretically, this agent may have reduced adverse effects due to its unique chemical structure or because a lower total dose is needed to produce its effect on ADHD symptoms. It should be noted that this has not been

adequately tested or proven, as the initial study may not have had enough statistical power to detect differences in adverse effects.

2. There are subgroups of patients for whom a duration of action shorter than the long-acting stimulants but similar to, or slightly longer than, methylphenidate may be optimal (e.g. younger children, individuals with pervasive developmental disorders and ADHD symptoms who are often hypersensitive to stimulant adverse effects and require lower dosages, or perhaps individuals who display stimulant induced or exacerbated tics on other stimulants). Although there is some suggestion that dexmethylphenidate may have a slightly longer duration of action than methylphenidate, further research is needed on duration of action relative to other stimulants, as well as use with specific patient subgroups as described above.

3. Currently, the most likely use for is dexmethylphenidate is as a sculpting drug. For example, some adolescents and adults with ADHD often require 14 to 16 hours of treatment, especially if they are working or doing homework at night. Concerta<sup>TM</sup> or Adderall XR<sup>TM</sup> may provide an initial 10 to 12 hours of coverage, but this often requires supplementation, either to provide coverage during homework or studying time in the early evening or before the long-acting medication takes effect. Dexmethylphenidate may be a good choice to sculpt or combine with a long-acting stimulant. Another possibility would be for individuals with comorbid disorders who require concomitant psychotropic medication, such as an individual with depression and ADHD. The caution here is that there is very little empirical support for this approach, although it is commonly used in practice.

Hopefully, the availability of this agent will spur clinical research. Studies are needed which directly compare the efficacy, time course and stimulant adverse effects of dexmethylphenidate with other stimulants and with new populations, which will ultimately impact on clinical treatment.

<sup>1</sup> Use of tradenames is for product identification purposes only and does not imply endorsement.