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Stimulant formulations for the treatment of ADHD

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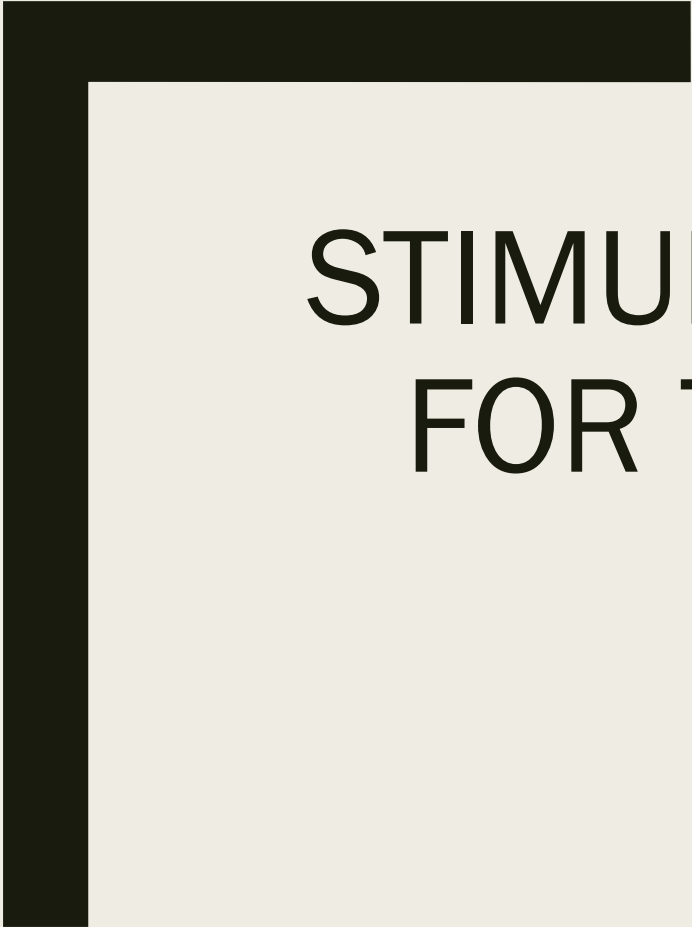
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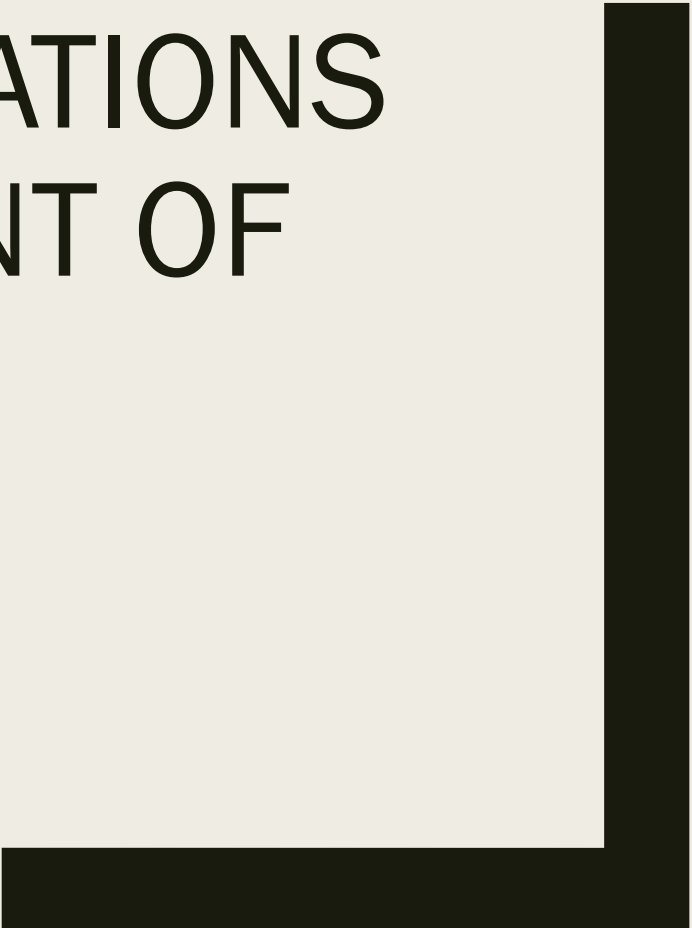
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STIMULANT FORMULATIONS FOR THE TREATMENT OF ADHD

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Why & how did we do this?

- Clinicians have access to a variety of formulations of methylphenidate and amphetamine to treat attention-deficit hyperactivity disorder (ADHD)
- However, due to new emerging formulations clinicians may lack up-to-date knowledge about all available stimulant formulations
- We present a comprehensive guide of 13 formulations of methylphenidate and 10 formulations of amphetamine that have U.S. Food and Drug Administration (FDA) approval to treat ADHD
- We searched PubMed using the following medical heading (MeSH) terms: “attention-deficit hyperactivity disorder”, “ADHD”, “stimulant”, “amphetamine”, and “methylphenidate”
- Our inclusion criteria were randomized control trials and systematic reviews until and through 2017

Methylphenidate

- Immediate release (IR)
- Sustained release (SR)
- Long acting (LA)
- OROS
- Transdermal
- Chewable tablet

Methylphenidate

- Dexmethylphenidate and dexmethylphenidate extended release (ER)
- Suspension solution
- Orally disintegrating tablet
- Multilayer-release beads

Amphetamines

- Mixed amphetamine salt (MAS)
- Dextroamphetamine IR and SR
- Lisdexamfetamine
- Dextroamphetamine extended release (XR)
- Amphetamine orally disintegrating tablet
- Amphetamine immediate release
- Amphetamine oral solution

Table 1. Currently Available Formulations of Methylphenidate and Amphetamine

Formulations	Time to Reach Peak Plasma Concentration	Duration of Action	Dosing
Methylphenidate			
Concerta (osmotic controlled-release delivery)	1 h, overall peak 6–10 h	12 h	Once daily
Daytrana (transdermal)	7.5–10.5 h	12 h	Once daily
Quillivant XR (suspension)	5–6 h	12 h	Once daily
Aptensio XR (multilayer beads)	5 h, shoulder at 7 h	12 h	Once daily
Cotempla CR-ODT (orally disintegrating tablets)	< 6 h	Up to 12 h	Once daily
Focalin XR (dextromethylphenidate)	1–3 h, shoulder at 4.7–6.3 h	8 h	Once daily
Quillichew ER (chewable tablets)	4–5 h	8 h	Once daily
Ritalin LA (long acting)	1–3 h, shoulder at 4.7–6.3 h	8 h	Once daily
Ritalin SR (sustained release)	4.7 h	8 h	Once daily
Focalin IR (dextromethylphenidate)	1–2 h	4 h	3 times daily
Methylin IR (chewable tablets)	1–2 h	3–6 h	3 times daily
Ritalin (immediate release)	1.9 h	3–6 h	3 times daily
Amphetamine			
Mydayis XR (dextroamphetamine)	7–10 h	16 h	Once daily
Vyvanse (lisdexamfetamine)	3–5 h for active compound	> 8 h	Once daily
Adderall XR (extended release)	7 h	> 8 h	Once daily
Adzenys XR (orally disintegrating tablets)	5 h	> 8 h	Once daily
Evekeo IR (dextroamphetamine/levoamphetamine)	4 h	9 h	Once daily
Dynavel XR (dextroamphetamine/ levoamphetamine suspension)	4 h	8 h	Once daily
Procentra IR (dextroamphetamine suspension)	< 3 h	< 6 h	2 times daily/3 times daily
Adderall (immediate release)	3 h	4–6 h	3 times daily

Abbreviations: CR = controlled release, ER = extended release, IR = immediate release, XR = extended release.

Clinical points

- Many stimulant formulations are available for the treatment of attention-deficit/hyperactivity disorder (ADHD)
- Stimulant formulations for ADHD have unique properties such as type of formulation, time to reach peak plasma concentration, duration of action, and dosing schedule
- Currently available formulations of methylphenidate and amphetamine are highly customizable for many unique patient factors

Disclosures

- Gautam M, Prabhakar D. Stimulant formulations for the treatment of attention deficit/hyperactivity disorder. *Prim Care Companion CNS Disord.* 2018;20(6)
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