STIMULANT MEDICATION

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Learning Objectives

1. Identify whether a stimulant medication is a methylphenidate or amphetamine product.
2. Distinguish between short and long/intermediate-acting stimulant products used in the treatment of ADHD.
3. Compare and contrast the time to benefit and expected duration of action of short and long/intermediate-acting stimulant products
4. Formulate key counseling pearls for a patient newly starting on stimulant medication for ADHD, including onset and duration of action, administration principles, common and serious adverse effects, follow-up monitoring, and expected duration of use.
5. Describe how a stimulant medication regimen can be adjusted to minimize a wearing off of effect in the afternoon/evening and to address bothersome side effects
6. Select a stimulant medication for treating ADHD in an individual patient

Stimulant Classes

Class	MOA	**Examples**
Methylphenidate	Blocks NE & DA reuptake into presynaptic neuron	**Concerta**, **Ritalin**, **Focalin**, **Metadate**, Daytrana, Adhansia, Jornay PM, Quillivant, Quillichew
Amphetamines		
Dextroamphetamine	NE & DA agonists, NE & DA reuptake blockade	**Dexedrine**, Zenzedi
Dextroamphetamine / Amphetamine (mixed salts)	NE & DA agonists, NE & DA reuptake blockade	**Adderall**, Evekeo
Lisdexamfetamine	Pro-drug of dextroamphetamine	**Vyvanse**

Principles of Use

- First line therapy
  - ~65 - 75% response rate in clinical trials
  - Rapid onset of effect
- Equivalent efficacy and tolerability observed between stimulant classes and formulations at population level
  - ADHD symptoms clusters are not predictor of response to specific agent
- Trial with alternative stimulant warranted if:
  - Lack of effectiveness (40% respond to methylphenidate and amphetamine stimulants; 40% respond to one or the other)
  - Intolerable adverse effects
- Start low dose and titrate as needed every 1-2 weeks

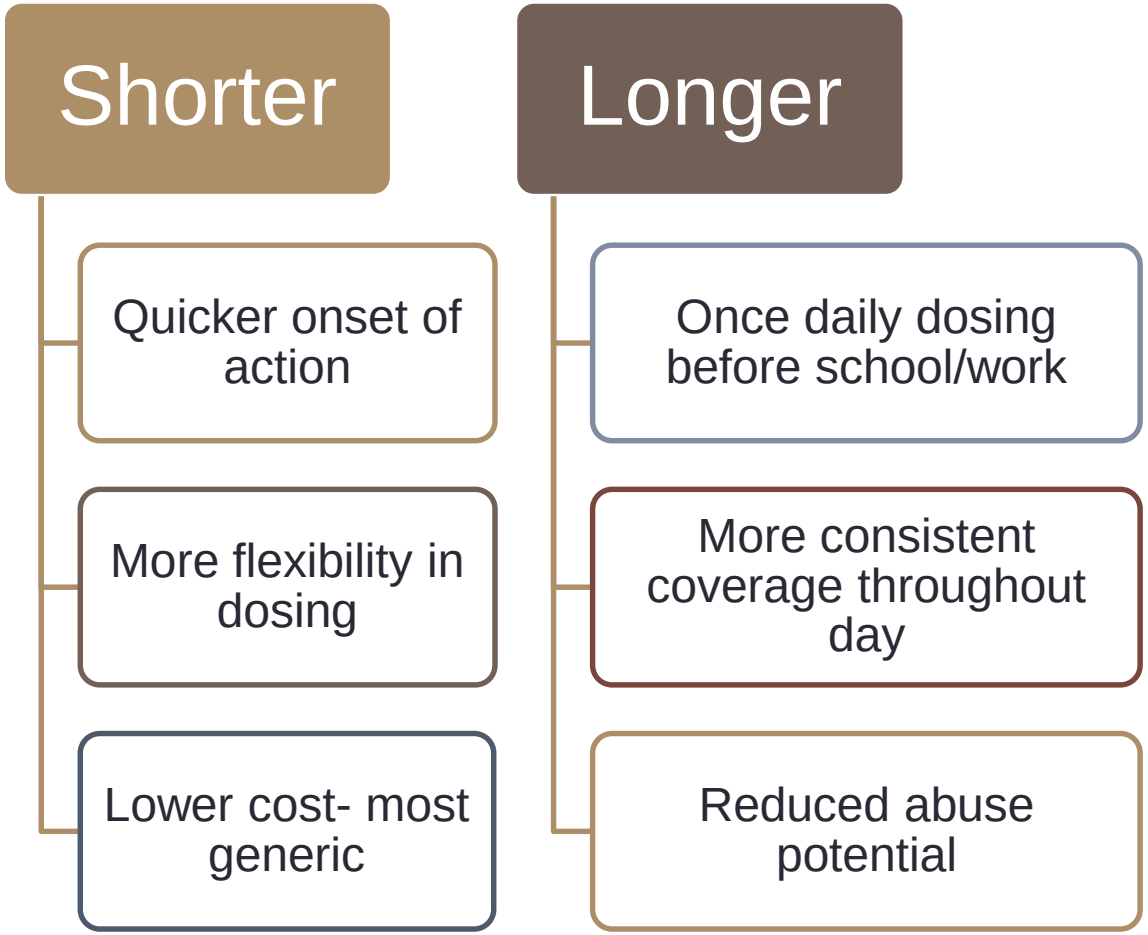
Shorter vs Longer/Intermediate Acting Stimulants

	Short Acting	Long / Intermediate Acting
Onset of Action	~30 minutes	~1 hour (longer delay for certain formulations)
Duration of Effect	Methylphenidate: 3 – 4 hours Amphetamine: 4 – 6 hours	8 – 12 hours (varies greatly based on formulation)
Available Dosage Forms	Methylphenidate: IR tablets, chewable tablets, oral solution Amphetamine: IR tablets, ODT, oral solution	Methylphenidate: ER tablets, XR capsules, LA capsules, LA/DR/ER capsules, XR ODT, ER chewable tablets, XR oral suspension, transdermal patch Amphetamine: XR capsules, chewable tablet, XR ODT, XR/ER oral suspension
Cost	Most generic, with exception of ODT	Methylphenidate: many generic options, some novel formulations brand only (XR ODT, XR suspension) Amphetamine: fewer generics, many brand only products
Administration		ER/XR tablets should be swallowed whole Many capsules can be opened, sprinkled on apple sauce

Special Formulations

Brand Name	Drug/Formulation	Onset of Action	Duration of Use	Administration / Notes
Methylphenidate derivatives				
Daytrana	Transdermal system	2 hours	2 – 3 hours post patch removal, 9 hours max wear time	Wear on hip, apply 2 hour prior to needed effect, titration recommended
Adhansia XR	Multi-layer release extended dose capsule	1 hours	16	May open capsule and mix with yogurt of applesauce
Jornay PM	DELEXIS® drug delivery system	8 – 10 hours	10 – 12 hours of effect (22 – 24 hours post dose)	Dose at bedtime, may open capsule and sprinkle on applesauce
Lisdexamfetamine				
Vyvanse	Prodrug of dextroamphetamine	1 – 1.5 hours	13	Lower abuse potential, may open capsule and mix in yogurt, water or OJ

Benefits of Shorter vs Longer/Intermediate Acting Stimulants



Adverse Effects of Stimulants

Common

- Loss of appetite
- Nausea / vomiting
- Weight loss
- Insomnia
- Anxiety
- Headache
- Behavioral rebounding

Serious and/or Rare

- ↑ HR, BP
- Growth retardation
- Mood liability / irritability / dysphoria / mania
- Psychotic symptoms
- Tics

Managing Stimulant Adverse Effects

Adverse Effect	Management Strategies
Loss of appetite / weight loss	Monitor weight every 6 mo, dose stimulant after AM meal, serve largest meal in evening, incorporate higher calorie foods/snacks, decrease dose or switch classes, weekend drug holidays
Insomnia	Administer dose earlier in day, switch from longer to shorting acting formulations, decrease dose, switch classes
Behavioral rebounding (wearing off effect)	Switch to longer acting agent, take small IR dose in afternoon, split doses for longer acting agents (AM and noon)

J Child Psychol Psychiatry. 2013;54:227-246.

Managing Stimulant Adverse Effects

Adverse Effects	Management Strategies
Tics	Observe intensity of tics over 3 mo before any decision is made, then dose reduction, switch classes or add alpha-2-adrenergic agonists (clonidine, guanfacine)
Growth retardation	Monitor height and weight every 6 mo, **see decreased appetite section, drug holidays
Mood liability / irritability / dysphoria	Screen for suicidal thoughts, treat underlying mental health condition, dose reduction or discontinuation
Psychotic or manic symptoms	Dose reduction or discontinuation, may switch to different class once psychotic or manic symptoms resolve

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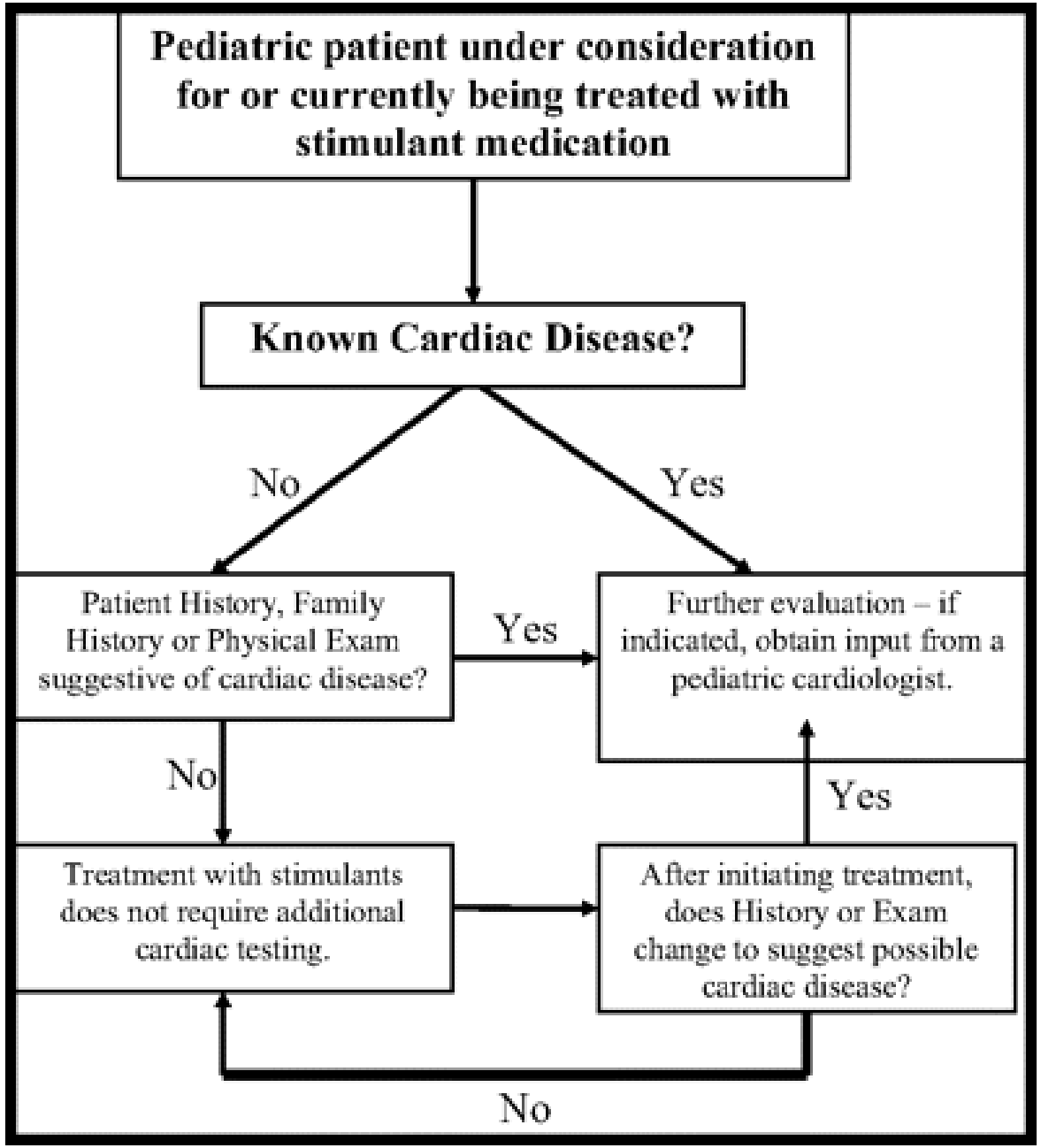
Recommended cardiac evaluation prior to receiving stimulant medication.



Pediatrics. 2008;122:451.

Stimulant Misuse Potential

- Stimulant misuse or diversion by patients and friends or family
  - Studying, staying awake, improved alertness, “cognitive performance enhancement”
  - Schedule II controlled substances
- Prevention
  - Full ADHD evaluation
  - Screen for personal or family history of AODA
  - Open discussion with patients and parents
  - Utilize long-acting preparations (Vyvanse)
  - Monitoring refill dates

Practice Assignments

- ADHD Practice Patient Cases in Canvas

Questions??

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