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ADHD in children and youth: Part 2 —Treatment – CPS Podcast

Developed by Renée Lurie and Dr. Stacey Bélanger, Dr. Mark Feldman and Dr. Brenda Clark for PedsCases.com.
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Introduction:

Hi, my name is Renée Lurie and I am a third-year medical student at the University of Ottawa. This podcast was made in conjunction with PedCases and the Canadian Pediatric Society. This is part two of a three-part series based on the 2018 CPS Statement on Attention Deficit and Hyperactivity Disorder. This podcast will discuss the new CPS statement, ADHD in children and youth: Part 2 – Treatment. These podcasts were created in conjunction with the authors of the statements: Dr. Stacey Bélanger from the University of Montreal, Dr. Mark Feldman from the University of Toronto, and Dr. Brenda Clark from the University of Alberta.

Learning Objectives:

1. Understand the key components of ADHD management and apply them to a clinical case.
2. Review non-pharmacologic interventions used in ADHD management.
3. Learn the indications for medical management.
4. Review commonly prescribed medications, regimens and side effects.

Clinical Case:

Let's review what we know so far. Sam is a 7-year-old boy who was brought into his primary care provider's office by his parents due to some difficulties he was having at school. His parents report that his teachers have noticed that he has difficulty sitting still in class, waiting his turn to answer questions and listening and following instructions. His parents note that once he gets home from school, he has lots of energy and is often jumping and climbing on the furniture. In our last podcast, you took a thorough history, did a physical exam and excluded common differential diagnoses. You provided Sam and his teachers with several standardized rating scales to fill out. After putting together all of this information, you diagnosed Sam with ADHD. He and his parents are now back to discuss management.

Management:

What are the key components of ADHD management?

ADHD treatment should comprise of a combination of pharmacological and non-pharmacological interventions. As many of these children have other psychiatric and

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developmental conditions, non-pharmacologic interventions are extremely beneficial to ensure the patient has a well-rounded care plan.

The type of first-line treatment will depend on the patient's age at diagnosis. For children who are younger than 6 years of age, a non-pharmacologic approach is recommended as the first-line treatment, whereas, in children older than six, medication along with behavioural interventions should be initiated. We will first discuss non-pharmacologic interventions and then pharmacologic. As there is a large range of non-pharmacologic interventions, treatment plans must be individualized to the patient's goals of care. Non-pharmacologic treatments should always be implemented first, or in conjunction with medications, if indicated. Non-pharmacologic interventions vary from those implemented in and outside of the school. At school, classroom interventions such as establishing routines and using visual cues, organizational skills training and daily report cards can be implemented. Outside of school, interventions include behavioural techniques focused on peer interactions and parent behaviour training. It is also important to manage the child's overall well-being through proper diet, sleep and exercise.

Now onto pharmacologic interventions! As I previously mentioned, medications may be considered as part of the treatment plan for children older than six. Health Canada actually has not approved the use of stimulants in children under six! It is advised that medications are provided to children whose attention difficulties and hyperactive behaviours impair their learning/academics or social interactions. Before selecting a medication, it is important to discuss any comorbid medical conditions and medications the patient is already on, whether there is a potential for medication abuse and how the patient will pay for these medications. The most effective medications used to treat ADHD are stimulants. These include dextroamphetamine-based (Adderall, Vyvanse) and methylphenidate-based (Biphentin, Concerta, Ritalin) medications. Stimulants can be very effective in both children and youth. For example, studies have shown improvements in school work productivity, decision making, fewer injuries needing ER visits, and better driving performance in adolescents[1-5].

Prior to starting medications, it is important to set goals or outcomes with the patient. These will help direct the treatment plan. The goals should be focused on symptom reduction and improving function, whether that be at school, in relationships or becoming more independent. As well, to track the patient's responsiveness to medications, standardized checklists should be used prior to and during treatment. These checklists should be completed in two or more settings, and must include involvement from the child's school. Examples of validated tools include the ADHD Rating Scale IV and the Conners Rating Scale[6]. The difference between the two main stimulant classes – methylphenidate and dextroamphetamine – is minimal. The choice of medication should depend on its effect, cost and administration. Stimulants are available in short-, intermediate-, and long-acting preparations. As adherence is often a challenge in children, once-daily, long-acting or extended release formulations are preferred. These are especially helpful in situations where a child is having inattention after school, such as when doing homework or socializing with friends, and teens who drive during the evenings. Extended release medications can last anywhere from 6 to 13 hours, depending on the drug prescribed. However, these are often more expensive and may not be an option for a family. Intermediate-release medications may be indicated for those patients who cannot tolerate longer-release formulations or if their treatment goals are focused more on short-term attention/behaviours. In some cases, for example, if a child struggles more at school or with friends than at home, a pause in taking the medication may be suggested over the weekends or school breaks. These

pauses should not be recommended for those who have a high risk of poor outcomes, a high possibility of risky behaviours during these times or are having issues interacting with peers.

Titration of dose should be individualized and not only based on the child's age, size or initial presentation severity. It generally takes 2-4 weeks after starting a medication to see if it's effective and tolerated. After the initial dose is tolerated, the dose should be increased weekly, biweekly or monthly until side-effects appear or symptoms improve. It is important to discuss efficacy with both the child's parents and teachers before changing doses. If there is a disagreement between the two, then identify in which situations they find the medication not working. For example, is it only after school? Then the medication may not be lasting the full day. Or is it only at school? Then there may be another contributing factor only in the school setting, such as bullying or the child having a learning disability.

To prevent side effects, the lowest effective dose should be prescribed. It is important to counsel parents on the most common adverse effects before starting a stimulant. These include decreased appetite, initial sleep difficulties, moodiness and irritability when the medication wears off. Before starting a stimulant, ask the patient about these to more easily monitor tolerance!

Some families also report that their child becomes quiet or too focused when on a stimulant. It may be that the stark difference in executive control they are witnessing is simply a normalization of behaviour. Adolescents rarely report personality changes. The overall risk of developing or worsening a tic disorder is not increased in those treated with a stimulant versus those with ADHD and not treated with a simulant.

One concern parents may have are the cardiovascular effects of stimulants. They can cause small increases in heart rate and blood pressure. Regular monitoring of blood pressure is recommended to ensure it does not go into a hypertensive range. Prior to starting medications, only children who have a personal or family history of cardiac disease, should undergo ECG testing or a cardiology consult. ECG screening is not recommended for all children.

Some studies have reported a decreased amount of growth with long-term, yearly, stimulant use; however, final adult height is usually not, or minimally affected. As well, children may experience a small reduction in BMI, especially if previously overweight, due to decreased appetite or a reduction in 'impulse-eating'. To prevent some of the effects of appetite suppression, extended-release medications should only be given with or shortly after breakfast, not prior. If the correct dose is given, appetite suppression should not be seen at dinner time, as the drug should wear off around then. It is important to continue to monitor the child's growth and height for a large change in percentiles on the child's growth curve. In these rare situations, supplements, a drug holiday, during a summer or break from school, or switching to a non-stimulant may be necessary[7].

If a medication change is required, before switching to a non-stimulant medication, another formulation of stimulant in the same class or an entirely different class of stimulant should be tried.

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Non-Stimulant Medications:

Although not first-line (and with a smaller treatment effect size), it is also important to discuss the two, long-acting non-stimulant medications, Atomoxetine – a selective norepinephrine reuptake inhibitor and Guanfacine XR - an alpha adrenergic drug. They are approved for children aged 6 to 17 years. These medications are given as add-ons to stimulants or when stimulants are contraindicated, ineffective or not tolerated. As their mechanism of action differs from that of a stimulant, they are less likely to be abused as their effect time is not as quick as a stimulant. If a stimulant is chosen for these individuals, a long-acting formulation is preferred. Non-stimulants generally last up to 24 hours and are usually once-daily dosing.

Non-stimulant medications also have adverse effects that are similar to simulants. Side effects reported with Amoxetine include GI symptoms, appetite loss, sleepiness, headaches, moodiness, irritability, and increased blood pressure and heart rate. Rare side effects include suicide events and hepatic disorders. Baseline liver function tests are needed if the patient is symptomatic.

Guanfacine XR has been shown to cause sedation, fatigue, orthostatic hypotension, decreased heart rate, and syncopal episodes. It is important to monitor blood pressure before starting the medication, when changing doses and at periodic intervals throughout the treatment course. As well, if Guanafacine is stopped, without tapering, it can cause rebound high blood pressure, increased heart rate and hypertensive encephalopathy. You should advise all patients to not stop the drug abruptly.

Both stimulants and non-stimulants come in a variety of delivery methods. These include capsules or tablets that need to be swallowed and capsules that contain granules that can be added to foods or liquids. Delivery method is one factor that should be considered when choosing the right medication.

In our case, would Sam need to be referred to a specialist or could he be managed by his primary care provider?

Most children without comorbid conditions are usually diagnosed and treated by their primary care provider. If the child has comorbid psychiatric, neurological or medical conditions or is still struggling after a trial of stimulants or non-stimulants, then a referral to or a consultation with specialist should be considered[8]. A referral can be made not only to specialist physicians but also psychologists, occupational therapists, social workers, and other health care professionals.

Now back to our case! Because Sam is 7 years old, we are going to start with a combined approach of medication and behavioural interventions. You and Sam's parents discuss the goals that they wish to include in his treatment plan. The rating scales are not repeated because they were recently completed. You will also conduct a full physical exam and record height and weight prior to starting therapy. As he has no comorbid medical conditions, you decide to prescribe him an extended-release stimulant, from the methylphenidate subclass, in a capsule that can be opened and added to soft food or liquids. As well, the social worker at Sam's school is going to work with his parents to provide behavioural techniques to use at home. The social worker, along with Sam's teacher, will also help implement classroom modifications, accommodations and organizational training to help Sam succeed at school! Sam's parents will

ensure he gets lots of exercise, which may help improve some of his symptoms. You set a follow-up appointment in two weeks to assess symptoms and for dose adjustment.

Key points learned:

1. ADHD is best managed with a combination of non-pharmacologic and pharmacologic interventions.
2. Non-pharmacologic interventions should focus on the child, school and parents. Examples of these include exercise, classroom accommodations and parent behaviour training.
3. When medications are required, stimulants are first line. If a stimulant is not effective in reducing symptoms or has adverse effects, changing the dose or using another formulation of stimulant in the same class or an entirely different class of stimulant should be tried. If there is still a large burden of symptoms or side effects, a non-stimulant medication can be prescribed.
4. A referral to a specialist may be helpful in terms of management if the child has comorbid conditions or has tried multiple medication trials with minimal improvements.

Thank you for listening! Stay tuned for part 3 of our series where we will discuss the assessment and treatment of children with ADHD and common comorbidities!

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