



## The Centre for ADHD Awareness, Canada

**The only Canadian charity focusing solely on ADHD,  
providing leadership in education, awareness and advocacy  
to improve the lives of families and individuals with ADHD  
across Canada**

# Teen Profile Discussion

## Discussion Questions

- Have you started to think about or attempted to develop your teen's profile?
- Are you finding it daunting?
- Was the template or sample profile of any assistance? How were you able to use it?
- What else do you feel might be helpful?





# CADDAC Interactive ADHD Adolescent Parenting Course

## ADHD Treatments

# PLEASE BE AWARE THAT

THE INFORMATION PROVIDED DURING THIS EDUCATIONAL COURSE IS FOR INFORMATIONAL PURPOSES ONLY.

IT IS NOT INTENDED TO BE PROFESSIONAL MEDICAL ADVICE, DIAGNOSIS, TREATMENT OR CARE.

NEVER DISREGARD PROFESSIONAL MEDICAL ADVICE OR DELAY IN SEEKING IT BECAUSE OF SOMETHING YOU HAVE HEARD DURING THIS WORKSHOP.

BY ACCESSING OR ATTENDING THIS PRESENTATION, YOU ARE INDICATING YOUR ACCEPTANCE TO BE BOUND BY THE TERMS AND CONDITIONS OF THE [USER AGREEMENT](#) AS STATED IN FULL.



# ADHD Treatment

Multimodal

Psychoeducation

Lifestyle

Therapies and Tutoring

Medication

Alternative Treatments

Research

# MULTIMODAL TREATMENT & PSYCHOEDUCATION

# ADHD Treatment

- Must always be multimodal, never medication alone - if used
- Psychoeducation should always be the first step

## The order of the next steps varies depending on individual adolescent

1. Life style changes – home structure, parenting and EF strategies – school accommodations and teaching strategies
2. If attention regulation is a significant symptom, medication should be considered – few other strategies significantly assist with this
3. Other options, CBT therapies and coaching (only for older more mature adolescents), mindfulness and EF tutoring
4. Some research has shown ADHD medication may help children decrease symptoms by adulthood

[Spencer TJ<sup>1</sup>](#), [Brown A](#), [Seidman LJ](#), [Valera EM](#), [Makris N](#), [Lomedico A](#), [Faraone SV](#), [Biederman J](#).

**Effect of psychostimulants on brain structure and function in ADHD: a qualitative literature review of magnetic resonance imaging-based neuroimaging studies, [J Clin Psychiatry](#). 2013 Sep;74(9):902-17. doi: 10.4088/JCP.12r08287.**

© CADDAC 2021



# LIFESTYLE



# Lifestyle

- A healthy brain friendly life style will be benefit general brain functioning but will not eliminate symptoms.
- A healthy balanced, protein rich diet, is good for general brain functioning.
- Elimination diets are not helpful unless the teen has special sensitivities which require a specialized diet.
- Physical aerobic activity may be beneficial.
- Insufficient sleep impacts concentration, coordination, memory, and mood – ADHD in of itself can cause sleep issues, good sleep habits may assist.
- Some studies have shown that limiting screen time may be helpful, but research is still minimal – time management impairment and over-focusing may be implemented in excessive computer gaming.
- Caffeine, energy drinks, cigarettes are all stimulants.
- Beware of self medication through alcohol and marijuana.



# THERAPIES AND TUTORING

# Therapies and Tutoring

## Cognitive Behaviour Therapy (CBT)

- Challenges a person's underlying negative thinking and replaces it with better thinking pattern
- Has proven effective in adults especially in combination with medication
- Has not proven affective in children and is less effective in adolescents than adults
- This is possibly due to less maturity and self insight pre adulthood

## Relaxation Therapies / Mindfulness

- Have been shown to be beneficial
- Mindfulness has been implemented in some schools
- Mindfulness has been shown to be beneficial for parents (Mindful Parenting Dr. Mark Bertin)



# Other Therapies and Tutoring

## Other Therapies

- All types of family therapy can be beneficial if the therapist has a good understanding of ADHD
- Anger management may be considered if above is also true

## Specialized Tutoring

- ADHD coaching is not recommended for children
- Specialized tutoring can be beneficial, especially if the tutor is knowledgeable about ADHD and EF and focuses on strengthening EF skills
- Increased accountability to a tutor may increase follow-through
- It is not recommended that parents act as tutors – this places additional strain on the parent/adolescent relationship



# MEDICATION

# The Medication Dilemma

- An extremely stressful decision for parents and adolescents may show great reluctance if they are forced
- Misinformation and therefore stigma remains a factor
- This is the most common topic leading to discord between parents, other than the diagnosis
- One parent may see themselves in the child
- Medication can become a power struggle between parents and ultimately the parents and adolescent
- This discord can easily sabotage treatment protocol
- This may be one of the reasons why medication is often stopped after the first sign of side effects
- Psychoeducation of the parent and adolescent will increase medication compliance
- Parents and adolescents need to be informed of what medication can and cannot do and potential side effects
- Medication is not a magic pill and pills do not teach skills



## Information to Consider When Reviewing Medication as a Treatment Option

- Decisions around medication are individual.
- Untreated ADHD has serious side effects as well.
- Have other treatments and strategies been tried –where they effective and to what degree?
- Consider the level of your teen’s impairment – safety issues?
- Has academic impairment occurred for some time resulting in learning gaps? How will this effect their post-secondary career?
- Consider impairments other than academic – family relationships, friendships, sports/hobbies.
- How quickly do you need treatment to take effect?
- Is self medication occurring?
- Driving when not on medication can be very dangerous

NOTE: There is no good way to know which medication and which dose is optimum without a trial.



# Adolescent Medication Adherence

- Medication adherence drops off in adolescence

## Why Might Your Adolescent be Refusing to Take Their Medication?

They may:

- be exerting their independence;
- want to deny that they have ADHD – may see this as labelling them and infringing on their individuality;
- want to deny that anything is wrong with them;
- not want to be different from their peers in any way – they may need help to develop their own identity;
- be embarrassed that they need to take medication;
- have read negative things about ADHD medication online or been told negative things about ADHD medication by others;
- fear that the medication will change their personality or peers may think they are more “fun” off of meds;
- be experiencing side effects;
- may not comply due to ODD.





# Strategies to Help with Medication

- Try not to turn this into a power struggle
- Parents' divided opinions may be causing issues – seek help
- Have an open discussion to find out what the underlying issue is so you can address it appropriately – if side effects see the doctor immediately
- Educate your adolescent about their ADHD and how their medication works (CADDAC adolescent video series)
- Have them speak with their doctor or other medical professional (counsellor) about their concerns – third party
- Encourage their participation in medical discussions about medication
- Have them meet with an older adolescent or young adult who can share their own experiences on medication
- Use the CPS approach
- Have your teen agree to a brief trial off and on medication and do not let teachers, friends etc. know – chart the good and bad effects while off and on medication and compare



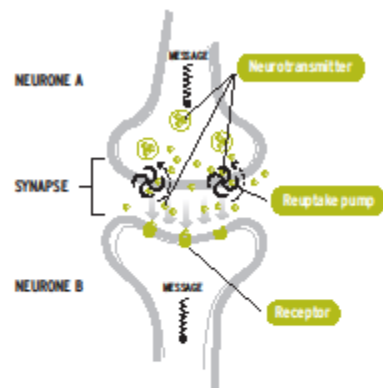
# Brain Functioning

## How the brain and nervous systems communicate

- Brain cells are made up of neurons which are separated by tiny gaps called synapses
- Neurons pass information to each other by sending chemical messengers or neurotransmitters across the synapses
- The neurotransmitter binds with the receptor site on the next neuron
- The unused portion of the neurotransmitter is reabsorbed by the neuron that produced it



## ILLUSTRATION OF A SYNAPSE



Illustrations from: My Brain Still Needs Glasses, Annick Vincent, Québec Livres 2013  
www.attentiondeficit-info.com

## ADHD Pharmacologic Treatment Steps\*

\* Caution: This may not apply to all. Always individualize treatment plan. For specific details on how to start, adjust and switch ADHD medications, clinicians are invited to refer to the Canadian ADHD Practice Guidelines ([www.caddac.ca](http://www.caddac.ca)).

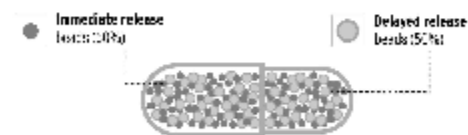
### ADHD Diagnosis + clinical indication to treat with medication

- Start long acting psychostimulant (amphetamines or methylphenidate-based)
  - Consider duration of action, delivery mechanism and active ingredient
  - Possibility to augment with a non stimulant or add a short acting stimulant to prolong clinical effects
- Failure/intolerance: Try a different long acting psychostimulant
  - Consider duration of action, delivery mechanism and active ingredient
  - Possibility to augment with a non stimulant or add a short acting stimulant to prolong clinical effects
- Failure/intolerance: Consider a switch to non-stimulant (monotherapy)
- Sub-optimal response: Consider adding a non-stimulant (adjunct / combination therapy)

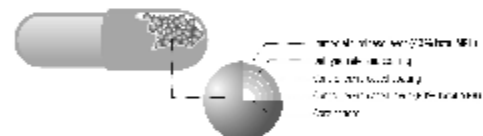


## Delivery System of Long Acting Psychostimulants

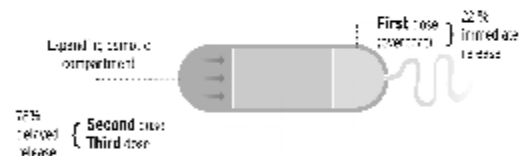
### ADDERALL XR®



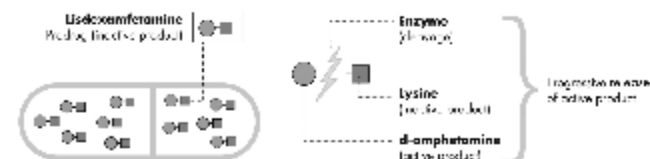
### BIPHENTIN®



### CONCERTA®



### VYVANSE®



Document developed by Annick Vincent MD ([www.attentiondeficit-info.com](http://www.attentiondeficit-info.com)) and Direction de l'intégration des technologies de l'information (DIT), Laval University.

# Brain Functioning and ADHD

## What needs to happen for this to work effectively?

1. Enough neurotransmitters need to be produced by the neuron and released
2. The neurotransmitter must stay in the synapse space long enough for it to bind with the receptor site on the next neuron

In those with ADHD the neurotransmitters may be prematurely reabsorbed – this prevents messages to be sent in a timely or adequate manner.



# How ADHD Medication Works

## Medications work in two ways

- They increase the release of the transmitters Dopamine and Norepinephrine
- They block or slow the reabsorption of the neurotransmitter

Thereby allowing more transmitters to be held in the synapse space so it can bind with the receptor and messages can be more effectively transmitted

- Methylphenidate based medications block the reuptake of dopamine and norepinephrine
- Amphetamines do the above but also increase the release of dopamine
- This may be why some people respond more to one medication than the other



# Types of ADHD Medication

## Two Main categories:

- Stimulant
  - Methylphenidate based
  - Amphetamine based
- Non-stimulant

## Stimulants

- Immediate response no build up in system required
- Works only when in system – can be tailored to patient's needs
- Different medications different in times of effectiveness (Concerta slower to enter, Adderall quicker to leave)
- Total effectiveness in 90-95% of ADHD population (70% respond to one type and 70% will respond to the other)





# Non Stimulant ADHD Medications

**Non-stimulant are not controlled substances**










## **Atomoxetine**

- It is a specific nor-adrenaline re-up take inhibitor – blocks Noradrenalin transporter has some impact on Dopamine
- Must be taken daily and starts working in 3-4 weeks with maximum potential reached in 6-8 weeks

## **Guanfacine**

- A alpha 2A-adrenergic receptor agonist – the receptor inhibits release of norepinephrine, no impact on Dopamine therefore complementary to both stimulants – add on or stand alone
- May be useful in cases with tic disorders, anxiety, ODD and aggression, or with significant side effects to stimulants
- Maximum treatment effect takes several weeks and onset gradual
- Sedation and lowering of pulse and blood pressure side effect – medication should not be stopped abruptly

## Quick Guide to ADHD Medication in CANADA - March 2019

Medications available and illustrations of Tabs	Liberation mode (% Immediate / delayed)	Particularities	Duration of action <sup>1</sup>	Starting Dose <sup>2</sup>	Dose titration as per product monograph
<b>Amphetamine-based psychostimulants</b>					
<b>Dexedrine®</b> Tablets 5 mg <b>Dexedrine®</b> Spansules 10, 15 mg 	(100/0)  (50/50)	Pill can be crushed <sup>3</sup> Spansule	~ 4 h  ~ 6 - 8 h	Tablets – 2.5 to 5 mg BID  Spansules – q.d. 10 mg am	↑ 2.5 - 5 mg at weekly intervals;  Max. dose/day: (q.d. or b.i.d.) All ages – 40 mg
<b>Adderall XR®</b> Capsules 5, 10, 15, 20, 25, 30 mg 	(50/50)	Sprinkable Granules	~ 12 h	5 - 10 mg q.d. a.m.	↑ 5 mg at weekly intervals Max. dose/day: Children – 30 mg Adolescents and Adults – 20 - 30 mg
<b>Vyvanse®</b> Capsules 10, 20, 30, 40 50, 60, 70* mg 	Prodrug	Capsule content can be diluted in water, orange juice and yogurt	~ 13 - 14 h	20 - 30 mg q.d. a.m.	↑ by clinical discretion at weekly intervals Max. dose/day: All ages – 60 mg
<b>Methylphenidate-based Psychostimulants</b>					
<b>Methylphenidate short acting</b> Tablets 5 mg (generic) 10, 20 mg (Ritalin®) 	(100/0)	Pill can be crushed <sup>3</sup>	~ 3 - 4 h	5 mg b.i.d. to t.i.d. Adult: consider q.i.d.	↑ 5 mg at weekly intervals Max. dose/day: All ages – 60 mg
<b>Biphentin®</b> Capsules 10, 15, 20, 30, 40, 50, 60, 80 mg 	(40/60)	Sprinkable Granules	~ 10 - 12 h	10 - 20 mg q.d. a.m.	↑ 5 - 10 mg at weekly intervals Max. dose/day: Children and Adolescents – 60 mg Adults – 80 mg
<b>Concerta®</b> Extended Release Tabs 18, 27, 36, 54 mg 	(22/78)	Pill needs to be swallowed whole to keep delivery mechanism intact	~ 12 h	18 mg q.d. a.m.	↑ 9 - 18 mg at weekly intervals Max. dose/day: Children – 54 mg Adolescents – 54 mg / Adults – 72 mg
<b>Foquest®</b> Capsules 25, 35, 45, 55, 70, 85, 100 mg 	(20/80)	Sprinkable Granules	~ 16 h	25 mg q.d. a.m.	↑ 10-15 mg in intervals of no less than 5 days Max. dose/day: Children and Adolescents – 70 mg Adults – 100 mg
<b>Non psychostimulant - Selective Norepinephrine Reuptake Inhibitor</b>					
<b>Strattera®</b> (Atomoxetine) Capsules 10, 18, 25, 40, 60, 80, 100 mg 	Not applicable	Capsule needs to be swallowed whole to reduce GI side effects	Up to 24 h	Children and Adolescents : 0.5 mg/kg/day Adults – 40 mg q.d. for 7-14 days	Maintain dose for a minimum of 7 - 14 days before adjusting: Children – 0.8 then 1.2 mg/kg/day 70 kg or Adults – 60 then 80 mg/day Max. dose/day : 1.4 mg/kg/day or 100 mg
<b>Non psychostimulant - Selective Alpha-2A Adrenergic Receptor Agonist</b>					
<b>Intuniv XR®</b> (Guanfacine XR) Extended Release Tabs 1, 2, 3, 4 mg 	Not applicable	Pills need to be swallowed whole to keep delivery mechanism intact	Up to 24 h	1 mg q.d. (morning or evening)	Maintain dose for a minimum of 7 days before adjusting by no more than 1 mg increment weekly Max. dose/day: Monotherapy: 6-12 years – 4 mg, 13-17 years – 7 mg As adjunctive therapy to psychostimulants 6-17 years – 4 mg

Note: Illustrations do not reflect real size of pills/capsules. For specific details on how to start, adjust and switch ADHD medications, clinicians are invited to refer to the Canadian ADHD Practice Guidelines ([www.caddac.ca](http://www.caddac.ca)). <sup>1</sup> Pharmacokinetic and pharmacodynamic response vary from individual to individual. The clinician must use clinical judgement as to the duration of efficacy and not solely rely on reported values for PK and duration of effect. <sup>2</sup> Starting doses are from product monographs. CADDAC recommends generally starting with the lowest dose available. <sup>3</sup> Higher abuse potential. \* Vyvanse 70 mg is an off-label dosage for ADHD treatment in Canada. Document developed by Annick Vincent MD ([www.attentiondeficit-info.com](http://www.attentiondeficit-info.com)) and Director des communications et de la philanthropie, Laval University.







# Detailed Medication Information

For detailed information on medication approved to treat ADHD in Canada please access:

[First line stimulant medication treatment information](#)

[Non stimulant long acting medication treatment information](#)

[Second line immediate release medication treatment information](#)

**Provincial and Federal Formulary Information**

<https://www.caddra.ca/provincial-and-federal-public-formulary-overview/>



# Effectiveness of ADHD Medication

- Medication effectiveness is measured on a scale 0.4 = barely evident and 1.0 = a strong therapeutic result
- Optimal stimulant medication at optimal dose can be as high as 2.1
- Not having an optimal result may be due to the physician not increasing the dose once some improvement is seen
- You need to increase past the optimal dose – once improvements are no longer seen the last dose is considered the optimal dose
- The goal is maximum benefit with minimal dose and least side effects
- No way to predict who will respond better to which medication and what is the best dose for a person – a medication trial must be done
- The reason why people respond differently to different medication is not known but may be due to metabolism rates, fast/slow

[How Does ADHD medication Work, William Dodson MD, Attitude](#)

A Deeper Dive into the Clinical Psychopharmacology of ADHD Medications, D. Coghill Meeting of the Minds



# Effectiveness of ADHD Medication

- ADHD medications are as effective as medications used for non psychiatric conditions
- Overall:
  - amphetamines showed a large improvement in all age groups,
  - methylphenidate a large improvement in children and moderate in adults and
  - guanfacine, clonidine, atomoxetine showed moderate improvements
- however results are still individual
- Stimulants found to be highly effective in reducing aggression, ODD and Conduct Disorder
- Use associated with increased probability of completing high school by 2/3rds
- Discontinuation associated with decline in grade point average
- Use associated with reduced injury, brain trauma, motor vehicle accidents, 40% reduction in the risk of depression, reduced substance abuse, offending, teen age pregnancy

International Consensus Statement



# Medication Tolerance

## Behavioural Tolerance

- “Behavioural tolerance” occurs when one notices that some ADHD symptoms are still there
- Dose increase may have been stopped after first realized benefits
- When the person reaches the “new normal” remaining symptoms become more apparent

## Medication Tolerance

- Gradual dose increase over time is not uncommon but many are fine with the same dose for extended periods of time (weight increase?)
- Most do not need medication holidays
- Some require higher doses at the end of the day
- If true medication tolerance is an issue medications can be washed out for a week and then restarted
- If this does not work medication may need to be changed

A Deeper Dive into the Clinical Psychopharmacology of ADHD Medications, D. Coghill Meeting of the Minds



# Side Effects

- All medications including over the counter meds have common as well as rare life threatening side effects
- Important thing is to be aware of: (Your physician should be sharing this information)
  - Which side effects are expected to be short term
  - When they become significant enough to consider changing the medications or dose
  - When side effects require an urgent call to the doctor
- If the child is too "wired", irritable or too serious during the time medication is working, the dose may be too high or a different medication may need to be tried
- More common side effects seen on CADDAC medication charts
- Side effects on one stimulant does not mean side effects on others
- Serious but very rare side effects of all ADHD medications, agitation, psychosis, suicidal ideation, possible serious cardiovascular events if preexisting cardiac issues exist for stimulants – cardiac history taken by physician



# Things to Consider When Selecting a Medication

- Length of symptom control required and early or late hour coverage?
- Is immediate symptom control required?
- The symptom profile including comorbidities
- Family history on ADHD medications
- Physical medical problems – medication interactions, cardiac risk
- Cost
- Are their problems with swallowing pills?
- Diversion or abuse potential
- There is no way of knowing which medication is most effective with the least number of side effects without a trial
- The rule of thumb is “start low” and “go slow” – therefore it will take some time to discover optimal medication and dose
- One must titrate past the optimal dose to find the optimal dose



# ALTERNATE TREATMENTS

# Alternative Treatments

- To-date there is no scientific evidence that indicates the use of alternative treatments
- Research indicates, very slight or no benefits from Omega 3 supplements – possible adjunct therapy
- Dietary interventions, elimination diets or supplements, conclusion to-date – no robust, unbiased evidence
- To-date neurofeedback and brain training including Cogmed – studies on NF contradict each other, Cogmed study found no transfer of skills to working memory or outside Cogmed
- While not found to be harmful these intervention can be expensive, time consuming and divert from more effective treatments
- Some natural products may have a stimulant effect, so be aware that using them in combination with medication may be dangerous – discuss this with your doctor
- People self medicate with caffeinated beverages, cigarettes etc. and can become dependent more easily





# RESEARCH

# Summary of Latest Research

- Lack of evidence for cognitive training, neurofeedback, antidepressants, antipsychotics, dietary therapy, fatty acids, and other complementary and alternative medicine
- Behavioural therapy alone was more effective than placebo
- Stimulants were superior to behavioral therapy
- Stimulants (methylphenidate and amphetamine) worked better than non-stimulants (atomoxetine and guanfacine)
- Behavioral therapy, combined with stimulants, was better than stimulants or non-stimulants alone
- Behavioral therapy, stimulants and their combination showed the best profile of acceptability
- Both stimulants and non-stimulants seemed well tolerated
- Most of the effective medication treatments were associated with some side effects (anorexia, weight loss and insomnia), but an increased risk of serious adverse events was not observed

Catalá-López F, Hutton B, Núñez-Beltrán A, et al. The pharmacological and non-pharmacological treatment of attention deficit hyperactivity disorder in children and adolescents: a systematic review with network meta-analyses of randomised trials. *PLoS One*. 2017;12(7). doi.org/10.1371/journal.pone.0180355. Published July 12, 2017.



# How to Evaluate Research Studies

## Questions to ask:

- Is the study a double blind study? (neither the participant nor examiner knows if the patient is receiving the treatment or placebo)
- Is it a large scale study?
- Has the study been duplicated many times with the same result?
- Is the study published in a reputable medical journal?
- Has the study been peer reviewed? (been reviewed for methodology, analysis and findings by others in the field)
- Has the study found causality or just correlation?
- Is more research required before conclusions can be drawn?



# References

- [Spencer TJ](#)<sup>1</sup>, [Brown A](#), [Seidman LJ](#), [Valera EM](#), [Makris N](#), [Lomedico A](#), [Faraone SV](#), [Biederman J](#). Effect of psychostimulants on brain structure and function in ADHD: a qualitative literature review of magnetic resonance imaging-based neuroimaging studies, [J Clin Psychiatry](#). 2013 Sep;74(9):902-17. doi: 10.4088/JCP.12r08287
- How do Stimulants for ADHD Work?  
<http://add.about.com/od/treatmentoptions/f/How-Do-Stimulants-Work.htm>
- Canadian Attention Deficit Hyperactivity Disorder Resource Alliance (CADDRA): Canadian ADHD Practice Guidelines, Fourth Edition, Toronto ON; CADDRA, 2018.
- <http://www.thementalelf.net/mental-health-conditions/adhd/brain-imaging-reveals-different-pattern-of-activity-in-adhd-which-is-partly-normalised-by-medication/#sthash.LVvPgLav.dpuf>
- [Sheik Hosenbocus](#), MD, FRCP(C)<sup>1</sup> and [Raj Chahal](#), MSW<sup>2</sup>. J Can Acad Child Adolesc Psychiatry. 2009 Nov; 18(4): 331–339, Review of Long-Acting Medications for ADHD in Canada
- Quick guide to ADHD Medication in Canada 2019, developed by Dr. Annick Vincent ([www.attentiondeficit-info.com](http://www.attentiondeficit-info.com)) and Direction de l'intégration des technologies de l'information (Diti), Laval University <http://www.attentiondeficit-info.com/pdf/quick-guide-adhd-medication-canada.pdf>



# DISCUSSION AND QUESTIONS?