Attention Deficit Hyperactivity Disorder
“Practical Pharmacology Update”

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• I am not endorsing the medications I am about to discuss.

• I do not intend to discuss an unapproved/investigative product/device in my presentation.
Learning Objectives

• Develop an appreciation for the evidence based medicine research supporting the use of these medications.

• Become more familiar with ADHD medications available on today’s market.

• Gain knowledge initiating, titrating and following up ADHD medications.

• Develop an appreciation for the concerns regarding the use of these medications.
Lifetime Impairment of ADHD

Appropriate management reduces the impairments described above to be almost equal that of non-ADHD patient!!!
Evidence Base Medicine

- The Multimodal Treatment Study of Children with ADHD (MTA)
  - 14-month clinical trial of treatment strategies
  - 579 children with ADHD
  - Subjects randomized to 1 of 4 treatment conditions
    - Medication management
    - Behavior management
    - Medication management and behavior management
    - Community-based treatment
Treatment Strategies for ADHD

• All treatment arms improved symptoms on an absolute basis.

• Medication management alone or medication management with behavior management were superior to behavior management alone or community-based treatment.

• Medication management alone or medication management with behavior management for ADHD symptoms were almost equally effective.
Proposed Neurochemistry of ADHD

• Both dopaminergic (DA) and noradrenergic (NE) systems are strongly implicated in the pathophysiology of ADHD.

• Meso-cortical / Fronto-striatal pathways

• Medications potentiate the actions of both dopamine and norepinephrine in the synapse.
Catecholamine Reuptake Inhibition: Likely Mechanism of Action of Drugs
Catecholamine Reuptake Inhibition: Likely Mechanism of Action of Drugs
ADHD Medications

Stimulants
- Methylphenidate
- Amphetamines

Duration of Action
- Short
- Long

Non-Stimulants
- Noradrenaline Re-uptake Inhibitors
- Alpha-2-Agonists
- Tricyclic Antidepressants
ADHD Symptoms and Rx:

- NON-ADHD
- UNTREATED ADHD
- SHORT ACTING STIMULANT: ↓ dose ↑ frequency
- SHORT ACTING STIMULANT: ↑ dose ↓ frequency
- LONG ACTING TREATMENT

Control of symptoms:
- +4 SD
- +3 SD
- +2 SD
- +1 SD
- 0
- -1 SD
- -2 SD
- -3 SD
- -4 SD

Time:
- 0700
- 1200
- 1900

Dose changes:
- ↓ dose
- ↑ frequency
- ↓ frequency
# Short-Acting Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>METHYLPHENIDATE</th>
<th>DEX-MPH</th>
<th>DEX-AMPH</th>
<th>MANUFACTURER</th>
<th>DOSES</th>
<th>DRUG FORM</th>
<th>FREQUENCY</th>
<th>ONSET</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>Ritalin</td>
<td>Methylin (grape)</td>
<td>Focalin</td>
<td>Dexedrine / ZENZEDI</td>
<td>Eveko</td>
<td>Procentra (bubble gum)</td>
<td>Adderall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MANUFACTURER:</td>
<td>NOVARTIS</td>
<td>MALLINCKRODT</td>
<td>NOVARTIS</td>
<td>GSK / USP</td>
<td>Arbor</td>
<td>Independent Pharmaceutical</td>
<td>SHIRE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOSES</td>
<td>5 mg 10 mg 20 mg</td>
<td>5 mg/5 ml 10 mg/5 ml 2.5, 5, 10 mg</td>
<td>2.5, 5, 10 mg</td>
<td>5 - 10 mg 2.5, 5, 7.5 10, 15, 20 30 MG</td>
<td>5 mg 10 mg</td>
<td>2.5, 5, 7.5, 10, 15, 20, 30 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>tablet</td>
<td>elixir chew tabs</td>
<td>tablet</td>
<td>tablet</td>
<td>tablet</td>
<td>elixir</td>
<td>tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>2-4 X per day</td>
<td>2-4 X per day</td>
<td>2-4 X per day</td>
<td>2-3 X per day</td>
<td>2-3 X per day</td>
<td>2-3 X per day</td>
<td>2-3 X per day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ONSET</td>
<td>20-30 minutes</td>
<td>20-30 minutes</td>
<td>20-30 minutes</td>
<td>20-60 minutes</td>
<td>20-60 minutes</td>
<td>20-60 minutes</td>
<td>30-60 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DURATION</td>
<td>3-5 hrs</td>
<td>3-5 hrs</td>
<td>3-5 hrs</td>
<td>4-6 hrs</td>
<td>4-6 hrs</td>
<td>4-6 hrs</td>
<td>4-8 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Long-acting Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>METHYLPHENIDIATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>RITALIN SR</td>
</tr>
<tr>
<td>MANUFACTURER</td>
<td>NOVARTIS</td>
</tr>
<tr>
<td>DOSES</td>
<td>20 MG</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>TABLET</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>1-2 X /DAY</td>
</tr>
<tr>
<td>ONSET</td>
<td>30-60 MIN</td>
</tr>
<tr>
<td>DURATION</td>
<td>6-8 HOURS</td>
</tr>
<tr>
<td>FORMULATION TECHNOLOGY</td>
<td>Wax Matrix</td>
</tr>
<tr>
<td>IMMEDIATE RELEASE</td>
<td>50%</td>
</tr>
<tr>
<td>SUSTAINED RELEASE</td>
<td>50%</td>
</tr>
<tr>
<td>PEARLS</td>
<td>One can cut and / or crush the tablet</td>
</tr>
</tbody>
</table>
# Long-acting Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>METHYLPHENIDATE</th>
<th>DEX-METHYLPHENIDATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>DAYTRANA MPH PATCH</td>
<td>QUILLIVANT XR (BANANA)</td>
</tr>
<tr>
<td>MANUFACTURER</td>
<td>SHIRE</td>
<td>PFIZER</td>
</tr>
<tr>
<td>DOSES</td>
<td>10, 15, 20, 30 MG</td>
<td>5 MG/ML</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>PATCH</td>
<td>ELIXIR</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>1 X / DAY</td>
<td>1-2X/DAY</td>
</tr>
<tr>
<td>ONSET</td>
<td>60-120 MIN</td>
<td>45-60 MIN</td>
</tr>
<tr>
<td>DURATION</td>
<td>9 HOURS</td>
<td>10-12 HOURS</td>
</tr>
<tr>
<td>FORMULATION TECHNOLOGY</td>
<td>TRANSDERMAL APPLICATION</td>
<td>---</td>
</tr>
<tr>
<td>IMMEDIATE RELEASE</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SUSTAINED RELEASE</td>
<td>100%</td>
<td>---</td>
</tr>
<tr>
<td>PEARLS</td>
<td>Apply when needed</td>
<td>Liquid that can be swallowed alone or</td>
</tr>
<tr>
<td></td>
<td>Beware of use adhesiveness in warm</td>
<td>mixed with another liquid</td>
</tr>
<tr>
<td></td>
<td>climates.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beware of contact dermatitis</td>
<td></td>
</tr>
</tbody>
</table>
## Long-acting Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>D-AMPHETAMINE</th>
<th>MIXED AMPHETAMINE SALTS (MAS)</th>
<th>D-AMPHETAMINE</th>
<th>D-AMPHETAMINE</th>
<th>Lis-Dexamfetamine</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>DEXEDRINE SPANSULES</td>
<td>ADDERALL XR</td>
<td>ADZENYS XR-ODT</td>
<td>DYANAVE XR</td>
<td>Vyvanse</td>
</tr>
<tr>
<td>MANUFACTURER</td>
<td>SHIRE</td>
<td>RHODES</td>
<td>TRIS</td>
<td>SHIRE</td>
<td></td>
</tr>
<tr>
<td>DOSES</td>
<td>5, 10, 15 MG</td>
<td>5, 10, 15, 20, 25, 30 mg</td>
<td>3.1, 6.3, 9.4, 12.5, 15.7, 18.8 MG</td>
<td>2.5 MG/ML</td>
<td>20, 30, 40, 50, 60, 70 mg</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>CAPSULE</td>
<td>CAPSULE</td>
<td>TABLET</td>
<td>Liquid</td>
<td>Capsule</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>1-2 X / DAY</td>
<td>1-2 X / DAY</td>
<td>1-2 X / DAY</td>
<td>1-2 X / DAY</td>
<td>1 per day</td>
</tr>
<tr>
<td>ONSET</td>
<td>30-60 MIN</td>
<td>30-60 MIN</td>
<td>30-60 MIN</td>
<td>30-60 MIN</td>
<td>30-60 minutes</td>
</tr>
<tr>
<td>DURATION</td>
<td>6-8 HOURS</td>
<td>8-10 HOURS</td>
<td>6-8 HOURS</td>
<td>6-8 HOURS</td>
<td>8-10 HOURS</td>
</tr>
<tr>
<td>FORMULATION TECHNOLOGY</td>
<td>---</td>
<td>Microtrol</td>
<td>---</td>
<td>---</td>
<td>Proteolytic</td>
</tr>
<tr>
<td>IMMEDIATE RELEASE</td>
<td>---</td>
<td>50%</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>SUSTAINED RELEASE</td>
<td>---</td>
<td>50%</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>PEARLS</td>
<td>Capsule that can be opened and sprinkled</td>
<td>Capsule that can be opened and sprinkled</td>
<td>TABLET THAT CAN BE CUT AND CHEWED</td>
<td>Liquid that can be swallowed alone or mixed with another liquid</td>
<td>Capsule that can be opened and sprinkled Dissolves in liquid</td>
</tr>
</tbody>
</table>
MPH OROS (Concerta®)

![Graph showing concentration over time for IR MPH 10 mg tid (n=15) and CONCERTA® 36 mg qd (n=15).]

Outer Coat of Medicine
(22% Immediate Release)
Pulse Delivery System
(Diffucaps, Microtrol, SODAS)
Daytrana DOT Matrix™ Transdermal Technology

- Methylphenidate is mixed with adhesive
# Non-Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>NORPINEPHRINE REUPTAKE INHIBITOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>ATOMOXETINE (Strattera)</td>
</tr>
<tr>
<td></td>
<td>BUPROPION / WELLBUTRIN SR/ XL</td>
</tr>
<tr>
<td>MANUFACTURER:</td>
<td>ELI LILLY</td>
</tr>
<tr>
<td></td>
<td>GSK</td>
</tr>
<tr>
<td>DOSES</td>
<td>10, 18, 25, 40, 60, 80, 100 mg</td>
</tr>
<tr>
<td></td>
<td>100 mg</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>Capsule</td>
</tr>
<tr>
<td></td>
<td>Tabs</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>1-2 times per day</td>
</tr>
<tr>
<td></td>
<td>1-2 times per day</td>
</tr>
<tr>
<td>ONSET</td>
<td>30-90 minutes</td>
</tr>
<tr>
<td></td>
<td>30-90 minutes</td>
</tr>
<tr>
<td>DURATION</td>
<td>&lt; 20 hours</td>
</tr>
<tr>
<td></td>
<td>12-18 hours</td>
</tr>
<tr>
<td>PEARLS</td>
<td>BLACK BOX - ↑ risk for SI;</td>
</tr>
<tr>
<td></td>
<td>WARNING - hepatitis</td>
</tr>
<tr>
<td></td>
<td>Start at 0.5 mg/ kg/ day</td>
</tr>
<tr>
<td></td>
<td>Max: up to 1.8 mg/ kg/ day</td>
</tr>
<tr>
<td></td>
<td>Anxiety d/ o: 1.2-1.4 mg/ kg/ day</td>
</tr>
<tr>
<td></td>
<td>Titrate every 1-2 weeks</td>
</tr>
<tr>
<td></td>
<td>May take up 8 weeks for effect</td>
</tr>
<tr>
<td></td>
<td>BLACK BOX - ↑ risk for SI</td>
</tr>
<tr>
<td></td>
<td>Not FDA approved</td>
</tr>
<tr>
<td></td>
<td>Beware of associated with Seizure</td>
</tr>
<tr>
<td></td>
<td>d/ o</td>
</tr>
</tbody>
</table>
# Non-Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>TRI CYCLIC ANTI-DEPRESSANTS</th>
<th>MULTI-NEUROCHEMICAL ACTIVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCTS</td>
<td>IMIPRAMINE (TOFRANIL)</td>
<td>NORTRIPTYLINE (PAMELOR)</td>
</tr>
<tr>
<td>MANUFACTURER:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOSES</td>
<td>10, 25, 50 mg</td>
<td>10, 25, 50, 75 mg</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>Tablets</td>
<td>Tablets</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>2-3 times / day</td>
<td>2-3 times / day</td>
</tr>
<tr>
<td>ONSET</td>
<td>1-2 hours</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>DURATION</td>
<td>6-12 hours</td>
<td>6-12 hours</td>
</tr>
<tr>
<td>PEARLS</td>
<td>BLACK BOX - ↑ risk for SI Not FDA approved for ADHD Monitor EKG for QTc changes If patient does not respond to stimulants, 70-80% will respond to TCA</td>
<td></td>
</tr>
</tbody>
</table>
# Non-Stimulant Medications

<table>
<thead>
<tr>
<th>CLASS</th>
<th>ALPHA AGONIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIMING:</td>
<td>SHORT ACTING</td>
</tr>
<tr>
<td>PRODUCTS</td>
<td>CATAPRESS (CLONIDINE)</td>
</tr>
<tr>
<td>MANUFACTURER:</td>
<td>BOEHRINGER INGLEHEIM</td>
</tr>
<tr>
<td>DOSES</td>
<td>0.1, 0.2, 0.3 mg</td>
</tr>
<tr>
<td>DRUG FORM</td>
<td>Tablets and patch</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>1-4 times / day</td>
</tr>
<tr>
<td>ONSET</td>
<td>1-2 hours</td>
</tr>
<tr>
<td>DURATION</td>
<td>4-8 hours</td>
</tr>
<tr>
<td>PEARLS</td>
<td>Not FDA approved for ADHD Monitor BP Sedation: Clonidine &gt; Tenex Can use w/ stim; consider EKG EFFECTIVE FOR HYPERACTIVE / IMPULSIVE / DISRUPTIVE BEHAVIOR.</td>
</tr>
</tbody>
</table>
SELECTING A MEDICATION:

• Consider Texas Children’s Algorithm for ADHD in JAACAP for guidance.
• All medications approved for the treatment of ADHD are effective in treating core symptoms.
• Not all patients will respond to any one medication.
• Family history
• Duration of action during the day
• Age

Medication Selection: Age

**Symptoms**

- HYPERACTIVITY / IMPULSIVITY
- INATTENTION

**Response to Stimulant:**
- 30-50%

Consider Alpha-2-agonist

**Response to stimulants:**
- 70-80%

Consider stimulant or non-stimulant
Initial Trial of Medication

- Can the patient swallow a pill?
  - Use "medicinal" candy to test swallow ability (tic tacs, M&M’s, Skittles)
  - If they cannot, use a capsule, elixir or tablet (crush/cut)

- Attempt to start with long acting medication

- General Rule – “Start low and slow”

- Stimulants:
  - Titrate up once per week

- Alpha-2-Agonist
  - Typically start with evening dose and add morning dose in 1-2 weeks

- Atomoxetine
  - Start with 0.5 mg/kg/day
  - Be patient! Anticipate 3-8 weeks to see full response
Dosing Pearls

• Amphetamines and Dex-Methylphenidate are approximately twice as potent as Methylphenidate products.

• Titrate up to:
  - Methylphenidate dosing:  ~0.5-1 mg/kg/day
  - Amphetamines and Dex-MPH:  ~0.25-0.5 mg/kg/day
  - Atomoxetine:  ~ 1.3 to 1.8 mg/kg/day

• If the patient poorly responds to those doses, consider referral to Child Psychiatry or Developmental Pediatrics
### Medication Effect:

#### Core Symptoms
- ↑ Attention Span
- ↓ Hyperactivity
- ↓ Impulsivity

#### Other Symptoms
- ↑ Compliance
- ↓ Opposition
- ↓ Aggression
- ↑ Social interactions
- ↑ Academic efficiency
- ↑ Academic accuracy
- ↑ Sleep
- ↑ Family dynamics
# Common Side Effects:

## NON-STIMULANTS
- **NERI**
  - Stomachache (~25%)
  - Decreased appetite, but less than stimulants
  - Mood swings
- **Alpha-2-Agonist**
  - Drop in BP
  - Sedation / Tired

## STIMULANTS
- Insomnia (Sleep onset): 20%
- Decreased Appetite: 20%
- Abdominal pain: 10%
- Tics / exacerbation: 10%
- Headache: 3%
- Emotional Lability / Rebound
- Growth
  - Weight: ↓ velocity
  - Height: +/- ↓ velocity
- Cardiovascular effects
  - Heart Rate: ↑
  - Blood Pressure: ↑
Be cautious:

• Closed angle glaucoma
• History of psychosis and mania
FDA Stimulant Warnings:

• Concerns for stimulant use linked to cardiovascular events.

• Extensive debate and discussion in the literature as to the true potential harmful impact.

• One does need to be extremely careful with those with a known cardiac pathology and/or abnormal cardiac rhythm patterns.

• To date … in general … ADHD medications as a whole are NOT linked to cardiovascular events. However, over time, subject to change … AGAIN.
**WHAT TO DO???

Emphasis on “**HISTORY and PHYSICAL”**

<table>
<thead>
<tr>
<th>PAST MEDICAL HISTORY:</th>
<th>FAMIL Y MEDICAL HISTORY:</th>
</tr>
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<tbody>
<tr>
<td>Heart Disorders</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Heart Murmur</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>High Blood Pressure</td>
<td>Heart Attack / Coronary Artery Dis</td>
</tr>
<tr>
<td>Chest Pain with or without exercise</td>
<td>Elevated serum cholesterol or TG</td>
</tr>
<tr>
<td>History of fainting with exercise</td>
<td>Cardiac arrhythmia's</td>
</tr>
<tr>
<td>History of dizziness with exercise</td>
<td>Stroke / Cerebral Vascular Disease</td>
</tr>
<tr>
<td>Shortness of Breath With Exercise</td>
<td>Early cardiac death</td>
</tr>
<tr>
<td>“Hole” in the heart</td>
<td>Hypertrophic cardiomyopathy</td>
</tr>
<tr>
<td>Seen by Pediatric Cardiologist</td>
<td>Dilated cardiomyopathy</td>
</tr>
<tr>
<td>History of Heart Surgery</td>
<td>Long QT Syndrome</td>
</tr>
<tr>
<td></td>
<td>Marfan Syndrome</td>
</tr>
</tbody>
</table>
Adherence:

• ADHD is a chronic disorder that warrants regular daily treatment.
• Encourage patients to put medications in a pill box in a place that will see at the same time every morning (i.e. – toothbrush or set alarm on smart phone).
• Day to day historical adherence to ADHD medications is 20-80%.
• < 50% continue medication treatment after 6 months.
• Non-adherent patients are at risk for the complications associated with untreated ADHD.
• Improved adherance with long acting meds.
Objective Medication Monitoring

• Objective data measures
  - Clinical Attention Problems (CAP) scale
    • Available at dbpeds.org
  - Vanderbilt Parent and Teacher Rating Scale (F/U)
    • Available at NICHQ.org
  - Conner's Parent Rating Scale-R, Conner's Teacher Rating Scale-R
  - Stimulant Drug Side Effects Rating Scale (dbpeds.org)

• Objective data to appropriately titrate for appropriate effect.
Follow Up:

- When first starting medications, encourage the family to call or email progress within the first week.

- Physically see in office within 2-4 weeks.

- If doing well, space out to every 3 months.

- If doing well, space out to every 6 months.

- At each visit, obtain rating scales from parents and teachers, monitor height, weight, BP, appetite, sleep, inquire about rebound, adverse behavior changes and potential cardiac effects.
**Management Pearls:**

- **Medication Adjustments:** Most children will require several medication adjustment during the first year of medication treatment.

- **Rapid metabolizer** – There is a subset of patients that will metabolize these medications faster than expected and may require much higher or frequent doses.

  - These kids typically get referred to Child Psychiatry or Developmental Pediatrics for management.
Dealing with ADHD Plus:

• When a child has ADHD with other active co-morbidities, where does one begin?

• “Attempt” to address the ADHD issues first.

• Frequently, when the ADHD symptoms are under better control, the other co-morbidities are easier to manage.

• It is not uncommon that some of these more complex children are on many classes of medications concurrently.
Pitfalls of ADHD Pharmacology:

• One needs to be very sensitive to the fact that many families do not like to have their child labeled with ADHD.
• Families are frequently resistant to starting medications.
• Inaccurate information regarding side effects.
• Costs - $$$
Controversies:

• Growth deficits
  - There are concerns for impaired growth for children chronically taking ADHD medications.
  - Several studies support that growth will slow, with “usual” catch up later. Those that are compliant are at highest risk.

• Seizures
  - There are concerns that use of stimulants medications lowers seizure threshold.
  - Several recent studies have not found data to support this concern.
Controversies:

- **Drug abuse**
  - Very real issue for this population
  - Document when prescriptions are given
  - Be wary of repetitive “lost” prescriptions
  - Risk is very real of using short acting MPH or AMP, particularly dex-AMP
  - Risks drastically drops when using long acting stimulants.

- Consider non-stimulant medication
Controversies:

Stephen Nissen, MD

ANTI-STIMULANT

PRO-STIMULANT

BEHAVIORAL MODIFICATION

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BEHAVIORAL MODIFICATION
Controversies:

Stephen Nissen, MD

ANTI-STIMULANT

BALANCE

PRO-STIMULANT

BEHAVIORAL MODIFICATION
Goals of Treatment:

• Educate patient and family about the diagnosis, co-morbidities, treatment and long term outcome.
• Prioritize problems for management.
• Set achievable goals.
• Increased structure and feedback.
• Prevent secondary academic, emotional and social complications.
• Instill a sense of potential to the patient and family.
• Normalize quality of life.
Summary:

• ADHD has a prevalence of 8-10%.

• Medication treatments have been proven to reduce the associated impairments.

• Proper management can lead to a normalized quality of life.
QUESTIONS?

Taiwanese Pink Cherry Blossoms (Sakura)
Najikin Castle, Okinawa, Japan
References


References


