2019 FMX Pediatrics Handouts

Adolescent Opioid Misuse (CME187-188)

Advanced Concepts: Diabetes, Pumps and Monitors - Oh My! (CME179-180)

Collaborative Care: Adolescent Depression Management and Bullying Mitigation - Tackling Tough Topics in Your Office (CME189-190)

Collaborative Care: Adolescent Depression Management and Bullying Mitigation - Tackling Tough Topics in Your Office (Workshop) (CME191-192)

Juvenile Arthritis (CME185-186)

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Pediatric Hypertension: Never Too Early to Start (CME177-178)

Practical Pediatric and Adolescent Immunization in the Office Update (CME183-184)

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Type 1 Diabetes: Where Does the Family Doc Fit in? (CME181-182)
Adolescent Opioid Misuse

Peter Ziemkowski, MD, FAAFP

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The content of my material/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated: Some medications used for Medication-Assisted are not approved for use below age 16, though are advocated for use by several studies and guidelines. We will review use of buprenorphine, naloxone, naltrexone and methadone in patients down to age 13. The FDA-approved uses will always be noted.

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Dr. Ziemkowski is a graduate of the University of Illinois at Chicago and completed his family medicine residency at the Michigan State University Kalamazoo Center for Medical Studies. He practices family medicine in southwest Michigan, where he is on the faculty of the Western Michigan University Homer Stryker, MD, School of Medicine’s Family Medicine Residency Program and serves as associate dean for Student Affairs. He has been teaching for 20 years and maintains a blog for residents. Dr. Ziemkowski is board certified in family medicine, and he is also certified by the American Board of Preventive Medicine (ABPM) in clinical informatics. He seeks to use technology to help educate patients on healthy lifestyles. Other clinical interests include the care of metabolic conditions associated with cardiovascular risk, including hypertension, hyperlipidemia, diabetes, and obesity. He believes that primary prevention of these diseases and their complications will deliver the greatest benefit to the greatest number of patients.
Learning Objectives

1. Implement a validated tool to screen adolescents for opioid misuse.

2. Identify brief intervention and referral options for adolescents who are misusing opioids.

3. Describe characteristics of adolescent neurobiology and impact on risk for substance abuse.

4. Describe medication assisted therapy options for adolescent patients with opioid use disorders.

Audience Engagement System

Step 1

Step 2

Step 3
Substance Use Among Teens

- The CDC Reports:
  - Alcohol, marijuana, and tobacco are substances most commonly used by adolescents.
  - By 12th grade, about two-thirds of students have tried alcohol.
  - About half of 9th through 12th grade students reported ever having used marijuana.
  - About 4/10 9th through 12th grade students reported having tried cigarettes.
  - Among 12th graders, close to 2/10 reported using prescription medicine without a prescription.
  - 12 to 20 years of age consume about one-tenth of all alcohol consumed in the United States.


AES Question #1

Which of the following types of opioids has lead to the greatest number of overdose deaths among those ages 15 to 24 over the last 5 years for which date is available? (2012-2017)

A. Prescription Opioids
B. Prescription Opioids mixed with Synthetic Narcotics
C. Heroin
D. Heroin mixed with Synthetic Narcotics
E. Other Synthetic Narcotics (fentanyl)

Opioid Deaths by Type: 15-24 y/o

Slang

- “Sizzurp, Lean, Purple Drank”
  - Codeine/promethazine cough syrup + soft drink (+/- hard candy)
  - Popularized by hip-hop in 90’s
    - at least 4 hip-hop star deaths
  - Many death/hospitalizations

https://commons.wikimedia.org/wiki/Category:Purple_drank#/media/File:Purple_Drank.jpg
Opioid Use Disorder (OUD)

- What is OUD?
  - OUD is defined in the DSM-5 as a problematic pattern of opioid use leading to clinically significant impairment or distress.
  - OUD was previously classified as Opioid Abuse or Opioid Dependence in DSM-IV.
DSM-5 Diagnostic Criteria for OUD

- In order to confirm a diagnosis of OUD, at least two of the following should be observed within a 12-month period:
  - Opioids are often taken in larger amounts or over a longer period than was intended.
  - There is a persistent desire or unsuccessful efforts to cut down or control opioid use.
  - A great deal of time is spent in activities necessary to obtain the opioid, use the opioid, or recover from its effects.
  - Craving, or a strong desire or urge to use opioids.
  - Recurrent opioid use resulting in a failure to fulfill major role obligations at work, school, or home.

- Continued opioid use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of opioids.
- Important social, occupational, or recreational activities are given up or reduced because of opioid use.
- Recurrent opioid use in situations in which it is physically hazardous.
- Continued opioid use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.
- Exhibits tolerance.
- Exhibits withdrawal.


Adolescent Neurobiology

“The adolescent brain is often likened to a car with a fully functioning gas pedal (the reward system) but weak brakes (the prefrontal cortex)”

Adolescent Neurobiology

• More vulnerable to temptation
  – Reward pathways develop before prefrontal cognition
• Sustained substance use affect neuropsychological functioning
  – Results in attention deficits, memory problems and decreased cognitive flexibility


“While many social and cultural factors affect drug use trends, when young people perceive drug use as harmful, they often reduce their level of use.”

Screening Tools

• “81% of patients seeking SUD treatment had been seen by a primary care physicians the previous year.”


SBIRT

• Screening,
• Brief Intervention,
• Referral to Treatment
• = SBIRT
Single Question Screening

• “How many times in the past year have you used an illegal drug or used a prescription medication for nonmedical reasons?”
  – Nonmedical = “For instance, because of the experience or feeling it caused.”


Drug Abuse Screening Test

• DAST
  – 10 questions or 20 questions
  – Scored Yes=1/No=0
    • (except Q 3 = 1 point for No)

• DAST-10 Scoring
  – 0 points = low risk
  – 1-3 points = moderate risk
    • Monitor/reassess
  – > 3 points = substance abuse/dependence

• Sensitivity = 90% to 100%
• Specificity = 77%

DAST-10

1. Have you used drugs other than those required for medical reasons?
2. Do you abuse more than one drug at a time?
3. Are you always able to stop using drugs when you want to? (If never use drugs, answer “Yes”)
4. Have you had "blackouts" or "flashbacks" as a result of drug use?
5. Do you ever feel bad or guilty about your drug use? (If never use drugs, choose "No")
6. Does your spouse (or parents) ever complain about your involvement with drugs?
7. Have you neglected your family because of your use of drugs?
8. Have you engaged in illegal activities in order to obtain drugs?
9. Have you ever experienced withdrawal symptoms (felt sick) when you stopped taking drugs?
10. Have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding, etc.)?


A Primary Care Approach

- Hazardous Use
  - Infrequent
  - Risks health/dependence
- Substance abuse
  - Consequences from use
- Substance dependence
  - Chronic relapsing illness

A Primary Care Approach

– Brief Counseling
  • “Motivational Interviewing has been show to decrease quantity and frequency of drug and alcohol use.”
  • Elicit patients own reasons for change


CRAFFT Screening Test

• 6 questions:
  – Car, Relax, Alone, Forget, Friends, Trouble
• For under age 21
  – American Academy of Pediatrics' Committee on Substance Abuse recommended
• Screens for simultaneous risky alcohol and other drug use disorders

The CRAFFT Screening Interview

Begin: "I'm going to ask you a few questions that I ask all my patients. Please be honest. I will keep your answers confidential."

Part A

During the PAST 12 MONTHS, did you:

1. Drink any alcohol (more than a few sips)?
   - No
   - Yes
2. Smoke any marijuana or hashish?
   - No
   - Yes
3. Use anything else to get high?
   - No
   - Yes

For clinic use only: Did the patient answer "yes" to any questions in Part A?

   - No
   - Yes

Ask CAR question only, then stop

Ask all 6 CRAFFT questions

Part B

1. Have you ever ridden in a CAR driven by someone (including yourself) who was "high" or had been using alcohol or drugs?
   - No
   - Yes
2. Do you ever use alcohol or drugs to RELAX, feel better about yourself, or fit in?
   - No
   - Yes
3. Do you ever use alcohol or drugs while you are by yourself, or ALONE?
   - No
   - Yes
4. Do you ever FORGET things you did while using alcohol or drugs?
   - No
   - Yes
5. Do your FAMILY or FRIENDS ever tell you that you should cut down on your drinking or drug use?
   - No
   - Yes
6. Have you ever gotten into TROUBLE while you were using alcohol or drugs?
   - No
   - Yes

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Screening Tools

• POSIT
  – Problem Oriented Screening Instrument for Teenagers
  • Age 12-19
  • Questionnaire, 139 yes/no questions, 20-30 minutes
• NIH: National Institute on Drug Abuse (NIDA)
  – Screening and Assessment Tools Chart
  • https://www.drugabuse.gov/nidamed-medical-health-professionals/screening-tools-resources/chart-screening-tools
NIH: NIDA Tools for Adolescents

- Online tools for ages 12-17
- Take less than 2 minutes each
- Validated in adolescents
- Very similar
- Suggest you use the one best suited to your practice

1. BSTAD: 
   Brief Screener for Tobacco, Alcohol and other Drugs
   [https://www.drugabuse.gov/ast/bstad/#/](https://www.drugabuse.gov/ast/bstad/#/)

2. S2BI: 
   Screening to Brief Intervention
   [https://www.drugabuse.gov/ast/s2bi/#/](https://www.drugabuse.gov/ast/s2bi/#/)

- 3 questions about frequency of:
  - Tobacco
  - Alcohol
  - Marijuana
- Those reporting use of any of these 3 are then asked about additional substance use.
- Divided into 3 categories
  - No reported use / Lower risk / Higher risk

Accessed: July 20, 2019
Confidentiality

- Confidentiality in adolescent health visit is predictor of the number and subject of issues discussed
- Split-visit model
  - Parents in clinical visits for limited time
  - Offer exams and counseling separately as well.
  - Must explain benefits to both, clarify boundaries.

- “The AAFP believes that adolescents’ access to confidential healthcare is important for their health and well-being, while also recognizing the benefit of supportive parental involvement.”

From: https://www.aafp.org/about/policies/all/adolescent-confidentiality.html
Accessed: July 20, 2019


Principles of Treatment

- Behavioral approach
- Family-based approach
- Addiction Medications
  - Buprenorphine
  - Methadone
  - Naltrexone
- Recovery Support Services

Principles of Treatment

1. Adolescent substance use needs to be identified and addressed as soon as possible.
2. Adolescents can benefit from a drug abuse intervention even if they are not addicted to a drug.
3. Routine annual medical visits are an opportunity to ask adolescents about drug use.
4. Legal interventions and sanctions or family pressure may play an important role in getting adolescents to enter, stay in, and complete treatment.
5. Substance use disorder treatment should be tailored to the unique needs of the adolescent.


Principles of Treatment

6. Treatment should address the needs of the whole person, rather than just focusing on his or her drug use.
7. Behavioral therapies are effective in addressing adolescent drug use.
8. Families and the community are important aspects of treatment.
9. Effectively treating substance use disorders in adolescents requires also identifying and treating any other mental health conditions they may have.
10. Sensitive issues such as violence and child abuse or risk of suicide should be identified and addressed.

Principles of Treatment

11. It is important to monitor drug use during treatment.
12. Staying in treatment for an adequate period of time and continuity of care afterward are important.
13. Testing adolescents for sexually transmitted diseases like HIV, as well as hepatitis B and C, is an important part of drug treatment.


AES Question #2

What percentage of diagnosed Opioid Use Disorder patients younger than 18 received Medication-Assisted Treatment?

A. <2%
B. 5%
C. 10%
D. 25%
MAT in Adolescents

• AAP Policy Statement
  – Medication-Assisted Treatment of Adolescents with Opioid Use Disorders
    • “Opioid use disorder is a leading cause of morbidity and mortality among US youth. Effective treatments, both medications and substance use disorder counseling, are available but underused, and access to developmentally appropriate treatment is severely restricted for adolescents and young adults. Resources to disseminate available therapies and to develop new treatments specifically for this age group are needed to save and improve lives of youth with opioid addiction.”


AAP Policy Statement—Recommendations

1. Opioid addiction is a chronic relapsing neurological condition.
   – Rates of spontaneous recovery are low
   – Outcomes can be improved with MAT
   – AAP advocates for resources to improve access to MAT.

2. AAP recommends offering or referring to MAT for adolescents and young adults.

3. AAP supports further research on developmentally appropriate treatment for substance use disorders.
American Society of Addiction Medicine

1. Clinicians should consider treating adolescents who have opioid use disorder using the full range of treatment options, including pharmacotherapy.
2. Opioid agonists (methadone and buprenorphine) and antagonists (naltrexone) may be considered for treatment of opioid use disorder in adolescents. Age is a consideration in treatment, and federal laws and US FDA approvals need to be considered for patients under the age 18. Buprenorphine is US FDA-approved for adolescents aged 16 years and above.
3. Psychosocial treatment is recommended in the treatment of adolescents with opioid use disorder.
4. Concurrent practices to reduce infection (eg, sexual risk reduction interventions) are recommended as components of comprehensive treatment for the prevention of sexually transmitted infections and blood-borne viruses.
5. Adolescents may benefit from treatment in specialized treatment facilities that provide multidimensional services.


Medication–Assisted Treatment

- **Opioid Agonists**
  - Methadone
  - Buprenorphine
- **Opioid Antagonist**
  - Naltrexone
  - (Naloxone – used w/ Buprenorphine)

- **Not FDA approved for pediatric use!**
  - Adolescent buprenorphine use based on two studies
  - Naltrexone used off-label in adolescents
  - Methadone programs usually restricted to 18 or older
Medication Assisted Treatment (MAT)

• Do not just replace one drug for another!
  – Relieve withdrawal symptom and psychological cravings
  – At proper dose, have no effect on intelligence, mental capacity, physical functioning, or employability.

• All medications used in Medication-Assisted Treatment (MAT) are prescribed as part of a comprehensive treatment plan that includes counseling and participation in social support programs.

AES Question #3

James is a 16 y/o male high school student who is seen for a sports physical. His S2BI screening notes that he is at Higher Risk of Drug Use. Further evaluation notes that he meets the criteria for Opioid Use Disorder. He finds it difficult to avoid taking opioids for more than a few days. Appropriate behavioral therapies are initiated and it’s decided to start Medication-Assisted Treatment. What is the best option to consider for MAT for James?

A. Naloxone
B. Naltrexone
C. Buprenorphine
D. Buprenorphine/Naloxone
E. Methadone
Methadone

- Full opioid agonist
  - Pain relief = 4-8 hours
  - half-life = 24-55 hours
- Less euphoria, blocks withdrawal from other opioids
- Can only be dispensed through SAMHSA-approved Opioid Treatment Programs
  - Limited access
- Long-established effective treatment for opioid addiction
  - But
- Most methadone programs prohibit patients under 18!

Buprenorphine

- Partial opioid agonist
  - Less euphoria/respiratory depression
  - Long-acting/once-daily dosing
  - Effects level off despite dose increases
    - “Ceiling effect”
- First opioid dependency treatment prescribed or dispensed in physician offices!
- Compared to non-pharmacologic treatment of OUD, MAT w/ Buprenorphine is more effective in:
  - Reducing opioid use
  - Retaining patients in treatment
  - Reducing risk of overdose death
Naltrexone / (Naloxone)

- Non-selective/competitive opioid antagonists
  - Blocks the euphoric / sedating effects of other opioids
- Naloxone
  - Very poor oral and GI tract absorption

Naltrexone

- Oral or IM
- Reported to reduce opioid cravings
- On relapse, prevents feeling of “getting high”
  - but reduces tolerance to opioids.

Naltrexone

- Must be opioid free for 7-10 days prior to starting treatment
- Consider "challenge test" if risk of withdrawal
  - Measures symptoms
  - Give small dose of naloxone (0.2-0.8 mg IM)
  - Observe for withdrawal

Dosing:
- PO naltrexone (ReVia)
  - 25 mg PO
    - Observe for 1 hour, if no withdrawal, give another 25 mg
  - then 50 mg/day
- IM (Vivitrol)
  - 380 mg once a month
• “Be Prepared. Get Naloxone. Save a Life.”
  – “You have an important role to play in addressing this public health crisis.”

VADM Jerome M. Adams, MD, MPH
U.S. Surgeon General’s Advisory on Naloxone and Opioid Overdose
April 2018
https://www.hhs.gov/surgeongeneral/priorities/opioids-and-addiction/naloxone-advisory/index.html#ftn6

Surgeon General’s Report

• Patients/Public
  – Talk to your doctor about getting Naloxone
  – Learn signs of opioid overdose
  – Get trained to administer in suspected overdose
  – Resources:
    • Prevent & Protect:  
      – www.prevent-protect.org

• Prescribers/Pharmacists
  – Identify patients at high risk for overdose
  – Follow CDC Guideline for Prescribing Opioids for Chronic Pain
  – Utilize state PDMP
  – Find out whether Rx needed in your state
  – Rx Naloxone to those at risk/friends & family
  – Prescribe to Prevent
    • www.prescribetoprevent.org
AES Question #4

Jean is a 17 y/o female high school student who is seen at 10 weeks gestation for an initial OB visit. Her S2BI screening notes that she is at Higher Risk of Drug Use. Further evaluation notes that she meets the criteria for Opioid Use Disorder with frequent misuse of Prescription opioids. Appropriate behavioral therapies are initiated and it’s decided to start Medication-Assisted Treatment. What is the best option to consider for MAT for Jean?

A. Naloxone  
B. Naltrexone  
C. Buprenorphine  
D. Buprenorphine/Naloxone  
E. Methadone

Buprenorphine/Naloxone

- Offset the risk of Buprenorphine abuse
- Taken Orally  
  - Buprenorphine effect predominates
- Crushed and Injected  
  - Naloxone effect predominates  
  - Can bring on withdrawal
- Combination preferred  
  - Less likely to be abused/diverted
- Buprenorphine alone in pregnant or lactating women
## Available forms/brands

<table>
<thead>
<tr>
<th>Drug Formulation</th>
<th>Buprenorphine</th>
<th>Buprenorphine/Naloxone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sublingual tab</td>
<td>buprenorphine-generic (previously Subutex)</td>
<td>Zubsolv</td>
</tr>
<tr>
<td>Sublingual film</td>
<td>Belbuca (for pain)</td>
<td>Generic, Suboxone, Bunavail</td>
</tr>
<tr>
<td>Patch</td>
<td>Butrans</td>
<td></td>
</tr>
<tr>
<td>Injection (IM/IV) – pain tx</td>
<td>Buprenex (not MAT)</td>
<td></td>
</tr>
<tr>
<td>Injection-Extended Release</td>
<td>Sublocade</td>
<td></td>
</tr>
<tr>
<td>Implant</td>
<td>Probuphine</td>
<td></td>
</tr>
</tbody>
</table>

### Drug Formulation

<table>
<thead>
<tr>
<th>Drug</th>
<th>Formulation</th>
<th>Maintenance Dose</th>
<th>~ Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprenorphine (generic)</td>
<td>2 &amp; 8 mg SL tabs</td>
<td>4-24 mg SL qd</td>
<td>$330: 60 8-mg tabs</td>
</tr>
<tr>
<td>Probuphine (implant)</td>
<td>74.2 mg subdermal implant</td>
<td>4 implants/6 months (equiv to 8mg SL/day)</td>
<td>$5176: 4-implants** ($1294/month)</td>
</tr>
<tr>
<td>Sublocade extended-release IM injection</td>
<td>100 mg/0.5 mg 300 mg/1.5 ml</td>
<td>100 mg IM q month</td>
<td>$1658: 100 mg/0.5 mg</td>
</tr>
<tr>
<td>Buprenorphine/naloxone (generic)</td>
<td>2/0.5, 8/2 mg SL tabs</td>
<td>4/1 to 24/6 mg qd</td>
<td>$550: 60 8/2-mg tabs</td>
</tr>
<tr>
<td>Bunavail buccal film (w/ naloxone)</td>
<td>21/.0.3, 4.2/0.7, 6.3/1 mg buccal films</td>
<td>2.1/.0.3 – 12.6/2 mg qd</td>
<td>$530: 60 4.2/0.7-mg films</td>
</tr>
<tr>
<td>Suboxone SL film (w/ naloxone)</td>
<td>2/0.5, 4/1, 8/2, 12/3 mg SL films</td>
<td>4/1 – 24/6 mg qd</td>
<td>$540: 60 8/2-mg films</td>
</tr>
<tr>
<td>Zubsolv SL tab (w/ naloxone)</td>
<td>0.7/0.18, 1.4/0.36, 2.9/0.71, 5.7/1.4, 8.6/2.1, 11.4/2.9 mg SL tabs</td>
<td>2.9/0.71 – 17.2/4.2 mg qd</td>
<td>$530: 30 11.4/2.9-mg tabs</td>
</tr>
</tbody>
</table>

In general, products are not bioequivalent to each other.

*Approximate cost from goodrx.com unless otherwise noted (Accessed: July 24, 2019)

**Approximate cash cost from drugs.com (Accessed: July 24, 2019)

MAT w/ Buprenorphine

- FPs write more opioid Rx by volume than other physicians, but most don’t provide MAT.
- MAT w/ buprenorphine is an effective alternative to methadone and can be provided in primary care offices after obtaining a SAMHSA waiver.

Preparing office/team requires:
- Identify a practice champion.
- Assess practice readiness
- Set up office protocols
- Secure pharmacy, lab and counseling services
- Establish a clinical workflow


Buprenorphine treatment

  - 8 hour course
  - Contact SAMHSA
    - 1-866-287-2728
    - [www.samhsa.gov/medication-assisted-treatment](http://www.samhsa.gov/medication-assisted-treatment)
- Allow physicians to treat increasing # patients with SAMHSA application:
  - 30 patients first year
  - 100 patients subsequent year(s)
  - May increase to 275 patients
Buprenorphine treatment

• Equally as effective as moderate methadone dose

• Phases
  1. Induction
  2. Stabilization
  3. Maintenance

• **Approved for age 16 and above!**

• Increased success with:
  – Stable or controlled
  – Medical comorbidities
  – Psychiatric condition

  – Safe, substance free environment

• Otherwise may benefit from specialty care setting.


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Buprenorphine Initiation

• Drug testing, informed consent, treatment contract

• Should be in mild withdrawal
  – 8-12 hour abstinence
  – Use clinical scale (COWS)
  – If not, reschedule

• Dose titration in office
  – Monitor at 60-minute intervals until withdrawal symptoms abate

• Close follow-up in 1 day to 1 week

• Consider Clonidine Rx
  – 0.1 mg q 6-8 hours

• Consider Naloxone kit Rx

AES Question #5

James, our 16 y/o patient is started on appropriate MAT. At follow-up visits in the first few months of treatment, he reports occasional relapses. What is the best way to address such relapses?

A. No change to his current treatment.
B. He has failed MAT and it should be stopped immediately.
C. Increased visits/behavioral therapies.
D. Immediate up-titration of his MAT.
E. Change to an alternate medication for his MAT.

Buprenorphine Maintenance

- Drug titration to stable dose
  - Opioid use stops
  - Withdrawal abates
  - Cravings minimized
- Pill/wrapper counts
- Document relapse, cravings, withdrawal
- State Rx database check
- Random drug screen
- Initial occasional opioid use common
  - Increased visits
  - Behavioral tx
    - Cognitive behavioral therapy
    - Contingency management
    - Motivational enhancement
    - Case management

Practice Recommendations

• Consider screening all adolescents for substance use.
  – Simple, quick online tools are available.
• Refer or provide treatment to appropriate patients.
• Consider medication-assisted treatment in those over age 16 (buprenorphine).

Summary

• Adolescents are susceptible to opioid use disorder.
• Simple tools to screen for use/abuse in adolescents are available.
• Treatment can be affective.
• If appropriate, Medication-Assisted Treatment should be considered.
• Medication-Assisted Therapy with Buprenorphine can be provided in the Family Physician office.
• Family physicians are appropriate providers for opioid use disorder treatment.
Questions

Resources

• SAMHSA
  – SBIRT
    • https://www.integration.samhsa.gov/resource/sbirt-resource-page
  – Screening Tools
    • https://www.integration.samhsa.gov/clinical-practice/screening-tools

• American Academy of Pediatrics
  – Substance Use and Prevention
Resources

• NIH: (NIDA)
  – Screening and Assessment Tools Chart
    • https://www.drugabuse.gov/nidamed-medical-health-professionals/screening-tools-resources/chart-screening-tools

References

References

15. Editors FPM. How to obtain a waiver to treat opioid use disorder with buprenorphine [Internet]. [cited 2019 Jul 22]. Available from: https://www.aafp.org/journals/fpm/blogs/impractice/entry/opioid-use-disorder.html
References


Advanced Concepts: Diabetes, Pumps and Monitors - Oh My!

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Katherine Beben, MD, FAAFP

Associate Program Director, Prisma Health–Upstate/University of South Carolina School of Medicine Greenville/Family Medicine Residency Program (Oconee)

Dr. Beben earned undergraduate degrees in molecular biology and Spanish language and literature at Tulane University, New Orleans, Louisiana. She earned her medical degree at the University of Connecticut School of Medicine, Farmington, and completed a family medicine residency at the AnMed Health Family Medicine Residency Program in Anderson, South Carolina. After graduation, she fulfilled her National Health Service Corps (NHSC) obligation in rural El Dorado Springs, Missouri, practicing full-spectrum family medicine. She and her family returned to South Carolina, where she practiced for seven years and became an instructor of family medicine for the AnMed program. Recently, Dr. Beben joined the Oconee Family Medicine Residency Program to serve as associate program director.
Learning Objectives

1. Demonstrate understanding of available technology for monitoring and treating Type 1 Diabetes.

2. Interpret glycemic variability given a continuous glucose monitor (CGM) report.

3. Evaluate patients’ and families’ coping skills and adherence who use technology to manage Type 1 Diabetes.

Audience Engagement System

Step 1

Step 2

Step 3
Insulin Administration and Monitoring

<table>
<thead>
<tr>
<th></th>
<th>Glucometer</th>
<th>Continuous Glucose Monitor</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infusion pump</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Mutually exclusive events for managing Type 1
- You can pick your preferred method of insulin administration and preferred method of monitoring
- Pros and Cons to each

Poll Question #1

The preferred initial insulin regimen for the management of Type 1 Diabetes in children is:

A. Regular insulin with NPH  
B. Premixed insulin (i.e. 70/30)  
C. Long-acting basal with rapid-acting bolus  
D. Rapid-acting boluses
Insulin Regimens

- Conventional: regular insulin with NPH
- Intensive: rapid-acting and long-acting
  - Multiple daily injections (MDI)
  - Continuous infusion pump

Multiple Daily Injections
Multiple Daily Injections

- Basal injections once a day lasting 24 hours
- Bolus injections with every meal and before snacks
- Bolus before bedtime
- Bolus to correct for hyperglycemia

Multiple Daily Injections

- Lower mean fasting
- Lower pre- and post-breakfast
- Lower pre- and post-lunch
- Lower incidence of nocturnal hypoglycemia

Murphy NP, Keane SM, Ong KK, et al. Randomized cross-over trial of insulin glargine plus lispro or NPH insulin plus regular human insulin in adolescents with type 1 diabetes on intensive insulin regimens. Diabetes Care 2003; 26:799.
Poll Question #2

How often does the insulin and infusion site need to be changed when using continuous infusion pumps?

A. Every day
B. Every 2-3 days
C. Once a week
D. Once a month
Continuous Infusion Pumps—What

• Subcutaneous cannula that is replaced every 2-3 days
• Site rotation to prevent lipohypertrophy
• Use rapid or short-acting insulin
• Need to keep emergency kit for MDI in case of pump failure

Continuous Infusion Pumps—Who

• Recurrent severe hypoglycemia
• Wide fluctuations in blood glucose levels regardless of A1C
• Suboptimal diabetes control
• Microvascular complications and/or risk factors for macrovascular complications
• Good metabolic control, but insulin regimen that compromises lifestyle

Continuous Infusion Pumps-Pros

- Pre-programmed by endocrinology with carb ratios, sensitivity factors, basal rates
- Can suspend insulin delivery
- Can program alarms/reminders
- Better than MDI for glycemic control and avoiding hypoglycemia with less total daily insulin


Continuous Infusion Pumps-Cons

- Cost
- Pump failure
  - Rapid rise in BG can lead to DKA
  - Back-up supplies
- Superficial infection risk at infusion site
Continuous Infusion Pumps

Continuous Glucose Monitors
Poll Question #3

Where would be an appropriate site to place a continuous glucose monitor (CGM)?

A. Upper arm
B. Abdomen
C. Thigh
D. Buttock
E. All of the above

Continuous Glucose Monitors-What

• Subcutaneous microfilament reads interstitial glucose concentrations every 5 minutes
• Usually place on abdomen or arm
• Variable need to calibrate with traditional fingerstick
Continuous Glucose Monitors-Who

- Poorly controlled A1C
- Wide fluctuations in blood glucose levels
- Non-adherence with traditional glucometer use

Continuous Glucose Monitors-Pros

- Fewer fingersticks
- Waterproof
- ONSET Study:
  - Lower glycemic variability
  - No severe hypoglycemia

Continuous Glucose Monitors-Cons

- Cost
- Skin reaction to adhesive
- Adhesive augmentation with swimming
Pump with CGM

- Partially closed-loop: suspends insulin delivery if senses low or rapidly dropping BG
- Hybrid closed-loop: + auto-adjusts basal rates
- Complete closed-loop: + auto boluses for correction

Pump with CGM

- More likely to achieve goal A1C
- Fewer hyperglycemic episodes
- Lower glycemic variability
- 2-fold reduction in hypoglycemic events

Objectives

• Demonstrate understanding of available technology for treating and monitoring Type 1 Diabetes.
• Interpret glycemic variability given a continuous glucose monitor (CGM) report.
• Evaluate patients’ and families’ coping skills and adherence when using technology to manage Type 1 Diabetes.

Poll Question #4

What kind of information can you get from looking at a continuous glucose monitor report?

A. How often they check their blood sugar
B. What type of insulin is in use
C. If/when the patient disconnects his/her pump
D. When the patient is exercising
Objectives

• Demonstrate understanding of available technology for treating and monitoring Type 1 Diabetes.
• Interpret glycemic variability given a continuous glucose monitor (CGM) report.
• Evaluate patients' and families' coping skills and adherence when using technology to manage Type 1 Diabetes.

Evaluating Adherence

• Ask patients about pump and CGM use
• Ask if they download their data
• Ask how often they’re seeing endocrinology
• Ask about their latest A1C
Evaluating Coping Skills

- Ask patient and/or family to show you where sites are and what they’re using
- Ask about triumphs and struggles
- Determine insight by asking about reasons why sugars are high or low
- Who do they call for help?

Practice Recommendations

- Ask patients and families what technology they are using to manage their Type 1 Diabetes.
- Offer support for lifestyle interventions to help manage glycemic variability.
- Know who to contact to help patients and families troubleshoot any technologic difficulties.
Contact Information

Email: Kati.beben@prismahealth.org
Phone: (864) 482-3491
Twitter: @BebenKati

Questions
Collaborative Care: Adolescent Depression Management and Bullying Mitigation - Tackling Tough Topics in Your Office

Celia Neavel, MD, FSAHM, FAAFP
Geordi Cortez-Neavel
Sasha D. Jaquez, PhD

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Celia Neavel, MD, FSAHM, FAAFP

Director, Center for Adolescent Health and GOALS Program, People’s Community Clinic, Austin, Texas

Dr. Neavel earned her medical degree from Baylor College of Medicine, Houston, Texas, and completed residency and a fellowship at the University of Cincinnati, Ohio. She is board certified in family medicine and has a Certificate of Added Qualifications (CAQ) in Adolescent Medicine, as well as fellowship training in both adolescent medicine and developmental disorders. Dr. Neavel supervises and teaches a variety of health care professionals within her own team, as well as trainees rotating through the clinic. She founded—and continues to direct—the Center for Adolescent Health and the GOALS Program at People’s Community Clinic, a nonprofit federally qualified health center (FQHC). The Center for Adolescent Health provides primary, behavioral, and reproductive care at a main clinic site, with additional sites embedded in youth-serving community agencies. The GOALS Program is a developmental, behavioral, and primary care program for individuals ages 4 to 19.

Dr. Neavel works with diverse community organizations. She is on the Texas Health Steps Advisory Council, as well as serving as a Travis County Medical Society delegate to the Texas Medical Association and a medical advisor for the Texas Youth-Friendly Initiative. The recipient of numerous awards, she frequently is named Austin’s top adolescent medicine physician in Austin Monthly magazine. Dr. Neavel has given national, state, and local presentations on integrated behavioral health, adolescent wellness care, reproductive health, and minor consent and confidentiality. She currently collaborates with University of Texas faculty on research on integrated behavioral health.
Geordi Cortez-Neavel
Intern/Volunteer, People’s Community Clinic, Austin, Texas

Cortez-Neavel earned his bachelor’s degree in global health from Washington University in St. Louis, Missouri. He is currently pursuing a master’s degree in clinical research management from University of North Texas Health Science Center and applying to medical schools for the 2019-2020 cycle. Previously, he has participated in projects focused on access to quality care; youth assessment and treatment; emergency medicine; and primary care. He has received training as an emergency medical technician-basic (EMT-B), a National Academy of Sports Medicine (NASM) trainer, and—most recently—a youth peer wellness specialist. As a volunteer at People’s Community Clinic, he serves as an ambassador and a member of the Youth Advisory Council.

Sasha D. Jaquez, PhD
Pediatric Psychologist, Dell Children’s Medical Center, Austin, Texas; Clinical Assistant Professor, Department of Psychiatry, Dell Medical School, Austin, Texas; Clinical Assistant Professor, Department of Educational Psychology, University of Texas at Austin

Jaquez received her doctorate degree in Clinical Psychology, with an emphasis on pediatric/child clinical psychology, from Oklahoma State University, Stillwater. She completed her predoctoral psychology internship at University of Alabama at Birmingham/Children’s of Alabama, followed by a postdoctoral fellowship at University of Texas at Austin, where she worked both at Dell Children’s Medical Center and Texas Child Study Center. Following postdoctoral fellowship, she moved to Akron, Ohio, where she received training in pediatric behavioral sleep medicine, established the Sleep Psychology Clinic at Akron Children’s Hospital, and worked on the inpatient consultation/liaison team. Upon returning to Austin, Jaquez became the director of the Medical Coping Specialty Clinic at Texas Child Study Center and saw patients within the Texas Center for the Prevention and Treatment of Childhood Obesity (TCPTCO). She sees patients in the Dermatology, Allergy, and Comprehensive Care Clinics at Dell Children’s Medical Group. In these clinics, she specializes in cognitive behavioral therapy with youth who present with comorbid psychological and medical concerns, as well as sleep disorders. In addition to medical residents and fellows, she trains psychology graduate students, interns, and postdoctoral fellows. Her current research focuses on weight bias among pediatric providers and trainees and use of behavioral interventions during dermatology procedures.
Learning Objectives

1. Utilize appropriate diagnostic criteria to screen adolescent patients for depression, bullying, mood disorders, and suicide risk.

2. Counsel caregivers and adolescent patients regarding bullying prevention and intervention.

3. Devise collaborative treatment plans, including appropriate psychotherapy and pharmacotherapy, that take into account the risks and benefits of various interventions.

4. Coordinate care for adolescent patients who require referral to sub-specialists or admission to hospitals for suicide prevention.

Audience Engagement System

Step 1

Step 2

Step 3
AES POLL QUESTION #1

What % of your practice is between the ages of 10-24?
1) 0-10%
2) 10-30%
3) 30-50%
4) >50%

Youth Account of Experiences
During the 12 months before the survey, 31.5% of students nationwide had felt so sad or hopeless almost every day for 2 or more weeks in a row that they stopped doing some usual activities.

"our new information shows that suicide [among] adolescents has reached its highest recorded level, and it shows that there's especially an increase in recent years in adolescent males," he said. "The data shows that it is a very real threat."

First author Oren Miron, research associate Harvard Medical school
AES POLL QUESTION #2

Which organization(s) recommend depression screening starting at age 12? (Select all that apply)

1) United States Preventive Services Task Force
2) American Academy of Family Practice
3) American Academy of Pediatrics
4) Bright Futures
5) Institute Of Medicine
A Look at Each Agency’s Guidelines

1) **USPSTF**: screening for major depressive disorder (MDD) in adolescents (12 to 18 years).
   - should be implemented with adequate systems in place (ensures accurate diagnosis, effective treatment, and appropriate follow-up). Grade B

2) **AAFP**: supports the USPSTF recommendation

3) **AAP**: supports that adolescent patients ages 12 years and older be screened annually for depression (MDD or depressive disorders) with a formal self-report screening tool either on paper or electronically (universal screening) (grade of evidence: 2; strength of recommendation: very strong)

4) **Bright Futures**: screen teens for depression, if indicated. (Share results of screening with teen and parents).

5) In light of the benefits associated with early intervention and the existence of effective treatment options, the **IOM** recommended that physicians in primary care settings screen adolescents for MDD

VALIDATED TOOLS

- **PSC, PSC-17, PSCY**  Pediatric Symptom Checklist
- **CRAFFT**  Car, Relax, Alone, Friends, Forget, Trouble
- **PHQ 2, 9, & A**
- **SCARED**  Screen for Child Anxiety Related Disorders
- **CES-DC**  Center for Epidemiological Studies Depression Scale for Children
- **CDI**  Beck Child Depression Inventory for Primary Care (not free)
- **CBCL**  Child Behavior Checklist (not free), TRF, YSR  Achenbach System of Empirically Based Assessment (ASEBA)
- **RAAPS**  Rapid Assessment for Adolescent Preventive Services
EXAMPLE HEEADSSSSS INTERVIEW

- Home
- Education
- Eating
- Activities
- Drugs

- Sexuality
- Suicide/Depression
- Safety
- Strengths

PRACTICE RECOMMENDATIONS

- Universal screen for depression WCC 12 & up
- Screen as indicated by clinical situation
- Use validated tools
- Office champion
LISTENING/WATCHING FOR FLAGS

- Somatization
- Declining medical adherence
- Behavior change
- Affect in office
- LGBTQ youth at risk for all 3
- Depressed AND being bullied: higher risk for suicide
- History of trauma or ACES

Clinical Assessment Flowchart

- Evaluation: Positive for Depression but not for other features of mental illness
- Evaluation: Positive for Trichotillomania
- Evaluation: Positive for NCIS
- Evaluation: Positive for ODD
- Evaluation: Positive for ADHD
- Evaluation: Positive for BED
- Evaluation: Positive for SAD
- Evaluation: Positive for GAD
- Evaluation: Positive for PTSD
- Evaluation: Positive for PMDD
- Evaluation: Positive for ESL
- Evaluation: Positive for adjustment disorder
- Evaluation: Positive for reactive attachment disorder
- Evaluation: Positive for specific phobia
- Evaluation: Positive for social phobia
- Evaluation: Positive for panic disorder
- Evaluation: Positive for agoraphobia with panic attacks
- Evaluation: Positive for anxiety disorder
- Evaluation: Positive for bipolar disorder
- Evaluation: Positive for schizoaffective disorder
- Evaluation: Positive for schizophrenia
- Evaluation: Positive for schizotypal personality disorder
Asses if Bullying Victim

- “Any unwanted aggressive behavior by another youth or group of youths who are not sibling or current dating partners that involves an observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated.” CDC, 2014
- Can be physical, verbal or relational
  - Direct – blatant attacks on a targeted young person
  - Indirect – communication with others about targeted individual
  - Makes it more difficult for others to recognize what is happening
Prevalence Rates (US)

• 20% of 12-28 yo students
• 19% in grades 9-12 at school
• 49% in grades 4-12 in last month
• 30% youth admit bullying others
• Mostly in school, school grounds, school bus
• Only 20 to 30% bullied students notify adults

Screening: Best Practice

• Start when enter elementary school
• Screen high risk groups
  • Special needs (including chronic illness)
  • Under- or overweight
  • Identify as LGBTQ+
• Watch for indicators and ask about behaviors
  • Mood changes, psychosomatic sx, behavioral concern, substance use
  • SIB, SI or attempt, decline academic functioning, school truancy
• Screen if engaging in bullying behavior
• Screen if bystander to bullying
CYBERBULLYING

- May not admit
- Don't want access restricted
- Less common, but correlated trad'l bullying
- School environment imp't, but can take place away from school
- Cyberbullies can be anonymous
- Can happen 24 hrs/day
- No amt parent monitoring can catch all
- Higher rates suicidality

INTERVENING BULLYING

- **Information:**
  - For families https://www.stopbullying.gov/
    - https://www.helpguide.org/articles/abuse/bullying-and-cyberbullying.htm & others
  - Most effective interventions school-based

- **Recs for Parents:**
  - Support the teen with empathy, take it seriously, **don't confront other parents**, advocate at school

- **In the office:**
  - Express support – kids right to feel safe
  - **Engage in problem solving** – create a plan for school, create family media plan
    - https://www.healthychildren.org/English/media/Pages/default.aspx

- **Advocate** with the teen's school and inquire about resources
MAJOR DEPRESSIVE DISORDER

F32 (recurrent F33)

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful). (Note: In children and adolescents, can be irritable mood.)

2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation.)

3. Significant weight loss when not dieting or wt gain more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. (Note: In children, consider failure to make expected weight gain.)

4. Insomnia or hypersomnia nearly every day.

5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down).

6. Fatigue or loss of energy nearly every day.

7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick).

8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others).

9. Recurrent thoughts of death, recurrent suicidal ideation without specific plan, or suicide attempt or a specific plan for committing suicide.

S
RISKS:
- Interpersonal loss & stressors
- Psychiatric disorders
- Prior attempts
- Substance use / risky behaviors
- LGBTQ with little support
- Access to means
- Isolation
- Chronic disease or disability

PROTECTIVE:
- Access to interventions
- Social support/connectedness
- Life skills
- Restricted access to means
- Self-esteem & sense of purpose
- Cultural/religious/personal beliefs against suicide

FURTHER SAFETY ASSESSMENT

S ex

A ge

D epression or affective disorder

P revious attempt

E TOH or drug abuse

R ational thinking loss

S ocial supports lacking

O rganized plan

N egligent parenting or family stress or suicidal modeling

S chool Problems
*Self harm not always equal suicidality
*Clarify passive vs active thoughts
*Who knows? Trusted adult relationship?
*Try stay neutral. Keep pt focused on questions and history. Bring structure.
*Your presence invaluable
DEPRESSION INTERVENTION

• *Educate*:  
  – AACAP Facts for Families [https://www.aacap.org](https://www.aacap.org) & others  
  – Stress mind-body connection  

• *For Caregivers*:  
  – Importance of treating; clear directions  
  – No blame; offer support  

• *With Adolescent*:  
  – Validate, normalize  
  – Behavioral activation  
  – Consider medication and/or referral  
  – Close follow-up

---

BRIEF INTERVENTION: BEHAVIORAL ACTIVATION

• 5 minutes
• Make or provide list
• Teen tracks completion and rates mood
• Present as a “prescription”
REFERRALS: Behavioral Health

- **Doctoral Level:** Psychologists (PhD, PsyD, EdD), Psychiatrists - *Telehealth available? Develop relationships with consulting psychiatrist & others*
- **Master's Level:** Social Workers (LMSW, LCSW), Licensed Counselors (LPC), Licensed Marriage and Family Therapists (LMFT)
- **Bachelor's Level:** Licensed Chemical Dependency Counselors (LCDC)

- **Mental Health Nurse**
- **Assess patient & family readiness & potential barriers**
- **Ensure insurance will work**
- **Ensure evidence-based treatment**

OTHER RESOURCES

- National Alliance Mentally Ill (NAMI)
- MHMR
- Child Guidance Center
- Schools, especially if on-site therapy
- Insurance Plan
- Specialized Hospital Systems
- Local Non-profits
- Regional Academic Center
AES POLL QUESTION #3

Which medication is FDA approved for treating depression in a 14 yo?
1) Paroxetine
2) Fluoxetine
3) Bupropion
4) Amitriptyline

SSRIs

Figure 1. FDA-Approved Pediatric Age Ranges and Indications for Antidepressant Medications

*Fluoxetine is FDA approved for the treatment of MDD in pediatric patients up to 18 years old.
## SSRI TITRATION SCHEDULE

<table>
<thead>
<tr>
<th>Medication</th>
<th>Starting Dose (qd/od), mg</th>
<th>Increments, mg</th>
<th>Effective Dose, mg</th>
<th>Maximum Dosage, mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citalopram</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Fluoxetine</td>
<td>10</td>
<td>10–20</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>Fluvoxamine</td>
<td>50</td>
<td>50</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>Sertraline</td>
<td>25</td>
<td>12.5–25</td>
<td>50</td>
<td>200</td>
</tr>
<tr>
<td>Escitalopram</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

## STARTING MEDICATION

- **Be positive and optimistic**
- Take with breakfast
- Start low
- See or connect q week 1st 4 weeks
- Clinical effects continue improve 3-6 weeks
- Primary care may underdose
- If no response > 4 weeks, consider switch
  - May be 30-40%
SAFETY PLAN

Coping strategies and resources
Do together
Gives control, framework
or search:
Developing effective safety plan for suicidal youth
- Star Center

Have handouts, websites, textlines, hotline numbers available
ACTIVELY SUICIDAL/NEEDS ADMISSION

Make immediate referral to mental health provider or emergency services if severe depression, psychotic, or suicidal ideation/risk is evident.

- Already have practice plan
- If have IBH, page them
- Call 911, mental health deputies, local mental health hotline, police or EMS as needed
- Hospital emergency department
- Local mental health authority if have intake site
- Psychiatric hospital

Let family know what to expect, including your role
CARE COORDINATION

- Post hospitalization if occurred
- Communication between behavioral health, primary care, family, & school
- Clarify duration therapy &/or medication
- Ongoing screening

PRACTICE RECOMMENDATIONS

- Follow best practices workflow
  - Use validated tools & structured interviews
  - Have plan for + screens
  - Harm in not treating
  - Utilize compassion, optimism, and close f/u
- Practice self-care; acknowledge when cases are difficulty; talk about with your team
SOCIAL MEDIA POLL QUESTION
What social media sites/apps are youth using most frequently?
1. Twitter
2. Instagram
3. Snapchat
4. Pinterest
5. YouTube
6. Facebook

WHAT ADOLESCENTS WANTED TO INCLUDE IN THIS TALK

• Using ‘Meme Culture’ as an outlet for stress and depression.
• Engaging adolescents in healthy “Self-Talk”
• “Teenagers are masters at disguising their depression… Across both physiological and mental illness: kids have really long compensatory phases before they suddenly crash”
MEMES

Engaging Youth Through Social Media

- How can we use social media
- Texting
- Outreach
Questions

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### Mental Health Screening

- [https://www.cdc.gov/features/yrbs/index.html](https://www.cdc.gov/features/yrbs/index.html) 2017 YRBS
- For Pediatric Symptom Checklist
  - [http://www.massgeneral.org/psychiatry/services/psc_home.aspx](http://www.massgeneral.org/psychiatry/services/psc_home.aspx)
- For CRAFFT [http://www.ceasar-boston.org/clinicians/crafft.php](http://www.ceasar-boston.org/clinicians/crafft.php)

### Mental Health Screening - 2

Key Resources Assessment & Management
Adolescent Depression in Primary Care


• [http://www.glad-pc.org/ Guidelines for Adolescent Depression in Primary Care (GLAD-PC) Toolkit]

Depression Treatment

• Antidepressant use in pediatric patients [https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/Medicaid-Integrity-Education/Pharmacy-Education-Materials/Downloads/ad-pediatric-factsheet.pdf]
• Pediatric Psychopharmacology for Treatment of ADHD, Depression, and Anxiety [http://pediatrics.aappublications.org/content/pediatrics/136/2/351.full.pdf]
• Effectivechildtherapy.org What evidence supports what mental health therapy
• [https://www.aacap.org American Academy of Child & Adolescent Psychiatry - has information for families and treatment recommendations for physicians]
• [https://jamanetwork.com/journals/jama/fullarticle/199274 TADS]
DEPRESSION RESOURCES TEENS & FAMILIES

https://www.helpguide.org/articles/depression/teenagers-guide-to-depression.htm
https://www.aacap.org/
https://kidshealth.org/en/teens/depression.html
Has Spanish and oral

Bullying Resources

• https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/Pages/Connected-Kids.aspx Connected Kid includes a Clinical Guide and 21 handouts for parent and teen topics such as bullying, discipline, interpersonal skills, parents, suicide and television violence.
• https://www.stopbullying.gov/
• https://www.helpguide.org/articles/abuse/bullying-and-cyberbullying.htm
Suicide Prevention

- [http://www.sprc.org/](http://www.sprc.org/) Suicide Prevention Resource Center. Has hotline # and Suicide Assessment Five-step Evaluation and Triage for Mental Health Professionals
- [www.sprc.org/library/SafetyPlanTemplate.pdf](http://www.sprc.org/library/SafetyPlanTemplate.pdf) and Search Developing effective safety plan for suicidal youth-Star Center
- [https://pflag.org/hotlines](https://pflag.org/hotlines) comprehensive for LGBTQ+ youth and families
Collaborative Care: Adolescent Depression Management and Bullying Mitigation - Tackling Tough Topics in Your Office (Workshop)

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Sasha D. Jaquez, PhD

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Celia Neavel, MD, FSAHM, FAAFP

Director, Center for Adolescent Health and GOALS Program, People’s Community Clinic, Austin, Texas

Dr. Neavel earned her medical degree from Baylor College of Medicine, Houston, Texas, and completed residency and a fellowship at the University of Cincinnati, Ohio. She is board certified in family medicine and has a Certificate of Added Qualifications (CAQ) in Adolescent Medicine, as well as fellowship training in both adolescent medicine and developmental disorders. Dr. Neavel supervises and teaches a variety of health care professionals within her own team, as well as trainees rotating through the clinic. She founded—and continues to direct—the Center for Adolescent Health and the GOALS Program at People’s Community Clinic, a nonprofit federally qualified health center (FQHC). The Center for Adolescent Health provides primary, behavioral, and reproductive care at a main clinic site, with additional sites embedded in youth-serving community agencies. The GOALS Program is a developmental, behavioral, and primary care program for individuals ages 4 to 19.

Dr. Neavel works with diverse community organizations. She is on the Texas Health Steps Advisory Council, as well as serving as a Travis County Medical Society delegate to the Texas Medical Association and a medical advisor for the Texas Youth-Friendly Initiative. The recipient of numerous awards, she frequently is named Austin’s top adolescent medicine physician in Austin Monthly magazine. Dr. Neavel has given national, state, and local presentations on integrated behavioral health, adolescent wellness care, reproductive health, and minor consent and confidentiality. She currently collaborates with University of Texas faculty on research on integrated behavioral health.
Geordi Cortez-Neavel
Intern/Volunteer, People’s Community Clinic, Austin, Texas

Cortez-Neavel earned his bachelor’s degree in global health from Washington University in St. Louis, Missouri. He is currently pursuing a master’s degree in clinical research management from University of North Texas Health Science Center and applying to medical schools for the 2019-2020 cycle. Previously, he has participated in projects focused on access to quality care; youth assessment and treatment; emergency medicine; and primary care. He has received training as an emergency medical technician-basic (EMT-B), a National Academy of Sports Medicine (NASM) trainer, and—most recently—a youth peer wellness specialist. As a volunteer at People’s Community Clinic, he serves as an ambassador and a member of the Youth Advisory Council.

Sasha D. Jaquez, PhD

Pediatric Psychologist, Dell Children’s Medical Center, Austin, Texas; Clinical Assistant Professor, Department of Psychiatry, Dell Medical School, Austin, Texas; Clinical Assistant Professor, Department of Educational Psychology, University of Texas at Austin

Jaquez received her doctorate degree in Clinical Psychology, with an emphasis on pediatric/child clinical psychology, from Oklahoma State University, Stillwater. She completed her predoctoral psychology internship at University of Alabama at Birmingham/Children’s of Alabama, followed by a postdoctoral fellowship at University of Texas at Austin, where she worked both at Dell Children’s Medical Center and Texas Child Study Center. Following postdoctoral fellowship, she moved to Akron, Ohio, where she received training in pediatric behavioral sleep medicine, established the Sleep Psychology Clinic at Akron Children’s Hospital, and worked on the inpatient consultation/liaison team. Upon returning to Austin, Jaquez became the director of the Medical Coping Specialty Clinic at Texas Child Study Center and saw patients within the Texas Center for the Prevention and Treatment of Childhood Obesity (TCPTCO). She sees patients in the Dermatology, Allergy, and Comprehensive Care Clinics at Dell Children’s Medical Group. In these clinics, she specializes in cognitive behavioral therapy with youth who present with comorbid psychological and medical concerns, as well as sleep disorders. In addition to medical residents and fellows, she trains psychology graduate students, interns, and postdoctoral fellows. Her current research focuses on weight bias among pediatric providers and trainees and use of behavioral interventions during dermatology procedures.
Learning Objectives

1. Practice applying new knowledge and competencies gained from Adolescent Depression and Bullying Mitigation: Interventions That Make A Difference talk, and receive feedback from expert faculty.

2. Interact collaboratively with peers in a case-study scenario of depression, bullying, and suicidal ideation.

3. Develop skills to communicate effectively with patients presenting with these issues in order to elicit true concerns, provide education, refer to appropriate services, and discuss medications and/or brief behavioral intervention.

Audience Engagement System

Step 1

Step 2

Step 3
Introductions and Plan for Today

- Team-based learning format using case example
- Teams are identified (1-10) by tent cards
- Team interaction & discussion is encouraged
- Please pick a “scribe” for your team
  - Only the Team Scribe should select the EAS button on their device
  - Other team members: pull up the handout on your individual devices for reference
  - Always put your Team # in front of any submitted response or question
  - the “Enter” key on your device will submit your response

Chief Complaint

“We are here for my son’s WCC, I have noticed him complaining more about a stomach ache lately, but I think it’s because the flu went around at home. He has missed more school than my other kids, but he never really liked school anyway.”
History of Present Illness

- Juan here with mother for well-visit
- 12-year-old Latino complaining of recurring abdominal pain
- Began September
- No similar symptoms prior to this school year

Other Review of Systems

- Ocass HA
- Poor sleep. Up late on phone. Tired during day
- Sees dentist q 6 months. Brushes teeth
- No CP, SOB
- No weakness
- Mild acne. No rashes
Family History

- Mother, grandmother: depression. Mother postpartum depression w/ patient.
- Father: alcohol abuse & high cholesterol.
- Maternal & paternal grandmothers: Type 2 DM
- 2 younger siblings healthy & doing well in school

Decision Point / Question

- What does H E E A D D/S S S (S) stand for?
Social History as HEEADDSSS

- **Home:** Lives w/ Mother, parents separated. Visits father 2x month. Keeps to self. Siblings annoy him. Family stressed due to parents not being documented & finances.
- **Education:** 5th grade, previous A’s & B’s, now C’s, occasional B’s. Doesn’t like school.
- **Eating:** Not hungry. Would like to lose weight. Skips meals. Binge eats at night.
- **Activities:** Quit soccer & piano. No exercise. 2-3 friends. No best friend. 4+ hours/day on phone/video games.
- **Drugs:** CRAFFT -

  **Depression/Suicidality:** Screening tool +

- **Sexuality:** no abuse, sex ed home & school. Attracted to girls. Never dated.
- **Safety:** Safe & no guns at home. W/ probing, reports boys mean to him at school. Ex-best friend posted lies about him on Facebook. Another friend threatened to fight him.
- **Strengths:** Can’t think of anything does well or likes about self
- **Spirituality:** Goes to church with family 3x month.

**Decision Point / Question**

- List some validated psychosocial or depression screening tools that you could use in your office
Physical & Mental Status Exam

• Appearance: well-groomed, clean, obese
• Behavior: limited eye contact, tried to get off topic when discussing stomach aches
• Speech: fluent, clear, normal volume
• Perception: did not appear to be responding to internal stimuli
• Cognition: alert, oriented to situation, oriented to time, oriented to place, oriented to person, memory intact
• Mood: irritable
• Affect: congruent to thought content
• Insight: limited
• Judgment: limited
• Thought Processes: intact
• Thought Content: unremarkable
• Motor Activity: intact
Decision Point / Question

• What is/are your diagnostic impression(s)?
Decision Point / Question

• What did you like best about this physician-patient interaction?

Decision Point / Question

• How did the physician elicit information in this clip?
Decision Point / Question

• What criticism did you have about this physician-patient interaction?

Decision Point / Question

• Is there anything from this clip that you think would be beneficial to integrate into your own practice?
JUAN

- **Home:** Lives w/ Mother, parents separated. Visits father 2x month. Keeps to self. Siblings annoy him. Family stressed due to parents not being documented & finances.

- **Education:** 5th grade, previous A’s & B’s, now C’s, occasional B’s. Doesn’t like school.

- **Eating:** Not hungry. Would like to lose weight. Skips meals. Binge eats at night.

- **Activities:** Quit soccer & piano. No exercise. 2-3 friends. No best friend. 4+ hours/day on phone/video games.

- **Drugs:** CRAFFT -

- **Depression/Suicidality:** Screening tool +

- **Sexuality:** no abuse, sex ed home & school. Attracted to girls. Never dated.

- **Safety:** Safe & no guns at home. W/ probing, reports boys mean to him at school. Ex-best friend posted lies about him on Facebook. Another friend threatened to fight him.

- **Strengths:** Can’t think of anything does well or likes about self.

- **Spirituality:** Goes to church with family 3x month.
Decision Point / Question

• Give an example of an open ended question you might ask to follow up about + depression screen

Decision Point / Question

• Give an example of an open ended question you might ask to follow up about bullying
ROLE PLAY ACTIVITY

• Physician
• Juan
• Mother
• Scribe
• Observers
• Reporter

DISCUSSION

1. How did each actor feel in their role?
2. What was easy or challenging?
3. What did the observers notice?
4. What strategies would you like to learn that would be helpful in this situation?
BULLYING

1) Ask pts to describe own behaviors & those of others in indirect, open-ended way.
2) Opening discussion can draw attention to problem & empower patients & caregivers
3) Encourage find enjoyable activities, promote confidence & self-esteem

ROLE PLAY ACTIVITY 2

• Physician
• Juan
• Mother
• Scribe
• Observers
• Reporter
DISCUSSION

1. How did each actor feel in their role?
2. What was easy or challenging?
3. What did the observers notice?
4. What strategies would you like to learn that would be helpful in this situation?

“CHECK YOUR OWN PULSE”

- Bring structure/safety to encounter
- Be mindful of your own affect
- Bring back to history or here and now
- Compassion, not always empathy
- OK to admit to yourself difficult case, not always clear answers
- Debrief with a team member
Decision Point / Question

Would you like to learn more about:
1) Motivational Interviewing & In Office Interventions?
2) Starting & Monitoring Medication?
3) Collaborating with Mental Health Professionals?
4) The Suicidal Patient?

PATIENT PLAN
PRACTICE RECOMMENDATIONS

- Use validated tools & structured interviews
- Have a coordinated, team-based plan in place
- Harm in not intervening as the PCP
- Include behavioral health consultants & judicious use SSRI

*Utilize compassion, optimism, and close f/u*

*Keep practicing yet acknowledge when dealing with a tough situation*

Celia Neavel MD, FSAHM, FAAFP

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Questions
Juvenile Arthritis

Sarah Merrill, MD

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Sarah Merrill, MD

Assistant Professor, Department of Family Medicine and Public Health, University of California, San Diego School of Medicine

Dr. Merrill is a board-certified family physician who specializes in sports medicine. In addition to diagnosing and treating injuries associated with athletics, she provides primary care for patients of all ages, including preventive care and treatment of acute and chronic diseases. An avid yoga practitioner and certified yoga instructor, she has a special interest in rehabilitating individuals who have yoga injuries. She also enjoys performing ultrasound-guided diagnostics and procedures. Recently, she published two chapters in the clinical reference text The 5-Minute Sports Medicine Consult, 3rd Edition.

Dr. Merrill instructs students, residents, and fellows at UC San Diego School of Medicine, is an assistant program director for the UCSD Family Medicine Residency Program, and is the medical director of UC San Diego Health’s Scripps Ranch Family Medicine Center. She also provides care throughout the San Diego community and for many sporting events, serving as the team physician for the University City High School and Scripps Ranch High School football teams; medical director for the California State Games; medical team captain for San Diego Rock ‘n’ Roll Marathon; and event physician for the BMX World Championships. Dr. Merrill completed a sports medicine fellowship at UC San Diego School of Medicine, where she also completed a residency in family medicine with an additional certification in integrative medicine. She earned her medical degree from Loyola University Chicago Stritch School of Medicine in Illinois. She is a member of numerous professional associations, including the American Medical Society for Sports Medicine (AMSSM), the American Medical Association (AMA), and the AAFP.
Learning Objectives

1. Describe diagnostic principles, appropriate pre-referral evaluation, and red flags in pediatric rheumatologic diseases.

2. Discuss treatment options, including side effects of common medications and what contraindications to immunizations exist for patients in active treatment.

3. Define the subtypes of Juvenile Idiopathic Arthritis (formerly Juvenile Rheumatoid Arthritis) and identify common signs and symptoms of each subtype.

Audience Engagement System

Step 1

Step 2

Step 3
Juvenile Arthritis: Definition

- Variety of autoimmune and inflammatory diseases that affect the joints of children 18 years and younger

Pathogenesis

- Genetic and environmental factors
- Stress
- Trauma
- Gut microbiome
- History of infections
Juvenile Idiopathic Arthritis

- “Group of inflammatory disorders that begins before the 18th birthday and persists for at least 6 weeks with other known conditions excluded”

Juvenile Idiopathic Arthritis: Categories

- Systemic JIA
- RF+ JIA
- Enthesitis/spondylitis related JIA
- Early onset ANA+ JIA
- Other JIA
- Unclassified JIA
Systemic JIA

**Fever** of unknown origin for > 3 days and recurring for at least 2 weeks

**Major criteria**: erythematous rash and/or arthritis

**Minor criteria**: generalized LAD/hepatomegaly/splenomegaly, serositis; arthralgia without arthritis; leukocytosis with neutrophilia

Need fever + 2 major or 1 major and 2 minor

---

**Systemic JIA**

- Leukocytosis, hypochromic microcytic anemia, thrombocytosis, elevated acute phase reactants\textsuperscript{4,13}
- **ANA and RF negative**\textsuperscript{4,13}
Systemic JIA

- Salmon colored rash on trunk and proximal extremities
- Can be polyarticular in both small or large joints

Poll Question #1

Which of the following is not required for the diagnosis of systemic juvenile idiopathic arthritis?

A. +ANA
B. Fever of unknown origin
C. Arthralgia
D. A and C
E. A and B
+Rheumatoid Factor JIA

- Arthritis > 6 weeks and 2 +RF tests or +CCP\textsuperscript{13}

- Worst prognosis
- Female predominance
- Late onset
- Symmetric and progressive
- Predominantly affects wrists and small joints hands and feet\textsuperscript{13}
Enthesitis/spondylitis-related JIA

- Peripheral arthritis and enthesitis
- Arthritis or enthesitis + >/=3 months of inflammatory back pain and sacroiliitis on x-rays
- Arthritis or enthesitis + two of the following:
  - SIJ TTP
  - Inflammatory back pain
  - +HLA-B27 antigen
  - Acute symptomatic anterior uveitis
  - H/o SpA in 1st degree relative

Early onset ANA+ JIA

- Arthritis >/= 6 weeks
- Early onset (< 6 years)
- Two +ANA at least 3 months apart (titer > 1/160)
Other JIA

- Arthritis > 6 weeks
- Does not fit criteria for previous categories

Unclassified JIA

- Arthritis > 6 weeks
- Fits > 1 previous disorder
Poll Question #2

A 13 year female with a 8 week history of joint pain and swelling in bilateral wrist and toes would most likely have the following lab values?

A. -ANA
B. -RF and -ANA
C. +RF and +CCP
D. +HLA-B27
E. Type O blood

Work Up

- **No antibody panels** unless positive ANA and evidence of rheum disease!²
- Initial lab testing: ANA, CBC, RF, ESR and CRP¹
- Initial imaging: MRI or ultrasound preferred⁸
Complications

- Uveitis

Increased risk of developing CVD$^4,11$
- Increased systolic and diastolic pressures$^{11}$
- Increased aortic stiffness$^{11}$
Complications

- Sleep and psychosocial factors

Complications

- Growth retardation
- Macrophage activation syndrome
- Multi-organ insufficiency
- Osteoporosis
Treatment

- Involves multidisciplinary team\(^4,9\)
  - PCP
  - Pediatric rheumatologic
  - Ophthalmologist
  - Pediatric psychiatrist
  - Physical therapist
  - Sports med/ortho

Treatment

- NSAIDs
- DMARDs
- Corticosteroids
- Biologics
Treatment

• Monitor pain, sleep and psychosocial indicators for both parents and patients\textsuperscript{6}

Prognosis

• FHx disease, early ankle or hip joint involvement, erosions on xray and higher number of joints affected are poor prognostic indicators\textsuperscript{4, 8}
• Remission rate increased and rate of joint damage decreases with early initiation of treatment\textsuperscript{4}
Follow Up

- Psychosocial monitoring
- Cardiac screening
- Eye screening

Poll Question 4

You are evaluating a 3 year old female with fever of unknown origin daily for 2 weeks and joint swelling. You suspect JIA, although are still waiting on lab results and imaging. Which is the most appropriate next step?
A. Refer to sports medicine/ortho
B. Discuss patient’s sleep habits with patient
C. Refer to ophthalmology
D. Order EKG
E. Order bone marrow biopsy
Practice Recommendations

- JIA is a broad diagnosis of exclusion and does not necessarily require arthritis/arthralgia
- Practitioners need to be aware of presentations in order to start workups quickly – better outcomes are associated with early treatment
- Initial lab work should include ANA, RF, CBC, ESR, CRP, HLA-B27 and imaging of affected joints
- Inclusion of multidisciplinary team is key early in diagnosis and treatment
- Uveitis is the primary extra-articular complication of JIA and needs to be screened frequently
- NSAIDs and DMARDs are first line therapies

Questions
Resources


Contact Information

Sarah Merrill, MD
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Neonatal Hypoglycemia

MAJ Craig Barstow, MD

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MAJ Craig Barstow, MD

Director of Hospital Medicine, Womack Army Medical Center, Fort Bragg, North Carolina; Assistant Professor of Family Medicine at Uniformed Services University of Health Sciences, Bethesda, Maryland; Director of Ultrasound Education, Family Medicine Residency Program, Womack Army Medical Center; Physician, Scotland Memorial Hospital Emergency Department, Laurinburg, North Carolina

Dr. Barstow is a graduate of the Uniformed Services University of the Health Sciences – F. Edward Herbert School of Medicine in Bethesda, Maryland. He completed undergraduate studies at the U.S. Military Academy. Dr. Barstow joined the Womack Army Medical Center Family Medicine Residency Program in 2012, and created the fellowship program, accepting the first fellow in July 2015. He is the former program director of the hospitalist fellowship at Womack Army Medical Center. His areas of interest include inpatient family medicine, newborn care, and point-of-care ultrasound teaching.
Learning Objectives

1. Screen infants for neonatal hypoglycemia, in accordance to currently guidelines.

2. Assess the benefits and risks of bedside glucose analysis, versus laboratory enzymatic methods.

3. Taylor treatment to the specific clinical situation, while fostering optimal mother-infant contact and breastfeeding.

Audience Engagement System
Neonatal Hypoglycemia

• Screening of Asymptomatic Newborns
• Symptomatic Newborns
• Prolonged hypoglycemia

Case 1

You are covering the newborn nursery over the weekend and the nurse calls you Friday night about a new delivery. The newborn is a term infant born to a G3, now P3 mother who is GBS negative and O+. The pregnancy was complicated by gestational diabetes treated with oral medication. The delivery was unremarkable. The nurse wants to know if you would like to screen the newborn for hypoglycemia.
Poll Question 1

Which asymptomatic infants are at risk for hypoglycemia?

A. Late term preterm newborns (34-36 \( \frac{6}{7} \) weeks)
B. Large for Gestations Age (LGA) newborns
C. Small for Gestational Age (SGA) newborns
D. Infants born to diabetic mothers
E. All of the above

Newborns at Risk for Hypoglycemia

- Small for gestational age (SGA)
- Born to diabetic mother
- Late-term preterm (34-36\( \frac{6}{7} \))
- Large for gestational age (LGA)
When to screen?

Onset of hypoglycemia

Hypoglycemia manifests at 1-12 hours of life
- Born to diabetic mother
- Late-term preterm (34-36\textsuperscript{6/7})

Hypoglycemia manifests at 3 hours of life – 10 days
- Large for gestational age (LGA)
- Small for gestational age (SGA)

When to screen?

Initial feed within first hour of life and screen 30 minutes after 1\textsuperscript{st} feed
Feed every 2-3 hours after and screen before each feed

Screen 0-12 hours of life
- Born to diabetic mother
- Late-term preterm (34-36\textsuperscript{6/7})

Screen 0-24 hours of life
- Large for gestational age (LGA)
- Small for gestational age (SGA)

How to measure glucose?

- Centralized laboratory is the gold standard
- Plasma versus whole blood
- Plasma glucose concentrations are 10-15% higher than whole blood

- Point-of-care (POC) testing is readily available
  - Results are much quicker
  - May differ from plasma measurement by 10-20 mg/dL
  - Variation is greatest at low concentrations

How to Measure?

Use POC testing for immediate treatment decisions
Send confirmatory blood to centralized treatment prior to treatment
Do not wait for results before treating symptomatic hypoglycemia
Case 2

You make it through the night without any further calls. It is now Saturday morning and a nurse calls you again. A 2-hour old infant appears “jittery,” and the nurse would like to check the newborn’s glucose.

Poll Question 2

Which value is the lowest, normal glucose for a term newborn in the first hours of life?

A. 60 mg/dL
B. 47 mg/dL
C. 45 mg/dL
D. 35 mg/dL
E. 25 mg/dL
Neonatal Hypoglycemia

• Hypoglycemia occurs in 5-15% of neonates
• Prolonged hypoglycemia has been associated with permanent neurological injury
• Most infants with “low glucose” will be asymptomatic
• Historically, treatment has been recommended for glucose < 45-47 mg/dL


Neonatal Hypoglycemia

• Early studies linked neonatal hypoglycemia with poor neurological outcomes
  • Transient and permanent structural brain abnormalities
  • Adverse developmental outcomes
  • Studies had significant design flaws
• Recent studies have failed to substantiate this finding
Infant Health and Development Program

• 745 preterm infant with birth weight < 2500g followed developmentally through age 18
• 20% lowest glucose < 35 mg/dL (37% glucose < 45)
• No difference in intellectual or academic achievement

Exact level and duration of hypoglycemia that causes neurological damage is unknown


Normal Glucose Homeostasis

• Fetal glucose is only slightly below maternal glucose
  • 9 mg/dL difference for normal maternal glucose
• Fetal insulin secreted in response to fetal glucose
• Fetal glucose is determined primarily by maternal glucose

Normal Glucose Homeostasis

- Glucose drops at birth and is 60-80% of maternal glucose
- Drops as low as 30 mg/dL in first 1-2 hours of life\(^1\)
  - Infants are asymptomatic
  - Probable normal physiological response
- Use alternative fuels
  - Ketone bodies
  - Lactate
- Rises above 45 mg/dL by 12 hours of life


Signs of Hypoglycemia

- Tremor
- Jitteriness
- Floppiness
- Sweating
- Lethargy
- Exaggerated Moro reflex
- High pitched cry
- Poor feeding
- Cyanosis
- Apnea
- Coma
- Seizures

Whipple’s Triad

1. Clinical signs of hypoglycemia
2. Symptoms occur during a documented period of hypoglycemia
3. Symptoms resolve with treatment of hypoglycemia


Differential Diagnosis

• Sepsis
• Inborn errors of metabolism
• Hyponatremia
• Neonatal encephalopathy due to perinatal asphyxia
Case 2 Continued

The initial heel stick glucose is 20 mg/dL. The nurse send a confirmatory plasma sample to the lab and feeds the newborn. An hour later, the recheck heel stick is 23 mg/dL. What would you like to do now?

Neonatal Hypoglycemia - Treatment

If symptomatic and glucose < 40 mg/dL → IV glucose

If asymptomatic

Birth to 4 hours of age
If initial screen < 25 mg/dL
Feed and check in 1 hour
If recheck < 25 mg/dL -> IV glucose
If recheck 25-40 mg/dL -> refeed/IV glucose as needed

4 to 24 hours of age
If initial screen < 35 mg/dL
Feed and check in 1 hour
If recheck < 35 mg/dL -> IV glucose
If recheck 35-45 mg/dL -> refeed/IV glucose as needed
Glucose dose 200mg/kg (dextrose 10% at 2 mL/kg) or 5-8 mg/kg mg/kg/min (80-100 mL/kg/d)

Target glucose 40-50 mg/dL


Treatment – Oral Dextrose

• Dextrose gel applied directly to buccal mucosa
• Allows for rapid correction of hypoglycemia
• Does not interrupt breast feeding and maternal care
Treatment – Oral Dextrose

2016 Cochrane Review
• Reduces mother-infant separation for treatment (RR 0.54)
• Increases rate of breastfeeding on after discharge (RR 1.10)
• No identified adverse outcomes
• No difference in neurodevelopmental outcome at 2-year follow-up
• Does not alter need for IV glucose


Case 2 Continued

It is now Sunday night. You started D10 at 6 mg/kg/min Saturday morning and titrated up to achieve a goal glucose of 50 mg/dL. You are currently waiting for a bed to open in the nearest NICU so you can transfer the newborn and the infant is now requiring 15 mg/kg/min of D10.
Poll Question 3

Which of the following are possible causes of persistent hypoglycemia in the newborn?

A. Birth asphyxia
B. Sepsis
C. Hyperinsulinism
D. Inborn error of metabolism
E. All of the above

Persistent Neonatal Hypoglycemia

Hypoglycemia that persists past 3 days of life

Prolonged neonatal hyperinsulinism (common)
- Birth asphyxia
- Intrauterine growth restriction
- Toxemia

Genetic hypoglycemia disorders
- Hyperinsulinism
- Adrenal insufficiency
- Glucose, glycogen or fatty acid
- metabolic disorders

Toxins
- Insulin
- Sulfonylureas
- Alcohol
- Beta blockers
- Salicylate

Pros-prandial hypoglycemia
- Fundoplication
- Gastric bypass
Prolonged Neonatal Hyperinsulinism

Mild and transient hyperinsulinism probably part of normal physiological response immediately after birth

- Some infants will have a prolonged period of relative hyperinsulinism due to perinatal stress
  - Birth asphyxia
  - Intrauterine growth restriction
  - Toxemia
- Most common cause of persistent hypoglycemia


Persistent Neonatal Hypoglycemia Differential Diagnosis

- Hyperinsulinism
- Adrenal insufficiency
- Beckwith-Wiedemann syndrome
- Toxins and drugs
- Post-fundoplication and gastric bypass

Persistent Neonatal Hypoglycemia

Delay evaluation until after 48-hours of life to exclude transitional hypoglycemia
Draw labs when patient is symptomatically hypoglycemic
  • Bicarbonate
  • Beta-hydroxybutyrate (BOHB)
  • Lactate
  • Free fatty acids

If labs not available during symptomatic hypoglycemia, a period of fasting may be necessary to make the diagnosis or to determine safety for discharge


Genetic Hyperinsulinism

• Incidence of approximately 1 in 50,000 births
• May be as high as 1 in 2,500 births in some populations
  • Parts of Finland
  • Arabian peninsula
• May be born with macrosomia
  • Suggests prenatal hyperinsulinemia
• 45% present in soon after birth
• 77% will present within first 6 months

Hyperinsulinism

- For prolonged hypoglycemia, start glucose at physiological rate of 4-6 mg/kg/min
- Increase infusion to maintain glucose above 45-50 mg/dL (70 mg/dL)
  - May require infusion rates as high as 15-20 mg/kg/min
- Insertion of venous umbilical catheter strongly encouraged
- Consider early referral to tertiary care center
- Fasting test may be necessary to make the diagnosis
- Exaggerated response to glucagon (> 30 mg/dL) is highly suggestive of hyperinsulinism


Practice Recommendations

- Screen late preterm (34-36\textsuperscript{6/7}), small for gestational age (SGA), large for gestation age (LGA) and newborns of diabetic mothers for hypoglycemia in the postpartum period. (SOR B)
- For newborns with blood glucose < 25 mg/dL within the first 4 hours of live and < 35 mg/dL after the first 4 hours of life despite feeding, start a glucose infusion. (SOR B)
- Consider transfer to a tertiary care center for newborns with persistent hypoglycemia in whom you suspect a diagnosis of congenital hyperinsulinemia, adrenal insufficiency, or metabolic disorders. (SOR C)
Contact Information

• Craig Barstow, MD
• craig.h.Barstow.mil@mail.mil

Questions
Additional Reading


Pediatric Hypertension: Never Too Early to Start

Peter Ziemkowski, MD, FAAFP

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The content of my material/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated: Some anti-HTN medications (ramipril, chlorthalidone, …) do not have Pediatric indications per the FDA, but are recommended as treatment by the American Academy of Pediatrics. My presentation will mention those drugs that are approved specifically, but also the concept of using adult studies to guide anti-hypertensive treatment in children.

Peter Ziemkowski, MD, FAAFP

Associate Professor, Department of Family and Community Medicine, Western Michigan University Homer Stryker, MD, School of Medicine, Kalamazoo

Dr. Ziemkowski is a graduate of the University of Illinois at Chicago and completed his family medicine residency at the Michigan State University Kalamazoo Center for Medical Studies. He practices family medicine in southwest Michigan, where he is on the faculty of the Western Michigan University Homer Stryker, MD, School of Medicine’s Family Medicine Residency Program and serves as associate dean for Student Affairs. He has been teaching for 20 years and maintains a blog for residents. Dr. Ziemkowski is board certified in family medicine, and he is also certified by the American Board of Preventive Medicine (ABPM) in clinical informatics. He seeks to use technology to help educate patients on healthy lifestyles. Other clinical interests include the care of metabolic conditions associated with cardiovascular risk, including hypertension, hyperlipidemia, diabetes, and obesity. He believes that primary prevention of these diseases and their complications will deliver the greatest benefit to the greatest number of patients.
Learning Objectives

1. Evaluate children with confirmed hypertension, and overweight children with prehypertension, for additional risk factors for comorbidities.

2. Develop an evidence-based treatment plan that encourages patient adherence to the prescribed therapy.

3. Recognize the tendency to and contribution of clinical inertia and adopt treatment algorithms that advance care appropriately in uncontrolled patients.

4. Counsel parents of children with prehypertension or hypertension to make therapeutic lifestyle changes to lower blood pressure.
2017 AAP Clinical Practice Guidelines

• Goals
  • Develop an updated, evidence-based guideline
    • Provide recommendations on diagnosis, evaluation, and management of childhood HTN.
    • Aimed at practicing clinicians seeing patients in the outpatient setting.

Poll Question 1

Out of all the following risk factors for primary hypertension in children, which is considered the strongest?

A. Low birth weight
B. Male sex
C. Elevated BMI
D. Ethnicity
E. Family history of hypertension
2017 AAP Clinical Practice Guidelines

• Rationale
  • Increase in childhood hypertension since 2004 “Fourth Report”
    • 3.5% of children with HTN.
    • 10%-11% with elevated blood pressure
    • Increase in prevalence due to obesity
  • High blood pressure in childhood increases risk for adult HTN and cardiovascular disease.
  • Youth with HTN demonstrate evidence of accelerated vascular aging.


4 Questions

1. How should systemic HTN (primary, renovascular, white-coat, masked) in children be diagnosed and what is the optimal approach?
2. What is the recommended workup for pediatric HTN?
   • How do we best identify the underlying etiology of secondary HTN in children?
3. What is the optimal goal SBP and/or DBP for children and adolescents?
4. In children 0 to 18 years of age, how does treatment with lifestyle vs. anti-HTN agents influence indirect measures of CVD risk?
% Age/Sex/height?

• Hypertension - basis:
  • Children: normative distribution in healthy children.
  • Adults: related to clinical outcome data.

• In general, be alert. Many online resources still reference the 2004 NHLBI report!
• Make sure the one you use is based on 2017 AAP Guideline

• Tables:
  • American Academy of Pediatrics (2017)
    http://pediatrics.aappublications.org/content/early/2017/08/21/peds.2017-1904.figures-only

• Calculators:
  • Canadian Pediatric Endocrine Group: https://apps.cpeg-gcep.net/BPz_cpeg_dde/
    • (works well in mobile browser)

2017: Major changes from 2004 Report

• Strict Evidence-based approach
  • Reviewed 15,000 articles
• Replaced “prehypertension” with “elevated blood pressure”
• New normative tables based on children with normal weight
• Simplified screening table
• Simplified BP classification age ≥ 13 years
  • Aligned with AHA/ACC adult guideline
• Limited BP screening to preventative care visits
2017: Major changes from 2004 Report

• Streamlined evaluation and management recommendations
• Expanded role of 24-hour ambulatory BP
• Limited recommendation on echocardiography
  • Generally at medication initiation
• Revised LVH definition
• Revised treatment goals based on published evidence
  • Lower treatment goals for primary HTN
  • Ambulatory goal for Chronic Kidney Disease

Factors to consider

• Inherent variability
  • Only ~5% of adolescents had same BP on 3 separate visits.
• “Accommodation Effect”
  • Adjustment to the experience of having your BP measured.
• Higher BP in childhood correlates with higher BP in adulthood.
Epidemiology

• AAP 2017
  • Clinical setting/repeated BP measurement
  • Pediatric Hypertension = ~ 3.5% (2% - 5%)
    • (CDC estimates ~ 1.3 million age 12-19 y/o)
    • Missed up to 75% of pediatric patients in primary care setting
  • Persistently elevated BP (formerly prehypertension)
    • 2.2% to 3.5 %
      • (BP in 90th to 94th percentiles or 120/80 to 130/90 in adolescents)
      • Higher rates with those overweight or obese (3.8% to 24.8%)

Definition (2017 American Academy of Pediatrics)

• New normative tables based on normal-weight children
  • Excluded BMI ≥ 85th %
  • Based on auscultatory measurements of ~ 50,000 children and adolescents
  • SBP and DBP arranged by age, sex and height %
  • Provide actual heights in cm and inches directly in table
  • Organized in more simple format

• Practical Change:
  • Excluding overweight/obese -> values are several mmHg lower than previous guideline!

New BP Tables

- Fourth report tables generated from ~70,000 healthy children,
  - many overweight or obese!
  - Likely biased normative BP values upward
- New normative tables commissioned for this practice guideline
  - based on readings from ~50,000 normal-weight children.

Definition (2017 American Academy of Pediatrics)

- Definition of Hypertension (1-18 years)
  - Normal ≤ 50th percentile
  - Elevated BP > 90th percentile
    - no longer called prehypertension
  - Stage 1 HTN ≥ 95th percentile
  - Stage 2 HTN ≥ 95th percentile + 12 mmHg

New BP Tables

- Fourth report tables generated from ~70,000 healthy children,
  - many overweight or obese!
  - Likely biased normative BP values upward
- New normative tables commissioned for this practice guideline
  - based on readings from ~50,000 normal-weight children.

<table>
<thead>
<tr>
<th></th>
<th>2004 Report</th>
<th>2017 CPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTN</td>
<td>8%</td>
<td>13%</td>
</tr>
<tr>
<td>Stage 1</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>Stage 2</td>
<td>2%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Reclassification to a higher BP category was associated with increased odds of abnormal Target Organ Damage (TOD) and tended to have higher BMI & DBP.

FIGURE. Prevalence of elevated blood pressure (BP) and hypertension among youths, by new and former guidelines — United States, 2001–2016

[Graph showing prevalence over time]


### Screening

- **Simplified table**
  - 90th % BP for age and sex for children at 5th % for height
  - Negative predictive value of > 99%
  - Quick screening table for staff
  - Not for diagnosis!
    - Actual cutoff up to 9 mm Hg higher
  - > 120/80 for ≥ 13 y/o
    - to align with adult guideline

---

### Table 6 Screening BP Values Requiring Further Evaluation

<table>
<thead>
<tr>
<th>Age, y</th>
<th>BP, mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
</tr>
<tr>
<td></td>
<td>Systolic</td>
</tr>
<tr>
<td>1</td>
<td>98</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>101</td>
</tr>
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<td>4</td>
<td>102</td>
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<td>5</td>
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<td>105</td>
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<td>106</td>
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<tr>
<td>8</td>
<td>107</td>
</tr>
<tr>
<td>9</td>
<td>107</td>
</tr>
<tr>
<td>≥10</td>
<td>120</td>
</tr>
</tbody>
</table>

---

Measurement

• Initial BP at visit
  • Oscillometric or Auscultatory
  • Measured in right arm, relaxed/seated
  • Unless atypical aortic arch anatomy
  • Appropriate size cuff
  • If initial BP elevated (> 90th percentile)
    • take 2 additional measurements and average them
    • If auscultatory-> average determines BP category
    • If oscillatory AND average > 90th %
      • Take 2 auscultatory measurements and average to determine BP category


Measurement

• Begin routinely at 3 y/o
  • Measure annually in otherwise healthy children
    • not at each encounter as previously
  • Measure at every encounter in:
    • Obesity (BMI ≥ 95th percentile)
    • Renal disease
    • Diabetes
    • Aortic arch obstruction/coarctation
    • Taking medications known to increase BP
  • Measure in children < 3 y/o
    • At increased risk for developing HTN

• Key Action Statement 1.
  • BP should be measured annually in children and adolescents ≥3 years of age
    (grade C, moderate recommendation).

• Key Action Statement 2.
  • BP should be checked in all children and adolescents ≥3 years of age at every health care encounter if they have obesity, are taking medications known to increase BP, have renal disease, a history of aortic arch obstruction or coarctation, or diabetes (see Table 9)
    (grade C, moderate recommendation).

Repeating High Blood Pressure Measurements

- BP in childhood varies considerably:
  - Between visits &
  - During a single visit.
- Clinician should
  - Repeat high BP reading at the visit
  - Obtain multiple measurement over time before diagnosing HTN!

- Leg BP 10-20 mm Hg higher than corresponding arm
- Pharmacologic causes of Elevated BP
  - OTC: Decongestants, caffeine, NSAIDs, Herbal/Nutritional supplements
  - RX: stimulants for ADD/ADHD, Contraceptives, Steroids, TCAs
  - Illicit: Amphetamine, Cocaine

<table>
<thead>
<tr>
<th>BP Category</th>
<th>BP Screening Schedule</th>
<th>Lifestyle Counseling (Weight, Nutrition)</th>
<th>Check Upper and Lower Extremity BP</th>
<th>ABPM</th>
<th>Diagnostic Evaluation</th>
<th>Initiate Treatment</th>
<th>Consider Sub-specialty Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Annual</td>
<td></td>
<td>X</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Elevated BP</td>
<td>Initial Measurement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td></td>
<td>Second Measurement</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat in 6 months</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Third Measurement</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Repeat in 6 months</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1 HTN</td>
<td>Initial Measurement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>Second Measurement</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat in 1-2 weeks</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Third Measurement</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Repeat in 3 months</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 2 HTN</td>
<td>Initial Measurement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Second Measurement</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat/refer to specialty care within 2 weeks</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Management

- Normal BP:
  - If BP normal or normalizes after repeat readings (< 90th %)
    - No action needed
    - Measure BP at next routine well-child visit

- Elevated BP *(previously prehypertension)*
  1. Initially
     - Recommend lifestyle interventions
     - Healthy diet, sleep, physical activity
     - Consider nutrition/weight management referral
     - Repeat BP by auscultation in 6 months
  2. Remains elevated after 6 months
     - Check upper and lower extremity BP (Right arm, left arm, 1 leg)
     - Repeat lifestyle counseling
     - Recheck in 6 months by auscultation
  3. Remains elevated after 12 months
     - Order ambulatory (ABPM) if available
     - Conduct diagnostic evaluation
       - U/A, Chem profile (BMP), Lipids (fasting/non), Renal U/S < 6 y/o or with abnormal U/A or renal function
       - if Obese: A1c, AST/ALT, fasting Lipids
       - Optional: fasting glucose, TSH, drug screen, sleep study, CBC
     - Consider subspecialty referral
       - Nephrology/Cardiology
  4. If BP normalizes at any point
     - Return to annual BP screening

---

Management

**Stage 1 HTN**

1. Initially-if asymptomatic
   - Recommend lifestyle interventions
     - Healthy diet, sleep, physical activity
   - Repeat BP by auscultation in 1-2 weeks

2. Remains Stage 1 after 1-2 weeks
   - Check upper and lower extremity BP
     - Right arm, left arm, 1 leg
   - Repeat lifestyle counseling
     - Consider nutrition/weight management referral if appropriate
   - Recheck in 3 months by auscultation

3. Remains Stage 1 after 3 months
   - Order ambulatory (ABPM) if available
   - Conduct diagnostic evaluation
     - U/A, Chem profile (BMP), Lipids (fasting/non), Renal U/S < 6 y/o or with abnormal U/A or renal function
     - if Obese: A1c, AST/ALT, fasting Lipids
     - Optional: fasting glucose, TSH, drug screen, sleep study, CBC
   - **Initiate treatment**
     - Consider subspecialty referral
     - Nephrology/Cardiology

**Stage 2 HTN**

1. Initially
   - Check upper and lower extremity BP
     - Right arm, left arm, 1 leg
   - Recommend lifestyle interventions
     - Healthy diet, sleep, physical activity
     - within 1 week
     - Repeat BP by auscultation -OR-
     - Consider subspecialty referral

2. Remains Stage 2 on recheck
   - Order ambulatory (ABPM) if available
   - Conduct diagnostic evaluation
     - U/A, Chem profile (BMP), Lipids (fasting/non), Renal U/S < 6 y/o or with abnormal U/A or renal function
     - if Obese: A1c, AST/ALT, fasting Lipids
     - Optional: fasting glucose, TSH, drug screen, sleep study, CBC
   - **Initiate treatment**—OR—
     - Refer to subspecialty care within 1 week

3. If Stage 2 and symptomatic OR BP > 30 mmHg above 95th % (OR > 180/120 in adolescent)
   - Referral to immediate care (ED)
• **Key Action Statement 3:**
  • Trained health care professionals in the office setting should make a diagnosis of HTN if a child or adolescent has auscultatory-confirmed BP readings ≥95th percentile on 3 different visits
  • (grade C, moderate recommendation).

• **Key Action Statement 4:**
  • Organizations with EHRs used in an office setting should consider including flags for abnormal BP values both when the values are being entered and when they are being viewed
  • (grade C, weak recommendation).

---

**BP Measurement**

• Auscultatory vs. Oscillometric
• Forearm and/or Wrist
• Ambulatory BP Measurement
• In Obese Children
• At-Home
• School-based

<table>
<thead>
<tr>
<th></th>
<th>Office BP</th>
<th>Ambulatory BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td>Sustained HTN</td>
<td>Elevated</td>
<td>Elevated</td>
</tr>
<tr>
<td>White Coat HTN</td>
<td>Elevated</td>
<td>Normal</td>
</tr>
<tr>
<td>Masked HTN</td>
<td>Normal</td>
<td>Elevated</td>
</tr>
</tbody>
</table>
Ambulatory Readings

• **Key Action Statement 5:**
  - Oscillometric devices may be used for BP screening in children and adolescents. When doing so, providers should use a device that has been validated in the pediatric age group. If elevated BP is suspected on the basis of oscillometric readings, confirmatory measurements should be obtained by auscultation
    • (grade B, strong recommendation).

• **Key Action Statement 6:**
  - ABPM should be performed for the confirmation of HTN in children and adolescents with office BP measurements in the elevated BP category for 1 year or more or with stage 1 HTN over 3 clinic visits
    • (grade C, moderate recommendation).


Key Action Statement 7:
- The routine performance of ABPM should be strongly considered in children and adolescents with high-risk conditions (see Table 12) to assess HTN severity and determine if abnormal circadian BP patterns are present, which may indicate increased risk for target organ damage
  - (grade B, moderate recommendation).

Key Action Statement 8:
- ABPM should be performed by using a standardized approach (see Table 13) with monitors that have been validated in a pediatric population, and studies should be interpreted by using pediatric normative data
  - (grade C, moderate recommendation).

Key Action Statement 9:
- Children and adolescents with suspected WCH should undergo ABPM. Diagnosis is based on the presence of mean SBP and DBP <95th percentile and SBP and DBP load <25%
  - (grade B, strong recommendation).

Key Action Statement 10:
- Home BP monitoring should not be used to diagnose HTN, MH, or WCH but may be a useful adjunct to office and ambulatory BP measurement after HTN has been diagnosed
  - (grade C, moderate recommendation).
Poll Question 2

A 10 year old female is found to have an elevated blood pressure when measured in their left arm, but normal when measured in their right. Which of the following studies would be most useful in determining the cause of this finding?

A. Blood for elevated cortisol levels  
B. Urine drug screen  
C. Echocardiogram  
D. Polysomnography  
E. Blood and urine for elevated catecholamine levels

Poll Question 3

A 16 year old male is found to have an elevated blood pressure c/w Stage 2 hypertension when measured in both left and right arm. On exam, he is noted to be tachycardic and have significant acne on his face and back, along with striae on his abdomen. This presentation is most consistent with which cause of secondary hypertension?

A. Hyperthyroidism  
B. Pheochromocytoma  
C. Obstructive sleep apnea  
D. Drug-induced  
E. Coarctation of the aorta
Primary and Secondary HTN

• Primary HTN **(most common)**
  - Older (≥ 6 y/o)
  - Family hx HTN (parent/grandparent)
  - Overweight/obese

• Secondary HTN
  - Renal and/or Renovascular
    - (34%-79% and ~12%)
  - Cardiac, including Aortic Coarctation
  - Endocrine
  - Environmental exposure
    - Lead, Cadmium, Mercury, Phthalates
  - Neurofibromatosis
  - Medication related

• Monogenic HTN
  - Familial hyperaldosteronism type I
  - Glucocorticoid remediable aldosteronism
  - Liddle syndrome
  - Pseudohypoaldosteronism type II (Gordon syndrome)
  - Apparent mineralocorticoid excess
  - Familial glucocorticoid resistance
  - Mineralocorticoid receptor activating mutation
  - Congenital adrenal hyperplasia


Evaluation

• History
  - Perinatal
  - Nutritional
  - Physical activity
  - Psychosocial
  - Family

• Physical Exam
  - Focused on clues from history and possible causes of secondary HTN
  - BP measured in right/left arm + 1 leg
    - Normally leg 10-20 mmHg higher than arm
    - Frequently normal!

• Laboratory Evaluation
  - Basic screening tests
  - Specific tests based on history and physical exam
    - (noted previously in Management)

• Assess for target organ damage
  - EKG: Unnecessary for LVH!
    - High specificity/poor sensitivity
      - extremely low PPV.
  - Imaging
    - Echocardiography at time of consideration of pharmacologic treatment.
• **Key Action Statement 11:**
  • Children and adolescents ≥6 years of age do not require an extensive evaluation for secondary causes of HTN if they have a positive family history of HTN, are overweight or obese, and/or do not have history or physical examination findings (Table 14) suggestive of a secondary cause of HTN
  • (grade C, moderate recommendation).


---

**Table 14**

(continued)

<table>
<thead>
<tr>
<th>Body System</th>
<th>Finding, History</th>
<th>Possible Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital signs</td>
<td>Tachycardia, Hypothyroidism</td>
<td>PCC, Neuroblotoma, Deconization of the aorta</td>
</tr>
<tr>
<td>Ears, nose, throat</td>
<td>Decreased lower extremity pulses, drop in BP from upper to lower extremities</td>
<td>Severe HTN, more likely to be associated with secondary HTN</td>
</tr>
<tr>
<td>Height, weight</td>
<td>Increased capillary filling time, Hypertrophy</td>
<td>Obesity (BMI)</td>
</tr>
<tr>
<td>Head, neck</td>
<td>Ectopic facies, Obesity, Neck</td>
<td>Truncal obesity, Hyperthyroidism</td>
</tr>
<tr>
<td>Skin</td>
<td>Palmar flushing, Diaphoresis</td>
<td>Acne, hirsutism, Striae</td>
</tr>
<tr>
<td>Hematologic</td>
<td>Palmar</td>
<td>Renal disease</td>
</tr>
</tbody>
</table>

• **Key Action Statement 12:**
  • Children and adolescents who have undergone coarctation repair should undergo ABPM for the detection of HTN (including MH)
    • (grade B, strong recommendation).


• **Key Action Statement 13:**
  • In children and adolescents being evaluated for high BP, the provider should obtain a perinatal history, appropriate nutritional history, physical activity history, psychosocial history, and family history and perform a physical examination to identify findings suggestive of secondary causes of HTN
    • (grade B, strong recommendation).

• **Key Action Statement 14**
  • Clinicians should not perform electrocardiography in hypertensive children and adolescents being evaluated for LVH
    • (grade B, strong recommendation).
Key Action Statement 15:

- It is recommended that echocardiography be performed to assess for cardiac target organ damage (LV mass, geometry, and function) at the time of consideration of pharmacologic treatment of HTN;
- LVH should be defined as LV mass >51 g/m².7 (boys and girls) for children and adolescents older than 8 years and defined by LV mass >115 g/BSA for boys and LV mass >95 g/BSA for girls;
- Repeat echocardiography may be performed to monitor improvement or progression of target organ damage at 6- to 12-month intervals. Indications to repeat echocardiography include persistent HTN despite treatment, concentric LV hypertrophy, or reduced LV ejection fraction; and
- In patients without LV target organ injury at initial echocardiographic assessment, repeat echocardiography at yearly intervals may be considered in those with stage 2 HTN, secondary HTN, or chronic stage 1 HTN incompletely treated (noncompliance or drug resistance) to assess for the development of worsening LV target organ injury.

Key Action Statement 16:

- Doppler renal ultrasonography may be used as a noninvasive screening study for the evaluation of possible RAS in normal-weight children and adolescents ≥8 years of age who are suspected of having renovascular HTN and who will cooperate with the procedure.

Key Action Statement 17:

- In children and adolescents suspected of having RAS, either CTA or MRA may be performed as a noninvasive imaging study. Nuclear renography is less useful in pediatrics and should generally be avoided.

• Uric Acid
  • Prior small studies suggest:
    • Childhood UA levels associated with adult BP level
    • Lowering UA can decrease BP
    • Increased UA can blunt lifestyle benefits on BP
  • No large-scale multicenter trials
  • Not sufficient evidence to support routine measurement!

• Microalbumin
  • in adults, MA = marker of HTN related injury, predictor of CVD
  • No evidence to support such relationship in children

• Key Action Statement 18:
  • Routine testing for MA (microalbumin) is not recommended for children and adolescents with primary HTN
    • (grade C, moderate recommendation).


Treatment

• Goal:
  • to reach BP level that reduces risk of target organ damage in childhood,
  • and reduce risk of HTN and CVD in adulthood.
    • may even reverse TOD in youth!
• Optimal BP level:
  • < 90th percentile or < 130/80 mmHg
  • Whichever is lower

• Lifestyle/Nonpharmacologic
  • Diet
    • DASH diet
  • Physical Activity
    • 40 minutes moderate/vigorous activity 3 to 5 days a week
  • Weight Loss and Related CV Risk Factors
    • Motivational Interviewing to address obesity, promote physical activity and dietary changes
    • Regular patient/family contact
    • > 1 hour physical activity daily
  • Stress Reduction

• **Key Action Statement 19:**
  • In children and adolescents diagnosed with HTN, the treatment goal with nonpharmacologic and pharmacologic therapy should be a reduction in SBP and DBP to <90th percentile and <130/80 mm Hg in adolescents ≥ 13 years old
    • (grade C, moderate recommendation).

• **Key Action Statement 20:**
  • At the time of diagnosis of elevated BP or HTN in a child or adolescent, clinicians should provide advice on the DASH diet and recommend moderate to vigorous physical activity at least 3 to 5 days per week (30–60 minutes per session) to help reduce BP
    • (grade C, weak recommendation).

**Treatment - Pharmacologic**

• Pharmacologic tx if:
  • Remain hypertensive despite lifestyle modifications -OR-
  • Symptomatic HTN -OR-
  • Stage 2 HTN w/o modifiable risk factor -OR-
  • Any HTN with CKD or diabetes tx
  • Initiate single medication at low dose.
  • Titrate every 2 to 4 weeks until:
    • BP controlled, max dose, adverse effects (home BP/clinic visits)
    • Add second agent if not controlled

• Generally in children:
  • Start with ACEi, ARB, long-acting CCBs, thiazide diuretics
    • β-blockers not recommended initially
  • Anti-HTN drugs decrease BP with few adverse effects
  • Few comparative studies
    • No clinically significant differences between classes
  • No CV endpoint studies
  • No long-term studies of anti-HTN safety
### Drug Class Considerations

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| ACE inhibitors   | • Contraindications: pregnancy, angioedema  
• Common adverse effects: cough, headache, dizziness, asthenia  
• Severe adverse effects: hyperkalemia, acute kidney injury, angioedema, fetal toxicity |
| ARBs             | • Contraindications: pregnancy  
• Common adverse effects: headache, dizziness  
• Severe adverse effects: hyperkalemia, acute kidney injury, fetal toxicity |
| Thiazide diuretics | • Contraindications: anuria  
• Common adverse effects: dizziness, hypokalemia  
• Severe adverse effects: cardiac dysrhythmia, cholestatic jaundice, new onset diabetes mellitus, pancreatitis |
| CCBs             | • Contraindications: hypersensitivity to CCBs  
• Common adverse effects: flushing, peripheral edema, dizziness  
• Severe adverse effects: angioedema |


### Choice of agent

- **African American children**  
  • Higher dose of ACEi–or–  
  • Long-acting CCB, thiazide diuretic
- **Female/Childbearing potential**  
  • Informed of risk of ACEi/ARB and fetal injury or death – generally avoided  
  • CCB, β-blocker if appropriate
- **Children w/ CKD, proteinuria, DM**  
  • ACEi or ARB unless contraindication
- **Others classes reserved for those who do not respond to 2 preferred drugs**  
  • α-blockers, β-blockers, combination α & β-blockers, centrally acting agents, K-sparing diuretics, direct vasodilators
- **See Table 17:**  
  • Most drugs approved starting at  
    • 1-6 years or 35-50 kg
  • **Enalapril**  
    • approved ≥ 1 month  
    • 0.08 mg/kg/d (up to 5 mg)  
    • To 0.6 mg/kg/d (up to 40 mg)  
    • Suspension preparation on package insert.
- **HCTZ**  
  • Approved “child” (> 6 m)  
    • 1-2 mg/k/d (up to 37.5 mg/d)
Choice of agent

• **Key Action Statement 21:**
  - In hypertensive children and adolescents who have failed lifestyle modifications (particularly those who have LV hypertrophy on echocardiography, symptomatic HTN, or stage 2 HTN without a clearly modifiable factor [eg, obesity]), clinicians should initiate pharmacologic treatment with an ACE inhibitor, ARB, long-acting calcium channel blocker, or thiazide diuretic
  - (grade B, moderate recommendation).


• **Key Action Statement 22:**
  - ABPM may be used to assess treatment effectiveness in children and adolescents with HTN, especially when clinic and/or home BP measurements indicate insufficient BP response to treatment
  - (grade B, moderate recommendation).

• **Key Action Statement 23:**
  - Children and adolescents with CKD should be evaluated for HTN at each medical encounter;
  - Children or adolescents with both CKD and HTN should be treated to lower 24-hour MAP to <50th percentile by ABPM; and
  - Regardless of apparent control of BP with office measures, children and adolescents with CKD and a history of HTN should have BP assessed by ABPM at least yearly to screen for MH
  - (grade B; strong recommendation).

Treatment Resistant HTN

- Persistently elevated BP despite:
  - 3 or more agents of different classes at maximal effective dose, and at least one diuretic
  - Requires:
    - Correct office BP measurement
    - Confirmation of treatment adherence
    - Confirmation by ABPM

- Treatment
  - Dietary sodium restriction
  - Elimination of BP elevating substances
  - Identification of causes of secondary HTN
  - Optimization of current therapy
  - Additional agents
    - Aldosterone receptor antagonist (spironolactone) is optimal additional agent in adults
    - No information for children

- Key Action Statement 24:
  - Children and adolescents with CKD and HTN should be evaluated for proteinuria
    - (grade B, strong recommendation).

- Key Action Statement 25:
  - Children and adolescents with CKD, HTN, and proteinuria should be treated with an ACE inhibitor or ARB
    - (grade B, strong recommendation).

- Key Action Statement 26:
  - Children and adolescents with T1DM or T2DM should be evaluated for HTN at each medical encounter and treated if BP is ≥95th percentile or >130/80 mm Hg in adolescents ≥13 years of age
    - (grade C, moderate recommendation).

Acute Severe HTN

- Usually well above Stage 2 levels
  - Little evidence for evaluation/management in children
  - Usually due to underlying secondary cause of HTN
    - Expedient evaluation for secondary cause, TOD as necessary
    - May include renal function, echocardiography, CNS imaging
  - Goal: 95th % in ~ 24 hours
    - 25% of planned reduction in first 8 hours
    - Oral agents if tolerate, IV otherwise

- Key Action Statement 27:
  - In children and adolescents with acute severe HTN and life-threatening symptoms, immediate treatment with short-acting antihypertensive medication should be initiated, and BP should be reduced by no more than 25% of the planned reduction over the first 8 hours
  - (grade expert opinion D, weak recommendation).

- Key Action Statement 28:
  - Children and adolescents with HTN may participate in competitive sports once hypertensive target organ effects and risk have been assessed
  - (grade C, moderate recommendation).

- Key Action Statement 29:
  - Children and adolescents with HTN should receive treatment to lower BP below stage 2 thresholds before participating in competitive sports
  - (grade C, weak recommendation).

- Key Action Statement 30:
  - Adolescents with elevated BP or HTN (whether they are receiving antihypertensive treatment) should typically have their care transitioned to an appropriate adult care provider by 22 years of age (recognizing that there may be individual cases in which this upper age limit is exceeded, particularly in the case of youth with special health care needs). There should be a transfer of information regarding HTN etiology and past manifestations and complications of the patient’s HTN
  - (grade X, strong recommendation).
AAFP

- Reviewed AAP 2017 Guidelines
  - February 2018 “Affirmation of Value”
  - The AAFP uses the category of “Affirmation of Value” to support clinical practice guidelines that provide valuable guidance, but do not meet our criteria for full endorsement. The primary reasons for not endorsing this guideline included:
    - There was a lack of transparency in the methodology used for study evaluation.
    - While recommendations based on expert opinion were identified, it was unclear how those recommendations were developed.
    - The management of conflicts of interest was not well described.
    - There was inadequate discussion of the potential harms of medications for long-term use in children.

USPSTF 2013

- Acknowledges:
  - Childhood BP, to a significant degree, predicts adult BP.
  - Hypertensive children are at risk for progression of metabolic disorders.
    - Insulin resistance, lipid abnormalities...
  - Some evidence that drugs and/or lifestyle changes are effective in reducing BP.
  - No evidence of harm in screening for hypertension in children...

- However:
  - No evidence that routine BP measurements in childhood accurately identifies individuals at risk for adult cardiovascular disease.
  - Rejected identifying secondary hypertension as a rationale for screening as it was considered rare
USPSTF 2013

• Risk Assessment
  • Strongest risk factor: elevated BMI
  • Also: low birthweight, male, ethnicity, family history

• Screening Tests:
  • Clinical sphygmomanometry has reasonable sensitivity
  • But false-positives occur w/ subsequent normalization

• Treatment
  • Stage 1: lifestyle and pharmacologic; medications not recommended as first-line tx.

• Balance harms/benefits
  • Inadequate evidence:
    • Diagnostic screening test
    • Effectiveness of treatments and harms of screening or treatment
  • Cannot determine balance of benefits/harms of screening or treatment.

Recommendation (USPSTF 2013)

• (I) Insufficient
  • “Current evidence insufficient to assess the balance of benefits and harms”

• Applies to children/adolescent who do not have symptoms of hypertension

Expert Opinion

- Pediatric/Adolescent HTN can contribute to premature atherosclerosis and early CVD.
- Prevalence of childhood HTN has increased along with increased prevalence of obesity.
- Overweight children are more likely to be hypertensive.
- Hispanic children are more likely to have elevated BP than other ethnic groups.
- Family history of HTN is present in ~50% of children with HTN.
- White-coat hypertension is very common in children.
- Unsure of significance.
- Secondary HTN:
  - ~70% due to renal disease
  - ~11% endocrine

Poll Question 4

Joyce L is a 16 year old female is found to have a blood pressure of 132/86. She has no significant symptoms. She really does not like to use medications, unless she absolutely has to. She weighs 76 kg, stands 158 cm tall and has a BMI of 30.4 kg/m². This reading is most consistent with a diagnosis of?

A. Normal Blood Pressure
B. Elevated Blood Pressure
C. Stage 1 HTN
D. Stage 2 HTN
E. Unable to determine from data given.
Joyce’s care

Joyce’s blood pressure remains elevated to the same range on subsequent recheck 2 weeks later. She receives all appropriate evaluation, which fails to show an identified cause of secondary hypertension.

You correctly treat her by weight management counseling, introduce physical activity and diet management. You schedule her back to recheck her BP in three months.

Poll Question 5

Joyce’s does not return until her mother makes her an appointment for a 17 y/o exam. She is now 159 cm tall, and has lost 5 kg, but her blood pressure, on subsequent evaluations, is consistently within the Stage 1 range. Which of the following is the most appropriate intervention at this time?

A. No therapy, recheck BP in 6 months
B. Encourage healthy diet, sleep and physical activity
C. Weight management counseling, introduce physical activity and diet management
D. Initiate drug therapy using a single agent.
E. Initiate drug therapy using two agents.
Poll Question 6

Remembering that Joyce really would prefer to take as few medications as possible, which of the following is the most appropriate single drug to use for her at this time?

A. Enalapril (an ACEi)
B. Losartan (an ARB)
C. Amlodipine (a CCB)
D. Clonidine (a central α-agonist)
E. Hydralazine (a vasodilator)

Best Practice Recommendations

• Use established workflow to encourage correct pediatric blood pressure measurement.
• Use simple screening tables or electronic system to identify abnormal BP values in children.
• Follow-up elevated BP in appropriate time frame.
• Encourage lifestyle changes frequently.
• Do not delay pharmacotherapy when appropriate.
Questions

Contact Information

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Resources

• AAP 2017 Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents
  • https://pediatrics.aappublications.org/content/140/3/e20171904
• CDC: High Blood Pressure During Childhood and Adolescence:
  • https://www.cdc.gov/bloodpressure/youth.htm
• AHS: High Blood Pressure in Children:
  • https://www.heart.org/en/health-topics/high-blood-pressure/why-high-blood-pressure-is-a-silent-killer/high-blood-pressure-in-children
• CPEG-GPEC 2017 Pediatric BP Calculator
  • https://apps.cipeg-gcep.net/BPz_cpeg_dde/

References

References


Answers

1. C
2. C
3. D
4. C
5. D
Practical Pediatric and Adolescent Immunization in the Office Update

James Loehr, MD, FAAFP

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James Loehr, MD, FAAFP

Founder/Family Physician, Cayuga Family Medicine, Ithaca, New York

Dr. Loehr has practiced as a family physician in Rochester and Ithaca, New York, for the past 29 years. He graduated from Cornell University in Ithaca, earned his medical degree from Baylor College of Medicine in Houston, Texas, and completed his residency training in Rochester. In 2000, he founded Cayuga Family Medicine, a practice with four physicians and two nurse practitioners providing outpatient care to patients of all ages, from birth to death. Dr. Loehr became especially interested in vaccines while discussing the topic with vaccine-hesitant families in Ithaca, which has been described as “10 square miles surrounded by reality.” After writing a book about vaccines to share his perspective with his patients (The Vaccine Answer Book: 200 Essential Answers to Help You Make the Right Decisions for Your Child), he did a part-time vaccine fellowship with the AAFP. In addition, he served as the AAFP liaison to the Advisory Committee on Immunization Practices (ACIP) from 2011 to 2015 and is still an at-large representative on the ACIP Influenza Work Group.
Learning Objectives

1. Follow the updated ACIP recommendations for children and adolescent vaccination schedules; understand how to provide catch-up vaccination schedules.

2. Establish evidence-based vaccine administration procedures and protocols.

3. Counsel parents of children and adolescents, using available patient education resources and motivational interviewing about vaccine safety and efficacy.

4. Participate in available childhood immunization programs, and administer using a standardized process.

Audience Engagement System

Step 1

Step 2

Step 3
Presentation Outline

1. New pediatric and adolescent vaccine information
2. Logistics of giving vaccines in the office
3. Vaccine hesitancy
Recommended Child and Adolescent Immunization Schedule
Put out yearly by ACIP and CDC
Harmonized with AAP, AAFP, ACOG

- Reminder about content syndication
  - automatic web updates


Recommended Child and Adolescent Immunization Schedule

- Vaccines on the left (red oval)
- Months and years at the top (blue oval)
  - Example - DTaP #5 at 4-6 yrs (green oval)
- Explanatory colors at the bottom
- When not clear, refers reader to notes (purple oval)
Structural Changes

In 2019 new format

- Explanatory cover page
  - Helpful Information links (red circle)
  - Abbreviations, trade names (blue oval)
- Note the CDC Vaccine App
Structural Changes

- More colors under Medical Indications (Table 3)
- The indications I refer to most are pregnancy, asplenia, diabetes
- Note the red boxes - live virus vaccines
  - Reminder to check for pregnancy with MMR and Varicella
  - LAIV with lots of red boxes so mostly for healthy people
Structural Changes

- Old Footnotes are now called Notes and are in alphabetical order
  - Reminder that hyphen means “through”
    - DTaP#4 says 15-18 months is “through” 18 months
  - 4 weeks = 28 days and 16 weeks does not equal 4 months
  - Four day grace period explained
    - not valid for rabies or spacing of different live vaccines (except oral rotavirus or oral typhoid)
  - General recommendations
    - [https://www.cdc.gov/vaccines/hcp/acip-recks/general-recs/downloads/general-recs.pdf](https://www.cdc.gov/vaccines/hcp/acip-recks/general-recs/downloads/general-recs.pdf)
Vaccine Specific Changes - HIB & pneumococcal

- Table 2 or Catch Up Schedule
  - Minor changes to understand when no further doses are needed for HIB or pneumococcal vaccines

- The catch up schedule is the schedule I consult the most
Vaccine specific changes - LAIV

- LAIV - ACIP approved in 2018 and AAP in 2019
  - 2018 AAFP prefers IIV unless pt won’t vaccinate
- LAIV better than IIV 2004-2008 children ages 2-8 yrs
  - But LAIV worse 2009-2015
  - LAIV equal IIV Great Britain 2017-18
- Ages 2 through 49 years
- Not for pregnancy, immunosuppressed
- Not for wheezing ages 2-4, asthma
Vaccine specific changes - Hep A & Hep B

• Hep A now recommended for homeless
  – And for 6-11 mo travelers - but does not count for two dose series
  – And close contact with certain international adoptees

• Hep A - Hep B (Twinrix) vaccine available for >= 18 years
• CpG-adjuvanted Hep B vaccine (Heplisav-B) for >= 18 years

Vaccine specific changes - Tdap

• Children who receive Tdap ages 7-10 years should still get booster at age 11-12 years

• Still recommending Tdap at 27-36 weeks with each pregnancy

• These are the only recommendations for repeat Tdap
Hexavalent Vaccine

- VAXELIS = DTaP, IPV, Hep B, and HIB
  - DTaP, HIB, IPV from Sanofi = Pentacel
  - Hep B from Merck = Recombivax
- FDA approval December 2018
- Three dose series between ages 6 weeks and 4 years
  - Usually 2, 4, 6 months
- ACIP approval June 2019, available 2021?
- CPT code ???, CVX code 146

Poll Question 1

Which of the following statements is correct regarding a 6 1/2 year old patient receiving Dtap-IPV vaccine as a fifth dose?

A. The Dtap vaccine is considered delayed.
B. The IPV vaccine is considered delayed.
C. Both are considered delayed.
D. Both are considered on schedule.
Presentation Outline

1. New pediatric and adolescent vaccine information
2. Logistics of giving vaccines in the office
3. Vaccine hesitancy

Many of the following slides courtesy of Immunization Action Coalition
www.immunize.org

Poll Question 2

How many of you are:

A. Primarily responsible for vaccine decisions such as ordering, buying equipment, writing protocols
B. Involved but not the final decision maker?
C. Public Health?
D. Not involved at all?
E. Other?
How to set up a vaccine process in your office

- **Starting from scratch:** Vaccinating Adults: A Step by Step Guide - [http://www.immunize.org/guide/](http://www.immunize.org/guide/)
- Aimed at adults but useful for children
- Also useful as refresher - Are you doing it right?
- Table of contents includes
  - Setting up your office
  - Storage and handling
  - How to administer vaccines
  - Documentation and Billing
Refrigerator, Freezer, and Temperature Monitoring

• Separate refrigerator and freezer
  – Avoid combination units because less reliable
  – If using combination unit, don’t use freezer
• No food!
• Temperature monitoring
  – VFC now requires an electronic log of temps
  – CDC recommends continuous monitoring and probe in glycol solution
Hot topic: Shoulder injury related to vaccine administration (SIRVA)

- Defined as musculoskeletal injury from injection into tendons, ligaments, bursae instead of intramuscular injection
- Chapter 5 - instructions on adult vaccine admin
  - Useful for staff training
- IAC - instructions on pediatric vaccine administration

How to Administer Intramuscular and Subcutaneous Vaccine Injections

Administration by the Intramuscular (IM) Route

**Administer These Vaccines via IM Route:***
- Diphtheria-tetanus-pertussis (DTP, TD)
- Hepatitis B
- Hemophilus influenzae type b (Hib)
- Haemophilus influenzae type b (Hib)
- Inactivated influenza vaccine
- Inactivated poliomyelitis vaccines
- Measles-mumps-rubella (MMR) vaccination
- Meningococcal conjugate (MenC)
- Pneumococcal conjugate (PCV13)
- Tetanus, diphtheria, and pertussis (Tdap)
- Inactivated poliomyelitis vaccine
- Pneumococcal polysaccharide (PPV23) vaccine
- Hepatitis A

**Needle Insertion:**

1. **Intermuscular (IM) injection site for infants:**
   - The injection site is the upper part of the baby's thigh, just below the buttocks.
   - Insert the needle at a 90-degree angle and release the plunger to deposit the vaccine.

2. **Intermuscular (IM) injection site for children:**
   - The injection site is the upper part of the thigh, just below the buttocks.
   - Insert the needle at a 90-degree angle and release the plunger to deposit the vaccine.

3. **Intermuscular (IM) injection site for adults:**
   - The injection site is the upper part of the thigh, just below the buttocks.
   - Insert the needle at a 90-degree angle and release the plunger to deposit the vaccine.

**Special Instructions:**

- For infants and young children, the injection site is the upper part of the thigh, just below the buttocks.
- For adults, the injection site is the upper part of the thigh, just below the buttocks.
- Ensure that the needle is inserted at a 90-degree angle to avoid damaging the muscle tissue.

**Note:**

Always use aseptic technique and follow the manufacturer's instructions for administration.
Standing orders

- Allows vaccines to be given to a patient based on a written protocol instead of an individual patient order.
- Delegating authority but physician ultimately responsible
- Commonly used for flu clinics
- Who can legally administer vaccine does not change
  - In New York an MA cannot give vaccines
  - AND an LPN cannot implement a standing order!
- In New York, pharmacists need an MD to sign off on protocol

Benefits of standing orders

- Strong evidence of increased vaccination
  - 35 studies, average increase 16-27% over various categories
  - Mostly adults but four studies in children with 28% increase
  - Wide variety of settings so like widely applicable
- Also improved efficiency and flow of busy offices
- Mean increased income from flu, Tdap, pneumococcal standing orders was around $24 per patient
- No harms noted

https://www.cdc.gov/mmwr/preview/mmwrhtml/rr4901a2.htm
Barriers to Standing Orders

- State laws limit implementation
- Physicians unwilling to delegate
- Staff uncomfortable with lack of a specific patient order
- Additional workload for staff with more vaccines given
- Patients unwilling to accept vaccines before seeing physician

Elements of a standing order

- Who is eligible for the vaccine?
- Indications, contraindications?
- How to manage emergencies?
How to implement standing orders

  - Leadership support
  - Materials and Strategies
  - Make it happen
- Emphasizes how to create necessary structure for implementation - more useful for larger practices
How to implement standing orders

• Create your own workflow
  – Flu clinics
    • Checklist for contraindications (next slide)
    • Five minute appointments
    • Two staff: one for injection, one for documentation
  – Regular visits
    • Staff reviewing vaccines needed, getting consent
    • Nurse administering vaccines before patient seen by MD
Finding pre-made standing orders

- Immunization Action Coalition - [www.immunize.org](http://www.immunize.org)
- Over 30 different forms for most common vaccines
- The IAC Express is a weekly email that keeps you up to date on all things related to vaccines


Vaccine Reminder Systems

- Start with your EMR
  - Talk to your IT staff, EMR vendor
- State vaccine registry
  - Pediatrics
  - Adults?
- Pre-visit planning
  - Review vaccines due for the day at huddle
Vaccine Information Sheets (VIS)

- The IAC website also has VIS (Vaccine Information Sheets) in English and several other languages.
- Plus the VIS page has a list of all current VIS and the date of the most recent VIS. You can use this list to stay up to date.
Vaccine Billing

- Bill for the vaccine and the administration code
- Pediatric admin codes require counseling at visit
  - Bill by component of vaccine
    - MMR has 3 components
    - Hexavalent DtaP-HepB-IPV-HIB has 6!
      - CPT codes 90460 (first), 90461(second+)
    - If no counseling, need to bill with adult codes
      - CPT codes 90470 (first), 90471 (second+)
Vaccine Billing

• Kindergarten vaccines = MMRV, DTaP-IPV
  – MMRV & DTaP-IPV each 90460x1 + 90461x3
  – 90460 pays $45, 90461 pays $27.50

• Payment
  – 90460 x 2 x $45 = $90
  – 90461 x 6 x $27.50 = $165

• Total Payment = $255

Vaccine Billing

• But without counseling
  – 90471 first vaccine ($45) + 90472 2nd ($27.50)
  – Total = $72.50

• *** Compare $255 vs $72.50 if counseling ***

• More relevant if combination vaccines, I don’t use with flu clinic
• Immunizations: How to Protect Patients and the Bottom Line
Poll Question 3

Which of the following statements is true regarding standing orders?

A. They allow staff members who otherwise are not allowed to give vaccines legal permission to give immunizations.
B. They increase vaccination rates.
C. They relieve the physician from litigation risk when staff are giving vaccines.
D. They require extra work to review for contraindications.

Presentation Outline

1. New pediatric and adolescent vaccine information
2. Logistics of giving vaccines in the office
3. Vaccine hesitancy
Vaccine Hesitancy - What?

• Plan to defer or decline vaccines despite easy availability
• Spectrum of attitudes
  – Unsure vs delay vs refusal vs trying to convince you
• Vaccine delay (19%) vs refusal (3%)
  – Some patients/families will never be convinced
  – BUT questions and concerns do not equal refusal
    • Do not overestimate resistance
Vaccine Hesitancy - Why?

- WHO - Issues of confidence, complacency, convenience
- Common parental concerns focus on safety
  - Fear of side effects, both immediate and long term
  - Overloading immune system, too many vaccines
  - Fear of ingredients (thimerosal, aluminum)
  - Pain for children
  - Mistrust of medicine, government, Big pharma
  - Natural disease is better
  - Healthy kids don’t need protection
  - Diseases no longer present, not dangerous

Vaccine Hesitancy - Response

- One response might be to try motivational interviewing
  - Empathy: I understand where you are coming from
    - Seek common ground - We both care for your child
  - Discrepancy: What they would do if traveling overseas?
  - Adjust to resistance but don’t fight
    - Answer questions with simple language
    - But ok to say you encourage vaccination
  - Support self-efficacy: Ultimately they make the decision
Vaccine Hesitancy - Responses

• Some specific responses to specific concerns
  – Fear of side effects
  – Overloading immune system
  – Fear of ingredients (thimerosal, aluminum)
  – Pain for children
  – Mistrust of medicine, government, pharma
  – Natural disease is better
  – Healthy kids don’t need protection
  – Diseases no longer present, not dangerous

Vaccine Hesitancy - Responses

• Fear of side effects
  – Side effects are real so don’t discount them BUT
  – Most side effects listed on VIS are minor
  – The few serious ones are rare
  – And some are so rare unclear if related to vaccine

The risk of dying in a car accident is 1/10,000 per year. Many of the risks listed are higher than that.
Vaccine Hesitancy - Responses

• Overloading immune system
  – More antigens daily from environment than from vaccine(s)

Vaccine Hesitancy - Responses

• Fear of ingredients (thimerosal, aluminum)
  – Thimerosal no longer in children’s vaccines
  – Aluminum only relevant if
    • Renal disease
    • Neonatal TPN
  – Otherwise you are able to excrete it
  – More aluminum in diet than in vaccines
Vaccine Hesitancy - Responses

- Pain for children
  - Children cry for many reasons
  - This is a safety issue
  - Do you let child out of car seat if crying?

Vaccine Hesitancy - Responses

- Mistrust of medicine, government, pharma
  - I trust the CDC
    - Rotavirus vaccine taken off market in 1999
      - VAERS, Rapid response vaccine review
    - LAIV not recommended when not effective 2015
  - I trust the FDA
    - Regulations re manufacturing
    - 3 years to test before changing caps of vaccines approved
  - I trust the data
    - Studies show no increase sig side effects with vaccines
Vaccine Hesitancy - Responses

• Natural disease is better
  – But natural disease has its own side effects
  – Ex - risks of measles
    • 10-30% hospitalized
    • 1/1000 die

Vaccine Hesitancy - Responses

• Healthy kids don’t need protection
  – Ex - Meningococcal disease in previously healthy teen
Vaccine Hesitancy - Responses

- Diseases no longer present, not dangerous
  - Pertussis California 2010, >10,000 cases, 10 deaths
  - Measles 2019

Vaccine Hesitancy - Responses

- But do responses work?
Poll Question 4

Which of the following interventions has been shown to improve vaccination rates?

A. Making a strong recommendation in favor of giving the vaccine
B. Showing parents pictures of a child infected with a vaccine-preventable disease
C. Teaching physicians better communication skills re: vaccines
D. Providing parents written information about the dangers of vaccine-preventable disease

Vaccine Hesitancy - What Works?

• Many articles
  – A strong recommendation from the child’s doctor is the most important reason a patient accepts a vaccination
  – A presumptive approach (“We have these shots today”) is better than participatory (“Which vaccines do you want today”)
  – Removing vaccine exemptions (92.8 to 95.1% California)
  – Persistence - 33-47% of parents who initially refused finally accepted vaccines
Vaccine Hesitancy - What doesn’t work?

• Cochrane review - face-face interventions lacking in impact and generally low quality studies.
• Better quality studies show no significant benefit

• For example:
• Cluster randomized trial of MD communication training
  – 56 clinics, >300 mothers
  – No detectable effect

Vaccine Hesitancy - What doesn’t work?

• Randomized trial, 5 messages, >1700 parents
• Messages included
  – Info that MMR vaccine not linked to autism
  – Info re: dangers of diseases prevented by MMR vaccine
  – Images of diseases
  – Dramatic narrative of an infant who almost died from measles
  – No intervention
Vaccine Hesitancy - What doesn’t work?

• None of the interventions increased intent to vaccinate
  – First message dec misperceptions about MMR/autism link
    • BUT also decreased intent to vaccinate
  – Images increased concerns about MMR/autism link
  – Dramatic narrative about disease increased concerns about side effects about vaccine

Conclusions: Current public health communications about vaccines may not be effective. For some parents, they may actually increase misperceptions or reduce vaccination intention. Attempts to increase concerns about communicable diseases or correct false claims about vaccines may be especially likely to be counterproductive.

• [https://www.researchgate.net/publication/260485891_Effective_Messages_in_Vaccine_Promotion_A_Randomized_Trial](https://www.researchgate.net/publication/260485891_Effective_Messages_in_Vaccine_Promotion_A_Randomized_Trial)
Vaccine Hesitancy and Statistics

• Blah, blah, blah

• Statistics don’t persuade people
  – (or at least very few and they were already on board with vaccines)

Vaccine Hesitancy - What Else?

• Non-proven recommendations include
  – Emphasize social norms - >95% people vaccinate
  – Discuss herd immunity: protecting the community
  – Bundle and sandwich HPV vaccine with Tdap and mening
  – Refusal waiver

When all else fails, consider a delayed schedule

Reference - Countering Vaccine Hesitancy, Pediatrics
https://pediatrics.aappublications.org/content/138/3/e20162146.long
Vaccine Exemptions from School

- Increased exemptions linked to increased incidence of disease - very good data
- Medical exemptions (ex: anaphylaxis) - all 50 states
  - Five states only allow medical exemptions
  - California rates increased after removing religious exemptions
- About 30 states allow religious exemptions
  - No major religion opposes vaccinations
- Philosophical or personal - 15 states

Vaccine Exemptions from School

- My (anecdotal) experience
  - Most parents would vaccinate if exemptions unavailable
  - Most parents would vaccinate if diseases more common
  - Exemptions not relevant for <5 yrs unless day care included
- Unintended consequences
  - More homeschooling
  - Socio-economic issues of who can afford to homeschool
  - Clustering of non-immunized children
- The AAFP, AAP, AMA, and IDSA are advocating for only allowing medical exemptions
Practice Recommendations

• What you can do immediately:
  – Start or expand use of standing orders
  – Make sure you are using pediatric vaccine administration codes 90460 and 90461
  – Make strong recommendations for vaccines
  – Advocate for only medical exemptions for vaccines

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Questions
Smoking Cessation and Tobacco Use Prevention in Adolescents: How to Snuff Out the Smoking

Mary E. Krebs, MD, FAAFP

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Will include discussion of medications that are FDA-approved for adults, but not FDA-approved for adolescents.

Mary E. Krebs, MD, FAAFP

Family physician/Medical leader, HealthSource of Ohio, Lebanon; Faculty, Family Medicine Residency at Soin Medical Center, Beavercreek, Ohio

Dr. Krebs earned her medical degree from the Ohio State University College of Medicine in Columbus and completed a family medicine residency at Miami Valley Hospital in Dayton, Ohio. She is a solo family physician at a rural federally qualified health center (FQHC) and teaches residents at a new family medicine residency program. She is developing a practice management curriculum and is focused on the patient-centered medical home (PCMH) and quality improvement. Her completed projects include efforts to improve diabetes care, improve preventive health, decrease emergency department and hospital utilization, improve care coordination, address population health, measure physician quality, and deliver medical neighborhood care within the context of the PCMH model. Dr. Krebs has experience writing and evaluating quality measures and served on the American Medical Association (AMA) Prediabetes Quality Measures Technical Expert Panel. She is frequently consulted on matters relating to quality measures, population health, lifestyle modification, value-based payment, and diabetes. In addition, she is a frequent contributor to The Ohio Family Physician and has written on a variety of public health issues. Previously, Dr. Krebs co-ran Family Practice Associates, an independent practice where she led transformation to the PCMH model of care and was involved in the Center for Medicare & Medicaid Innovation’s Comprehensive Primary Care (CPC) initiative. She also implemented clinical staff and electronic health record (EHR) training, numerous quality improvement and population health projects, and other efforts to improve patient and practice team satisfaction. Dr. Krebs currently serves on the AAFP’s Commission on Quality and Practice and is the chair of the AAFP Working Group on Rural Health, as well as serving on the Ohio Academy of Family Physicians Board of Directors. In the past, she has served on the National Conference of Constituency Leaders (formerly the National Conference of Special Constituencies), the Congress of Delegates, and the Reference Committee on Organization and Finance. She served on the quality committee for Premier Health—a physician-led insurance plan—to help make decisions regarding measurement of physician performance, population health, development of quality measures, compensation for quality, and privileging.
Learning Objectives

1. Establish protocols to screen adolescent patients for tobacco use, as per current evidence-based recommendations.

2. Provide interventions, including education or brief counseling, to prevent initiation of tobacco use among school-aged children and adolescents.

3. Evaluate adolescent smokers for health risk behaviors.

4. Create an individualized smoking cessation plan for patients.

Audience Engagement System

Step 1

Step 2

Step 3
Tobacco: The Problem

Tobacco Use in US High School Students

![Bar Chart showing tobacco use percentages]
Tobacco Use in Middle School and High School Students

- In 2018, 7.2% of middle school students and 27.1% of high school students reported current use of a tobacco product.

- Current use is defined as use in the past 30 days.

Teen Cigarette Smoking

From 2011 to 2018, current (past 30 day) cigarette smoking decreased among middle and high school students.

- 1.8% of middle school students reported in 2018 that they smoked cigarettes in the past 30 days—a decrease from 4.3% in 2011.

- 8.1% of high school students reported in 2018 that they smoked cigarettes in the past 30 days—a decrease from 15.8% in 2011.
Cigar Smoking

From 2011 to 2018, current use of cigars went down among middle school students and high school students.

- 1.6% of middle school students reported in 2018 that they had used cigars in the past 30 days—a decrease from 3.5% in 2011.

- 7.6% of high school students reported in 2018 that they had used cigars in the past 30 days—a decrease from 11.6% in 2011.

Teen E-Cigarette Usage

Since 2014, more teenagers used e-cigarettes or vaped nicotine than smoked cigarettes.

- 4.9% of middle school students reported in 2018 that they used electronic cigarettes in the past 30 days—an increase from 0.6% in 2011.

- 20.8% of high school students reported in 2018 that they used electronic cigarettes in the past 30 days—an increase from 1.5% in 2011.
What are E-Cigarettes?

- E-cigarettes produce an aerosol by heating a liquid that usually contains nicotine, flavorings, and other chemicals that help to make the aerosol.
- Users inhale e-cigarette aerosol into their lungs.
- Bystanders can also breathe in this aerosol when the user exhales it into the air.

Risks of E-Cigarettes

- Scientists are still learning about the long-term health effects.
- Some ingredients in the e-cigarette aerosol could be harmful to the lungs. Some flavorings may be safe to eat but not inhale, because the gut can process more substances than the lungs.
- Defective batteries have caused fires and explosions, resulting in serious injuries.
- Children and adults have been poisoned by swallowing, breathing, or absorbing e-cigarette liquid through skin or eyes.
Risks of E-Cigarettes

• Currently, there are no federal quality standards to ensure the accuracy of e-cigarette constituents as advertised or labeled.

• Refillable cartridges allow the user to deliver other psychoactive substances, including marijuana.

• Toxins and carcinogens have been found in e-cigarette solutions, including aldehydes, tobacco-specific nitrosamines, metals, tobacco alkaloids, and polycyclic aromatic hydrocarbons.

• E-cigarette solution has also been shown to be cytotoxic to human embryonic stem cells.

Poll Question 1

What tobacco product is used most in adolescents?

A. Cigarettes
B. Cigars
C. Chewing tobacco
D. E-cigarettes
Differences in Addiction between Adolescents

- Adolescent brain more vulnerable to the rewarding aspects of nicotine.
- Prefrontal cortex is susceptible to effects of nicotine. The prefrontal cortex does not finish developing until age 25.
- Using nicotine in adolescence can affect attention, learning, mood, and impulse control.
- Adolescent rats exposed to nicotine had more problems with impulsive behavior and concentration.
- Early onset human substance abuse, including tobacco, is associated with greater severity as an adult.

Dangers of Tobacco

Over half of children show evidence of tobacco exposure.

Nearly 90% of adult smokers started before age 18.
Prevention

Risk Factors

- Most important: parental smoking
- Low level of parental monitoring
- Easy access to cigarettes
- Perception that peers smoke
- Exposure to tobacco promotions
- Low self-esteem
Risk Factors

- Older age
- Male
- White
- Lacking college plans
- Having parents who are not college educated
- Experiencing highly stressful events
- Perception of risk

Path to Daily Smoking: 5 Stages

1. Susceptible (never smoked)
2. Initiation (trying the first cigarette)
3. Experimentation (repeatedly trying cigarettes, may show signs of addiction)
4. Established smoking (regular smoking, likely to show signs of addiction)
5. Nicotine Dependence
Path to Addiction
Children are susceptible to smoking experimentation and initiation. It can take up to two years to progress from experimentation to addiction, though some progress more rapidly.

Other Risks of Tobacco
• Children and adolescents who use tobacco are more likely to use alcohol.
• Adolescents who smoke are eight times more likely to use marijuana and 22 times more likely to use cocaine.
• Smoking is associated with other risky behaviors, such as fighting and engaging in unprotected sex.
Counseling

- Behavioral counseling interventions, such as face-to-face or phone interaction with a physician, print materials, and computer applications, can reduce the risk of smoking initiation in school-age children and adolescents.
- Moderate net benefit to providing primary care interventions to prevent tobacco use in school-age children and adolescents.
- USPSTF Grade B

Include Tobacco and Vaping in Anticipatory Guidance

- Message should be clear, age-appropriate, and specific.
- Start as early as children can understand, usually age 5.
Messages for Adolescents

- Effects of tobacco on appearance, breath and sports performance
- Lack of benefit for weight loss
- Cost
- How tobacco industry deceives them
- How fast tobacco dependence develops and severity of tobacco addiction

Prevention

- Ask children and adolescents to make a commitment to be tobacco free
- Help patients identify their own reasons for being tobacco free
Anticipatory Guidance: E-cigarettes

• Most teens mistakenly believe that e-cigarettes are safe
• Many teens are not aware that the devices contain nicotine or that nicotine is highly addictive

Anticipatory Guidance

• Address parent/caregiver tobacco use and recommend treatment
• Recommendations should be appropriate to the parent’s willingness to change
• If unwilling to quit, recommend smoke-free home and car
Prevention Outside the Exam Room

• Increase price of tobacco products
• Mass media campaigns
• Stronger local laws for retailers
• Retailer education and stronger enforcement

5 A’s
Five A’s

- Ask
- Advise
- Assess
- Assist
- Arrange

Ask

Ask about tobacco use at every visit.

Talk to adolescent alone and outline rules on confidentiality.
Questions to Ask Adolescents

- Do any of your friends use tobacco?
- Have you ever tried a tobacco product?
- How many times have you tried (name of tobacco product)?
- How often do you use (name of tobacco product)?
- Do you friends use e-cigarettes, e-hookah, vape, or JUUL?
- Have you tried an e-cigarette, e-hookah, vape, or JUUL?

Advise

Advise the patient to quit all forms of tobacco.

Clear, strong, personalized message
Give Reasons to Quit

• Smelly clothes
• Bad breath
• Dental problems
• Cost
• Effects on sports
• Deception by tobacco companies

Assess

• Severity of tobacco dependence
• Are they ready to quit?
Assess

• Previous history of attempts to stop smoking
• Triggers
• Changes the adolescent is ready to make

Stages of Change

• Pre-contemplation (not ready to quit)
• Contemplation (considering a quit attempt)
• Preparation (actively planning a quit attempt)
• Action (actively involved in a quit attempt)
• Maintenance (achieved smoking cessation)
If Patient Not Ready to Quit

Physician’s role is to understand the patient's perspective of the risks and benefits of continuing to smoke in order to help the smoker contemplate quitting. Most smokers want to stop smoking, but may not be ready to take specific actions to quit.

Ask what he or she likes and does not like about smoking.

Personalized message about a smoking-related health problem the patient is experiencing may motivate the patient to act.

If Patient Not Ready to Quit: 5 R’s

- Relevance- encourage patient to explain why quitting is relevant to them
- Risks- ask patients to explain the risks of tobacco
- Rewards- ask patients to explain the benefits of quitting
- Roadblocks- determine barriers
- Repetition- use motivational interviewing each visit
Assist

- Tailor support to the patient’s readiness to change and severity of addiction
- Review lessons learned from previous quit attempts
- Discuss potential challenges
- Discuss coping strategies

Factors That Make Quitting Difficult

- Physical effects- reward feeling of nicotine, and withdrawal symptoms of irritability, craving, attention problems, disturbed sleep, and increased appetite
- Behavioral factors: adolescents frequently associate smoking with hanging out with friends who smoke. The influence of peers on smoking behavior declines with age, but affects whether adolescents begin smoking and whether smoking becomes a daily habit.
- Smoking early in adolescence: the earlier a patient begins smoking, the more likely they are to become addicted to nicotine.
- Concerns about weight gain
- Genetic factors
Differences in Tobacco Cessation Between Adolescents and Adults

Approximately half of adult smokers attempt to stop each year, but fewer than 5% succeed.

Youth make more quit attempts before being successful compared with adults. Approximately 4% of adolescent smokers 12 to 19 years of age successfully quit smoking each year.

Starting smoking at a younger age is associated with more severe addiction and decreased rates of stopping smoking.

Should Patients Use E-Cigarettes to Quit Smoking?

USPSTF found insufficient evidence to recommend e-cigarettes to help patients quit smoking.
AAP Statement on E-Cigarettes

For established smokers, e-cigarettes may reduce health risks for the individual user compared with the risk of continued combustible tobacco use. However, the nuance in this finding must be placed in a larger public health context. Tobacco, when used as intended, causes disease, disability, and death. Operationally, even if e-cigarettes themselves pose less risk to the user than other tobacco products, they still represent a significant public health burden in need of further regulation, particularly if they cause more adolescents and adults to begin harmful combustible tobacco use or prevent fewer people from quitting tobacco use.

Should E-Cigarettes Be Used for Smoking Cessation?

In New Zealand, a clinical trial of e-cigarettes for smoking cessation among moderately to severely tobacco-dependent adults found low cessation rates and no statistically significant difference between the use of nicotine-containing e-cigarettes and placebo.

Recommending E-Cigarettes sends a mixed message to adolescents and may increase their use.
Studies for Adolescent Tobacco Cessation

- Not many studies
- Many studies have methodological problems (poorly described interventions and methods, inadequate measures of cessation, brief follow ups, poor retention rates, and lack of control groups)

Assist

- Limited evidence on effectiveness of smoking cessation interventions for school-aged children and adolescents who have experimented with smoking or are regular smokers
- Some evidence shows that community and school-based behavioral counseling programs can work
- Evidence suggests that the long-term abstinence rate doubles when counseling is used compared to usual care (brief advice or pamphlets) or no treatment
US Public Health Service Recommendations

Cognitive-behavioral strategies (self-monitoring and coping skills)

Motivational strategies (techniques to clarify desire for change and reduce ambivalence toward change)

Social influence strategies (addressing social influences that serve to promote or maintain smoking)

Assist

• Discuss how to deal with cravings
• Discuss how to deal with triggers
• Suggest resources
• Treat depression or anxiety if present
Assist

- Provide concrete resources including resources by phone, text, app, internet.
- Refer to community or school-based programs when available.

Assist

- Phone: 1-800-QUITNOW
- Text: SmokefreeTXT. Text QUIT to 47848
- App: quitSTART
- Chat: National Cancer Institute Live Chat
  https://livehelp.cancer.gov/app/chat/chat_launch
Discussing Social Smoking

Usually occurs at parties.

Alcohol may be present in these situations, which can affect judgment.

9 out of 10 high schoolers do not smoke.

Most high schoolers say they would prefer to date a nonsmoker.

Quit Rates for Behaviorally Based Programs

Although still beneficial compared with nonintervention, behaviorally based programs have much lower rates of smoking cessation among teenagers who are severely tobacco dependent.

Project EX (an 8-session, school-based clinic tobacco use cessation program for adolescents that includes enjoyable, motivating activities) found that 30-day abstinence from smoking on completion of the program was 42% for those with minimal to mild tobacco dependence but only 7% for those with severe tobacco dependence.
Quit Rates for Behaviorally Based Programs

Not On Tobacco program: at 3 months’ follow-up, 24% of those with minimal to mild nicotine dependence reported not smoking, but only 9.4% of those with severe nicotine dependence reported not smoking.

Clinical trials of motivational interviewing versus brief advice (without medication use) for tobacco-dependent adolescents yielded very low stop-smoking rates that did not differ between treatment groups.

Assist

- There are several FDA-approved medications to help adults quit smoking (Varenicline, bupropion, nicotine replacement)
- No medications are currently approved by the FDA for tobacco cessation in children and adolescents.
- Evidence on alternative and complementary medicine, like acupuncture, is not available.
Poll Question 2

Which statement is correct about adolescent smoking?

A. It is more difficult for adolescents to quit smoking than adults
B. There are few studies on adolescent tobacco cessation
C. There are no FDA-approved medications for adolescent tobacco cessation
D. All of the above

What Should the Family Physician Do?

It is important to help adolescents quit to prevent a lifetime of tobacco use.

Harder for adolescents to quit tobacco compared to adults.

Few studies on how we can help adolescents quit tobacco.

No FDA-approved medications.
Is it Ever Okay to Use Pharmacotherapy?

According to the American Academy of Pediatrics, “Clinical Practice Policy to Protect Children From Tobacco, Nicotine, and Tobacco Smoke,” pharmacotherapy can be considered to help moderately to severely tobacco-dependent adolescents who want to stop, despite challenges with adherence and the resulting high relapse rates.

Nicotine Replacement Therapy

Not FDA-approved for adolescents.

Side effects include gastrointestinal symptoms (nausea, vomiting, abdominal pain, diarrhea), headache, and local irritation depending on the delivery method.

Nicotine dependence from NRT rarely occurs, especially with the long-acting patch. Nicotine does not cause cancer.
NRT in Adults

- Individual NRT products were found to be superior to placebo, increasing quit rates up to twofold.
- One randomized trial among the NRT patch, gum, inhaler, and nasal spray found no difference in efficacy.
- Single-agent NRT is less effective than combining the long-acting patch with a short-acting form such as gum, lozenge, or inhaler.
- In some but not all trials, NRT benefits men more than women.

NRT in Teens

Efficacy and safety not as well established as with adults.

FDA labeling states, “Safety and effectiveness in the pediatric population have not been established.”
NRT in Adolescents

- Investigators compared the use of a nicotine patch versus nicotine gum versus placebo in a randomized, double-blind, placebo-controlled clinical trial with 120 adolescents who wanted to stop smoking and had moderate or greater tobacco dependence.
- Medication was initiated on the planned stop-smoking day and continued for 12 weeks. Group cognitive behavioral therapy was provided to all participants.
- At 1 week after the stop-smoking date, 26.5% of those receiving the nicotine patch, 17.4% of those receiving the nicotine gum, and 5.0% of the placebo group were not smoking.
- By 3 months after pharmacotherapy was discontinued, nonsmoking rates were 20.6% for the patch, 8.7% for the gum, and 5% for placebo.
- Adherence to daily use of the patch was acceptable at 78.4%; adherence to use of the nicotine gum was poor at 38.5%.

Nicotine Patch in Adolescents

Not FDA approved for adolescents

Studies suggest it is safe in adolescents

In the US, a prescription is required to allow patients under 18 to purchase nicotine patches or gum
Nicotine Patch in Adolescents

In one study, 18% of patients who used the patch for 12 weeks in addition to behavioral intervention were abstinent 3 months after treatment cessation, compared with 2% of those treated with behavioral intervention and placebo.

Nicotine Patch

- Long-acting, slow-onset pattern of nicotine delivery, which produces relatively constant relief from withdrawal over 24 hours but requires several hours to reach peak levels.
- Compliance is high.
- Cannot adjust the dose of nicotine being released to respond to nicotine cravings and withdrawal symptoms.
- Available over the counter for adults, but requires prescription if under 18.
Nicotine Patch: How to Use

>10 cigarettes per day and weight >45 kg – Start with the highest dose nicotine patch (21 mg/day) for six weeks, followed by 14 mg/day for two weeks, and finish with 7 mg/day for two weeks.

≤10 cigarettes per day or weight < 45 kg – Start with the medium dose nicotine patch (14 mg/day) for six weeks, followed by 7 mg/day for two weeks.

Nicotine Patch: How to Use

Apply one patch each morning to any non-hairy skin site. Rotate the site daily to avoid skin irritation (most common side effect). Hydrocortisone cream may be used to relieve skin irritation if it occurs.

Remove and replace the patch with a new one at bedtime. If leaving the patch on overnight is causing the frequently reported side effects of insomnia and vivid dreams, replace the patch the next morning. Smoking cessation rates are similar whether the patch is left on for 24 hours or taken off at night.
Nicotine Patch: How to Use

When the patch is removed at night, substantial plasma levels of nicotine are reached 30-180 minutes after a new patch is applied in the morning. If the patch is removed at night and morning nicotine cravings occur, use a short-acting NRT (eg, gum, lozenge) while waiting for the nicotine patch to take effect.

Poll  Question 3

A 16-year-old female is using the nicotine patch and has not smoked in three days. She complains of occasional cravings and vivid dreams. What is the best option?

A. Continue current treatment.
B. Change to varenicline.
C. Advise her to take off the patch at night and add nicotine gum.
D. Stop the patch all together.
Short-Acting NRT

• Options: lozenge, gum, inhaler, or nasal spray.

• Studies in adults show that it can be used as a single agent or added to daily nicotine patch therapy. Limited studies in adolescents.

• Require repeated use throughout the day, lead to more variable nicotine levels than the patch, and require more instructions for correct use.

• Smokers may be instructed to use the product when they have a craving, but this generally leads them to underuse the products. Another option is to have the smoker use the short-acting NRT product at least once every hour while awake and more often as needed.

Nicotine Gum

• Chewing the gum releases nicotine to be absorbed through the oral mucosa.

• Peak blood nicotine levels 20 minutes after starting to chew.

• Available in several flavors.
Nicotine Gum

Dosing is determined by the number of cigarettes smoked daily.

• ≥ 25 cigarettes per day – 4 mg dose of gum is recommended
• < 25 cigarettes per day – 2 mg dose of gum is recommended

Chew at least one piece of gum every one to two hours while awake and also whenever there is an urge to smoke.

Use up to 24 pieces of gum per day for six weeks.

Gradually reduce use over a second six weeks, for a total duration of three months.

"Chew and park" is recommended: chew the gum until the nicotine taste appears, then "park" the gum in the buccal mucosa until the taste disappears, then chew a few more times to release more nicotine. Repeat this for 30 minutes, then discard the gum (because all nicotine in the gum has been released).
Nicotine Gum

Gastric and esophageal irritation can occur if the gum is chewed too rapidly, because nicotine is released faster than it can be absorbed by the buccal mucosa and the nicotine is thus swallowed. Nicotine absorbed from the gastrointestinal tract is largely metabolized by the liver and relatively ineffective for smoking cessation.

Nicotine Gum

- Acidic beverages (coffee, carbonated drinks) lower oral pH, which reduces nicotine absorption.
- Side effects are mostly a consequence of excess nicotine release with overly vigorous chewing and consist of nausea, vomiting, abdominal pain, constipation, hiccups, headache, excess salivation, a sore jaw, and mouth irritation or ulcers.
- Chewing gum may exacerbate TMJ disease and the gum can damage or adhere to dental appliances.
Nicotine Nasal Spray

• In one small study, 57% of adolescents stopped the nasal spray after one week.
• Common side effects include nasal irritation and burning, and less commonly, about the taste and smell.
• Those assigned to use nasal spray showed no difference in cessation rates, number of cigarettes smoked per day, or cotinine levels at 12 weeks compared to counseling alone.

Nicotine Lozenges and Inhalers

No studies available for adolescents
Varenicline

• Not approved for use in patients 16 and younger due to lack of efficacy
• In adults, more effective than placebo, bupropion, or NRT.
• Mechanism: Reduces the symptoms of nicotine withdrawal by blocking nicotine from binding to the receptor that mediates the reinforcing effects of nicotine that lead to nicotine dependence. This reduces the rewarding aspects of cigarette smoking. It does this by binding with high affinity and producing partial stimulation of the alpha-4 beta-2 nicotinic receptor.

Varenicline Safety

• Common side effects reported are nausea, insomnia, and abnormal dreams.
• Early concerns about neuropsychiatric and cardiovascular side effects, but subsequent studies have not supported these.
• Limited data about safety in adolescents.
Bupropion in Adolescents

• Few studies available with mixed results
• A study comparing bupropion plus nicotine patch with the patch alone did not show a difference
• Another study suggested bupropion plus short-term counseling had short-term efficacy compared with counseling alone, but abstinence rates were lower than for adults and rapid relapse after medication discontinued.

Bupropion in Adolescents

• A randomized, double-blind, placebo-controlled, parallel-group clinical trial included 6 weeks of bupropion plus counseling for tobacco-dependent adolescents.
• Improved rates of smoking cessation with 150 mg of bupropion twice daily when the medication was being taken (29% abstinent at 6 weeks with bupropion vs 16% with placebo); the benefit was quickly lost after the medication was stopped, however.
**Bupropion**

- Believed to act by enhancing central nervous system noradrenergic and dopaminergic release.
- Contraindicated in patients with a seizure disorder or eating disorders. The risk of seizure is dose-dependent.
- Common side effects are insomnia, agitation, dry mouth, and headache.
- Randomized trials have demonstrated the efficacy of bupropion in smoking cessation in adults. Higher quit rates with varenicline than bupropion, while nicotine patch produced comparable cessation rates to bupropion.

**Arrange**

- Arrange for follow up.
- Remind patients that most smokers require multiple attempts to quit.
Persistent Smoking

Discuss setbacks and help the patient with a different approach.

Reinforce or use different behavioral approaches.

Persistent Smoking

If medication is used, look for:

- Incorrect use of medication(s)
- Intolerance of side effects
- Failure of the drug to reduce nicotine withdrawal symptoms, despite correct use of the medication
- If the patient is already medication correctly and maximally without sufficient effect at four weeks, the options are to continue the therapy, switch to a different therapy, or consider combining medications by adding another agent (shown safe in adults, no available studies in adolescents). If there has been no response to the initial agent, switching to a different medication is recommended.
Billing (Commercial Insurance)

99406 Counseling on smoking cessation 3-10 minutes (intermediate)

99407 Counseling on smoking cessation >10 minutes (intensive)

May be bundled. Check with each insurance.

Billing (Medicaid)

- Many states offer some payment for individual tobacco cessation and treatment counseling for Medicaid patients. For example, the ACA requires states to expand Medicaid coverage of cessation services for pregnant women. You are encouraged to contact your state Medicaid office for coverage information in your specific state.

- The Centers for Medicare and Medicaid Services encourage state partners to support smoking cessation by ensuring coverage of all FDA-approved smoking cessation medication (prescription and over-the-counter [OTC]) without a copayment requirement or other financial barrier.
Helping Patients Afford Help

Resources for patients who do not have insurance coverage or who have limited coverage by their insurance carrier include the following:

▪ Quitline: 1-800-QUIT-NOW (1-800-784-8669)
▪ Flexible spending accounts may be used for smoking cessation
▪ Employee assistance programs (EAP), in some cases
▪ Community resources and support groups
▪ Out-of-pocket spending
▪ Online resources

Practice Recommendations

▪ Include tobacco/vaping in anticipatory guidance starting around age 5, including the risks of e-cigarettes
▪ Counsel parents to quit smoking to prevent children from starting
▪ Ask all adolescents about tobacco/e-cigarette use
▪ Review resources available for adolescents and decide how you will use them.
▪ Create individualized quit plans for adolescents
▪ Arrange close follow up
Contact Information

• Mary Krebs – maryekrebs@yahoo.com

Questions
Resources

Benowitz N. Nicotine: Addiction, Effects on the Adolescent Brain and Electronic Cigarettes
http://www.nationalacademies.org/hmd/~/media/79C64AF3B65448ECBECE08FDFD8CF83E.ashx/
Center for Disease Control, Preventing Tobacco Use Among Young People—A Report of the Surgeon General, 1994

Center for Disease Control. Youth and Tobacco Use.
https://www.cdc.gov/tobacco/data_statistics/fact_sheets/youth_data/tobacco_use/index.htm
Center for Disease Control. Youth Tobacco Cessation.
https://www.cdc.gov/tobacco/quit_smoking/cessation/pdfs/youth_tobacco.pdf

Jenco M. FDA: Smoking cessation drug not proven effective for teens. AAP News.

Mermelstein RT. Teen smoking cessation Tobacco Control 2003;12:i25-i34. 
https://tobaccocontrol.bmj.com/content/12/suppl_1/i25

Resources

PHS Guideline Recommendations. How to Help Adolescents Quit Smoking. 
https://www.cdc.gov/tobacco/quit_smoking/cessation/pdfs/phs_adolescents_508.pdf

https://www.aafp.org/afp/2014/1115/od1.html

PHS Guideline Recommendations. How to Help Adolescents Quit Smoking. 
https://www.cdc.gov/tobacco/quit_smoking/cessation/pdfs/phs_adolescents_508.pdf


Type 1 Diabetes: Where Does the Family Doc Fit in?

Katherine Beben, MD, FAAFP

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Katherine Beben, MD, FAAFP

Associate Program Director, Prisma Health–Upstate/University of South Carolina School of Medicine Greenville/Family Medicine Residency Program (Oconee)

Dr. Beben earned undergraduate degrees in molecular biology and Spanish language and literature at Tulane University, New Orleans, Louisiana. She earned her medical degree at the University of Connecticut School of Medicine, Farmington, and completed a family medicine residency at the AnMed Health Family Medicine Residency Program in Anderson, South Carolina. After graduation, she fulfilled her National Health Service Corps (NHSC) obligation in rural El Dorado Springs, Missouri, practicing full-spectrum family medicine. She and her family returned to South Carolina, where she practiced for seven years and became an instructor of family medicine for the AnMed program. Recently, Dr. Beben joined the Oconee Family Medicine Residency Program to serve as associate program director.
Learning Objectives

1. Differentiate T1D from other causes of diabetes based upon the clinical presentation of the patient and laboratory studies.

2. Evaluate current T1D therapeutics and emerging advances for efficacy, safety, adherence, and cost.

3. Develop collaborative care plans that foster therapeutic and dietary adherence, glucose monitoring, and clear physician-patient communication.

4. Establish care transition plans for adolescent patients as they approach young adulthood.

Audience Engagement System

Step 1

Step 2

Step 3
Case Presentation

- It’s February and EB is a 6 yo male who presents to your office for increased urination.
- His mother reports he started bringing a water bottle to school and he’s been getting up a few times at night to urinate for the past couple weeks.
- His POC glucose is HI and his A1C is 10.4%

Poll Question #1

Which of the following is a risk factor for EB to have developed Type 1 diabetes?

A. Born at 36 weeks  
B. Birth weight was AGA  
C. Family history of Type 2 diabetes  
D. Recent birthday party at all-you-can-eat pizza place
Pathogenesis

Genetic Predisposition
- GAD65
- IA-2
- Anti-insulin
- ZnT8

Environmental factors
- Viral infection
- Immunizations
- LGA
- Prematurity


Presentation

Classic Ps:
- Polyuria
- Polydipsia
- Polyphagia

Ketoacidosis
Positive screening test
Evaluation

- Fasting glu ≥ 126 mg/dL (7 mmol/L) on more than one occasion
- Random glu ≥ 200 mg/dL (11.1 mmol/L) with sx of hyperglycemia
- A1C ≥ 6.5 percent
- Glu ≥ 200 mg/dL (11.1 mmol/L) measured two hours after a glucose load of 1.75 g/kg (maximum dose of 75 g) in an oral glucose tolerance test (OGTT)

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Type 1 or Type 2?

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Habitus</td>
<td>Recent weight loss</td>
<td>Higher incidence of obesity</td>
</tr>
<tr>
<td>Age</td>
<td>Childhood</td>
<td>After puberty</td>
</tr>
<tr>
<td>Insulin resistance</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Family history</td>
<td>Possible</td>
<td>Common</td>
</tr>
<tr>
<td>Autoantibodies</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Ketosis</td>
<td>Common</td>
<td>Rare (5-10%)</td>
</tr>
<tr>
<td>Clinical presentation</td>
<td>Rapid</td>
<td>Insidious</td>
</tr>
</tbody>
</table>
The Zebras

- Exocrinopathies: CF, chronic pancreatitis, hemochromatosis
- Drug-induced: glucocorticoids, cyclosporine, tacrolimus
- Other endocrinopathies: Cushing’s disease, glucagon-secreting tumors, pheochromocytoma
- Monogenic diabetes (aka MODY)
- Neonatal diabetes

Poll Question #2

EB’s three siblings have been tested for the autoantibodies and two have tested positive. What is their lifetime risk of developing symptomatic Type 1 diabetes?

A. 6-10%
B. 20-30%
C. 50%
D. 75-80%
E. 100%
Stages of Type 1

<table>
<thead>
<tr>
<th>Stage</th>
<th>Antibodies</th>
<th>Glucose testing</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>2+ positive</td>
<td>Normal</td>
<td>None</td>
</tr>
<tr>
<td>Stage 2</td>
<td>2+ positive</td>
<td>Abnormal</td>
<td>None</td>
</tr>
<tr>
<td>Stage 3</td>
<td>2+ positive</td>
<td>Abnormal</td>
<td>Present</td>
</tr>
</tbody>
</table>


Objectives

- Differentiate T1D from other causes of diabetes based upon the clinical presentation of the patient and laboratory studies.
- Evaluate current T1D therapeutics and emerging advances for efficacy, safety, adherence, and cost.
- Develop collaborative care plans that foster therapeutic and dietary adherence, glucose monitoring, and clear physician-patient communication.
- Establish care transition plans for adolescent patients as they approach young adulthood.
Poll Question #3

What is the target A1C for EB at the time of diagnosis (6 years old)?

A. 6.5%
B. 7.0%
C. 7.5%
D. 8.0%
E. No goal

Therapeutics

• Goal A1C is < 7.5% in all age groups
• Mainstay of therapy
  – Insulin
  – Insulin
  – Insulin
• Injection vs pump
Emerging Advances

- Insulin-sparing medications
  - Safety and efficacy not established yet
- Medications to prevent or reverse beta-cell decay
  - In active clinical trials
- Closed-loop insulin pumps
  - Hybrid closed-loop is approved and on the market
- Other routes of insulin administration
  - Afrezza—inhaled insulin, one puff = 4 units, must be used with long-acting insulin in T1D

Monitoring

- Glycemic control is only as successful as the level of monitoring of blood sugar
  - Finger sticks
  - Continuous glucose monitors
    - (Therapy dogs)
- Ketone measurement
  - Urine
  - Blood
Objectives

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Poll Question #4

As EB enters third grade (8 years old) he tells his parents he wants to start checking his blood sugar in the classroom rather than go to the nurse’s office before lunch. Which of the following do you need to consider before advocating on his behalf?

A. His current height and weight
B. His cognitive ability
C. His lunchtime insulin:carb ratio
D. When recess takes place
Treatment Plans

Trickier in kids for several reasons:
- Size
- Unpredictable diet
- Unpredictable activity
- Inability to communicate symptoms
- Cognitive ability
- Emotional maturity

The Care Team

- Endocrinologist
- Nurse educator
- Dietician
- Mental health counselor
- Family doctor
- School nurse
The Challenges

• Surviving mode vs thriving mode
• Balancing glycemic control with risk of hypoglycemia
• Establishing goals that the patient and family can achieve
• Don’t ignore parents and siblings
• Advocate for the child at school/daycare
• Maintaining normal growth, development and emotional maturity
• Emotional/mental health
• Not letting routine primary care lapse

Poll Question #5

Which of the following is a benefit to providing team-based care to children with Type 1 diabetes?

A. Reduced number of hospitalizations
B. Reduced number of ED visit
C. Improved adherence to the treatment plan
D. Improved glycemic control
E. All of the above
The Benefits

• Reduces number of ED visits
• Reduces number of hospitalizations
• Improves adherence to the management plan
• Improves glycemic control


Objectives

• Differentiate T1D from other causes of diabetes based upon the clinical presentation of the patient and laboratory studies.
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Transition Plan

• Allow more independence at managing disease
• Learn from mistakes in a supportive environment
• Social risk assessment: driving, alcohol, tobacco, contraception, eating disorders, depression/anxiety
• Know what post-high school plans are
• Insurance coverage issues
• Prepare for adult endocrinologist

Practice Recommendations

• Develop an algorithm to correctly identify children at risk for developing diabetes as well as how to correctly diagnose Type 1 diabetes
• Gain familiarity with updates in treatment targets and therapeutics for kids with Type 1 diabetes
• Identify team members to help children and adolescents with Type 1 diabetes transition to age-appropriate independence

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Questions

References