Is Universal Pediatric Lipid Screening Justified?
No

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Disclosures

• No relevant disclosures.
Background

• “Expert Panel on Integrated Guidelines for Cardiovascular health and Risk Reduction in Children and Adolescents: Summary Report”
  – Published in Pediatrics December 2011
  – Expert Panel commissioned by the NHLBI
Background

• Atherosclerotic CV disease is the leading cause of death in US.
• The report developed guidelines that address known risk factors for CVD, including
  – Nutrition/diet
  – Physical activity
  – Tobacco exposure
  – Blood pressure
  – Lipid levels
  – Weight
Background

- Atherosclerotic CV disease is the leading cause of death in US.
- The report developed guidelines that address known risk factors for CVD.
  - Nutrition/diet
  - Physical activity
  - Tobacco exposure
  - Blood pressure

- **Lipid levels**
  - Weight
Background

• The guidelines recommended universal screening of a non-fasting Non-HDL level between the ages of 9 to 11 years old, and again between 17 to 21 years old.

• If non-HDL ≥ 145 mg/dL, recommend a fasting lipid panel.

• Non-HDL = Total cholesterol – HDL cholesterol
Familial Hypercholesterolemia

- The primary goal of screening children for lipid disorders is to diagnose Familial Hypercholesterolemia (FH).
- Screening may uncover other forms of dyslipidemias (hypertriglyceridemia or mild forms of LDL elevation or decreased HDL).
- But the most obvious benefit from screening children for lipid disorders comes from finding children with FH.
Familial Hypercholesterolemia

• Autosomal dominant disorder caused primarily by mutations in the LDL gene.
• The prevalence of heterozygous FH is estimated to be 1 in 500 people.
• No criteria for the diagnosis of FH are currently universally accepted.
  – Combination of elevated lipid levels, physical findings, family, history, or genetic tests.
  – The use of genetic diagnosis alone is complicated by incomplete penetrance of the genes that cause FH.
Familial Hypercholesterolemia

• Asymptomatic in childhood.
• Lifelong elevation of LDL leads to cholesterol deposition in the arteries, where it forms an atherosclerotic plaque that can begin early in life.
• By age 50, 25% of women and 50% of men with untreated FH will experience CVD.
Universal Screening: 3 Presuppositions

1. Children with FH are at increased risk of developing accelerated atherosclerosis and subsequent CVD.

2. Screening can accurately identify children with FH.

3. Existing therapies can effectively reduce the future CVD risk in children who are identified with FH.
Presupposition #1

• Children with FH are at increased risk of developing accelerated atherosclerosis and subsequent CVD.

• Multiple autopsy and imaging studies in diverse populations show that childhood CV risk factors track into adulthood and are predictive of subclinical atherosclerosis.
Presupposition #2

• Screening can accurately identify children with FH.

• It is estimated that targeted screening would miss between 30 to 60% of children with FH.

Presupposition #3

• Existing therapies can effectively reduce the future CVD risk in children who are identified with FH.

Presupposition #3

• Multiple randomized controlled trials with statins in children with FH.
• Longest length of study is 2 years.
• Statins lower LDL cholesterol.
• Statins improve surrogate markers of CV disease including endothelial function and carotid-intima media thickness.
• The benefit of taking a statin childhood on reducing eventual CV risk is unknown...will probably always be unknown.
Presupposition #3

• Minimal side effect profile thus far.

• Increased risk of diabetes in adults.
Presupposition #3

• What are the consequences of taking a statin for 30 years? 50 years?
• When is the best time to start a statin?
  – As early as possible?
  – 20 years old? 30 years old?
• How many children must take a daily, lifelong medication of unclear side effects in order to prevent 1 CV event?
3 Presuppositions

1. Children with FH are at increased risk of developing accelerated atherosclerosis and subsequent CVD.
2. Screening can accurately identify children with FH.
3. Existing therapies can effectively reduce the future CVD risk in children who are identified with FH.

• Largely true!
• End of story? No!!!
Is identifying and treating a child with proven FH a good idea?

is a different question than...

Is universal lipid screening in children a good idea?
The Real Question

• What is the cost vs. benefit analysis of universal lipid screening in children?

• No studies
What Are the Costs of Universal Lipid Screening?

• Has not been studied.
• Potential costs:
  – Cost of the lab draw
  – Cost of the patient missing school and the parent missing work
  – Anxiety/pain with the procedure
  – Over-diagnosis and undue anxiety regarding future risk
  – False positives leading to overtreatment
  – Increased burden on primary care physicians
  – Increased referrals (some appropriate, some not)
2015 USPSTF Guideline

- US Preventive Services Task Force
- “Insufficient evidence to recommend for or against routine screening for lipid disorders in infants, children or adolescents up to age 20.”
- “We found no direct evidence that selective or universal screening programs improve intermediate or long-term health outcomes in children or adolescents with FH.”
Conclusion

• If we are going to recommend that every child get at least 2 extra blood draws, the burden of proof lies in proving that the benefit outweighs the cost.
• Efforts have focused on the benefits, and it is acknowledged that there may be some benefits.
• From my perspective those who argue for universal lipid screening in children have ignored or minimized the costs.
• A cost/benefit analysis must be done and must have unequivocal results before taking the bold step of recommending universal lipid screening in children.