Creating and Implementing a High Value Cost Conscious Care Curriculum for Pediatric Residency Programs

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Disclosures

None
Learning Objectives

• Define and emphasize the importance of high value care (HVC)
• Recognize available HVC curriculum, Choosing Wisely
• Introduce a five-step model for delivering HVC
• Discuss the value implications of two scenarios and the evidence-based guidelines for appropriate diagnosis and treatment
• Describe the ongoing GME work at Duke
• Articulate strategies for bringing HVC into daily practice
Overview

• Highlight health care cost and its implications
• Define high value care and introduce the five-step concept
• Introduce Choosing Wisely
• Small group activities, application of five-step concept to clinical cases
• Duke HVC pediatric curricula and collaborations
• Challenges and next steps
High Value Care Definition

Care that balances the clinical benefit of an intervention with its cost and potential harms to achieve the goal of improving patient outcomes.
High Value Care is…

Consideration of what evaluation would provide the highest yield and what treatment would provide the highest value

AND

Offering an individualized and thoughtful approach to each patient’s case
High Value Care is...

Better Quality at Less Cost

Value = \( \frac{\text{Net benefit}}{\text{Net cost}} \)
High Value Care is NOT…

Withholding treatment that would be beneficial to the patient due to cost

OR

Providing less care

OR

Rationing of care
How important is incorporating cost and value into your care of patients?

A. Unimportant
B. Neither important / unimportant
C. Important
D. Very important
In what percent of your patient encounters do you consider cost in your decision making?

A. > 80%
B. 61-80%
C. 41-60%
D. 21-40%
E. < 20%
The main driver of unnecessary spending in health care is…

A. Administrative costs
B. Insurance companies
C. Malpractice claims
D. Physicians
Which of the following is the greatest source of health care waste?

A. Administrative system inefficiencies

B. Fraud and abuse

C. Provider inefficiencies and error

D. Unwarranted use
The fastest growth in health care spending over the past decade has been in...

A. Hospital facility charges
B. Imaging and tests
C. Physician charges
D. Surgical procedures
What is the problem?

- Healthcare spending = 17% of U.S. GDP
- U.S. spends > 2x on health care compared to other developed nations but has lower life expectancy
- $700 billion in “health care waste” annually
TIME

BITTER PILL

WHY MEDICAL BILLS ARE KILLING US

BY STEVEN BRILL
# The $2.7 Trillion Medical Bill

Colonoscopies Explain Why U.S. Leads the World in Health Expenditures

*By ELISABETH ROSENTHAL | Published: June 1, 2013*

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Avg. U.S. Price</th>
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Healthcare Waste

Estimated $700 Billion of “Healthcare waste” annually

- $25-50B in “Lack of care coordination”
- $75-100B in “Provider inefficiency and errors”
- $250-325B in “Unwarranted use”
Unwarranted Use

Two areas of greatest expenditures and most rapid growth:

IMAGING and TESTS
High Value Care is...

Better Quality at Less Cost

\[ \text{Value} = \frac{\text{Net benefit}}{\text{Net cost}} \]
Value and Cost

Value = \frac{\text{Quality}}{\text{Cost}}
Can you think of specific examples?

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<thead>
<tr>
<th></th>
<th>Improved Outcome</th>
<th>No Improved Outcome</th>
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<td><strong>Low Cost</strong></td>
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Can you think of specific examples?

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<tr>
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<th>No Improved Outcome</th>
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<tbody>
<tr>
<td><strong>High Cost</strong></td>
<td>• HAART for HIV</td>
<td>• Imaging uncomplicated headache</td>
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<td></td>
<td>• Chemotherapy</td>
<td>• Chest CT for pneumonia</td>
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<td></td>
<td>• Dialysis</td>
<td>• Imaging for nonspecific low back pain</td>
</tr>
<tr>
<td></td>
<td>• Targeted Autoantibodies and Biologics</td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Low Cost</strong></td>
<td>• D dimer in low risk pt</td>
<td>• Annual PAP, low risk pt.</td>
</tr>
<tr>
<td></td>
<td>• HIV screening</td>
<td>• Annual lipid testing</td>
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<td></td>
<td>• Good H and P</td>
<td>• Daily labs</td>
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<td></td>
<td>• Vaccines</td>
<td>• Preop labs / CXR</td>
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Old way of thinking - Pre HVC

• *Let’s get all the data, then we can figure it out.*
  – What do I do with that CRP 1.8?
• *I can MRI that.*
  – Incidentalomas
  – Poor physical exam (skills)
• *The hidden curriculum.*
  – Imbalanced focus on identifying rare cases
  – Sins of omission > sins of commission
• *It’s up to insurance and billing to worry about cost.*
  – Misperception that considering cost is not aligned with patient interests
New way of thinking - HVC Era

• Train providers to understand and focus on health care value
• Before ordering a test or treatment, consider the potential benefits and potential harms and costs.

SHIFT IN DOGMA:

More care is better care → High value, customized care is better care
IM Resident Curriculum - ACP

• Available online curriculum
• Based on a five-step framework
• Six, one-hour presentations
• Case-based small group activities with bills
• Facilitator’s guide to help faculty prepare
• Program Director’s toolbox
Steps Toward High Value Care

• **Step 1:** Understand the benefits, harms, and relative costs of the interventions that you are considering

• **Step 2:** Decrease or eliminate the use of interventions that provide no benefits and/or may be harmful

• **Step 3:** Choose interventions and care settings that maximize benefits, minimize harms, and reduce costs (using comparative-effectiveness and cost-effectiveness data)

• **Step 4:** Customize a care plan with the patient that incorporates their values and addresses their concerns

• **Step 5:** Identify system level opportunities to improve outcomes, minimize harms, and reduce healthcare waste
Examples of HVC in Practice
Choosing Wisely

- Partnership of ABIMF and over 50 medical specialty societies
- Created 5 things “patients and providers should question” within different specialties
- Helps providers, patients and other health care stakeholders think and talk about overuse of health care resources
- Lists and references available at www.choosingwisely.org
Antibiotics should not be used for apparent viral respiratory illnesses (sinusitis, pharyngitis, bronchitis).

Although overall antibiotic prescription rates for children have fallen, they still remain alarmingly high. Unnecessary medication use for viral respiratory illnesses can lead to antibiotic resistance and contributes to higher health care costs and the risks of adverse events.

Cough and cold medicines should not be prescribed or recommended for respiratory illnesses in children under four years of age.

Research has shown these products offer little benefit to young children and can have potentially serious side effects. Many cough and cold products for children have more than one ingredient, increasing the chance of accidental overdose if combined with another product.

Computed tomography (CT) scans are not necessary in the immediate evaluation of minor head injuries; clinical observation/Pediatric Emergency Care Applied Research Network (PECARN) criteria should be used to determine whether imaging is indicated.

Minor head injuries occur commonly in children and adolescents. Approximately 50% of children who visit hospital emergency departments with a head injury are given a CT scan, many of which may be unnecessary. Unnecessary exposure to x-rays poses considerable danger to children including increasing the lifetime risk of cancer because a child’s brain tissue is more sensitive to ionizing radiation. Unnecessary CT scans impose undue costs to the health care system. Clinical observation prior to CT decision-making for children with minor head injuries is an effective approach.
Case #1: Small Group Exercise

- 6 mo previously healthy male presents to ED in winter with 3 days of rhinorrhea, cough, and low-grade fever
- 1 day of decreased PO intake and increased work of breathing
- Older sibling had a cold last week
- Exam:
  - Vitals: T 38.5, HR 165, RR 60, BP 92/55, 93% on RA
  - HEENT: copious nasal secretions
  - Resp: suprasternal and subcostal retractions, diffuse crackles and wheezes
  - Heart: tachycardic, no murmurs, rubs or gallops
  - Abdomen, skin and extremities normal
Case #1: Small Group Exercise

• How would you further evaluate this patient with respiratory distress?

• Write down all the tests, consults, procedures, and treatments that you would order.

• Would you admit this patient?
Disclaimer on Cost and Value

Cost ≠ Value

Cost ≠ Cost of Test

• Cost includes cost of test and downstream costs, benefits and harms

• High-cost interventions may provide good value because they are highly beneficial

• Low-cost interventions may have little or no value if they provide little benefit or increase downstream costs
Disclaimer on Costs and Charges

• The prices listed are estimates based on actual hospital bills (i.e. hospital charge)
  – There are a lot of complexities to how things are priced and how much a specific patient is charged
  – The goal is to give an idea of magnitude
  – Costs reported here are hospital charges (found on a bill)

• Clinical reasoning and individualized care are very important

• Cost-conscious care is not about discouraging appropriate care, nor denying beneficial services
Approximate Hospital Charges

- Hospital physician fees: $200/day
- ED Physician fees: $1600-$3500
- CXR PA and lateral: $250
- ABG: $210
- Respiratory Viral PCR Panel: $360
- Extended Viral PCR Panel: $850
- BMP: $240
- CMP: $360
- ABC: $85
- Manual Diff: $62
- CRP: $95
- Blood culture: $150
- Urinalysis: $50
- Urine culture: $100
- IV medications: ~$80 (<$5 for med, but additional charges for pharmacy and nursing administration)
- Oral medications: ~ $5 per pill
- IV fluids: $120
- Albuterol: $13 for 1.25 mg (does not include RT charges)
- Hypertonic saline: $5 for 4 vials (does not include RT charges)
- Oxygen: ?
- Contact isolation: ?
- Continuous pulse oximetry: ?
Step 1: Know the benefits, harms, and costs of your interventions

- What is your work-up for bronchiolitis?
- Which labs or initial studies do you want to order?
- What are the benefits and harms of each requested study?
- How much does this cost?
- What factors lead us to make orders or recommendations for our patients?
Step 2: Decrease or eliminate care that provides no benefit and/or may be harmful

Which tests had the potential to change management and which ones would you consider eliminating from the initial work-up?
Step 3: Choose interventions and care settings that maximize benefits, minimize harms, and reduce costs

- What tests have the most benefit?
- What costs are necessary?
- What can be eliminated?
- What would be the most elegant approach to work-up and management?
Step 4: Consider the patient’s values and create a care plan that addresses his/her concerns.

Step 5: What costs can be reduced on a system based level?
Questions to Ask BEFORE Ordering a Test

- Did the patient have this test previously?
- Will the result of this test change the care of the patient?
- What are the probability and potential adverse consequences of a false positive result?
- Is the patient in potential danger in the short term if I do not perform this test?
- Am I ordering the test primarily because the patient wants it or to reassure the patient?
Reasons Residents Over-Order Tests

- Duplicating role modeled behavior
- Desire to be complete
- Pre-emptive ordering/rushing an evaluation/unnecessary duplication of tests
- Discomfort with diagnostic uncertainty
- Curiosity

- Lack of knowledge of the costs and harms
- Defensive medicine
- Patient requests
- Faculty demand
- No training in weighing benefit relative to cost and harm
- Ease of access to services when patient is hospitalized
Reflection

• What, if any, of the tests/consults/procedures may have been unnecessary in this case?

• Choosing Wisely List for Pediatric Hospital Medicine

• AAP Bronchiolitis Clinical Guidelines
Case #2: Small Group Exercise

- 15 year-old female presents to clinic complaining of headaches every 2 weeks for the past 6 months
- Headaches preceded by “seeing spots” and associated with nausea
- R-sided, pulsatile, last approximately 4-8 hours
- Cannot identify any “triggers”
- Normal neurologic exam

What is the most likely diagnosis?
Case #2: Small Group Exercise

• Would you perform head imaging? Why or why not?

• Would you refer to neurology? Why or why not?

• Do you know of any evidence based scoring systems or guidelines to help support your decisions?
Migraine Headache

- Characteristics:
  - Dull, throbbing, unilateral pain
  - Associated photophobia, nausea/vomiting, aura
  - Last hours to days
- “POUND” criteria:
  - Pulsating
  - One day duration (4-72 hr)
  - Unilateral
  - Nausea
  - Disabling

Likelihood Ratio for migraine by number of POUND criteria:
- 4 of 5 criteria – LR 24
- 3 of 5 criteria – LR 3.5
- 2 or fewer criteria – LR 0.41
Migraine Headache

1. Don’t do imaging for uncomplicated headache.

   Imaging headache patients absent specific risk factors for structural disease is not likely to change management or improve outcome. Those patients with a significant likelihood of structural disease requiring immediate attention are detected by clinical screens that have been validated in many settings. Many studies and clinical practice guidelines concur. Also, incidental findings lead to additional medical procedures and expense that do not improve patient well-being.

2. Don’t image for suspected pulmonary embolism (PE) without moderate or high pre-test probability.

   While deep vein thrombosis (DVT) and PE are relatively common clinically, they are rare in the absence of elevated blood d-Dimer levels and certain specific risk factors. Imaging, particularly computed tomography (CT) pulmonary angiography, is a rapid, accurate and widely available test, but has limited value in patients who are very unlikely, based on serum and clinical criteria, to have significant value. Imaging is helpful to confirm or exclude PE only for such patients, not for patients with low pre-test probability of PE.
Neurology Practice Parameter: Children and Adolescents with Recurrent Headache

• Reviewed 6 studies of children with recurrent headache:
  – 1275 children with recurrent HA examined by neurologist
  – 605 underwent neuroimaging
  – 14 (2.3%) had lesions that required surgical treatment
  – All 14 had definite abnormalities on exam
  – No patient with a normal exam had a lesion that required surgical treatment.

• “Obtaining a neuroimaging study on a routine basis is not indicated in children with recurrent headaches and a normal neuro exam.”
Start with the H&P!

The first key step is to perform a good history and physical examination

- Cost = Nominal
- Risk = Minimal
- Yield = Priceless
Red Flags

- Age < 3 years
- Acute, sudden onset with no prior history
- Absence of family history of migraine
- Steadily worsening headache
- Awakening with headache
- Occurrence of seizures
- Altered mental status
- Abnormal neuro exam
- Gait abnormalities
- Neurocutaneous syndrome
What is the price of a head CT?

A. $500
B. $800
C. $1300
D. $3200
What is the price of a brain MRI?

A. $1650
B. $2250
C. $5250
D. $7250
# Price of Head Imaging

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<tr>
<th>CT Head</th>
<th>Price</th>
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<tr>
<td>U.S. Minimum Price</td>
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<tr>
<td>U.S. Average Price</td>
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<tr>
<td>U.S. Maximum Price</td>
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<tr>
<td>Your Institution Price</td>
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<table>
<thead>
<tr>
<th>MRI Brain</th>
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<table>
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<tr>
<th>Moderate Sedation (30 min)</th>
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<tbody>
<tr>
<td>Your Institution Price</td>
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Neuroimaging utilization for HA

- Of ~16,000 children (age 3-17 yr) with insurance claims for “headache” diagnosis
  - 26% had ≥ 1 head CT
  - Patients seen in ED 4x more likely to have CT
  - However, 2/3 of patients with CT had no ED utilization
  - Evaluation by a neurologist strongly associated with lower likelihood of CT scan compared to other providers
  - 23% had MRIs

- CTs associated with increased lifetime risk of malignancy
- MRIs associated with sedation risk
How can WE address the problem?

• Physicians responsible for 87% of wasteful spending
• Within the current health care system, no real disincentive to curb providers’ ordering practices
• Lack of understanding of health care costs by physicians
• Physicians must lead in addressing these problems
  – Choosing Wisely campaign
  – Advocacy and lobbying
  – Evidence-based guidelines
• EDUCATION is the first step!
Duke HVC Curriculum

• GME Innovations Grant
• Collaboration
  – Internal Medicine
  – Pediatrics
  – Emergency Medicine
  – Radiology
• Pediatrics specific work
  – 7 modules with instructor guides
  – Submitted to MedEdPORTAL
Duke HVC Methods

- Enlist program directors to solicit department interest
- Focus groups of faculty and trainees
- Review American College of Physicians curriculum
- Determine content and cases specific to specialty
- Schedule conference time
Duke HVC Peds Modules

1. Introduction to Healthcare Value
   - 16 yo with post-operative pulmonary embolism

2. Healthcare Waste and Over-ordering of Tests
   - 15 yo with migraine; 6 mo with bronchiolitis

3. Health Insurance and Payment Models
   - 17 yo with a clavicle fracture

4. Screening and Prevention
   - 12 mo well child check, obesity counseling, lipid screening
Duke HVC Peds Modules

5. Biostatistics (pre-test probability and LR)
   - 5 yo with abdominal pain, rule out appendicitis

6. Balancing Benefits with Harms and Costs
   - 2 yo with leg pain, imaging modalities/radiation exposure

7. Barriers to High Value Care
   - Parental request head CT for uncomplicated headache
   - Parental request antibiotics for viral URI/pharyngitis
Emergency Medicine
- CBCd
- Blood cx
- Antibiotics
- O2
- CMP

Inpatient Pediatrics
- Daily labs
- Albuterol nebs
- Antibiotics

Radiology
- CXR
- Follow-up CXR or CT if abnl

Bronchiolitis

Supportive care
- O2

HVC Collaboration
- Bronchiolitis

Duke HVC Collaboration

Duke Medicine
Duke HVC Collaboration

• Next steps
  – Survey all GME trainees
  – Educate more trainees / faculty in other departments (Surgery, Family Medicine, OB GYN, Family Medicine)
  – Competition/quality improvement projects
  – Engagement of Health System Leadership
  – Identify areas of overuse and develop metrics
QI Projects!

- PPI prescription at hospital discharge (Cornell)
- “Nebs No More After 24” (UCSF)
- Reducing head imaging for uncomplicated head trauma (Walter Reed)
- Reducing unnecessary pre-operative coag studies (Duke)
Challenges/Opportunities

- End of life care
- Education / buy-in
- Over-pricing
- Price transparency
- Defensive medicine
- Improved reimbursement for care coordination
- Alignment of financial incentives
- Physician financial conflict of interest
Summary: What can we do?

• Eliminate unnecessary tests and treatments and teach our students, residents, fellows and faculty to do the same

• Individualize care by asking patients about their concerns, incorporating their values into the care plan and managing their expectations

• Use the FREE tools from the ACP, Choosing Wisely Campaign, Duke and other sources
Repeat audience response questions at the beginning and give answers here
Take Home Points

• Healthcare waste is a multi-billion dollar problem
• Every provider must carefully weigh costs, harms, and benefits and order only those interventions that add value
• Avoid unnecessary or “routine” testing by using the HVC 5 step framework
• Use guidelines and resources to determine indications for diagnostic studies
• Consider “downstream effects” as harms or “costs” when ordering tests/procedures
What is one thing that you will change in your daily practice to promote high value care?
Questions