American Board of Internal Medicine Foundation and Consumer Reports

Choosing Wisely promotes conversations among clinicians and patients by helping patients choose care that is:

- Not duplicative of other tests or procedures already received
- Supported by evidence
- Truly necessary
- Free from harm

The Duke Bleeding Time

- In 1910, WW Duke established that platelets came from bone marrow megakaryocytes, that they are needed in blood clotting, and that low platelet counts were associated with bruising.
- Duke developed the bleeding time test...
- Puncture the earlobe with a surgical blade.
- Start a timer and dab the wound with filter paper every 30 seconds until bleeding stops.
- Normal is 1–9 minutes.
- Prolongation signals low platelet count, functional platelet abnormality, von Willebrand factor deficiency, or afibrinogenemia.


Ivy Bleeding Time, 1935

AC Ivy further standardized the BT by placing a blood pressure cuff on the arm, inflating to 40 mm Hg, and making an incision parallel to the length of the arm on the forearm inner surface.

Tonsillectomy

BTs were used as screens to predict surgical bleeding. People with prolonged BTs were taken off the surgery schedule.

1% risk of postoperative hemorrhage
The Mielke Bleeding Time
• In 1969, CH Mielke, Jr. developed a template that further standardized the incision to 1–2 mm deep by 10 mm long.

Surgicutt device (once called Simplate)

Screening Test
• A screen is a test on an “unselected” population.
  – Sensitive: test sacrifices specificity for sensitivity
  – High FP rate, low FN rate
• A positive screen requires a confirmatory test
  – Specific: high FN rate, low FP rate
  – Safe to use subsequent to a positive screen

False Positive, False Negative
• True positive: assay result correctly identifies those with a disease or condition
• False positive: assay result incorrectly identifies disease where none is present (false alarm)
• True negative: laboratory assay correctly identifies those without a disease or condition
• False negative: assay result incorrectly rules out disease where it is present (miss)

Prevalence Effect on True and False Positive Rate

<table>
<thead>
<tr>
<th>Total Sample: 10,000</th>
<th>Sample Prevalence</th>
<th>With Disease</th>
<th>Without Disease</th>
<th>TP</th>
<th>FP</th>
<th>FN/TP Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selected sample</td>
<td>10%</td>
<td>1000</td>
<td>9000</td>
<td>100</td>
<td>200</td>
<td>0.012</td>
</tr>
<tr>
<td>Unselected/common</td>
<td>1%</td>
<td>100</td>
<td>9900</td>
<td>100</td>
<td>200</td>
<td>3.0</td>
</tr>
<tr>
<td>Unselected/rare</td>
<td>0.01%</td>
<td>1</td>
<td>9999</td>
<td>1</td>
<td>200</td>
<td>201.0</td>
</tr>
</tbody>
</table>

• False positive rate is 2.0%. The assay classifies a constant 2% of subjects without disease as positive for the disease.
• 98% of subjects with disease are correctly classified.
• At a prevalence of 1/10,000, an assay with a 2% false positive rate identifies 200 false positive results for every true positive result.

Receiver-Operating Characteristic Curve (ROC Analysis)

Bleeding Time Effectiveness
• Standardization does not enhance the bleeding time
• The BT is not a specific indicator of platelet function
• The BT does not predict the risk of hemorrhage in surgery or any other condition.
• BT prolongation doesn’t occur ahead of actual bleeding symptoms.
• BT is not useful in testing efficacy of therapy.

Choosing Wisely Recommendation

Don't use the bleeding time test to guide patient care.

The bleeding time test is an old assay that has been replaced by alternative coagulation tests. The relationship between the bleeding time test and the risk of a patient's actually bleeding has not been established. Further, the test leaves a scar on the forearm. There are other reliable tests of coagulation available to evaluate the risks of bleeding in appropriate patient populations.

Inherited Thrombosis Risk Factors

(“Hypercoagulability,” Thrombophilia)

- Antithrombin (antithrombin III, AT, ATIII) 1965
- Protein C (PC, 1984) and protein S (PS): 1986
- Activated protein C resistance, 1993
- Factor V Leiden (FVL) mutation: 1994
- Prothrombin G20210A mutation: 1996
- Factor VIII, homocysteinemia, MTHFR polymorphisms

Prevalence of Inherited Risk Factors in Unselected Population and in Thrombotic Disease

<table>
<thead>
<tr>
<th>Factor</th>
<th>General</th>
<th>Thrombosis*</th>
</tr>
</thead>
<tbody>
<tr>
<td>APCR (FVL)</td>
<td>3-8%**</td>
<td>20–25%</td>
</tr>
<tr>
<td>Prothrombin G20210A</td>
<td>2-3%**</td>
<td>4–8%</td>
</tr>
<tr>
<td>AT deficiency</td>
<td>0.02-0.05%</td>
<td>1–1.8%</td>
</tr>
<tr>
<td>Protein C deficiency</td>
<td>1 in 300</td>
<td>2.5–5%</td>
</tr>
<tr>
<td>Protein S deficiency</td>
<td>1%</td>
<td>2.8–5%</td>
</tr>
<tr>
<td>Homocysteinemia</td>
<td>11%</td>
<td>13.1–26.7%</td>
</tr>
<tr>
<td>(MTHFR 677 mutation)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Subjects with at least one thrombotic event
** Caucasians, Arabs, Hispanics, absent from Africans and Asians

Thrombophilia Testing Limitations

- Antithrombin
  - Acute phase reactant rises in acute inflammation
- Proteins C and S
  - Vitamin K dependent, activity of both drops in Coumadin therapy
  - Activity of both falls in acute inflammation
- All three: high false positive rate
  - Normal range is 60–140% of the mean
  - False positives are low values in apparently healthy people

Thrombophilia Testing Indications

Retrospective observational study of consecutive unselected patients undergoing thrombophilia testing in 2009

- Recurrent pregnancy loss, three or more instances
- Unprovoked arterial thrombosis
- Unprovoked venous thrombosis
- Pregnancy morbidity: pre-eclampsia, intrauterine growth retardation

- Department of Pathology, University of Texas Southwestern Medical Center, Dallas, TX.

Thrombophilia Testing Non-Indications

- Provoked venous thrombosis: immobilization, surgery, trauma, and malignancy prior to or at the time of the event
- Provoked arterial thrombosis: hypertension, dyslipidemia, diabetes mellitus, atherosclerotic disease
- 1–2 pregnancy losses
- Testing without a prior thrombotic event or adverse pregnancy outcome
Results

• 29% of patients had testing performed without a documented thrombotic event or pregnancy morbidity.
  – 80% with connective tissue or autoimmune disorders
• 69% had a known thrombotic event(s) or pregnancy loss.
  – 34% possessed an appropriate indication.
• 59 patients were on anticoagulant
• 146 patients had incomplete workups
• 136 patients had no follow-up tests
• Altogether, 85% of thrombosis risk orders were inappropriate

The Dallas Intervention

• Lab advisory committee (LAC), “do not perform thrombophilia testing of patients admitted with an acute VTE, arterial thrombosis, or patients diagnosed with a thrombotic event during their hospital stay.”
• Investigate as outpatients if they met the criteria (young age, unprovoked event) ≥ 2 weeks following D/C of anticoagulation.
• Hemostasis service communicated with clinicians to cancel testing that was deemed inappropriate.
• 18/month instead of 87/m, reduced to 5/m by intervention.
• Reduced orders on inpatients by 79%

Choosing Wisely Champion

Ravi Sarode, MD, UT Southwestern Medical Center discovered that approximately 85 percent of thrombophilia tests at UT Southwestern’s two teaching hospitals were ordered incorrectly or incompletely. Thrombophilia tests are frequently ordered for patients with acute thrombotic events, often while on anticoagulation therapy; however, these additional variables cause these standard tests to return false positive results. These abnormal results are not always checked for reproducibility or accuracy, causing some patients to be inappropriately placed on long-term anticoagulation therapy. To promote appropriate use of testing, Dr. Sarode’s team developed local guidelines and implemented them in the EHR via a series of cascading questions that providers must answer before ordering. After implementation of the intervention and an associated education campaign, UT Southwestern has reduced testing for inpatients by more than 90 percent.

Choosing Wisely Recommendation

Don’t test for thrombophilia in adult patients with venous thromboembolism (VTE) occurring in the setting of major transient risk factors (surgery, trauma or prolonged immobility).

Thrombophilia testing is costly and can result in harm to patients if the duration of anticoagulation is inappropriately prolonged or if patients are incorrectly labeled as thrombophilic. Thrombophilia testing does not change the management of VTEs occurring in the setting of major transient VTE risk factors. When VTE occurs in the setting of pregnancy or hormonal therapy, or when there is a strong family history plus a major transient risk factor, the role of thrombophilia testing is complex and patients and clinicians are advised to seek guidance from an expert in VTE.

Choosing Wisely Recommendation

Do not test for PS, PC, or AT during an active clotting event to diagnose a hereditary deficiency; these tests are not analytically accurate during an active clotting event.

Assays may be useful to test for an acquired deficiency in DIC. Tests are inaccurate during an active clotting event. Moreover they are not clinically actionable at the time of an acute clot because the same anticoagulation is used regardless of results. Deferral to the outpatient/non-acute setting allows for the testing to be done when the results would change patient management such as continuing anticoagulation. Because PC and PS decrease on warfarin, while AT is elevated, testing while on anticoagulants also yields misleading results and should be avoided.

Electronic Best Practice Alert: Stanford

• In 2016, every thrombophilia order generated a BPA highlighting CW thrombophilia recommendation
• 12-month pre-BPA versus 7-mth post-BPA orders, no hard stop
• Outpatient: BPA appeared 140 times
  – Pre-BPA: 471.5 tests/m; post-BPA: 471.6 test/m, p = 1.0
  – Orders could be legitimate
• Inpatient: BPA appeared 35 times
  – Pre-BPA: 101.1 tests/m; post-BPA: 73.3 tests/m, p = 0.038
  – Chart review in progress

Jun T, Kwang H, You E, et al. Using electronic best practice alerts to improve thrombophilia testing based on ASH choosing wisely guidelines. ASH Poster, Atlanta, 12-10-17, 6–8 PM

http://www.choosingwisely.org/
Choosing Wisely Champions Program

The Choosing Wisely Champions program recognizes clinicians who are leading efforts to reduce overuse and waste in medicine. The program was created to acknowledge the work of those dedicated to providing appropriate care and encourage others to follow their lead. Champions are selected by participating societies and include clinicians or teams of clinicians whose work in their respective specialties represents significant contributions to advancing the goals of the campaign. Such contributions can include:

- Creation of an intervention to implement Choosing Wisely in their clinical practice;
- Designing local initiatives to educate colleagues; or
- Playing a leadership role in developing society recommendations.

Choosing Wisely Champions, 2017

- Jack Jordan, MA—As Director of Performance Excellence and Quality at Henry Ford Health System, he has worked to make the utilization of laboratory services evidence-based, safer and compliant with Choosing Wisely recommendations.
- Meghan Kapp, MD—Dr. Kapp served as a founding member and co-chair of VUMC’s Choosing Wisely steering committee, educating house staff and faculty about the potential harm of daily labs, encourage discussions of lab results and the need for future labs during rounds and provide data feedback with peer comparisons.
- Christopher Polage, MD—Dr. Polage published research that contributed to the Infectious Diseases Society of America’s (IDSA) Choosing Wisely recommendation for clinicians to avoid testing for Clostridium difficile in certain situations.

Choosing Wisely Grant Program

- In 2013, RWJF provided funding to support 21 projects led by state medical societies, specialty societies and regional health collaboratives to educate physicians about the recommendations and build skills to have conversations with patients about the care they need.
- In spring 2015, the ABIM Foundation—with continued funding from RWJF—awarded another round of 7 grants to organizations that promote the goals of the Choosing Wisely campaign. These new grants support seven initiatives focused on reducing utilization of inappropriate tests and treatments. Each initiative includes delivery systems, hospitals and/or medical groups collaborating with multi-stakeholder community-based groups and physician-led organizations.

Blood Usage Recommendation

Don’t transfuse more units of blood than absolutely necessary

Each unit of blood carries risks. A restrictive threshold (7.0-8.0 g/dL) should be used for the vast majority of hospitalized, stable patients without evidence of inadequate tissue oxygenation (evidence supports a threshold of 8.0 g/dL in patients with pre-existing cardiovascular disease). Transfusion decisions should be influenced by symptoms and hemoglobin concentration. Single unit red cell transfusions should be the standard for non-bleeding, hospitalized patients. Additional units should only be prescribed after re-assessment of the patient and their hemoglobin value.

A Consumer Reports Vitamin D Recommendation

- Many people don’t have enough vitamin D in their bodies. Low vitamin D increases the risk of broken bones. It may also contribute to other health problems. That’s why doctors often order a blood test to measure vitamin D. But many people do not need the test. Here’s why:
  - A test usually does not improve treatment.
    Many people have low levels of vitamin D, but few have seriously low levels. Most of us don’t need a vitamin D test. We just need to make simple changes so we get enough D. We need to get a little more sun, eat foods rich in vitamin D, or take a supplement.
- Extra tests lead to extra treatments and costs.
  Getting tests that you don’t need often leads to treatments you don’t need, or treatments that can even be harmful. For example, if you take too much vitamin D, it can damage your kidneys and other organs.
  - One blood test for vitamin D does not cost much. But doctors are ordering tests six times as often as in 2008. All these tests add up. In 2011, Medicare spent $224 million on vitamin D tests for seniors.
  - Talk to your doctor about your risks. Here are some conditions where you might need a vitamin D test:
    - If you have osteoporosis. This disease makes your bones weak, so that they are more likely to break.
A Consumer Reports Vitamin D Recommendation

- If you have a disease that damages your body’s ability to use vitamin D. These are usually serious and ongoing diseases of the digestive system, such as inflammatory bowel disease, celiac disease, kidney disease, liver disease, pancreatitis and others.
- If your doctor suggests getting a vitamin D test, ask about your risks. If your risk is high, you should get the test. If your risk is low, ask if you can avoid the test. Ask if you can boost your vitamin D with sunlight and food, and possibly supplements.
- If your doctor does need to keep track of your Vitamin D, make sure the same test is used each time. Ask your doctor which tests are best.
- This report is for you to use when talking with your health-care provider. It is not a substitute for medical advice and treatment. Use of this report is at your own risk.

If Your Society Wants to Partner

- Submit up to five recommendations for consideration.
- Recommendations begin with the term “Don’t” or “Avoid.”
- Recommendations are evidence-based with current citations.
- Recommendations address frequent diagnostic or therapeutic choices.
- Recommendations are developed within the contributing society using internal society processes.
- Contributing societies may send recommendations that overlap with existing recommendations.
- Conversely, contributing societies should avoid redundancy, CW advocates for new recommendations.

Choosing Wisely Turns 5 With Mixed Results

- Overall savings could be $200 billion/year, reduce backlogs. Example…
- Cataract surgery uses local anesthesia, protected site, 15” procedure
- In 2015, UCLA recommended no EKG, chest X-ray, full lab profiles for cataract surgery
- Test ordering dropped by 80%, mean wait time shortened from 245 to 64 days, i.e., good vision six months earlier
- No adverse effects

Choosing Wisely: how To fulfill the promise In the next 5 years. Health Affairs 2017;36:11 doi.org/10.1377/hlthaff.2017.0953

Josephine Ebomoyi, Northern Illinois U; Micro
Muneeza Esani, U of Texas Med Branch, Galveston, Clin Chem
Brianna Miller, UAB, Hematology, Hemostasis, BB
Dana Bostic, U of Kansas MC; BB, Health Care Simulation
George Fritsma, Birmingham; Hematology, Hemostasis
Deborah Josko, Rutgers U; Immunology
Dawn Rudnick, U of Michigan Hlth Svc; Micro, Lab Mgt, General
Eddie Salazar, U of Texas Med Branch, Galveston, Clin Chem, UA
John Smith, Kansas; Micro, Hlth Care Utilization
Multiplex Testing and patient impact

Choosing wisely Recommendation:
Do not order Rapid Multiplex Molecular assays for microbial infections unless the assays will impact patient management decisions.

By
By Josephine Ebomoyi, Ph.D, MSPH, M(ASCP)CM
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Presented at CLEC 2018, Houston TX, February 23rd 2018

My goals

• To find evidence to support the recommendation
• To determine how Multiplex testing affect patient outcomes
• To determine if the evidence is strong enough to
  – keep the recommendation
  – reject the recommendation

Choosing wisely mission

• Promote conversations between clinicians and patients by helping patients choose care that is:
  • Supported by evidence
  • Not duplicative of other tests or procedures already received
  • Free from harm
  • Truly necessary

Overview of presentation

• Overall goal/s
• Strategic planning
• Choosing wisely mission
• What is Multiplex Molecular Testing?
• Which Microbial agents can be detected by Multiplex molecular testing?
• Brief review and findings from research on the topic
• Concerns about the testing and patient management?
• Outcomes that should be measured
• Decisions, decisions
• Learning module objectives

Strategies

• Contacted American Society For Microbiology (ASM)
• Requested to join Clinical Microbiology list serve and other list serves
• Aggressively look for published research that discusses Multiplex testing and patient management
• Determine the concerns raised about testing and patient outcomes

Multiplex Molecular Testing

• Automated Molecular diagnostic testing that simultaneously detects many microorganisms at the same time
• Involves extraction, purification and amplification of the target nucleic acid of the microorganism and identifies it with the
  • in-built specific probes
• Results print out through the network
• Different panels are available

http://www.choosingwisely.org/
Four comprehensive panels

- **Respiratory panel**
  - **Viruses**
    - Adenovirus
    - Coronavirus
    - Human metapneumovirus
    - Influenza A
    - Influenza B
    - Parainfluenza viruses 1, 2, 3, 4
    - Respiratory syncytial virus
  - **Bacteria**
    - Bordetella pertussis
    - Chlamydia pneumoniae
    - Mycoplasma pneumoniae

- **Gastrointestinal panel**
  - **Bacteria**
    - Salmonella
    - Campylobacter
    - Chlamydia
    - Clostridium difficile
    - Haemophilus influenzae
    - Neisseria meningitidis
    - Staphylococcus aureus
    - Streptococcus pneumoniae
    - E. coli
  - **Fungi**
    - Cryptococcus neoformans
    - Candida
  - **Viruses**
    - Adenovirus
    - Norovirus
    - Rotavirus
  - **Parasites**
    - Cryptosporidium
    - Cyclospora cayetanensis
    - Entamoeba histolytica
    - Giardia lamblia

- **Blood culture**

- **Meningitis/Encephalitis panel**
  - **Bacteria**
    - E. coli
    - Haemophilus influenzae
    - Listeria monocytogenes
    - Neisseria meningitidis
  - **Fungi**
    - Cryptococcus neoformans
    - Candida
  - **Viruses**
    - Cytomegalovirus
    - Herpes simplex virus 1 (HSV-1)
    - Varicella zoster virus (VZV)

**Research for evidence**

  - Faster than culture methods (about 6 hours)
  - Specificity 93%, Sensitivity 100%

- Halligan et al (2014) - *Multiplex for management of infectious gastroenteritis in a hospital setting*
  - Reduced time to diagnosis (about 5 days)
  - Fewer isolation rooms
  - Reduced inpatient stay
  - Cost savings: £150,546 compared to £63,416

http://www.choosingwisely.org/
Research for evidence

- Dierkes et al (2009) - Clinical impact of a commercially available multiplex on patients in patients with presumed sepsis
  - Adjustment of antibiotic therapy in 5 patients
  - Fungi detected
  - Listeria detected
  - Enterococcus faecium infection was detected more often
  - Fewer organisms from CNS specimens were identified by the Molecular multiplex method compared to conventional blood cultures (BC).

General advantages

- Faster results
- Faster turn around time for lab results
- High sensitivity and specificity
- Less decision steps from processing to detection of results
- Can detect numerous microorganisms including co-infections quickly

Concerns/Questions

- Are pathogens additionally detected by either Multiplex or BC clinically relevant?
- Are they merely “innocent bystanders”, i.e. contamination, colonization or true infection?
- Did the therapeutic adjustments initiated by the Molecular test have an impact on the survival of patients with sepsis?
- Cost and cost-effectiveness analyses will have to be done for different scenarios.
- Non randomized small study on one site

General concerns about Multiplex testing

- Article covered by Kevin B O’Reilly, CAP editor focused on the following:
  - High Prices of the multiplex tests
  - Difficult issue about how adequate they are and ensuring proper use
  - Should test be restricted in some way?
  - Should physicians be allowed to order them as they see fit?

General concerns about Multiplex testing

- The additional detection may be bystanders
- Molecular techniques detect both viable and non living components of the microorganisms
- Are these just bystanders?
- Healthy people shed pathogenic microorganisms e.g. Clostridium difficile in their stool
- Unnecessary treatment

General concerns about Multiplex testing

- Hospital administrators want to know if Molecular testing will
  - Decrease patient stay
  - Improve patient satisfaction
  - Reduce Costs
- To be able to measure outcomes, research studies should be designed appropriately

http://www.choosingwisely.org/
Research design to address the concerns

- Outcomes that need to be measured:
  - Faster access to treatment
  - Shorter duration of symptoms
  - Less time off work or school
  - Reduced emergency department times
  - Shorter hospital and ICU stays
  - Better implementation of infection prevention methods
  - Lower pharmacy costs
  - Lower laboratory costs due to less needs for follow up tests such as antibiotic peak and trough levels

Research design to address the concerns

- Fewer side effects from inappropriate use of antibiotics e.g. *Clostridium difficile* infection
- Lower total costs for the given medical encounter
- Beal et al (2017) compared conventional methods to Gastrointestinal PCR panel
  - Increased average of pathogens detected
  - Decreased hospital stay compared to control

Decisions, Decisions

- Decision on approving the choosing wisely recommendation would depend on further evaluation of more research on the topic
- Keep Recommendation
- Reject recommendation
- Modify recommendation

Learning module Outline

Molecular Multiplex Testing
Incorporating Choosing wisely mission into the learning module

Presented at CLEC 2018, Houston TX

By
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Learning objectives

- Describe the philosophy of Choosing wisely
- Briefly describe Molecular Multiplex testing
- List the different panels of Multiplex testing
- Review the microorganisms that can be detected by Multiplex testing
- Describe the advantage and disadvantages of Multiplex molecular testing
- Determine how choosing wisely philosophy can improve patient outcomes
- Reasons to be concerned about patient outcomes and Multiplex testing
- Questions to ask your physician
- Review/Evaluation

References

- O’Reilly, K (2016) When to fire up large multiplex PCR? *CAP today*

http://www.choosingwisely.org/
Choosing Wisely Learning Module

Muneeza Esani, PhD, MPH, MHA, MT(ASCP)

Objectives of Learning Module

1. Examine the contents of the Choosing Wisely initiative and recommendations related to laboratory science.
2. Critically analyze the evidence behind one of the Choosing Wisely recommendations that is related to Clinical Chemistry.
3. Present the findings and your evaluation of the chosen recommendations, including at least 5 citations in APA or AMA format via a written report.

Recommendations reviewed by graduate students enrolled in Clinical Chemistry course

1. Don’t test for myoglobin or CK-MB in the diagnosis of acute myocardial infarction (AMI). Instead, use troponin I or T. (ASCP)
2. Don’t order multiple tests in the initial evaluation of a patient with suspected thyroid disease. Order thyroid-stimulating hormone (TSH), and if abnormal, follow up with additional evaluation or treatment depending on the findings. (ASCP)
3. Don’t perform population based screening for 25-OH-Vitamin D deficiency. (ASCP)
4. Avoid routinely measuring thyroid function and/or insulin levels in children with obesity. (American Academy of Pediatrics – Section on Endocrinology)
5. Don’t routinely order testing for glucose-6-phosphate dehydrogenase (G6PD) deficiency for patients who are not predisposed due to race/ethnicity. (HIV Medical Association)
6. Do not test for amylase in cases of suspected acute pancreatitis. Instead, test for lipase. (ASCP)

Evaluation

- Following instructions, appropriate format, spelling and grammar – 15%
- Appropriate selection of recommendation – 10%
- Supportive evidence for the recommendation – 55%
- Student’s agreement/disagreement with the recommendation – 10%
- References – 10%

Future modules

- UTMB DCLS students will be working on new recommendations as a part of their Evidence Based Laboratory Practice course.

http://www.choosingwisely.org/
CHOOSE WISELY

WHAT IS OUR PRIMARY PURPOSE AS HEALTHCARE PROVIDERS?

The patient. Period.

- Not...
  - Comfort of the provider
  - Making money
  - What is easiest
  - Making yourself look good

WHAT ARE UNNECESSARY TESTS ORDERED?

WHY ARE UNNECESSARY TESTS ORDERED?

WHAT IS CHOOSING WISELY?

- Compilation of recommendations from national organizations representing medical specialists
- New recommendations are reviewed by panels of experts before implementation
- Identifies tests or procedures commonly used that need to be questioned
- Aims to promote conversations between clinicians and patients

WHY CHOOSE WISELY?

- “Conversations about what care patients truly need is a shared responsibility among all members of the health care team”
- Richard J. Baron, MD, president and CEO of the ABIM Foundation

- What is Medical Professionalism?
  - Medical Professionalism is the daily expression of the desire to help people and society as a whole by providing quality health care to those in need.

HISTORY

- 2010 — Medicine’s Ethical Responsibility for Health Care Reform – The Top Five List
  - Healthcare reform
  - Rising healthcare costs
  - Practice medicine from evidence-based guidelines
  - Five diagnostic tests or treatments
    - Very commonly ordered by members of that specialty
    - Among the most expensive services provided
    - Have been shown by the currently available evidence not to provide any meaningful benefit to at least some major categories of patients for whom they are commonly ordered

http://www.choosingwisely.org/
HISTORY CONT.

- 2012 Choosing Wisely campaign officially launched
- Began with 9 specialty societies
- Quickly added 37 more societies’ recommendations
- Now more than 80 specialties involved
- Multiple professions now included
  - Medicine
  - Dentistry
  - Physical therapy
  - Pharmacy
- 525+ recommendations now included

MAKING A DIFFERENCE

- 77% of US physicians said the frequency of inappropriate tests/procedures is a serious problem
- 69% said the average physician orders unnecessary tests/procedures at least once a week
- 53% say their patients ask for an unnecessary test or procedure at least once a week
- 73% say after they speak with the patient about why it is unnecessary, the patient avoids it

WHEN DO WE TEST?

PRETEST PROBABILITY

- 5 variables
  - Specific patient
  - Specific history
  - Specific clinical setting
  - Specific symptoms
  - Specific diagnosis
- Useful for 4 things:
  - Deciding whether we need to test at all
  - Testing threshold
  - Interpreting the results of a test
  - Deciding if more tests are needed
  - Choosing whether to start therapy
  - Treatment threshold

CLINICAL DECISION INSTRUMENTS

- Validated scoring systems using pretest probability to estimate the likelihood a patient has a disease
- Examples
  - Centor’s Criteria for Strep Throat
  - Wells Criteria for deep vein thrombosis
  - PERC Score for pulmonary embolism
  - Ottawa Rules of the Ankle/Knee

http://www.choosingwisely.org/
NUMBER NEEDED TO TREAT/HARM

- **NNT**
  - How many patients on average you would need to treat (protect) to prevent one additional bad outcome
  - Want this to be low
- **NNH**
  - How many patients on average need to be exposed to a risk factor over a specific period to cause harm in one person
  - Want this to be high
- Must still look at how much benefit the patient receives vs. seriousness of side effects

HOW HELPFUL ARE TESTS?

- Sensitivity
- Specificity
- PPV
- NPV
- Preanalytical variables
- Analytical variables
- Postanalytical variables

RECOMMENDATIONS

PREOPERATIVE TESTING

- Avoid routine preoperative testing for low risk surgeries without a clinical indication
  - CBC, PT, PTT, BMP, CMP, Urinalysis
  - Finds clinically insignificant results, unnecessary delay, additional testing
  - Doesn’t change surgery/make safer
  - Use targeted history, physical exam
  - Testing indications
    - Symptomatic patients
    - Risk factors present

ROUTINE BLOOD TESTS

- Don’t perform serial blood counts on clinically stable patients.
- Don’t order diagnostic tests at regular intervals (such as every day), but rather in response to specific clinical questions.
- Don’t perform repetitive CBC and chemistry testing in the face of clinical and lab stability.
  - Excess blood draws – blood volume, supplies, time
  - Test only when indicated by clinical symptoms

BLEEDING TIME

- Don’t use bleeding time test to guide patient care.
  - Difficult to achieve uniformity
  - Painful
  - Much better tests exist
    - Platelet function test (PFA-100)
**URINE CULTURES**
- Avoid the use of surveillance cultures for the screening and treatment of asymptomatic bacteriuria.
- Don't obtain a urine culture unless there are clear signs and symptoms that localize to the urinary tract.
- Don't treat asymptomatic bacteriuria with antibiotics.
  - Diarrhea, C. diff infection, MDR bacteria, costly
  - Testing indications
    - Pregnancy, urologic surgery, kidney tx
    - Objective signs of infection – fever, leukocytosis, left shift

**C. DIFFICILE**
- Don't use antibiotics in patients with recent *C. difficile* without convincing evidence of need. Antibiotics pose a high risk of *C. difficile* recurrence.
- Don't obtain a *C. difficile* toxin test to confirm "cure" if symptoms have resolved.
- Avoid testing for a *Clostridium difficile* infection in the absence of diarrhea.
  - *C. diff* infections cause watery diarrhea, sometimes bloody, and abdominal cramping/tenderness/pain
  - Unnecessary antibiotics
  - Some people are carriers

**ANTIBIOTICS**
- Don't continue surgical prophylactic antibiotics after the patient has left the operating room.
- Don't continue antibiotics beyond 72 hours in hospitalized patients unless patient has clear evidence of infection.
- Avoid routine postoperative antibiotics.
  - Risk of *C. diff*, yeast infections
  - Cost
  - Antibiotic resistance

**URT INFECTIONS**
- Avoid prescribing antibiotics for upper respiratory infections.
- Don't routinely prescribe antibiotics for acute mild-to-moderate sinusitis unless symptoms last for seven or more days, or symptoms worsen after initial clinical improvement.
  - Cost
  - Antibiotic resistance
  - Opportunistic infections – *C. diff*, yeast

**VITAMIN D TESTING**
- Don't perform population based screening for 25-OH-Vitamin D deficiency
  - Expensive
  - Confusing – number of tests, results
  - Although many people may have somewhat decreased levels, it can be managed with OTC supplements/sun exposure
  - Testing indications
    - Osteoporosis
    - Absorption issues (BD, celiac, CKD, liver dz)
    - Hypercalcemia

**PSA TESTING**
- Don't routinely perform PSA-based screening for prostate cancer
- Don't perform PSA testing for prostate cancer screening in men w/no symptoms and life expectancy <10 years
- Don't treat low-risk clinically localized prostate cancer w/o discussing active surveillance
  - BPH, UTI, prostatitis, ejaculation
  - Shared decision making is critical

http://www.choosingwisely.org/
**D-Dimer**

- In patients with low pretest probability of venous thromboembolism (VTE), obtain a high-sensitive D-dimer measurement as the initial diagnostic test; don’t obtain imaging studies as the initial diagnostic test.
- Don’t perform chest computed tomography (CT angiography) to evaluate for possible pulmonary embolism in patients with a low clinical probability and negative results of a highly sensitive D-dimer assay.

  - Exposure to radiation
  - Contrast media
  - Cost

**Vitamin K Levels**

- Don’t test vitamin K levels unless the patient has an abnormal international normalized ratio (INR) and does not respond to vitamin K therapy.

  - Vitamin K deficiency is rare
  - Test is costly
  - Investigate other causes of abnormal coagulation studies

**Warfarin Reversal**

- Don’t routinely use blood products to reverse warfarin.
- Don’t administer plasma or prothrombin complex concentrates for non-emergent reversal of vitamin K antagonists (i.e. outside of the setting of major bleeding, intracranial hemorrhage or anticipated emergent surgery).

  - Time, adverse effects with FFP
  - PCC – expensive, but efficient
  - Not stat – give vitamin K

**HIT Testing**

- Don’t test or treat for suspected heparin-induced thrombocytopenia (HIT) in patients with a low pre-test probability of HIT.

  - 4 Ts
    - Thrombocytopenia, Timing, Thrombotic events, alternative causes of thrombocytopenia
  - Screening test – high sens, low spec and PPV
  - Gold standard test – send out, expensive
  - Cost of alternative anticoagulants

**O Negative RBCs**

- Don’t transfuse O negative blood except to O negative patients and in emergencies for women of child bearing potential with unknown blood group.

  - Women of child-bearing age – don’t want anti-D
  - No other option for O neg patients

**Transfusions**

- Don’t transfuse more units of blood than absolutely necessary.

  - Side effects
  - Disease risk
  - Transfusion reaction risk
  - Antibody development
  - If 2 ordered, give 1 at a time
IDA TRANSFUSION

- Don’t transfuse red blood cells for iron deficiency without hemodynamic instability.
- Give iron orally/parenteral
- Allow the body to replenish RBCs

EXAMPLE: JOHNS HOPKINS

- Goal: reduce use of cardiac marker testing
  - Troponins 3/day
  - CK & CK-MB
  - Added duplicate order flag
  - Removed CK, CK-MB from cardiac order set
  - 66% reduction in number of tests
  - $1.25 million decrease in charges (50% decrease)
  - Diagnosis of ACS actually increased
  - Reduced false positives

PATIENT INFORMATION

EMPOWERING PATIENTS

- Nationwide network to help reach consumers
- Information about the test, as well as the conditions/diseases being tested
- Brochures, posters, wallet cards

WALLET CARD

http://www.choosingwisely.org/
ANOTHER DAY, ANOTHER DOCTOR, BUT THE SAME TESTS

The biggest thing that I learned throughout this all is that you need to be proactive. You can't just sit back. If you do, you'll get swept along in the stream and they'll do whatever they want with you, even if it means repeating tests, over and over again.

So make sure you ask questions. Ask if you really need each test, and why. And find out what will happen if you don't get it.

Galen G., California

ADDITIONAL RESOURCES

LAB TESTS ONLINE

- https://labtestsonline.org/
- Search by specific lab tests
- Search by condition

http://www.choosingwisely.org/