

How Effective Test Utilization Can Support Patient Safety

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Learning Objectives



Describe the Clinical Laboratory Integration into Healthcare Collaborative (CLIHC) project.

Discuss instances of miscommunication, poor utilization of laboratory services and patient consequences.

Analyze barriers and solutions currently being discussed in various institutions.

Evaluate implementation processes that might be useful in your setting.

Impetus for Greater Control



- Cost of health care
- Solvency of Medicare program
- Medical necessity rules
- Consumer demands
 - Employers and patients

Failures in the U.S. Health Care System



- Limited coordination between major players
- Vested interests drive medical decisions
- Little interest in “whole person”, prevention and wellness
- Limited resources
- No system

Dartmouth Studies



- The level of physicians and hospital beds drive demand
- Physician and hospital preference, not patient need, drive health care services in a community
- The number of surgical procedures vary geographically
- Likelihood of a diagnosis varies by location

Regional Variations in Diagnostic Practices



- There is substantial regional variability in test ordering practices that cannot be explained by case mix.
- Song, Y. et al. (2010).
 - New England Journal of Medicine.
<http://www.nejm.org/doi/pdf/10.1056/NEJMsa0910881>

Support Study



- Many Americans die in hospitals, alone and in pain, after receiving treatment regimens undertaken with known unfavorable odds.

Diagnosis and Management of Polycythemia Vera

- In the era since the Polycythemia Vera Study Group formulated its recommendations
- Significant variations in diagnostic and therapeutic approach were evident by region, practice type, specialty, and clinical experience
- Streiff et al. Blood February 15, 2002 vol. 99 no. 4 1144-1149

Primary Questions

- How do we control utilization of our services?
 - Control, not limit
- What knowledge do healthcare providers need to use laboratory services appropriately?

What We Know

- Facts
- Anecdotes
- Studies



Overutilization



- Study in April 1998 Issue of *American Journal of Medicine*
- Supported by Agency for Health Care Policy and Research
 - Many clinical laboratory tests redundant
 - Review of 6,000 charts looking for 12 standard tests
 - Chart revealed no clinical need for 92% of repeats

Overutilization



- *Do We Know What Inappropriate Laboratory Utilization Is? A Systematic Review of Laboratory Clinical Audits*
 - Carl van Walraven, MD, MSc, FRCPC; C. David Naylor, MD, DPhil, FRCPC
- Inappropriate testing not only causes unnecessary patient discomfort, it also increases the likelihood of generating false positive results, which cause unnecessary worry and further investigation.

Overutilization



- *Is Excessive Resource Utilization an Adverse Event?*
 - Josue, MD, MBA; Andrew R. Lai, MD, MPH; Christopher Moriates, MD; JAMA February 28, 2017, V. 317, #8. pg 849-50
 - 54 year-old woman with advanced MS admitted
 - To be treated only for “reversible illnesses”
 - Presented with fever, WBC 20,000, elevated liver enzymes
 - CT showed cholecystitis

Overutilization – An Adverse Event?



- House staff ordered acetaminophen and aspirin levels, autoimmune disease tests, viral hepatitis panel and liver service consult
- CT showed asymptomatic hip dislocation so orthopedic consult ordered
 - Primary care doctor not consulted
- Successful laparoscopic cholecystectomy; patient recovered and discharged in 10 days

Overutilization – An Adverse Event?



- Primary care physician referred case to hospital patient safety committee
 - Wanted committee to determine if house staff, hospitalists, etc. had “fulfilled their professional obligation to avoid potential harms related to excessive testing and consultation...”
 - Safety committee wasn’t sure what to do since they focus on adverse events and this was a resource utilization issue.

Overutilization – An Adverse Event?



- Potential for patient harm:
 - Excessive CT scans increase exposure to harmful radiation
 - C. difficile infections from antibiotic overuse
 - Delayed treatment as testing proceeds for too many other syndromes

Overutilization – An Adverse Event?



- Committee reviewed case and agreed:
 - “A stepwise approach” should have been used to work up the patient – and all patients
 - Focus on the most likely causes rather than less likely diagnoses
 - Like autoimmune hepatitis and tests like HIV, salicylate and IgG
 - Require communication with primary

Overutilization – An Adverse Event?



- *JAMA Editorial, Allison Lipitz-Snyderman, PhD; Deborah Korenstein, MD: Using infrastructure of patient safety to “target overuse”*
 - “Highlights it as an issue that affects the most important clinical outcomes for patients and physicians”
 - “Framing” over use as a patient safety issue gives it “an administrative home”

Overutilization



- Laboratory tests are examples of "little-ticket" health care technologies which, because they are commonly used, cost the health care system large amounts of money.
- Inappropriate laboratory utilization may be associated with other inefficiencies in health care delivery.
 - Clinicians view overuse as a cost issue since resulting harms may not be immediately evident.

IOM Report: Improving Diagnosis in Healthcare



- Health care organizations should ensure that health care professionals have the appropriate knowledge, skills, resources, and support to engage in teamwork in the diagnostic process.
- To accomplish this, they should facilitate and support:
 - Inter-professional and intra-professional teamwork in the diagnostic process.
 - Collaboration among pathologists, radiologists, other diagnosticians, and treating health care professionals to improve diagnostic testing processes.

Physician Ordering Patterns



- Quest to collect data
- Gather information to justify decisions
- Avoid criticism for not ordering a test
- Traditional orders
 - How they were taught
- Many studies to change behavior have been conducted
- Most work during the intervention but behavior reverts after study is stopped

Benchmark Information – What We Know

- Many common pre-operative tests are not of value
- Drug utilization costs drop with lab information
- Cost to diagnose and treat suspected MI reduced with lab tests

Benchmark Information Needed



- How to better focus diagnoses
 - Disease/organ specific
 - Effectively prescribe
- Direct optimal therapy
 - Disease progress
 - Drug levels
 - Treatment response
- Optimize wellness

Successful Strategies



- Provide test costs at order entry
- Change order forms
- Algorithms, reflex testing, pathways, case management
- Financial incentives
- Physician education/consultation
- Evidence based medicine
 - Support some strategies
 - Use current, best evidence to make patient care decisions
 - Conduct research & meta-analyses
 - Clinician must know how to access, read and interpret valid research

Utilization Strategies



- “First, payers want appropriate utilization for expensive genetic and molecular assays,” observed Matthew Zubiller, Vice President and General Manager of Advanced Diagnostic Management, a business unit of McKesson Corporation
- This is why we see payers beginning to implement utilization management requirements like pre-authorization and notifications
- “Labs are perfectly positioned to work with clinicians at the time of a test order to determine if that genetic test is appropriate for that patient. Doing so could have a dramatic impact on the follow-on care decisions.”
- This will require labs to be more interactive with their client physicians, and integrated informatics for clinical decision support is one way to deliver this added value service.

Successful Strategy



- MuirLab is the core laboratory and outreach laboratory service of the John Muir Health System.
- It has implemented an evidence-based automated diagnostic platform that enables it to collaborate in real-time with providers and payers and ensure that the most appropriate tests were being ordered by physicians at the point of care.
- This resulted in improved utilization of clinical tests and increased revenues, thanks to a marked decrease in claims denials.

Laboratory Formulary



- University of Rochester Medical Center formed a laboratory diagnostics committee (LDC) in 2009.
- Restrict send out tests
 - Found that most send out testing ordered on in-patients is unrelated to reason for admission
 - No reimbursement so direct loss
- Establish tiers of reference tests
 - #1 available to all
 - #2 available only to faculty subspecialty
 - #3 limited need special request with committee review
 - Paul Levy, MD Lab Institute Presentation 2012

Diagnostic Management Teams



- Vanderbilt University Hospital
- Coagulation rounds
- Hematopathology rounds with Radiology and Hem-Oncology
- Microbiology and Transfusion Medicine
- Anatomic Pathology – Cancer cases
- Major meeting about DMT just occurred in Galveston, TX

- Test Utilization Committee
 - Physician / Laboratory Professional Led
 - Leadership Support
 - Open/ Transparent/ Multidisciplinary
 - Active Support/ Partnership Information Technology
 - Clinical Decision Support Tools (CDST) and Computerized Physician Order Entry (CPOE)
 - Interact with (not harass) the physician at the time of order entry
 - Best Practice / Patient Care Focused; Not Cost-Reduction Focused
 - Monitoring and Reporting
 - Building credibility and support for your next project
 - Share Successes

Best Practices



- Boston Childrens
 - Bringing Expertise to Selecting Tests
 - Bringing Exceptional Service to Testing
- Addressing utilization of complex, high-end reference lab tests
- To succeed involving major players and a lot of communication

CDC Projects



- 2007 CDC Institute
- Integration Workgroup to focus on better integration of laboratory medicine in the health care continuum
 - Need to optimize utilization of laboratory services for better patient care
- Now called Clinical Laboratory Integration into Healthcare Collaborative™ (CLIHC)

CLIHCTM Workgroup



- **Co-Lead: John Hickner, MD, MSc**
University of Chicago
- **Co-Lead: Michael Laposata, MD, PhD**
Vanderbilt University Hospital
- **Paul Epner, MEd, MBA**
Paul Epner, LLC
- **Marisa B. Marques, MD**
University of Alabama at Birmingham
- **Jim L. Meisel, MD, FACP**
Boston Medical Center
- **Elissa Passiment, EdM**
American Society for Clinical Laboratory Science
- **Brian Smith, MD**
Yale School of Medicine



- Key Projects
 - Clinician Test Selection & Result Interpretation
 - Diagnostic Algorithms
 - Nomenclature Project
 - Survey of Clinicians' Challenges
- Survey of medical school curriculum content pertinent to laboratory services

Diagnostic Algorithms



- Goal:
 - Demonstrate complexity of selecting the appropriate laboratory test
 - Understand the most effective testing strategies
 - CDC has developed an app that physicians can use to determine what coagulation tests to order for a number of algorithms

Nomenclature

- Goal:
 - Demonstrate the complexity of test selection
 - Multiplicity - Hepatitis B surface antibody
 - HBs Antibody, Hepatitis Bs Ab, HBG, Anti-HBs
 - Complexity - lupus anticoagulant – not for lupus
- Developed a flow chart and tables demonstrating:
 - Complexity – Vitamin D
 - Breadth – Commonly ordered tests
 - Depth – Coagulation



Nomenclature



- Test naming could be based on:
 - Disease association
 - Method used to perform the test
 - Name of developer
 - Inappropriate names (i.e. no link between name and what is being tested)
- Multiple test name abbreviations
 - Many evolved from implementing Laboratory Information Systems

Existing Nomenclature Options for Vitamin D and its Multiple Forms

Vitamin D2
Ergosterol
Vitamin D3
Cholecalciferol
25-OH vitamin D2
25-OH vitamin D3
25-OH vitamin D
25 hydroxy vitamin D2
25 hydroxy vitamin D3
25 hydroxy vitamin D
1,25 (OH)₂ vitamin D2
1,25 (OH)₂ vitamin D3
1,25 (OH)₂ vitamin D
1,25 dihydroxy vitamin D2
1,25 dihydroxy vitamin D3
1,25 dihydroxy vitamin D
Vitamin D 25 Hydroxy D2 and D3
Vitamin D 1,25 Dihydroxy

In addition – The number of abbreviations created for laboratory information systems for vitamin D and its multiple forms is almost limitless

Article Published



- *Journal of General Internal Medicine*
- *Decoding Laboratory Test Names: A Major Challenge to Appropriate Patient Care*
 - March 2013
- Article cited on the *Agency for Healthcare Research and Quality (AHRQ) Patient Safety Network (PSNet)*

Clinician's Challenges in Test Ordering and Results Interpretation



- Goal:
 - Raise awareness of the challenges clinicians face in test ordering and result interpretation.
 - Phase 1 - Conduct three focus groups targeting internal, family, and general medicine practitioners.
 - Phase 2 - Using information from focus groups in Phase 1, conduct a national survey of clinicians.

Clinicians' Challenges



- To understand primary care needs and issues, three focus groups were conducted.
- The results are suggestive of actions that laboratory professionals can take to improve clinician performance.
- To validate findings and gain greater insights into needs, the CDC commissioned a national survey of primary care physicians.
 - National sample of Family Practice and Internal Medicine physicians: target sample size of 1600
 - Results collected in 2011



Enablers for Test Ordering and Result Interpretation

- Electronic resources
- Access to peers and colleagues
- Access and relationships with laboratory professionals
- Availability of practice guidelines, algorithms, etc.
- Follow-up testing information and reflex testing, when appropriate

Challenges/Barriers

Result Interpretation



- Insurance and cost limitations
- Varying practice guidelines and methodologies
- Difficulties in accessing and communicating with laboratory professionals
- Inconsistency of laboratory test results with clinical presentation
- Inadequate laboratory reporting and documentation

Focus Group Summary



- Physicians are comfortable with selecting from a small working repertoire of common tests.
- When results did not fit their suspected diagnosis, physicians relied on combination of patient presentation and own diagnostic instincts more than the laboratory results.
 - “Patient symptoms override the lab results”
- Laboratory consultation was a useful resource when the physician had effective and consistent access to laboratory services and were comfortable with laboratory professionals.
 - “Most of us don’t call the lab, we call a specialist.”
 - “It hasn’t even occurred to me to call a pathologist to ask what test to order. I wouldn’t have even considered it as an option.”
 - “You’re lucky if you have someone answer you but most of the time you have a machine or they’ll put you on hold for an extended time period.”

Focus Group Summary



- Electronic resources are becoming more important, with level of utilization dependent on ease of availability and a culture that encourages their use.

What We Don't Know



- What is the prevalence of diagnostic errors impacted by the testing process?
 - Failure to order necessary tests
 - Ordering of unnecessary tests
 - Inappropriate utilization of test results
- What are effective interventions that reduce diagnostic errors and could be initiated by laboratory professionals?
 - What settings are appropriate for these interventions?
 - What limitations exist in the use of these interventions?
 - What new sources of errors are created by the interventions?

Paul Epner, Diagnostic Errors in Medicine, October 25, 2010

Laboratory Medicine Education in U.S. Medical Schools

- Required courses in 57% (68/120) of schools
- Few schools report no training at all (2-4%)
- An ad hoc committee of The Academy of Clinical Laboratory Physicians and Scientists
 - Proposed medical student laboratory medicine curriculum
 - Developed:
 - Goals and objectives for training
 - Guidelines for instructional methods
 - Examples of how outcomes can be assessed

Smith, Brian R, et. al.; Educating Medical Students in Laboratory Medicine A Proposed Curriculum; AJCP; 2010: 133: 533-542

Clinical Pathology Residency Education



- Survey results:
 - 14 Accredited programs contacted – invited to visit 3
 - Some training programs have focal areas of consult activity
 - Many programs are not prepared to develop meaningful consultative roles for residents in laboratory medicine.
 - Obstacle - Limited # of doctoral level laboratory directors to teach residents
 - Need to obtain more data to substantiate the results and identify model programs



Opportunities to Enhance Lab Professionals' Role on the Diagnostic Team

- “Developing and disseminating laboratory updates for physicians, contributing to and/or offering educational programs associated with CME credit, and publishing quality improvement projects and/or guidance on test utilization in primarily clinical journals would make physicians more aware of the value of laboratory professionals’ expertise as patient care consultants.”
 - *Julie R. Taylor, MS, PhD, Pamela J. Thompson, MS, MT(ASCP), Jonathan R. Genzen, MD, PhD, John Hickner, MD, MSc, Marisa B. Marques, MD. Laboratory Medicine 48:1:97-103*



Opportunities to Enhance Lab Professionals' Role on the Diagnostic Team

- Laboratory professionals also need to be actively involved in developing and guiding the integration and usage of clinical decision support tools, such as electronic ordering guidance, trending of results, and test characteristics in the electronic health record, all of which guide appropriate test ordering and interpretation.



Opportunities to Enhance Lab Professionals' Role on the Diagnostic Team

- Laboratory professionals “must seek active participation in hospitals’ multidisciplinary teams, practice guideline development, and other policy committees that help guide clinical care.



Successful Strategies

- Physician involvement
- Laboratory professionals commitment and involvement
- Laboratory utilization committees
 - Track by physician, pathway, encounter, like pharmacy and surgery

Questions?

The information in this presentation is provided for educational purposes only and is not legal advice. It is intended to highlight laws you are likely to encounter, but is not a comprehensive review. If you have questions or concerns about a particular instance or whether a law applies, you should consider contacting your attorney.



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