

Improving Test Utilization: *An Analysis of 5 Intervention Strategies*

The Cleveland Clinic Experience



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Speaker Disclosure



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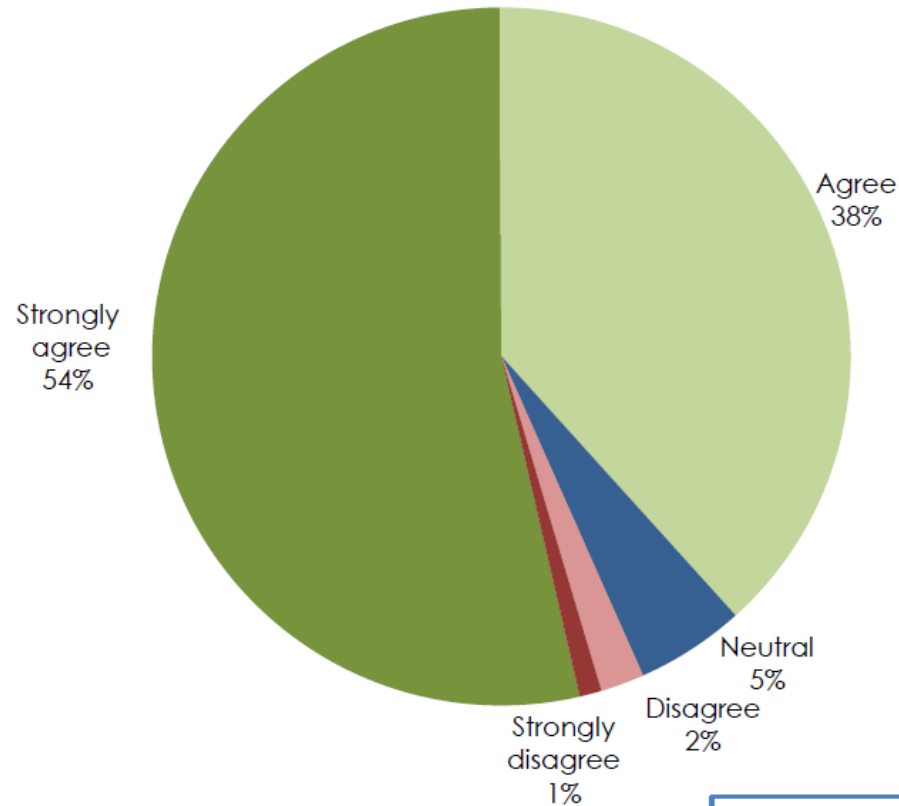
Healthcare Reimbursement

- ❧ Length of Stay and Outpatient Testing.
 - ❧ Incentive: Keep patient in-house.
- ❧ DRG models (with and without complications) and Outpatient Testing.
 - ❧ Incentive: Decrease LOS and increase outpatient visits.
 - ❧ Part II: Decrease HAIs and Re-admissions.
- ❧ Value-Based Care Models/ Pay-for-Performance.
 - ❧ Incentive: Keep patients healthy
 - ❧ Decrease hospitalizations and complications in chronic disease.
 - ❧ Take unnecessary costs out of the system

Take Unnecessary Costs Out of the System

- ❧ How Not to Do It. By indiscriminate cutting
 - ❧ Why not?
 - ❧ Cutting necessary components in the healthcare delivery system will have an opposite effect than the intended goal (i.e. patient will not remain well).
- ❧ How?
 - ❧ Physician/Laboratorian Leadership
 - ❧ Engage those who know the most about testing
 - ❧ Differentiating the necessary from the unnecessary. (Navigator)
 - ❧ Provider-level communication.
 - ❧ Make it about best practice and optimal patient care.
 - ❧ Professional Society Leadership
 - ❧ AACC: The Path to Better Test Utilization
 - ❧ ASCP engagement in the ABIM Choosing Wisely Campaign
 - ❧ CAP Test Utilization Working Group

Is Your Institution Interested?

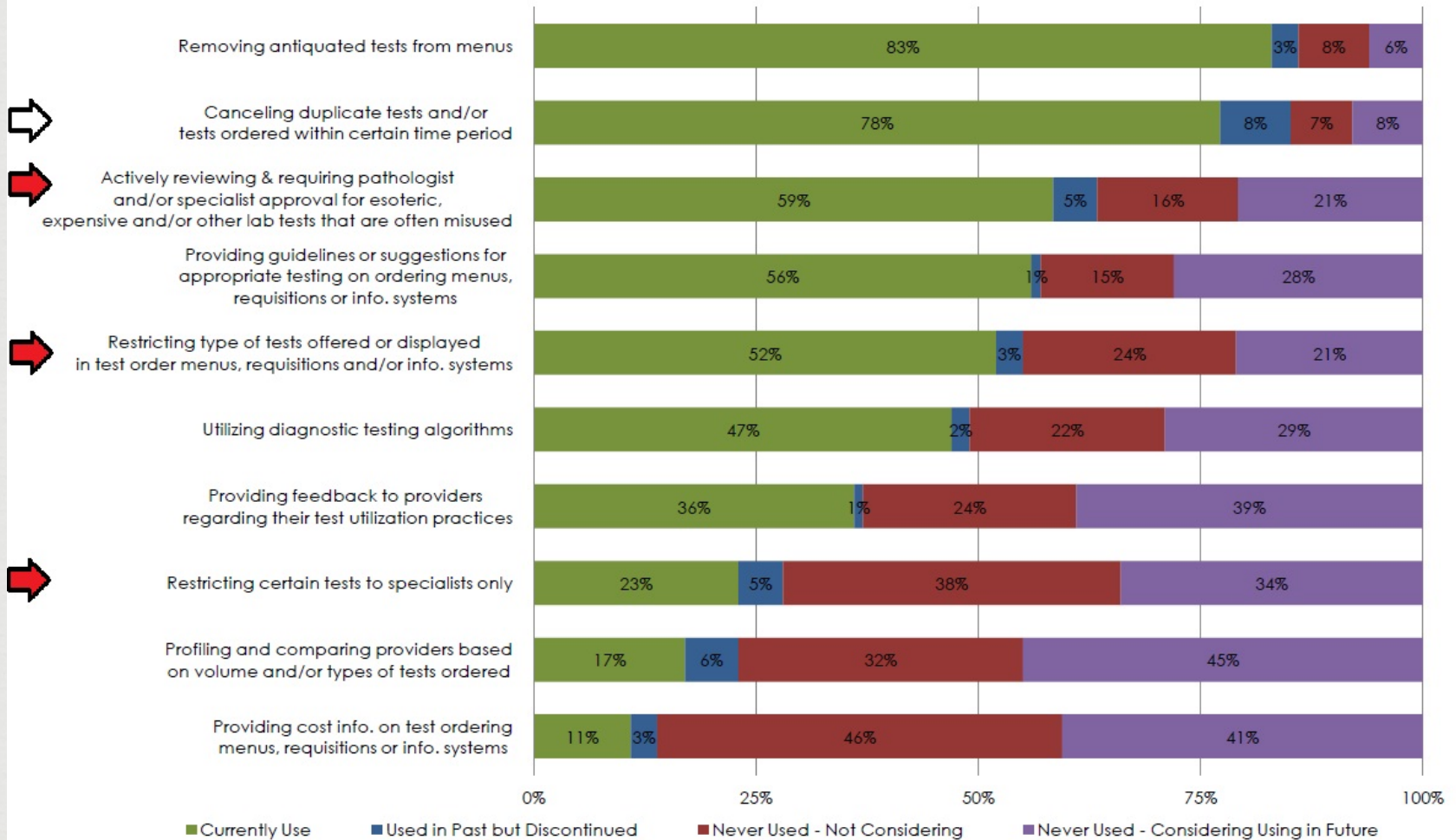


Reasons for disagreeing (n=4):

- No motivation (25%)
- Test utilization not a role for pathologists (25%)
- Tried but resistance from clinicians so discontinued (50%)

What are You Doing About it?

Test Utilization Strategies



Traditional Approaches to Test Utilization



- ❧ Education with New Test Implementation
 - ❧ Challenge: Communications that are read.
 - ❧ Are these read?

- ❧ Re-Education
 - ❧ Challenge:
 - ❧ How often? Every year / every test? = unwieldy.
 - ❧ New residents and fellows every year. = Did I already cover this?

- ❧ Inappropriate orders intercepted upon accessioning.
 - ❧ Doc-to-doc conversation.
 - ❧ Time consuming
 - ❧ May be confrontational –
 - ❧ (Good time for professionalism and communication skills).
 - ❧ Specimen already drawn

What's Changed?



- ❧ Computerized Physician Order Entry (CPOE)
 - ❧ The decision-maker is at the computer.

- ❧ Clinical Decision Support Tools (CDST)
 - ❧ There is an opportunity to unidirectionally interact with the decision-maker in real-time.
 - ❧ “Pop-ups” are hazardous.

- ❧ Meaningful Use
 - ❧ An obligation to improve practice with these new tools and systems.
 - ❧ Linked to reimbursement.

- ❧ Volume to Value Based Payment System.

- ❧ Time for Systems-Based Changes, when possible.

Building a 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

Once Upon a Time: Phlebotomy FastTrac

- ❧ Complaints concerning unnecessary duplicate phlebotomy reaches CEO
- ❧ Phlebotomy FastTrac performed.
 - ❧ Numerous issues uncovered.
 - ❧ Rich area for improvements -> numerous subprojects
- ❧ Evidence secured that duplicate phlebotomy is a significant issue.
 - ❧ How to control when some duplicates are valid, but many are not?
 - ❧ Benefits:
 - ❧ Increased patient satisfaction,
 - ❧ decrease unnecessary blood draws with implications for iatrogenic anemia, and
 - ❧ decrease costs in a DRG payment scenario.

Initiatives



☞ Soft Stop Initiative

☞ Hard Stop Initiative

☞ Restricted Use Initiative

☞ Laboratory-Based Genetic Counseling

☞ Regional Smart Alerts

☞ Expensive Test Notification

☞ Extended Hard Stop

Initial Question



- ❧ Will a clinical decision support tool that notifies the clinician that a duplicate test is being ordered change the behavior of ordering physician (i.e. will they discontinue the order)?

- ❧ Assumption:
 - ❧ The clinician is placing the order.
 - ❧ CPOE may be in place, but unit clerks still place the orders.
 - ❧ The clinician is reading the message.
 - ❧ “Pop-up fatigue” – Evidence says: It’s real.
 - ❧ The clinician cares about not ordering an unnecessary duplicate test.

The Limited Value of Electronic Notifications (Soft Stops)



- ❧ “Pop-up box” fatigue is real.
 - ❧ Too many pop-ups lead to caregivers not reading the information and clicking through
 - ❧ (Evidence Forthcoming).

- ❧ Initial Trial with Electronic Notification

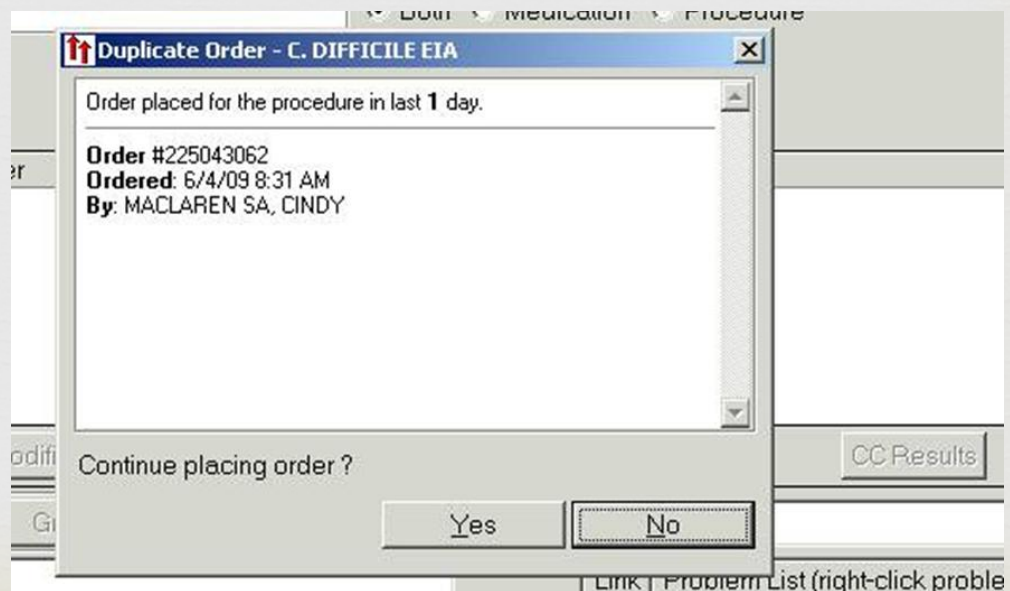
- ❧ Secondary Trial of Electronic Notification

- ❧ Inconsistent finding and a hypothesis.

Soft Stop Pilot(s)



- ❧ A CDST was used to notify that a duplicate test was being ordered.
- ❧ This CDST allowed the physician to continue to place the duplicate order, if desired.
- ❧ Autodefault “No”



Soft Stop Pilot Results



- ❧ Trial 1: Quantitative CMV and EBV PCR
 - ❧ Significant difference in same-day duplicate orders pre- versus post- intervention. ($p < 0.0001$)

- ❧ Trial 2: *C. difficile* PCR
 - ❧ No significant difference in same-day duplicate orders pre- versus post- intervention ($p = 0.21$)

- ❧ Why
 - ❧ Evidence that CDST Alerts are not read.

Example of “Pop-Up” Fatigue

Date	Test	Patient MRN	User ID	User name
9/1/2010 9:22	RETIC COUNT[23971]	Jane Doe	1	Doctor_____X
9/1/2010 9:22	RETIC COUNT[23971]	Jane Doe		Doctor_____X
9/1/2010 9:23	RETIC COUNT[23971]	Jane Doe		Doctor_____X
9/1/2010 11:58	RETIC COUNT[23971]	Jane Doe		Doctor_____X
9/1/2010 16:21	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/1/2010 16:24	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/1/2010 16:24	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/1/2010 16:24	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/1/2010 16:25	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/2/2010 16:04	RETIC COUNT[23971]	Jane Doe		Doctor_____Z
9/2/2010 16:04	RETIC COUNT[23971]	Jane Doe		Doctor_____Z
9/2/2010 21:02	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/2/2010 21:03	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/2/2010 21:06	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/2/2010 21:09	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/2/2010 21:09	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/2/2010 21:10	RETIC COUNT[23971]	Jane Doe		Doctor_____A
9/3/2010 14:30	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/3/2010 14:30	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/3/2010 15:00	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/5/2010 11:16	RETIC COUNT[23971]	Jane Doe		Doctor_____Y
9/5/2010 11:16	RETIC COUNT[23971]	Jane Doe		Doctor_____Y

Repetitive firing of this decision

support tool by the same physician (Doctor X, for example) suggests:

“pop-up” fatigue and

the caregiver is not reading the message.

The Hard Stop



- ❧ The soft stop studies provided *evidence* to medical operations that a firmer intervention was needed.
- ❧ They agreed, but...required a “break the glass” scenario in the event that a physician still wanted a duplicate study.
 - ❧ Duplicate tests were made available through the laboratory *Client Services* area

Testing, Inp A

Age: 77 year * DOB: 7/21/1932
Sex: M MRN: 55000123

Allergies: **Pencillin, Captopril, Peanut***
PCP: **SALAY, ELIZABETH M (DrC)**

Bed: **Z010-08** MyChart: **Inactive** Code: **History**
Alert: **HM** Type: **NFR**

- SnapShot
- Patient Summary
- Chart Review
- Results Review
- Problem List
- History
- Inpatient Notes
- Demographics
- Medications
- Allergies

- Order Entry**
- Order History
- Imm/Injections
- MAR
- I/O Summary
- Doc Flowsheet
- Initial Assessments
- Admission Nav
- Rounding Nav
- Transfer Nav
- Discharge Nav
- Order Set
- Document List
- Stroke CarePath
- Hotkey List
- Exit Workspace

Place orders Resize

Order mode: **Order defaults: Not using defaults**

Procedures (1)

HGB A1C

ONCE First occurrence Today at 1400, Routine, Lab Collect, BLOOD

F7- Prev Order F8- Next Order

Order Validation

The following information is missing or may need your attention

Warning:
 This lab test has been ordered in the last 24 hours; repeat testing is usually not warranted for this analyte within 24 hours. If you feel you need to override the alert please call Lab Client Services (216-444-5733).
HGB A1C was ordered on 5/13/10 at 1:10 PM by provider **KNOTT, PHILIP D**

Date/Time	Component	Result	Ref Range	Flag
5/13/10 1:37 PM	Hemoglobin A1C	7.2	4.0 - 6.0 %	H
5/13/10 1:37 PM	Estimated Average Glucose	160	mg/dL	

These orders cannot be accepted.

order selected

1:45 PM

Hard Stop Proposal



- ❧ Thirteen tests were selected for a pilot that were thought never to be needed more than once per day.
- ❧ The list was vetted with the medical staff via Doc.com.
- ❧ Institute a Hard Stop
 - ❧ An electronic notification that this is a duplicate order and same day repeated testing for this analyte is usually unnecessary.
 - ❧ Create a means for the caregiver to still order the test, but with documentation/approval.

Initial Hard Stop List



- ☞ Hemoglobin A1C
- ☞ CMV Detection, Blood
- ☞ Epstein Barr DNA Quant
- ☞ Hypercoagulation Diagnostic Interpretive Panel
- ☞ *C. difficile* EIA
- ☞ FACTOR V LEIDEN/PCR
- ☞ PROTHROMBIN GENE PCR
- ☞ Uric acid
- ☞ IRON + TIBC
- ☞ HEP REMOTE PANEL BL
- ☞ Lipid PANEL BASIC
- ☞ RETIC COUNT
- ☞ C-REACTIVE PROTEIN (CRP)

Uric acid removed after clinical input: May be needed more than once per day for during chemotherapy to monitor tumor lysis

Phased Implementation

☞ Hard Stop Implementation

☞ Phase 1:

- ☞ 12 tests that are NEVER needed more than once per day

☞ Phase 2:

- ☞ Added 78 tests (total 88)

☞ Phase 3:

- ☞ “Many more” tests added (>1,200 tests on the same-day Hard Stop list)

- ☞ Rapid review/removal process implemented

- ☞ Initially: Physicians only, then -> all

- ☞ (35% of orders were non-physicians in the 1st month)

☞ Governance is KEY

- ☞ Test Utilization Committee

- ☞ Feedback via “Doc.Com” (CCHS Intranet)

- ☞ Monthly Monitoring and Reporting

Impact of Rollout



- ❧ Phase I and II: No complaints from caregivers.
- ❧ Phase III: <5 complaints; all justified; list edited.

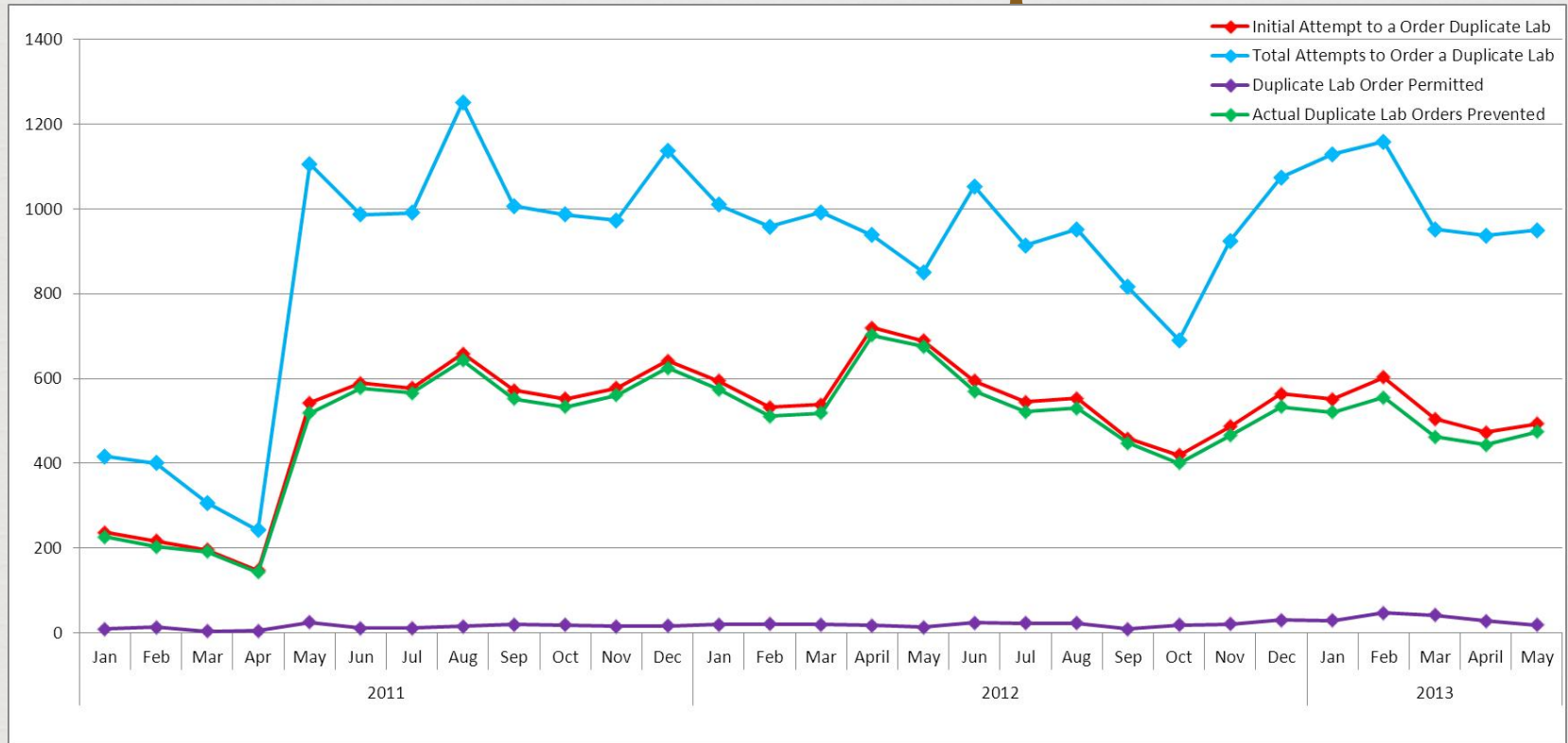
- ❧ Very few caregivers called Client Services to have a duplicate order placed.
 - ❧ Reasons for duplicate disclosed educational opportunities in most instances.

Cost Avoidance Based on Blocked Duplicates



Test	Data					
	Count of ID	Tech	Tim	Prof	TI	Cost of Supplies
C. DIFFICILE EIA[24219]	31	527	0		\$128.03	\$380.99
CMV DETECTION BLOOD[24221]	2	16	0		\$75.28	\$82.96
C-REACTIVE PROTEIN (CRP)[23342]	22	44	0		\$27.94	\$49.06
HEP REMOTE PANEL BL[23593]	3	30	0		\$42.72	\$57.12
HGB A1C[23607]	9	27	0		\$15.39	\$28.35
IRON + TIBC[23655]	3	6	0		\$1.11	\$3.99
LIPID PANEL BASIC[23683]	9	117	0		\$12.60	\$68.76
RETIC COUNT[23971]	19	19	0		\$18.43	\$27.55
	98	786	0		\$321.50	\$698.78
C. DIFFICILE EIA[24219]	11	187	0		\$45.43	\$135.19
CMV DETECTION BLOOD[24221]	3	24	0		\$112.92	\$124.44
C-REACTIVE PROTEIN (CRP)[23342]	12	24	0		\$15.24	\$26.76
HEP REMOTE PANEL BL[23593]	1	10	0		\$14.24	\$19.04
HGB A1C[23607]	5	15	0		\$8.55	\$15.75
IRON + TIBC[23655]	3	6	0		\$1.11	\$3.99
LIPID PANEL BASIC[23683]	6	78	0		\$8.40	\$45.84
RETIC COUNT[23971]	6	6	0		\$5.82	\$8.70
	47	350	0		\$211.71	\$379.71
C. DIFFICILE EIA[24219]	20	340	0		\$82.60	\$245.80
CMV DETECTION BLOOD[24221]	3	24	0		\$112.92	\$124.44
C-REACTIVE PROTEIN (CRP)[23342]	17	34	0		\$21.59	\$37.91
EPSTEIN-BARR DNA QNT[23153]	1	14	0		\$45.61	\$52.33
HEP REMOTE PANEL BL[23593]	4	40	0		\$56.96	\$76.16
HGB A1C[23607]	5	15	0		\$8.55	\$15.75
IRON + TIBC[23655]	2	4	0		\$0.74	\$2.66
LIPID PANEL BASIC[23683]	2	26	0		\$2.80	\$15.28
RETIC COUNT[23971]	4	4	0		\$3.88	\$5.80
	58	501	0		\$335.65	\$576.13
	203	1637	0		\$868.86	\$1,654.62

Hard Stops



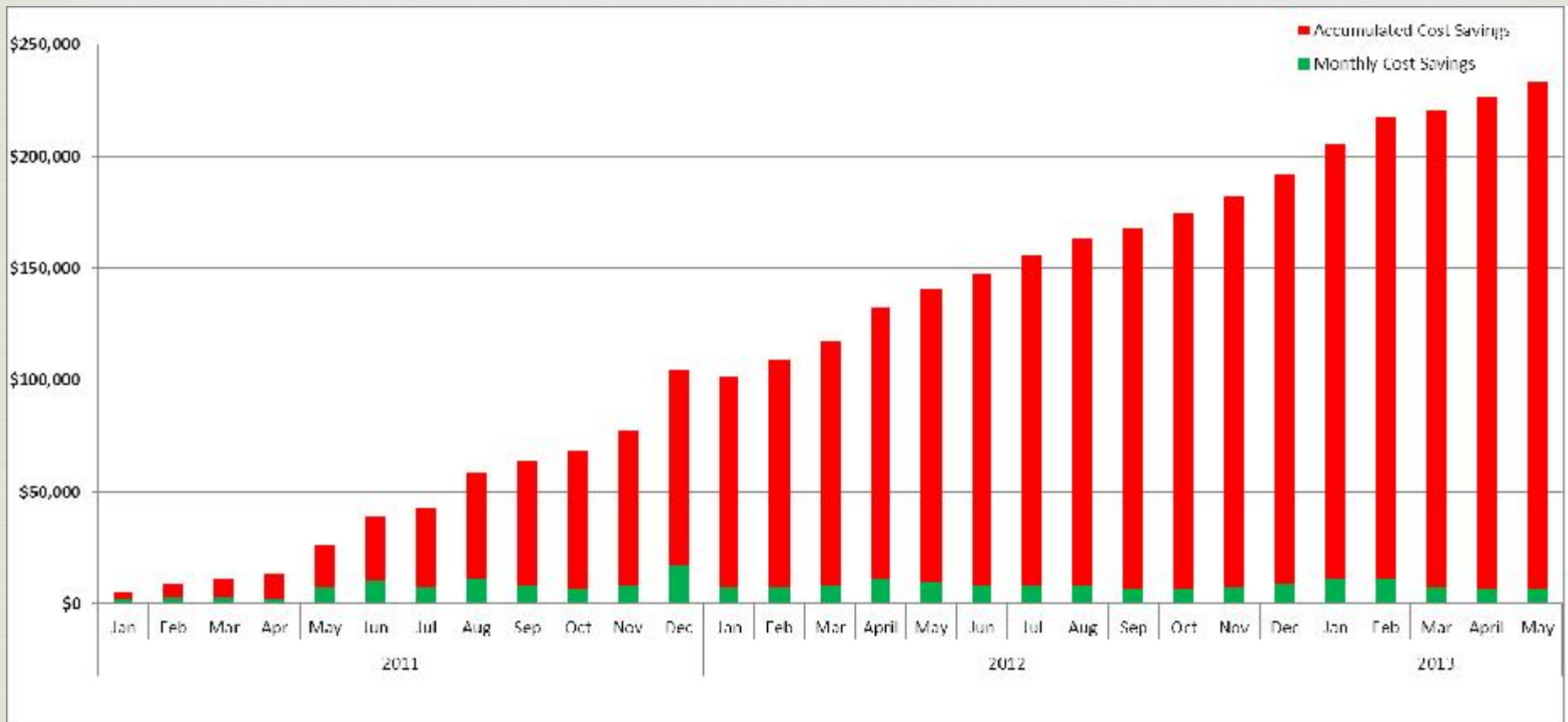
2014: 3,386 unnecessary orders prevented;

Full Program (1/11-12/14): 23,063 unnecessary orders prevented.

91-95% Success Rate

Unnecessary phlebotomies avoided and blood saved: A lot.

Hard Stop Financials



2014: Cost Avoidance - \$79,554;

Total: (1/11 to 12/14): \$361,549

Regional *Smart Alerts*



- ❧ Similar to Soft Stops.
 - ❧ But, with Previous Results Displayed.

- ❧ List includes: 752 of the 1,283 tests on Main.

- ❧ Considerations include:
 - ❧ Non-Cleveland Clinic Practitioners
 - ❧ Practitioner use of Computerized Physician Order Entry-availability
 - ❧ Written orders to unit clerks/nurses
 - ❧ No work-around infrastructure.

Regional Smart Alert

Place orders

New Order Interactions Providers Reports Pndged Orders Held Orders Pend Orders Sign & Hold Sign Orders Settings Order Set Pref List

New order: Search

Order mode: Standard New order defaults Not using defaults

During visit (1 Order)

LIPID PANEL BASIC (EU,FV,HL,LK,LU,MM,SP) P Routine, ONCE Fil

Order Validation

The following information is missing or may need your attention

Warning:

This lab test has been ordered in the last 24 hours; repeat testing is usually not warranted for this analyte within 24 hours.

LIPID PANEL BASIC (EU,FV,HL,LK,LU,MM,SP) was ordered on 9/20/12 at 12:53 PM by provider AGARWAL, RAJESH

If you are ordering LIPID PANEL BASIC (EU,FV,HL,LK,LU,MM,SP) at the same time as other orders, you must first remove LIPID PANEL BASIC (EU,FV,HL,LK,LU,MM,SP) from the order list before you can file the other orders.

Date/Time	Component	Result	Ref Range	Flag
9/20/12 1:58 PM	Triglyceride	333	30 - 149 mg/dL	H
9/20/12 1:58 PM	Cholesterol	222	100 - 199 mg/dL	H
9/20/12 1:58 PM	HDL Cholesterol	55	>55 mg/dL	L
9/20/12 1:58 PM	VLDL-Cholesterol	33	6 - 40 mg/dL	
9/20/12 1:58 PM	LDL Cholesterol	22	60 - 129 mg/dL	L
9/20/12 1:58 PM	Fasting Time	12	hrs	
9/20/12 1:58 PM	TC:HDL Ratio	11.00	1.00 - 5.00	H
9/20/12 1:58 PM	LDL:HDL Ratio	5.00	0.50 - 3.55	H
9/20/12 1:58 PM	Non HDL Cholesterol	6	90 - 159 mg/dL	L

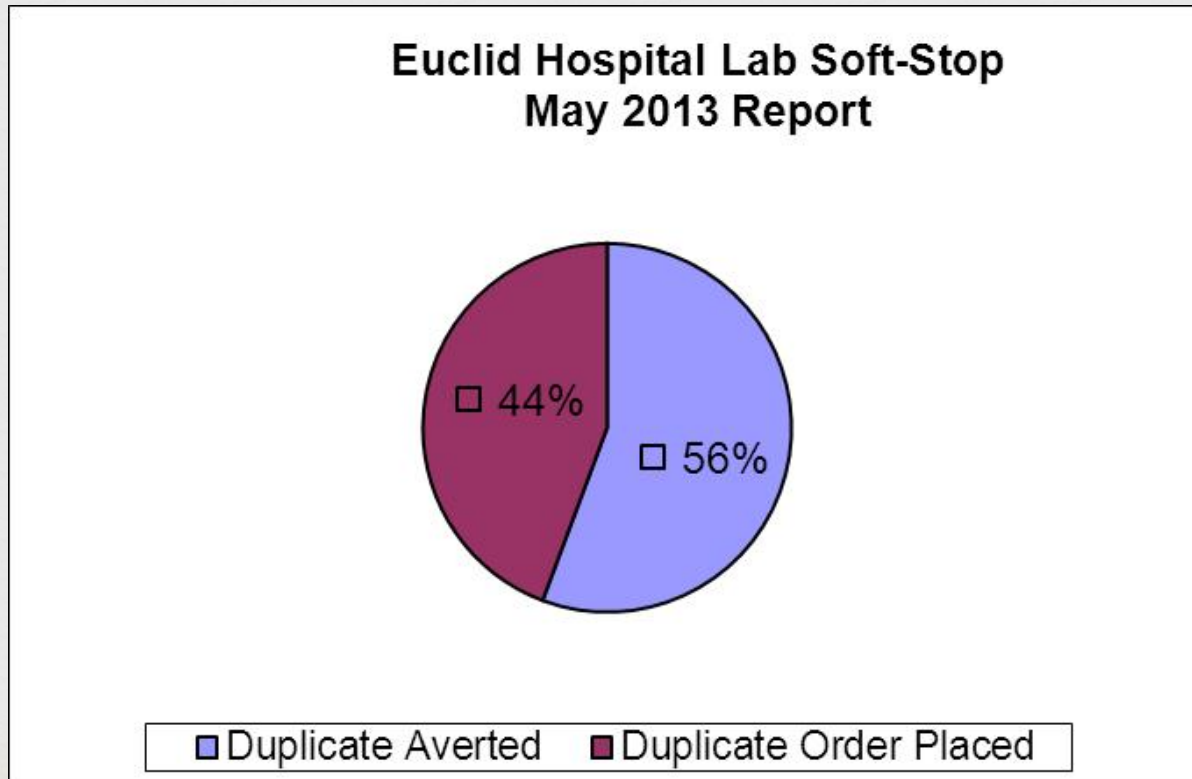
Do you want to accept these orders anyway?

Yes No

Regional Smart Alerts



Monthly calculation of alert compliance

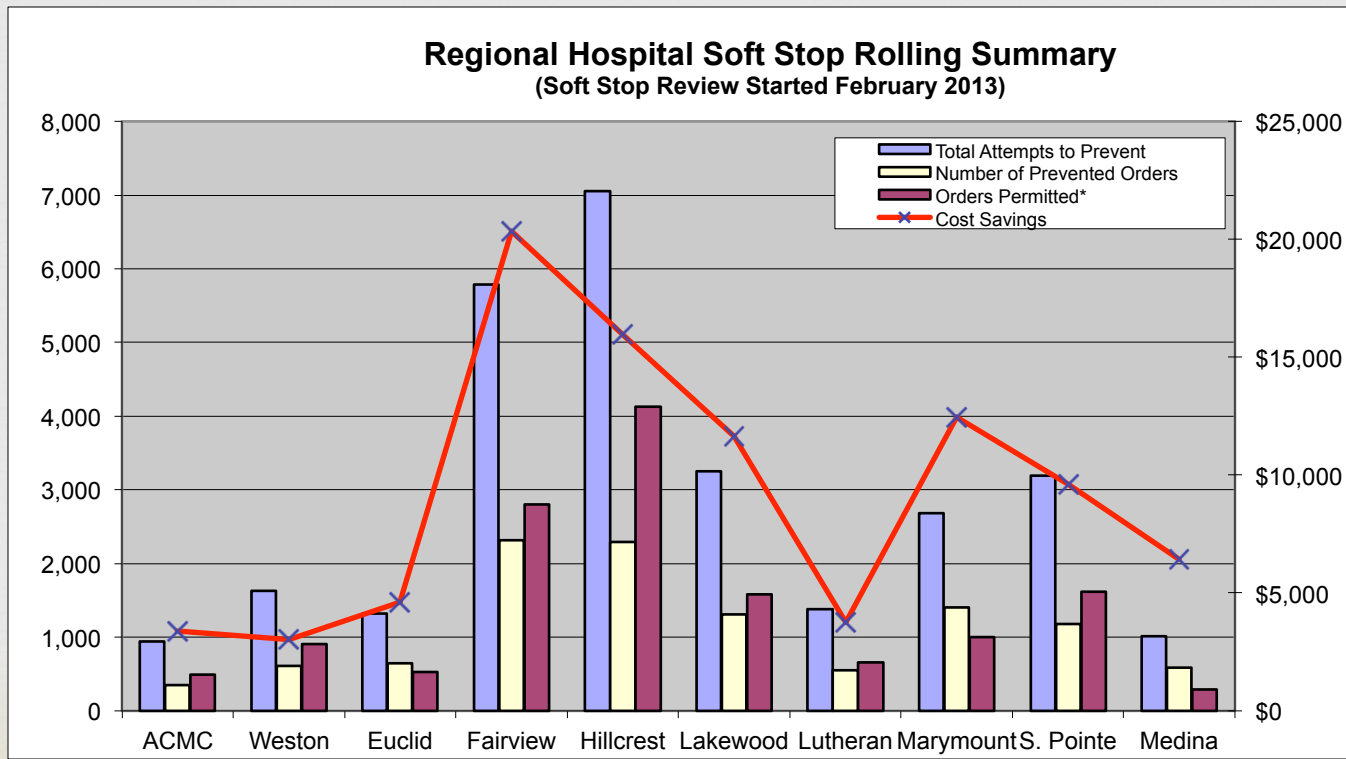


Regional Smart Alerts



5,618 unnecessary tests averted in 2014

Total (10 m 2013 + 2014) : 11,243

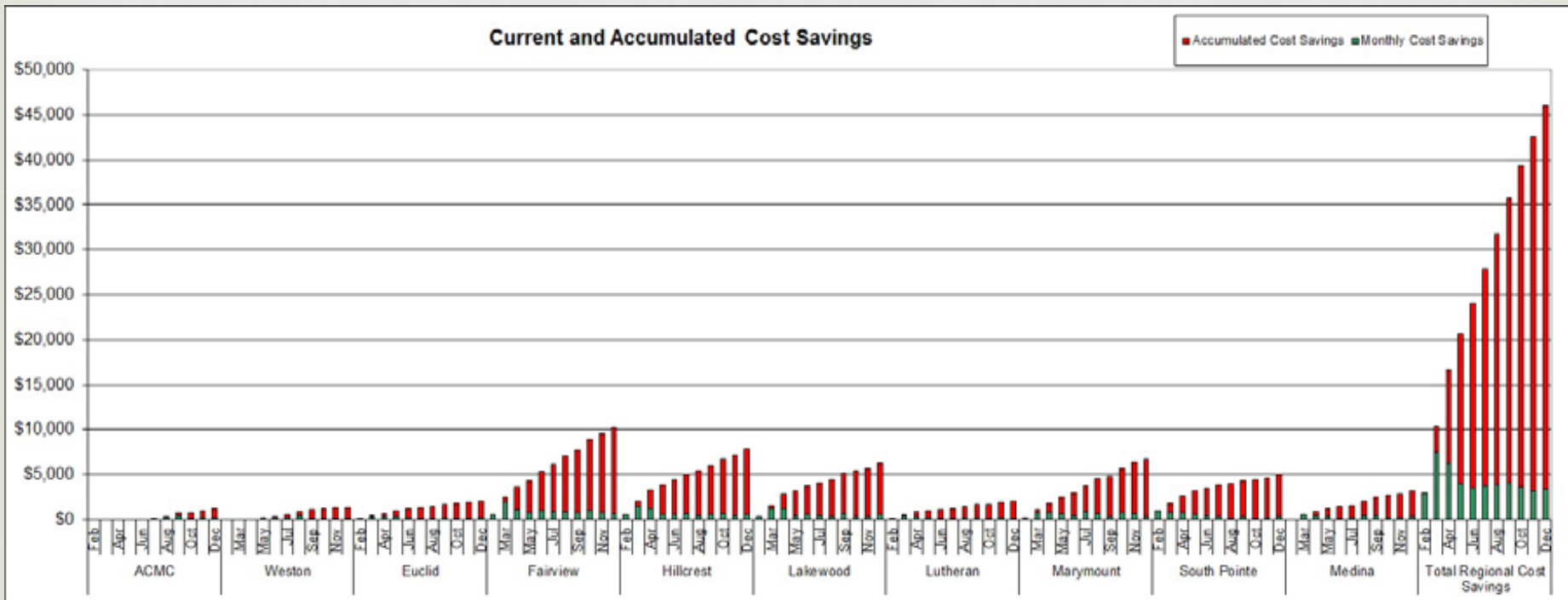


Regional Smart Alert: Cost Avoidance



Cost-Savings, 2014: \$45,213

Total (10m 2013 + 2014): \$91,244



Hard Stop versus *Smart Alert* Comparison

- ❧ One year comparison
 - ❧ Duplicate tests avoided and cost avoidance.
- ❧ The Hard Stop alert was significantly more effective than the Smart Alert (92.3% versus 42.6%, respectively; $p < 0.0001$).
- ❧ The cost savings realized per alert activation was \$16.08/alert for the Hard Stop alert versus \$3.52/alert for the Smart Alert.

Optimizing Molecular Genetic Testing



Restricting Testing

- Specialized tests not on standard menu “Lab Order Only”
- Restriction to Users Groups

Genetic Guidance

- Laboratory-Based Genetics Counselor
 - With Molecular Genetic Pathologist Oversight.
- Resident/Fellow Involvement
 - Educational/Not “Thrown to the wolves.”

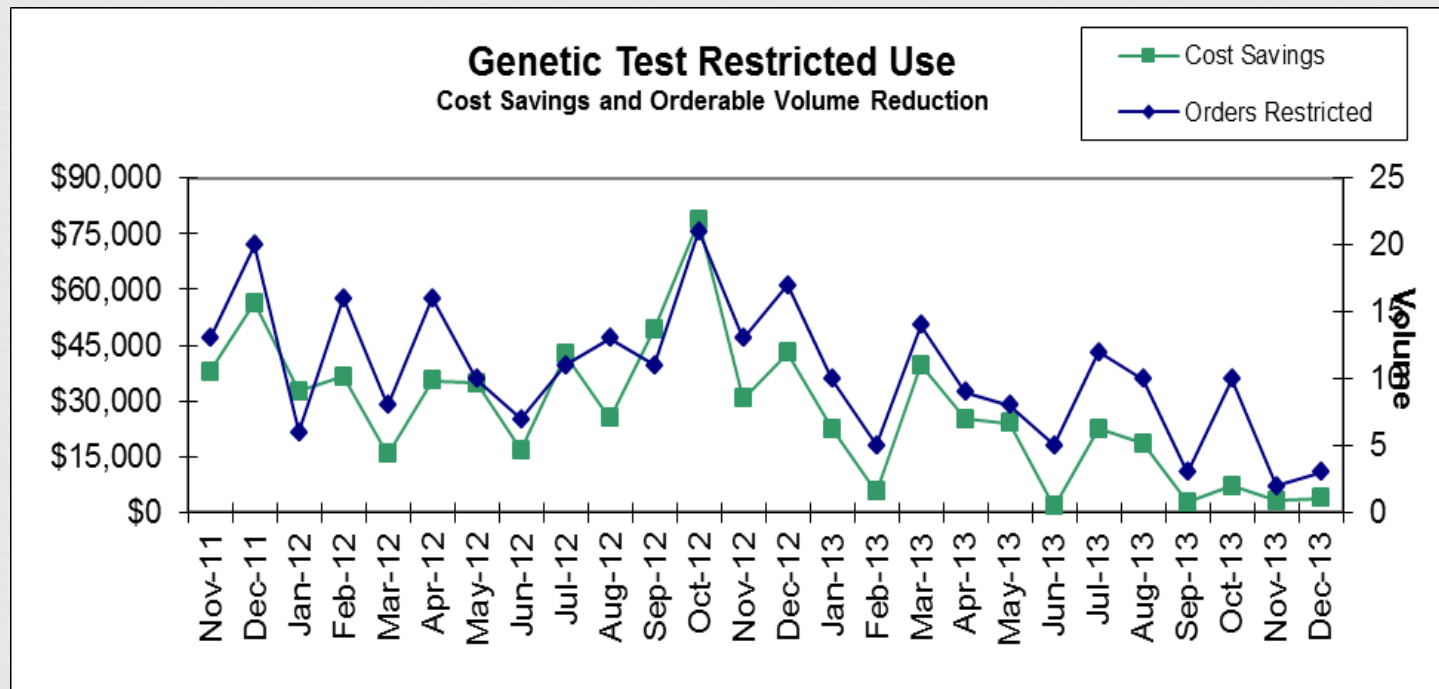
Algorithmic Testing

- Collaborative Development (Clinician/Pathologist) of Algorithms
- Extract/Hold -> Sequential Testing
 - Requires infrastructure & engagement.

Restricted Use Initiative

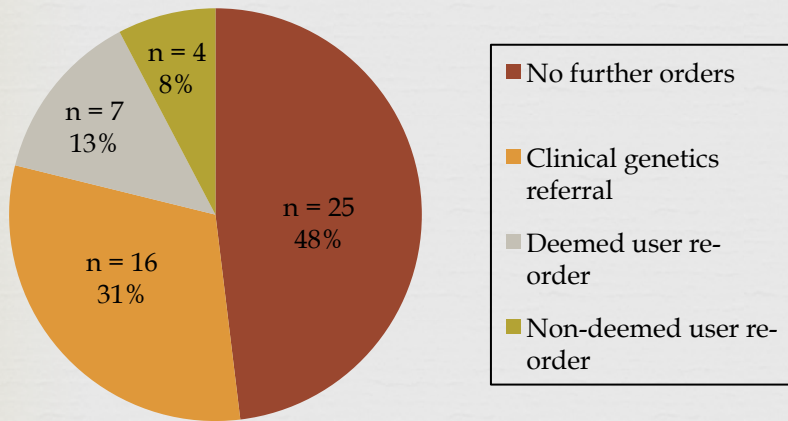


- ❧ Molecular Genetic Tests limited to “Deemed Users.”
- ❧ Inpatient testing requires a Medical Genetic Consult

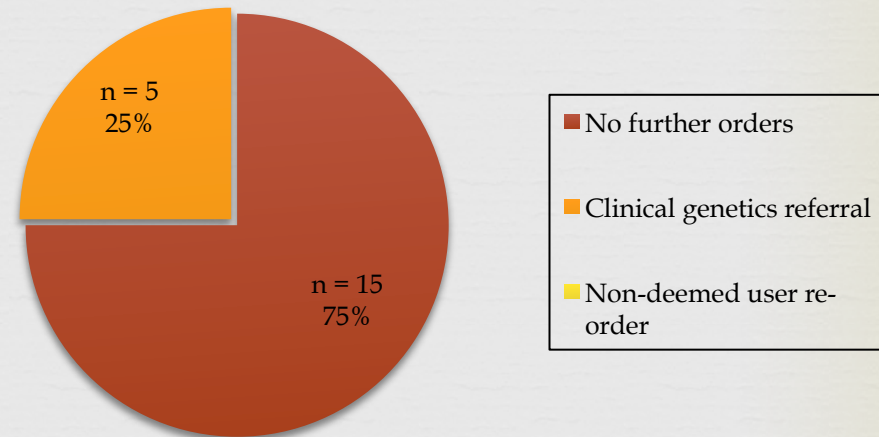


2014: 76 Tests; \$73,101; Total (11/11 to 12/14): 349 Tests; \$784,127

Follow-up to Restricted Orders



Ambulatory

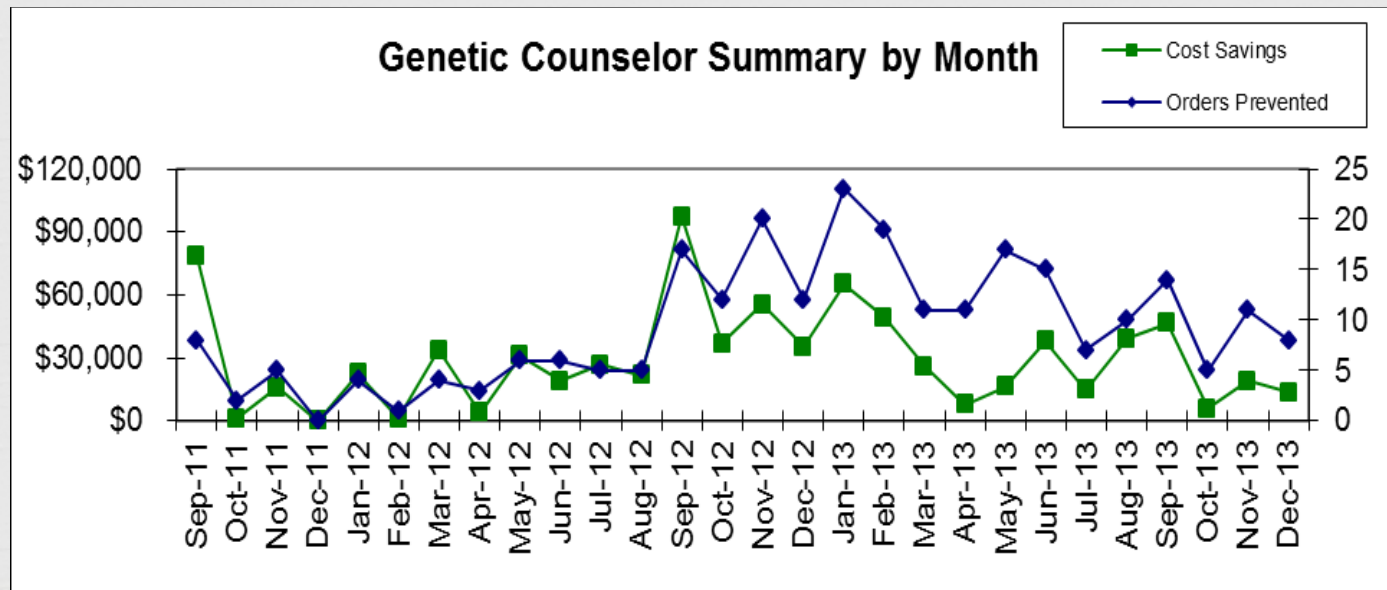


Inpatient

Laboratory-Based Genetics Counselor with Molecular Genetics Pathologist



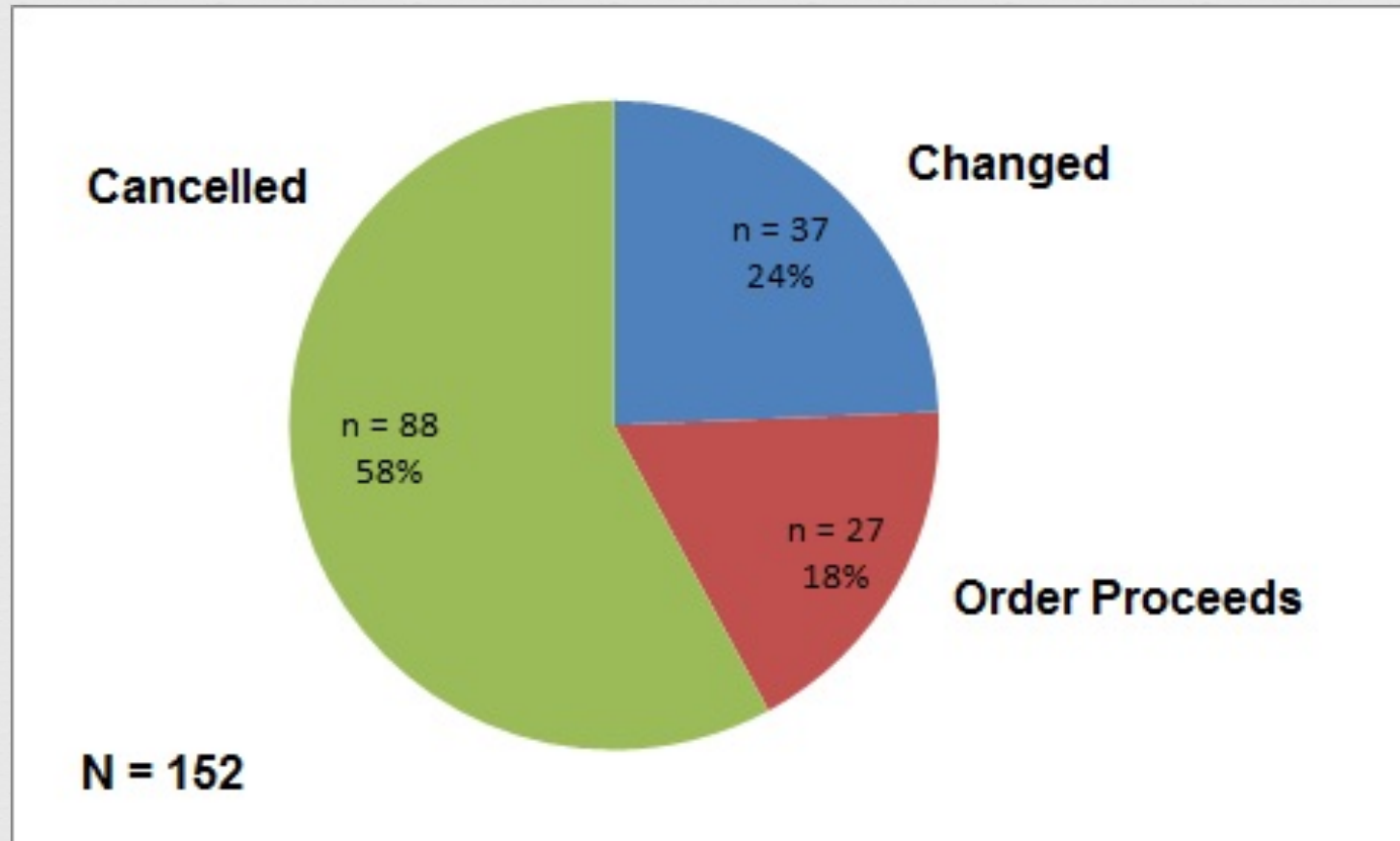
- Pre-Analytic Test Guidance and Post-Analytic Assessment
 - Triage, Decreased panel use and assistance in selecting the appropriate test



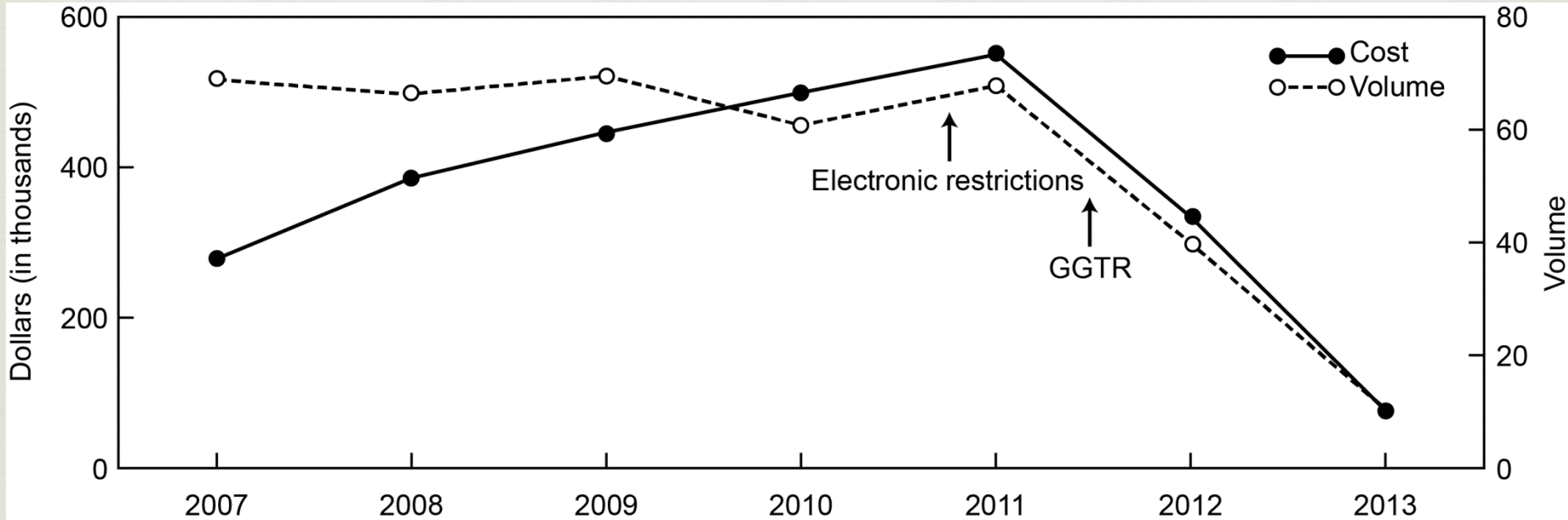
2014: 191 tests for \$246,406;

Total (9/11 to 12/14): 452 tests for \$1,067,292

Follow-up of Genetic Counselor Triage



Impact of Restricted Use and Genetic Counselor/MGP Triage Interventions



Expensive Test Notification



2014: 165 tests averted; \$262,221

Cumulative (9 m.2013 + 2014):

231 tests averted; \$354,048

Order Validation

The following information is missing or may need your attention

The test(s) below costs the institution >\$1000 to perform. Please consider carefully if this test is absolutely necessary, as charges, which may be substantially greater than costs, not covered by the insurance provider may be billed directly to the patient.

NEUROFIB TYPE 2 DNA [SQNEUFIB] >\$3000

Do you want to accept these orders anyway?

A screenshot of a software dialog box titled "Order Validation". The dialog box has a blue header bar with the title. Below the header is an orange bar with a document icon and the text "The following information is missing or may need your attention". The main content area is white and contains a warning message: "The test(s) below costs the institution >\$1000 to perform. Please consider carefully if this test is absolutely necessary, as charges, which may be substantially greater than costs, not covered by the insurance provider may be billed directly to the patient." Below this message, the specific test is listed: "NEUROFIB TYPE 2 DNA [SQNEUFIB] >\$3000". At the bottom of the dialog box, there is a question: "Do you want to accept these orders anyway?". Below the question are two buttons: "Yes" and "No". The "Yes" button is highlighted with a dotted border, indicating it is the selected option.

Extended Hard Stop



- ⌘ Time extended hard stop.
- ⌘ Went live 11/2014 (after more than a 12 month build).

- ⌘ *C. difficile* PCR
 - ⌘ Once/ 7 days
- ⌘ HbA1c
 - ⌘ Once/month
- ⌘ Constitutional Genetic Tests
 - ⌘ Once/lifetime

Education



- ❧ Graduate Medical Education Initiative
 - ❧ Information on GME Website
 - ❧ Infographic produced.
 - ❧ General
 - ❧ Introduction to the most over utilized tests.
 - ❧ Infographics for Individual Overutilized Tests
 - ❧ ANA
 - ❧ *C. difficile* testing
 - ❧ TSH
 - ❧ Etcetera,
 - ❧ How to capture impact?



Why reduce inappropriate lab testing?

- Increases patient satisfaction
- Increases patient safety (the more tests performed, the greater the potential for error) (i.e. There is a false-positive rate associated with any test that has a specificity less than 100 percent)
- Decreases unnecessary phlebotomy and potentially iatrogenic anemia
- Reduces financial burdens (lower tests = dollar savings) too:
 - hospitals
 - patients
 - third-party payers

How are we doing this at Cleveland Clinic?

- Pop-up notifications
 - Hard stops
 - Education on over-ordering
-

Results since 2010



Patient care *has not* been interrupted or compromised



Want more background on this initiative?
Read Strategies for Appropriate Test Utilization
http://portals.ccf.org/Portals/71/strategies_test_utilization.pdf

An education initiative from the Tensch Pathology & Laboratory Medicine Institute, Cleveland Clinic, Test Utilization Committee, Education Institute, and Medical Art & Photo

Annual and Cumulative Totals

2014

<u>Initiative</u>	<u>Duplicates Prevented</u>	<u>Cost Savings</u>
1. Hard Stops	3,386	\$79,554
2. Restricted Use	76	\$73,101
3. Genetics Counselor/MGP	191	\$246,406
4. Regional Smart Alert	5,618	\$45,213
5. Expensive Test Notification	165	\$262,221
Total:	9,436	\$706,495

Cumulative Totals Through 2014

<u>Initiative</u>	<u>Duplicates Prevented</u>	<u>Cost Savings</u>
1. Hard Stops	23,063	\$361,549
2. Restricted Use	349	\$784,127
3. Genetics Counselor/MGP	452	\$1,067,292
4. Regional Smart Alert	11,243	\$91,244
5. Expensive Test Notification	231	\$354,048
Total	35,338	\$2,658,260

Pearls of Pathology



- Test Utilization is part of our role and will likely become more so in the future.
 - Responsibility for pre- and post-analytics.
- The involvement of a pathologist or laboratorian brings balance and adds value.
- Utilizes and hones our skills in:
 - Practice-Based Learning and Improvement
 - Systems-Based Practice
 - Professionalism
 - Interpersonal Skills and Communication.

Summary



- ❧ Improvements in Test Utilization designed to enhance patient care and promote best practices without alienating caregivers is possible.
 - ❧ Advantages Include:
 - ❧ Decreases unnecessary phlebotomy.
 - ❧ Increases patient satisfaction.
 - ❧ Decrease false-positives
 - ❧ Appropriate use of limited resources.
 - ❧ Decreases cost.
- ❧ Pathologists and other Laboratorians have an Opportunity in the Era of ACOs and Integrated Care.
 - ❧ Participate in your Test Utilization Committee today,
 - ❧ Become active at the Hospital Administration/ Systems level.