

# From Cost Transparency to Clinical Transformation:

*Data Aggregation, Actionable Insights and Clinical Efficacy*

Dr. S. Nicholas Desai  
Chief Medical Information Officer



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- Healthcare Market Context
- IllumiCare Smart Ribbon
  - Overview/Objectives
  - Pilot/Systemwide Launch
  - Outcomes
- Lessons Learned
- Journey Forward

# Healthcare Market Context

National Impact, Global Reach



# Healthcare Market Context

National Impact, Global Reach

## Global Spending

- Projected to reach \$10.059 trillion by 2022



## Digital Innovation

- Supports/augments clinicians
- Returns focus to value-added, patient-facing activities



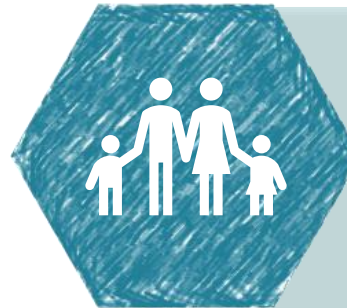
## Care Delivery Models

- Continued shift from fragmented, fee-for-service (volume) to comprehensive and coordinated (value)



## Changing Consumers

- Seeking coordinated, convenient, customized and accessible solutions



## Financial Disruptors

- Technologic advances
- Personalized medicine
- Disruptive competitors
- Market expansion



## Clinician Burnout

- Addressing well-being
- Redesigning work



# Moving the Needle

## Restoring Clinical Efficiency

Volume



Value

Quantity



Quality

Reactive



Proactive

Lack of cost awareness



cost-conscious  
clinical steward

Burned out



Engaged

# Moving the Needle

## Restoring Clinical Efficiency

Volume



Value

Quantity



Quality

Reactive



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Lack of cost awareness



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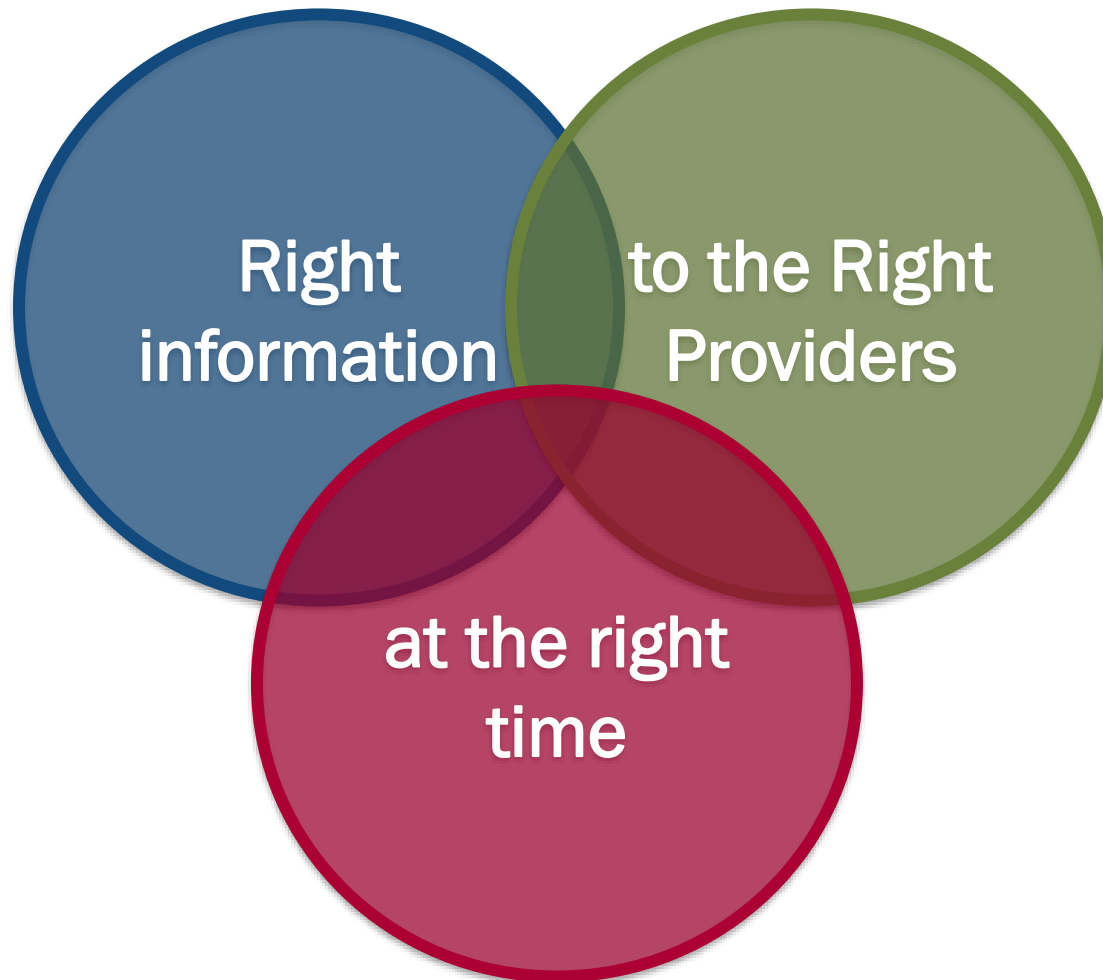
Engaged



# Shed Light on What Matters

IllumiCare Smart Ribbon

- Deliver the...



# Shed Light on What Matters

IllumiCare Smart Ribbon

Right  
information

to the Right  
Providers



at the right  
time





## Unobtrusive, automatically hovers over Epic

- Provides real-time, patient-specific cost, result and risk data at point of care for:
  - Medications
  - Labs
  - Radiology
- Also provides quick access to:
  - Observational status
  - NarxCare report
  - UpToDate CME tracking
  - Vigilandz activations (pharmacy)

# IllumiCare Smart Ribbon

## Solution Overview

Epic Hyperspace - GENERAL MEDICINE - PLY Environment - FINN-IM 12 Results Hospital Chart Completion

Patient Lookup Remind Me Personalize My Reports Rothman Unit/PL Master Daily Schedule

Hippolyta, Charlie

Hippolyta, Charlie Male CSN: 1... Unit: Hmh... Location: H... Exp Di... Attending Pr... Last B... Allergies Primary Te... Infection... Code Stat...  
DOB: 09/09/1958, 60-year old MRN: 20... Pref N... Bed: 0734-A Admit Date:... Patient... Weight: 86.2... Pharm... No Known Al... Isolation:... Precautio... Treatment...

Chart Review

Encounters Refresh (10:4)

Filters

Recent Visits

Yesterd

Yesterd

Summary

Chart Review

Results Revi...

Synopsis

Restraints

Problem List

History

Notes

Orders

More

my360 Patient, Test, 1 DOB 03/03/1970

Cost lookup All

Meds 10 sched. meds 0.4% c-diff risk 17% fall risk 32% adr risk

LABETALOL 5 MG/ML IV SOLN IV \$184.80/day

CELEC

LACTU

LEVOT

POLYE

Medication cost references

20 ML VIAL : LABETALOL 5MG/ML IV SOLN \$184.80/day

Related medication(s)

LABETALOL HCL ORAL TABLET 100 MG \$7.84/day

Labs

CBC WITHOUT DIFF panel 4/2 (+1 more) \$8.81/test

HEMOGLOBIN A1C 6.3% (H) 4/1 (+1 more) \$13.39/test

LACTIC ACID LEVEL 1.9 mmol/L 4/2 (+4 more) \$14.53/test

DIFF MANUAL panel 4/2 (+1 more) \$4.68/test

BLOOD CULTURE (Aerobic/Anaer...) report 4/1 \$14.05/test

Rads 210 mSv exposure ~1% cancer risk

XR KNEE 1 OR 2 VW LEFT report 4/1 \$329.19/test

XR CHEST 1 VM PORTABLE 3/2 \$329.19/test

Dismiss

Lower cost med may save \$177/day

LABETALOL 5MG/ML IV SOLN

Interesting? Never show me this again

Feedback

MRN 0001234567

powered by IllumiCare

Observation 22h my360 Controlled Su... UpToDate ARUP

# IllumiCare Smart Ribbon

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**Epic** Hyperspace - GENERAL MEDICINE - PLY Environment - FINN-IM 12 Results Hospital Chart Completion

Patient Lookup | Remind Me | Personalize | My Reports | Rothman Unit/PL | Master Daily Schedule

**Hippolyta, Charlie** x

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**Chart Review**

Encounters Refresh (10:4) Filters

Recent Visits Yesterday Yesterday

Summary Chart Review Results Revi... Synopsis Restraints Problem List History Notes Orders

**my360** Patient, Test, 1 DOB 03/03/1970

Cost lookup All

**Labs**

**Lactic acid level** \$14.53/test

4/2/2019	5:55 AM	1.9 mmol/L
4/2/2019	2:10 AM	1.3 mmol/L
4/1/2019	10:51 PM	2.2 mmol/L
4/1/2019	6:22 PM	1.9 mmol/L
4/1/2019	4:35 PM	2.8 mmol/L (H)

mmol/L abnormal 0.5 - 2.2

Frequency Interval  
If results are normal, may retest every 6 hours

**LACTIC ACID LEVEL** 1.9 mmol/L 4/2 (+4 more) \$14.53/test  
**DIFF MANUAL** panel 4/2 (+1 more) \$4.68/test  
**BLOOD CULTURE (Aerobic/Anaerobic)** report 4/1 \$14.05/test

**Rads** 210 mSv exposure ~1% cancer risk

XR KNEE 1 OR 2 VW LEFT	report	4/1	\$329.19/test
XR CHEST 1 VM PORTABLE		3/2	\$329.19/test

Feedback MRN 0001234567 powered by **IllumiCare**

Observation 22h my360 Controlled Su... UpToDate ARUP

# IllumiCare Smart Ribbon

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**Chart Review**

**Encounters** Refresh (10:4) Filters When Recent Visits Yesterday Yesterday

**Summary**

**Chart Review** Results Revi... Synopsis Restraints Problem List History Notes Orders

**my360** Patient, Test, 1 DOB 03/03/1970

**Labs**

Cost looku Labs

**Diff Manual** \$4.68/test

4/2/2019 6:57 AM latest >

4/1/2019 4:53 PM >

Manual Differential	PERFORMED	PERFORMED
Neutrophils	95.0 % (H)	90.0 % (H)
Lymphocytes	2.0 % (L)	5.0 % (L)
Monocytes	2.0 %	2.0 %
Eosinophils	0.0 %	0.0 %
Basophils	0.0 %	0.0 %
Metamyelocytes	0 %	1 %
Myelocytes	1 %	1 %
Promyelocyte	0 %	0 %
Pit Slide Review	App adequate	App adequate
Dohle Bodies	Occasional	
Toxic Granulation	Moderate (A)	Slight
Neutrophilic Vacuolation	Slight	Slight
Anisocytosis	Slight	1 +
Polychromasia	Slight	
Burr Cell	Moderate (A)	1 +
Acanthocytes	Occasional	
Reactive Lymphocyte		1.0
Enlarged Platelets		1 +

Frequency Interval

Order once per visit

XR CHEST 1 VM PORTABLE 3/2 \$329.19/test

Feedback MRN 0001234567 powered by **IllumiCare**

Observation 22h my360 2 Controlled Su... UpToDate ARUP

Open

# IllumiCare Smart Ribbon

## Solution Overview

**Epic** | Hyperspace - GENERAL MEDICINE - PLY Environment - FINN-IM | 12 | Results | Hospital Chart Complete

**Epic** | Patient Lookup | Remind Me | Personalize | My Reports | Rothman Unit/PL | Master Daily Schedule

**Hippolyta, Charlie** | Male | CSN: 1... | Unit: Hmh... | Location: H... | Exp Di... | Attending Pr... | Last B... | Allergies | Primary Te... | Infection... | Code Stat...  
DOB: 09/09/1958, 60-year old | MRN: 20... | Pref N... | Bed: 0734-A | Admit Date:... | Patient... | Weight: 86.2... | Pharm... | No Known Al... | Isolation:... | Precautio... | Treatment...

**Chart Review** | Encounters | Refresh (10:4) | Filters | When | Recent Visits | Yesterd | Yesterd

**Summary** | Chart Review | Results Revi... | Synopsis | Restraints | Problem List | History | Notes | Orders

**my360** | Patient, Test, 1 | DOB 03/03/1970

Cost lookup: All

**Labs**

**Blood Culture** \$14.05/test

4/1/2019 7:29 PM

Blood Culture (Aerobic \T\ Anaerobic Bottle: Staphylococcus aureus  
Blood Culture (Aerobic \T\ Anaerobic Bottle: Aerobic only:-This organism is Methicillin Sensitive.  
Clindamycin <=0.5 mcg/ml (S)  
Erythromycin <=0.5 mcg/ml (S)  
Linezolid 2 mcg/ml (S)  
Minocycline <=1 mcg/ml (S)  
Methicillin 0.5 mcg/ml (S)  
Penicillin G <=0.125 mcg/ml (S)  
Trimethoprim/Sulfamethoxazole <=0.5/9.5 mcg/ml (S)  
Vancomycin 1 mcg/ml (S)

Frequency Interval  
If results are normal, may retest every 3 days

BLOOD CULTURE (Aerobic\Ana...) report 4/1 \$14.05/test

**Rads** 210 mSv exposure ~1% cancer risk

XR KNEE 1 OR 2 VW LEFT report 4/1 \$329.19/test  
XR CHEST 1 VM PORTABLE 3/2 \$329.19/test

Feedback | MRN 0001234567 | powered by **IllumiCare**

Observation 22h | my360 | Controlled Su... | UpToDate | ARUP

# IllumiCare Smart Ribbon

## Solution Overview

Epic Hyperspace - GENERAL MEDICINE - PLY Environment - FINN-IM 12 Results Hospital Chart Complete

Epic Patient Lookup Remind Me Personalize My Reports Rothman Unit/PL Master Daily Schedule

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DOB: 09/09/1958, 60-year old MRN: 20... Pref N... Bed: 0734-A Admit Date... Patient... Weight: 86.2... Pharm... No Known Al... Isolation... Precautio... Treatment

Chart Review

Encounters Notes Labs

Refresh (10:44 AM) Route

Filters Hide Appt/Tele/Refil.

When Type

Recent Visits

Yesterday	ED to Ho
Yesterday	Surgery

Summary

Chart Review

Results Revi...

Synopsis

Restraints

Problem List

History

Notes

Orders

More

Controlled Substances

Tutorials: Overview | Narx Scores | Overdose Risk Score | Lorazepam Milligram Equivalents

Alice Testpatient, 118F

Narx Report Resources

Date: 05/25/2018

+ Testpatient, Alice

- Risk Indicators

NARX SCORES			OVERDOSE RISK SCORE	ADDITIONAL RISK INDICATORS (0)
Narcotic	Sedative	Stimulant	190 (Range 000-999)	
120	050	000		
Explanation and Guidance			Explanation and Guidance	Explanation and Guidance

This NarxCare report is based on search criteria supplied and the data entered by the dispensing pharmacy. For more information about any prescription, please contact the dispensing pharmacy or the prescriber. NarxCare scores and reports are intended to aid, not replace, medical decision making. None of the information presented should be used as sole justification for providing or refusing to provide medications. The information on this report is not warranted as accurate or complete.

Graphs

RX GRAPH

Narcot Sed Stim Other

PDMP Report

Patient has controlled substance exposure within last 24 months

Feedback

powered by IllumiCare APPRIOR HEALTH

22h Observation my360 Controlled Su.. UpToDate ARUP



# IllumiCare Smart Ribbon

## Solution Overview

The screenshot displays the IllumiCare Smart Ribbon interface, which is a patient-centric medical information system. The top navigation bar includes the Epic logo and links to Patient Lookup, Remind Me, Personalize, My Reports, Rothman Unit/PL, and Master Daily Schedule. The patient's name, Hippolyta, Charlie, is prominently displayed, along with their DOB (09/09/1968) and gender (Male). The interface is divided into several sections: Summary, Chart Review, Results Review, Synopsis, Restraints, Problem List, History, Notes, and Orders. The main content area shows a search for "crohns disease adult" and displays the clinical manifestations, diagnosis, and prognosis of Crohn's disease in adults. The search results include a topic outline, a summary of the clinical manifestations, and a list of differential diagnoses. The interface is powered by UpToDate and includes a feedback button.

**Epic** | Hyperspace - GENERAL MEDICINE - PLY Environment - FINN-IM 12 | Results | Hospital Chart Completion

**Epic** | Patient Lookup | Remind Me | Personalize | My Reports | Rothman Unit/PL | Master Daily Schedule

**Hippolyta, Charlie** | Male | CSN: 1... | Unit: Hmh... | Location: H... | Exp Di... | Attending Pr... | Last B... | Allergies | Primary Te... | Infection:... | Code Stat... | Precautio... | Treatment

DOB: 09/09/1968 | UpToDate

**UpToDate** | Language | Help

My UpToDate | CME 217.0 | Log Out

crohns disease adult

Contents | Patient Education | What's New | Practice Changing UpDates | Calculators | Drug Interactions

crohns disease adult | Find | Patient | Print | Share | Bookmark

**Clinical manifestations, diagnosis and prognosis of Crohn disease in adults**

Topic Outline

**SUMMARY & RECOMMENDATIONS**

**INTRODUCTION**

**CLINICAL MANIFESTATIONS**

- Abdominal pain
- Diarrhea
- Bleeding
- Fistulas
- Phlegmon/abscess
- Perianal disease
- Malabsorption
- Other gastrointestinal involvement
- Systemic symptoms
- Extraintestinal manifestations

**DIFFERENTIAL DIAGNOSIS**

- Irritable bowel syndrome
- Lactose intolerance
- Infectious colitis
- Ulcerative colitis
- Other disorders

**DIAGNOSIS**

- Laboratory studies
- Endoscopy
  - Colonoscopy
  - Wireless capsule endoscopy

**Clinical manifestations, diagnosis and prognosis of Crohn disease in adults**

Authors: Mark A Peppercorn, MD, Sunanda V Kane, MD, MSPH  
Section Editor: Paul Rutgeerts, MD, PhD, FRCP  
Deputy Editor: Kristen M Robson, MD, MBA, FAGG

Contributor Disclosures

All topics are updated as new evidence becomes available and our [peer review process](#) is complete.  
**Literature review current through:** Oct 2018. | **This topic last updated:** Nov 19, 2018.

**INTRODUCTION** — Crohn disease (CD) is a disorder of uncertain etiology that is characterized by transmural inflammation of the gastrointestinal tract. CD may involve the entire gastrointestinal tract from mouth to the perianal area:

- Approximately 80 percent of patients have small bowel involvement, usually in the distal ileum, with one-third of patients having ileitis exclusively.
- Approximately 50 percent of patients have ileocolitis, which refers to involvement of both the ileum and colon.
- Approximately 20 percent have disease limited to the colon. In contrast to rectal involvement in patients with ulcerative colitis, one-half of CD patients with colitis have sparing of the rectum.
- Approximately one-third of patients have perianal disease.
- Approximately 5 to 15 percent have predominant involvement of the mouth or gastroduodenal area, while fewer patients have involvement of the esophagus and proximal small bowel. This topic review will discuss the clinical manifestations, diagnosis, differential diagnosis, and natural history of CD. The management of this disorder is discussed separately. (See "[Overview of the medical management of mild \(low risk\) Crohn disease in adults](#)" and "[Overview of medical management of high-risk adult patients with moderate to severe Crohn disease](#)".)

**CLINICAL MANIFESTATIONS** — The clinical manifestations of Crohn disease (CD) are more variable than those of ulcerative colitis. Patients can have symptoms for many years prior to diagnosis [1-3]. Fatigue, prolonged diarrhea with abdominal pain, weight loss, and fever, with or without gross bleeding, are the hallmarks of CD [4].

**Abdominal pain** — Crampy abdominal pain is a common manifestation of CD, regardless of disease distribution. The transmural nature of the inflammatory process results in fibrotic strictures. These strictures often lead to repeated episodes of small bowel, or less commonly colonic, obstruction. A patient with

Feedback

powered by **UpToDate**

Observation | my360 | Controlled Su... | UpToDate | ARUP



## Houston Methodist Sugar Land Pilot

### Show Me the Data:

Does presenting cost/risk data at point of care impact ordering behavior and reduce cost?

*72% of physicians consider cost data valuable yet only 28% of them receive it*

<https://www2.deloitte.com/insights/us/en/industry/health-care/volume-to-value-based-care.html>

The screenshot displays the IllumiCare Smart Ribbon interface for a patient named 'Petient, Test, 1' (DOB 03/03/1970). The interface is divided into several sections:

- Cost lookup:** A dropdown menu set to 'All'.
- Meds:** A table showing medication costs and risks. The table has columns for medication name, route, and cost/day. Risks are shown as percentages: 0.4% c-diff risk, 17% fall risk, and 32% adr risk.
- Labs:** A table showing lab test costs and risks. The table has columns for test name, panel, result, and cost/test. Risks are shown as percentages: 37 mL blood loss and 14% anemia risk.
- Rads:** A table showing imaging costs and risks. The table has columns for test name, report, and cost/test. Risks are shown as percentages: 210 mSv exposure and ~1% cancer risk.

At the bottom of the interface, there is a navigation bar with icons for Observation, my360, Controlled Su., UpToDate, ARUP, and a lightbulb icon. The text 'powered by IllumiCare' is visible in the bottom right corner.

Medication	Route	Cost/day
LABETALOL 5 MG/ML IV SOLN	IV	\$184.80/day
CELECOXIB 100MG CAPSULE	oral	\$4.18/day
LACTULOSE 20 GRAM/30ML ORAL SOLUTION	oral	\$1.53/day
LEVOTHYROXINE 50 MCG TABLET	oral	\$1.16/day
POLYETHYLENE GLYCOL (MIRALAX) 17 GRAM OR...	oral	\$1.12/day

Test Name	Panel	Result	Cost/test
CBC WITHOUT DIFF	panel	4/2 (+1 more)	\$8.81/test
HEMOGLOBIN A1C	6.3% (H)	4/1 (+1 more)	\$13.39/test
LACTIC ACID LEVEL	1.9 mmol/L	4/2 (+4 more)	\$14.53/test
DIFF MANUAL	panel	4/2 (+1 more)	\$4.68/test
BLOOD CULTURE (Aerobic\Anae...)	report	4/1	\$14.05/test

Test Name	Report	Cost/test
XR KNEE 1 OR 2 VW LEFT	report	\$329.19/test
XR CHEST 1 VM PORTABLE	3/2	\$329.19/test

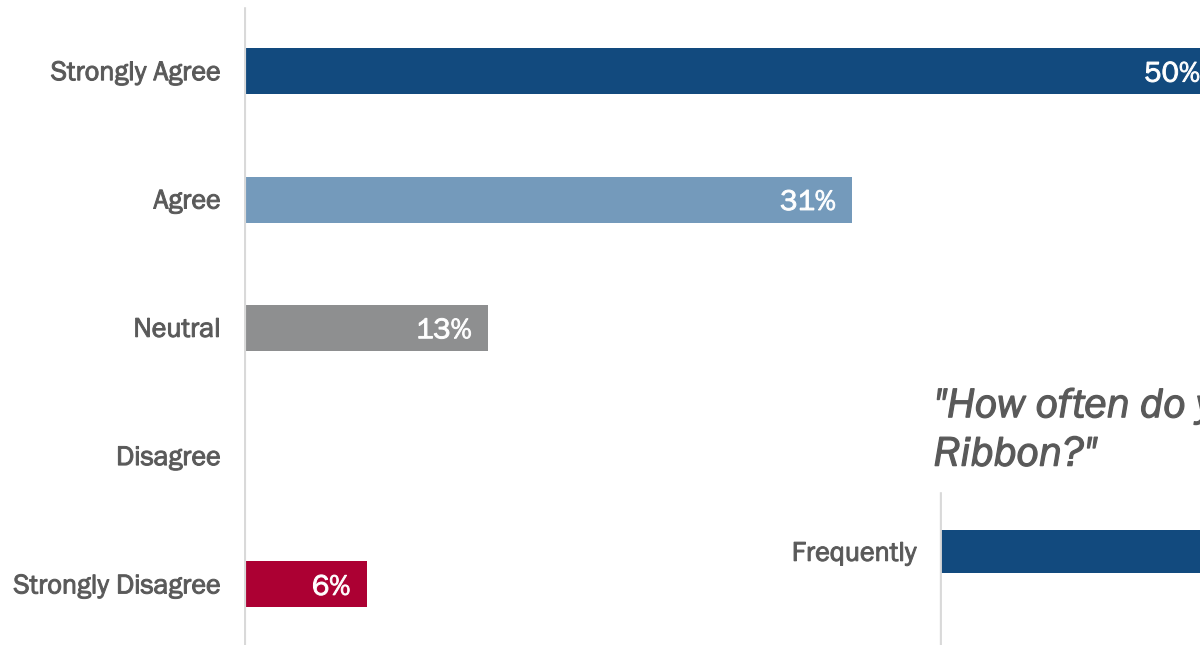
### 90-Day Pilot

- 145 Providers
- 38 Pharmacists

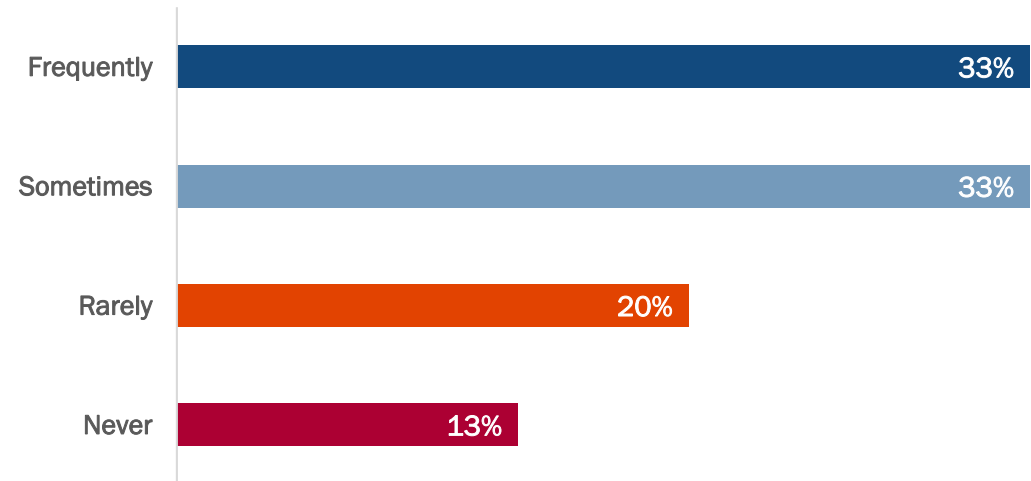
# IllumiCare Smart Ribbon

## HMSL Pilot Survey

*"Costs are an important consideration in the value and quality of care I provide to patients, and knowing the actual cost/risk of medications, labs and radiology can improve my practice."*



*"How often do you reference the Smart Ribbon?"*



# IllumiCare Smart Ribbon

HMSL Pilot Feedback

## Empowerment

Finally, something that makes sense!

Now I can see and understand the data

I can be a proactive steward of care

## Efficiency

Simple interface; has clinical utility

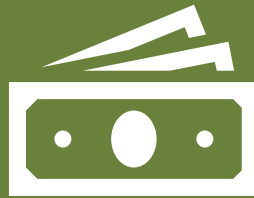
Aggregates actionable data

Good reference tools within workflow; greater collaboration

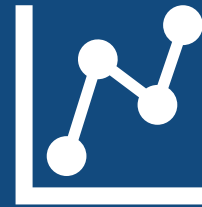
# IllumiCare Smart Ribbon

## Early Success

Early Financial Gains



Data Aggregation



Embedded in Workflow



Increased Efficiency



# IllumiCare Smart Ribbon

Enterprise Rollout

## IP/OP Physicians

- *Hospitalists/Internal Medicine*
- *Surgical Subspecialties*
- *Pulmonary/Critical Care/Intensivists*

## Advanced Practice Providers

*In Specialties Listed (See Left)*

## Graduate Medical Education

- *Residents/Fellows*
- *Pharmacy Students*

## Pharmacists

## Transplant Coordinators

# IllumiCare Smart Ribbon

January – Early September 2019

System ROI:  
~\$15.5 M to  
date projected  
savings

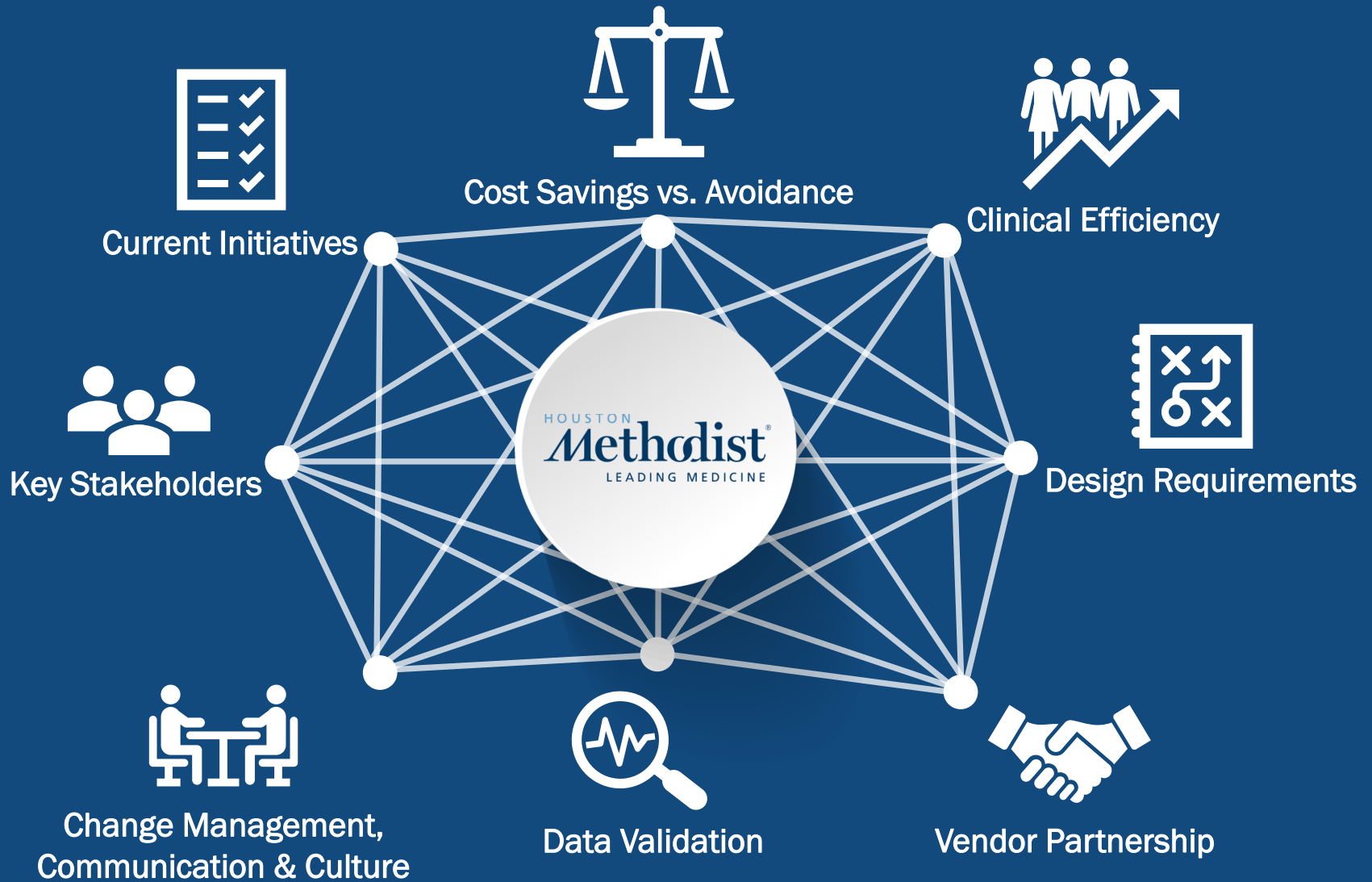
Includes lab, imaging and drug expense costs  
\$129 savings/admission

Ribbon Period	Average Cost per Admission	Average Lab Cost per Admission	Average Med Cost per Admission	Average Rad Cost per Admission
Pre-Ribbon	\$2,114.85	\$516.13	\$1,263.71	\$335.01
Post-Ribbon	\$1,985.02	\$452.59	\$1,206.70	\$325.73

- Key savings opportunities – pharmacy, internal medicine, hospitalists, residents, lab
- Highest utilizers – residents, hospitalists, pain management, internal medicine
- Includes hospital-based cost savings initiatives in pharmacy, lab and radiology

# IllumiCare Smart Ribbon

## Lessons Learned





# IllumiCare Smart Ribbon

## Lessons Learned



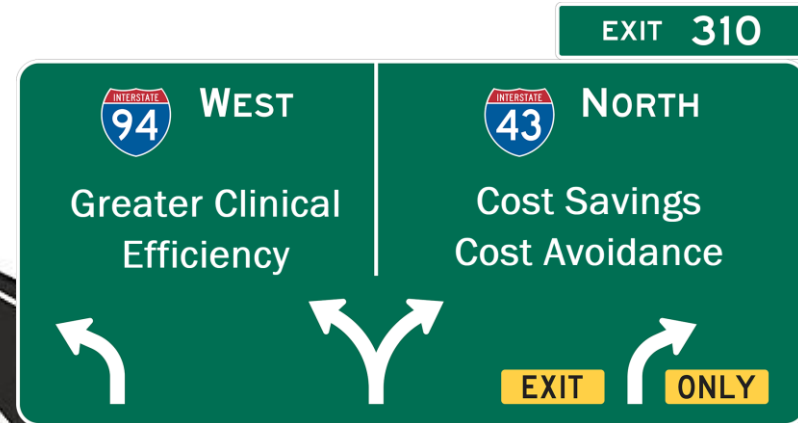
# Journey Forward

Continued Partnership

Quarterly upgrades



Recent upgrade  
complete



Monthly feature  
reviews and  
collaboration/  
design sessions

# Questions? Let's Connect!

## S. Nicholas Desai, DPM, MBA

Chief Medical Information Officer, Houston Methodist

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[houstonmethodist.org](http://houstonmethodist.org)

Houston Methodist IT  
2550 Holly Hall St., HH3-IT  
Houston, Texas 77054

Houston Methodist Hospital  
6560 Fannin St., Scurlock Tower, STB2  
Houston, Texas 77030

[sdesai2@houstonmethodist.org](mailto:sdesai2@houstonmethodist.org)

Office: 832.667.5964  
Cell: 281.413.8415

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