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INNOVATION. IMPACT. OUTCOMES.

ONWARD

Improving Care Transitions with IT-Enabled Medication Management

February 26, 2014

Frank J. Eidelman, MD, FRCPC, FAAAAI

Chairman, Department of Allergy and Immunology; Chairman, Medical Informatics,
Cleveland Clinic Florida

Michael R. Solomon, PhD, MBA

Lead Consultant, eCare Management, Point-of-Care Partners

Lead Faculty, University of Phoenix Department of Health Sciences and Nursing

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Conflict of Interest Disclosures

Frank J. Eidelman, MD, FRCPC, FAAAI
and

Michael R. Solomon, PhD, MBA

Have no real or apparent conflicts of interest to report.

Session Objectives

1. Identify common barriers to effective medication management during transitions of care
2. Define and illustrate a four-step model for “eMedication Management”
3. Describe the implementation of the eMedication Management model to overcome barriers to effectively managing care transitions
4. Identify areas for improvement and propose actions to enhance the value of health IT in managing medications during care transitions

Care Transitions Defined

Care Transitions: “The transfer of a patient from one setting of care or one set of providers to another during the course of an episode of care” – *National Transitions of Care Coalition*



Each type of care transition has its own set of complexities and challenges

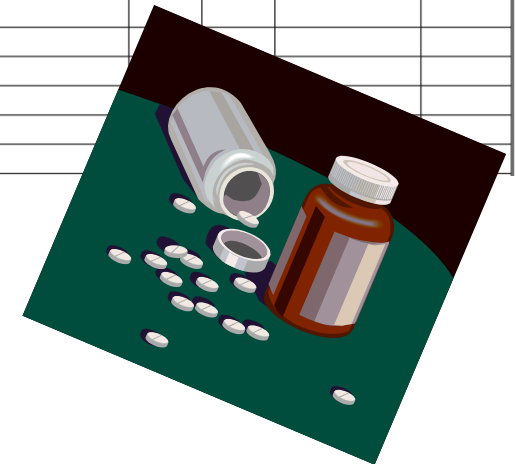
Persistent Challenges During Transitions of Care

- Most avoidable readmissions are the result of breakdowns in patient hand-off between settings¹:
 - Medication errors may be caused by inaccurate medication lists and test results
 - 1/3 patients discharged have at least one medication discrepancy²
 - 1/5 patients discharged experience an adverse event
 - 60% are medication-related and avoidable²

MEDICATION LIST

Patient Name: _____ MR#: _____

Date	Medication Name	Strength	Frequency	Physician	Date Discontinued



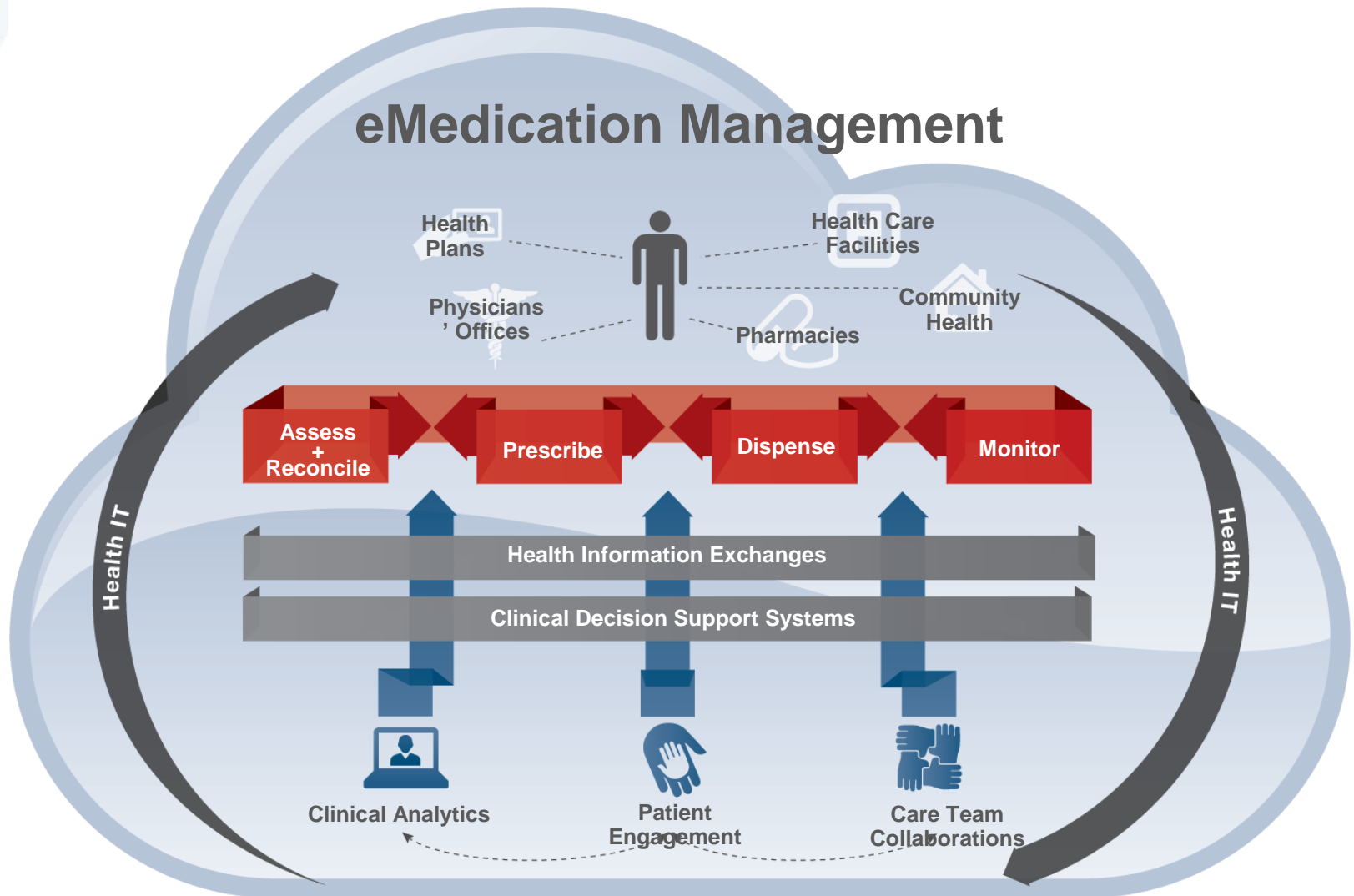
Persistent Challenges During Transitions of Care (continued)

- Patient adherence problems due to lack of timely follow-up and education post-discharge
- Referring a patient to a specialist with incomplete health information may also lead to adverse drug events



Medication management is a critical activity in most care transitions

Overview of eMedication Management



Source: © Point-of-Care Partners

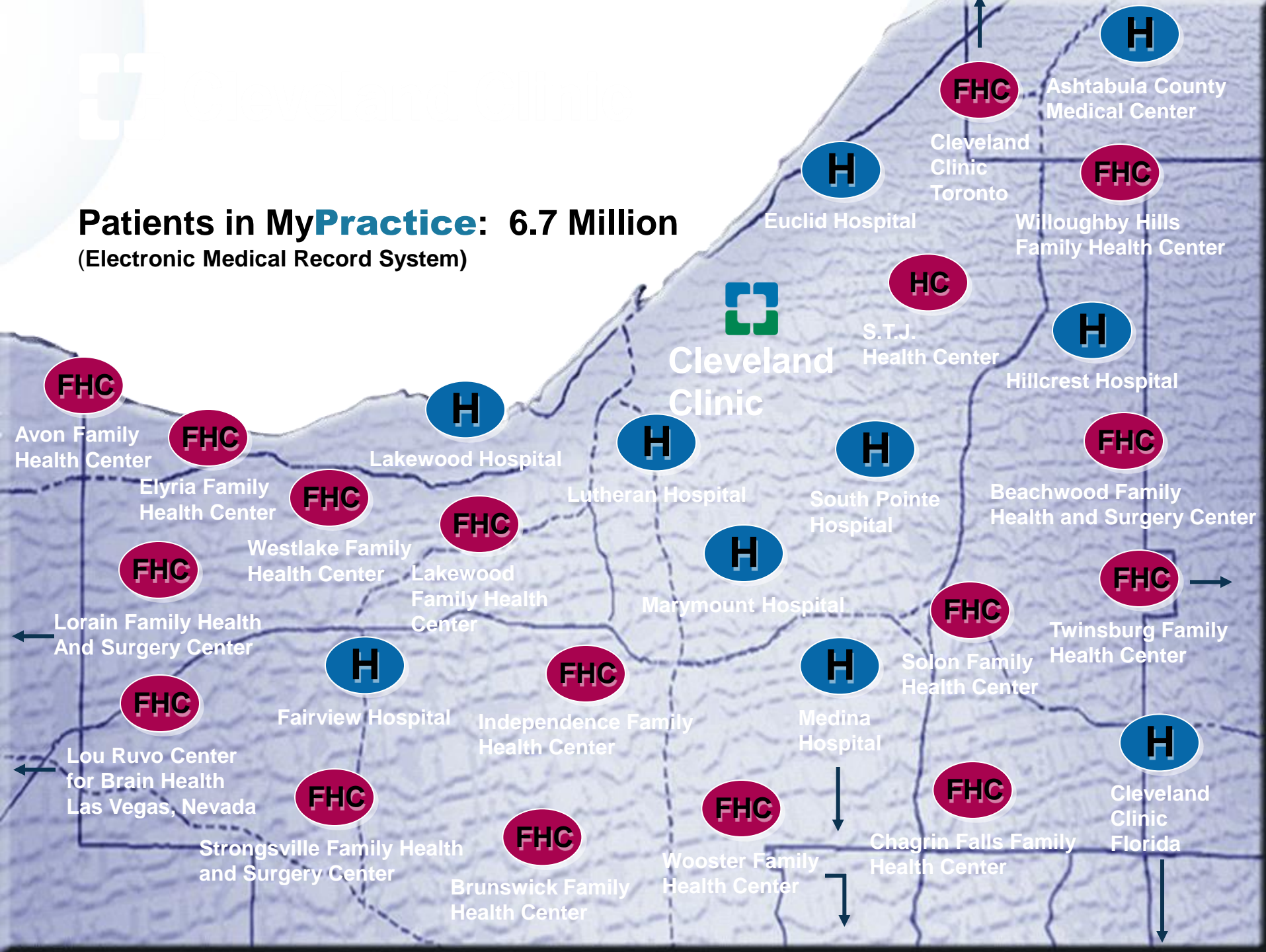
Cleveland Clinic



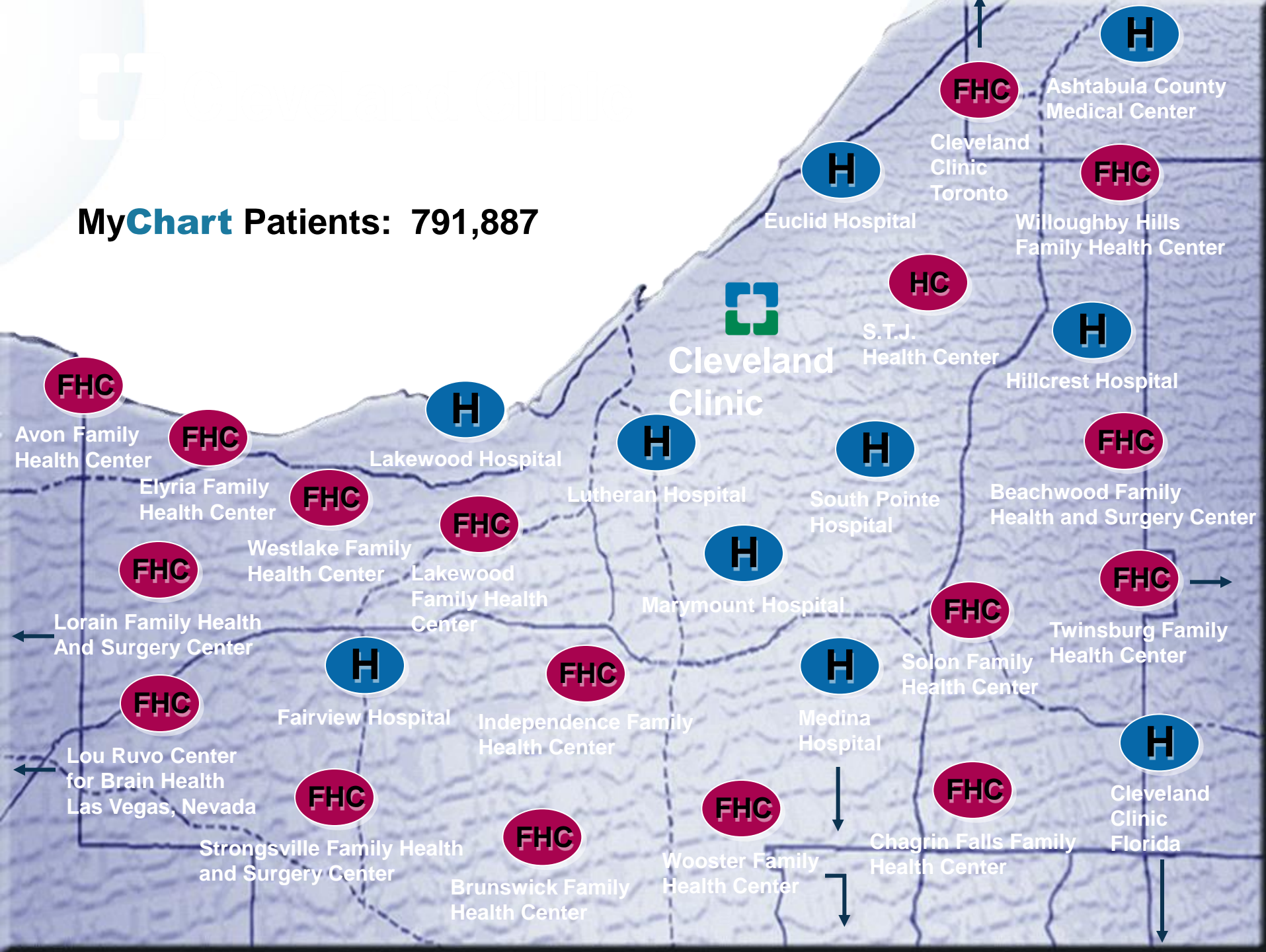
CLEVELAND CLINIC

Patients in MyPractice: 6.7 Million

(Electronic Medical Record System)



MyChart Patients: 791,887



MyPractice Electronic Medical Record

Cleveland Clinic User and Encounter Statistics Through July, 2013

Physicians:	7,849
Residents / Fellows:	2,761
Pharmacists:	472
Other End Users:	45,958
Patients in the EMR:	6,700,529
Encounters:	48,733,322
Prescriptions:	102,618,073
Orders:	316,506,687
Total Results:	968,571,042

Cleveland Clinic Integrated Care Model:

The Seamless Integration of **People**, **Processes** and **Tools**

Primary Care Coordination

Setting: Ambulatory

- Longitudinally follow high-risk patients for PCP team
- Main point of contact for the patient, family, and other care coordinators
- Targeted outreach, assessment and monitoring to ensure care goals are met

Specialty Care Coordination

Settings: Ambulatory and Inpatient

- Follow high-risk patients through course of specialty care in medical or surgical setting
- Ensure patients continue to follow recommended **CarePaths**
- Cross-venue patient, family, Primary Care Coordinator communication

Transitional Care Coordination

Settings: Hospital, ED, Post-Acute, -Surgical, -Procedural

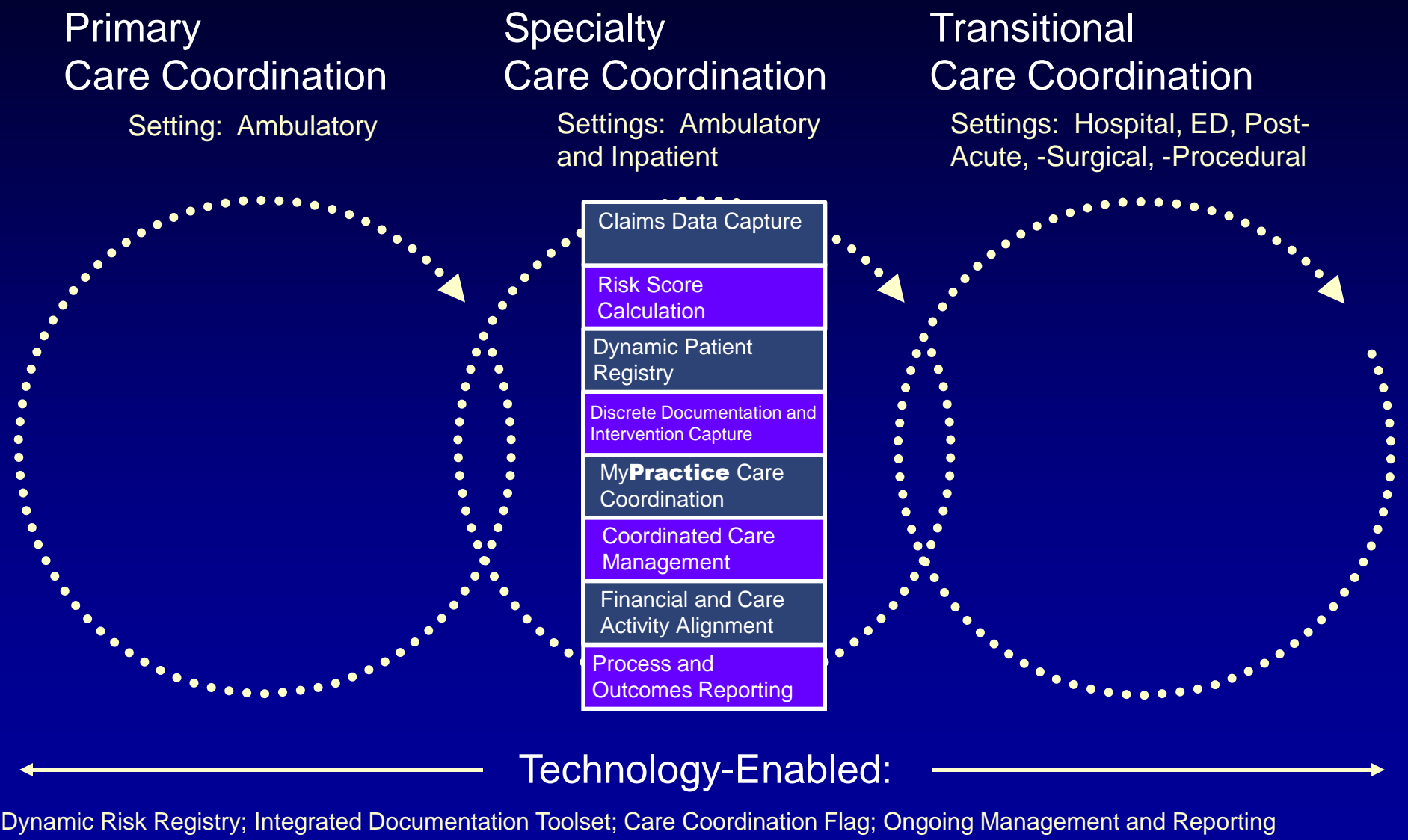
- Facilitate seamless care for high-risk patients transitioning across venues
- Follow the high-risk patient during the episode of care that is associated with the patient's presence in a particular venue

Technology-Enabled:

Dynamic Risk Registry; Integrated Documentation Toolset; Care Coordination Flag; Ongoing Management and Reporting

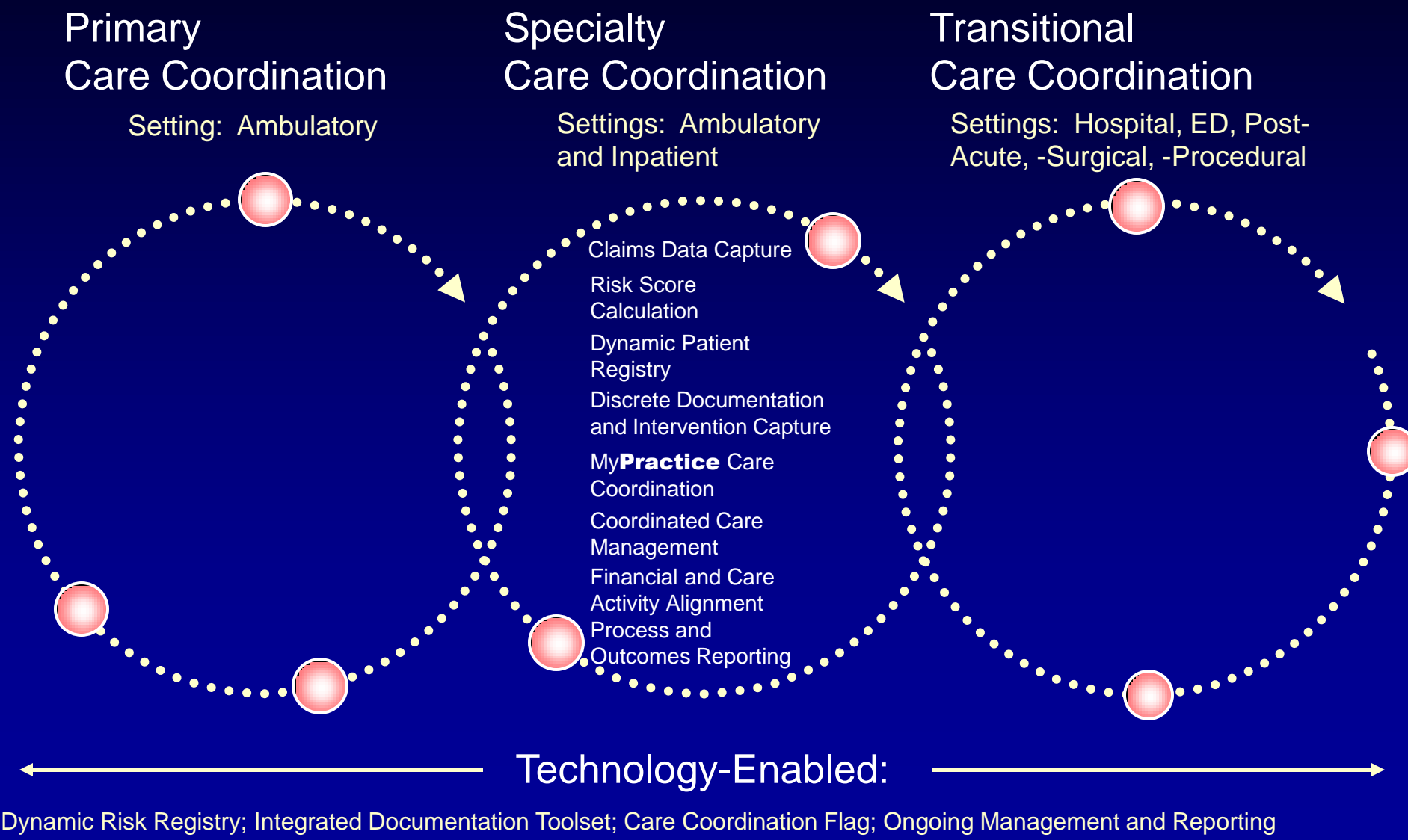
Cleveland Clinic Integrated Care Model:

The Seamless Integration of **People**, **Processes** and **Tools**



Cleveland Clinic Integrated Care Model:

The Seamless Integration of **People**, **Processes** and **Tools**



Inpatient Cycle

Prior to Admission
(PTA) Medications

- History
- Previous dispense
- EHR
- HIE
- External docs



Inpatient Cycle



Prior to Admission (PTA) Medications

- History
- Previous dispense
- EHR
- HIE
- External docs

Hospital Medication orders

Review PTA meds and

- Continue
- Substitute
- Discontinue

Order hospital medications

CDS

Inpatient Cycle



Prior to Admission (PTA) Medications

- History
- Previous dispense
- EHR
- HIE
- External docs

Hospital Medication orders

Review PTA meds and

- Continue
- Substitute (formulary)
- Discontinue

Order hospital medications

- CDS

Discharge Medication orders

Review Hosp meds and

- Order
- Substitute
- Discontinue

Order PTA meds

Order/Substitute

Inpatient Cycle



Prior to Admission (PTA) Medications

- History
- Previous dispense
- EHR
- HIE
- Ext docs

Hospital Medication orders

Review PTA meds and

- Continue
- Substitute (formulary)
- Discontinue

Order hospital medications

- CDS

Discharge Medication orders

Review Hosp meds and

- Order
- Substitute
- Discontinue

Order PTA meds

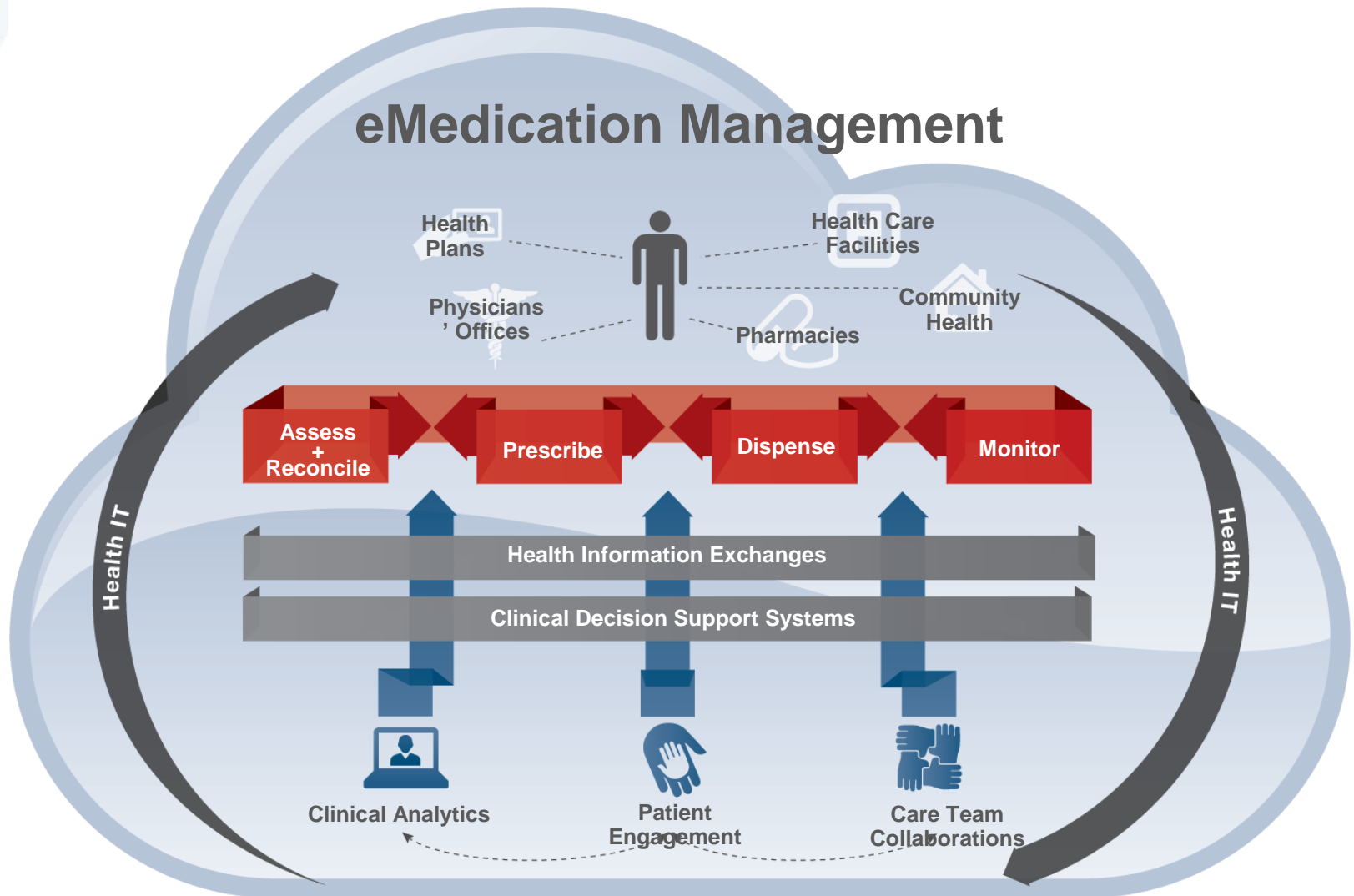
Order/Substitute

Inpatient Cycle

Delivery and Education



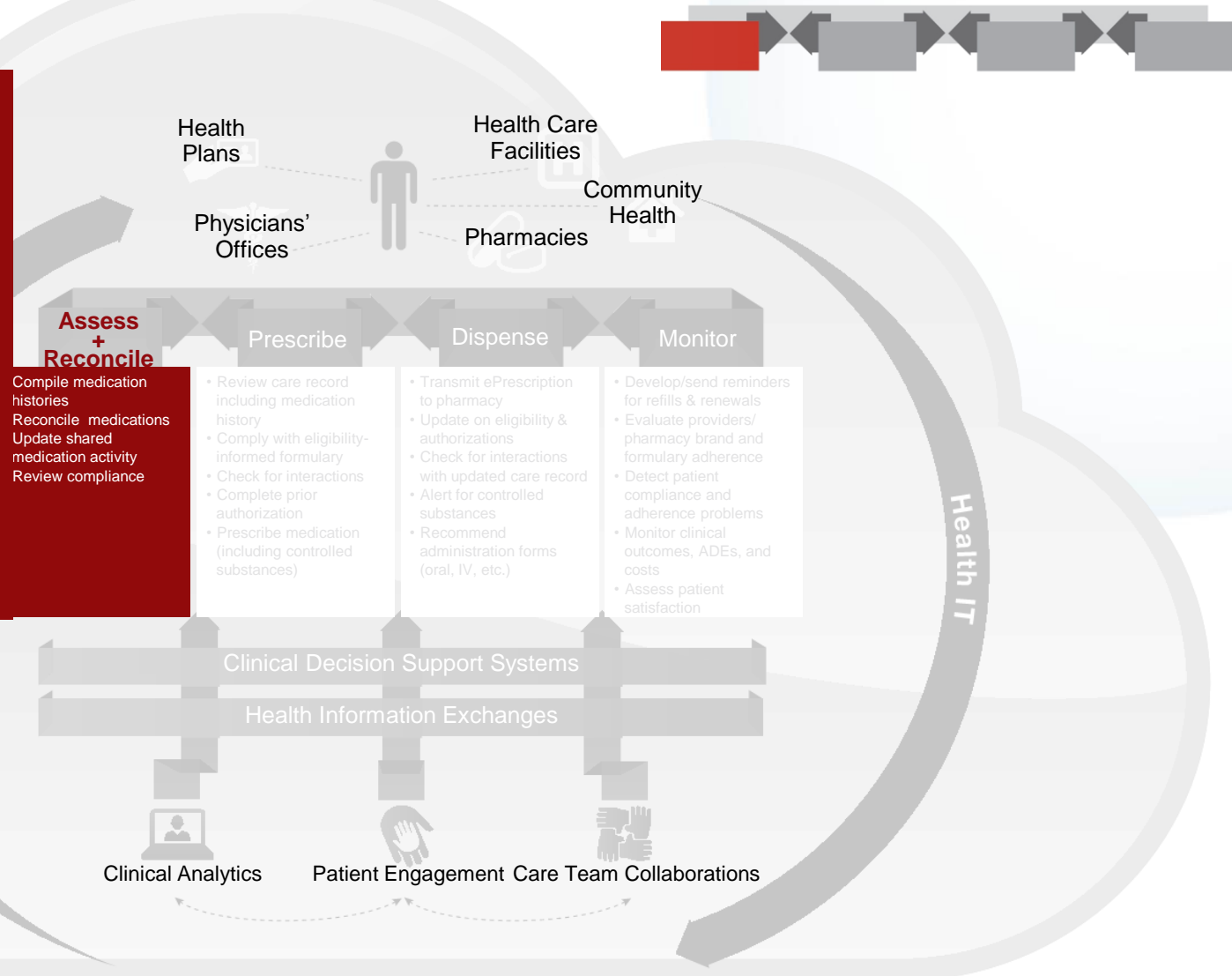
eMedication Management



Source: © Point-of-Care Partners


eMedication Management

- Compile medication histories
- Reconcile medications
- Update shared medication activity
- Review compliance



Pharmacy Benefit



Coverage found



 **Verify Pharmacy Benefits**

Only 1 coverage found for this patient.
Verify the listed coverage is correct.

Covered: **Retail, Mail Order** - **UGT "Y" RETAIL**
Not Covered: Specialty, Long-Term Care

Member ID: 8401 1987 - F
Group ID: 10131
DAVIS, FL 33324

 **Use This Coverage**  **Incorrect (Remove)**

 Restore  Close F9

Medication Reconciliation

Can assess compliance

		Quantity	Unit Strength	Unit Form	
▼	ATORVASTATIN CALCIUM				
7/26/2013	ATORVASTATIN 10 MG TABLET	90			Already recorded
▼	CITALOPRAM HYDROBROMIDE				
10/3/2013	CITALOPRAM HBR 20 MG TABLET	30			Already recorded
9/10/2013	CITALOPRAM HBR 20 MG TABLET	30			Already recorded
8/6/2013	CITALOPRAM HBR 20 MG TABLET	30			Already recorded
▼	CLONAZEPAM				
10/1/2013	CLONAZEPAM 0.5 MG TABLET	30			+ Add to Meds
8/8/2013	CLONAZEPAM 0.5 MG TABLET	30			+ Add to Meds

Option to add new meds

Inpatient MedRec

Update Prior to Admission Medications

?

Resize

Close

Help

1 Update Prior to Admission Medications

2 Reconcile Prior to Admission Medications

3 New Admission Orders

4 Review and Sign

Update Prior to Admission Medications

Previous

Next

This is a list of the patient's home medications. Please verify the list and add new medications as needed.

Med List Comments:

+ Add Note

New Prior to Admission Med

+ Add

Check Interactions

Informants

Sort by: Alphabetical

Show Details

Mark Unselected with Last Dose Today

Mark Unselected with Last Dose Yesterday

Alphabetical

	Last Dose	Time	Taking?
<div>albuterol HFA (PROAIR HFA) 90 mcg/actuation inhaler</div> <div>2 Puffs every 4 hours as needed. Take as directed</div> <div>Normal, Disp-1 Each, R-0</div> <div>Refills: 0 ordered Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>ALPRAZolam 1 mg/mL Conc</div> <div>Take 10 mL by mouth as needed.</div> <div>Print RX, ORAL, Disp-1 Bottle, R-0</div> <div>AS NEEDED Starting 2/11/2013, Until Discontinued</div> <div>Refills: 0 ordered Pharmacy: E- RIGHTSOURCE RX - WEST CHESTER, OH 45069 - 9843 WINDISCH RD - 800-967-9830</div> <div>Note written 10/8/2013 1433 patein was never on it. Or wrong dose now takes ... (Edit Note)</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>aspirin, buffered (BUFFERIN) 325 mg buffered tablet</div> <div>Take 1 tablet by mouth once daily.</div> <div>Normal, ORAL, Disp-21 tablet, R-0</div> <div>DAILY Starting 8/23/2013, Until Discontinued</div> <div>Refills: 0 ordered Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>Bromfenac Sodium 0.09 % ophthalmic solution</div> <div>Use 1 Drop in both eyes twice daily.</div> <div>Print RX, Disp-2.5 mL, R-0</div> <div>Refills: 0 ordered Pharmacy: E- RIGHTSOURCE RX - WEST CHESTER, OH 45069 - 9843 WINDISCH RD - 800-967-9830</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>Bromfenac Sodium 0.09 % ophthalmic solution</div> <div>Use 1 Drop in both eyes twice daily.</div> <div>Print RX, Disp-2.5 mL, R-0</div> <div>Refills: 0 ordered Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>diazepam 10 mg tablet</div> <div>Take 1 tablet by mouth every 6 hours as needed.</div> <div>Print RX, ORAL, Disp-1 tablet, R-0</div> <div>EVERY 6 HOURS AS NEEDED Starting 6/8/2012, Until Discontinued</div> <div>Refills: 0 ordered Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div></div>	at	<div></div> <div></div> <div>X</div> <div></div>
<div>Erythromycin-Benzoyl Peroxide (BENZAMYCIN) gel</div> <div>Apply 1 application to affected area twice daily as needed. Apply to Acne.</div> <div>Print RX, TOPICAL, Disp-50 g, R-3</div> <div>2 TIMES DAILY AS NEEDED Starting 2/11/2013, Until Discontinued, Last Dose: Not Taking</div> <div>Refills: 3 ordered Pharmacy: E- RIGHTSOURCE RX - WEST CHESTER, OH 45069 - 9843 WINDISCH RD - 800-967-9830</div> <div>Note written 3/19/2013 0915 Stopped taking after 14 days of use. (Edit Note)</div>	<div>Today</div> <div>Yesterday</div> <div>Last Week</div> <div>Other</div> <div>Not Taking</div>	at	<div></div> <div></div> <div>X</div> <div></div>

Inpatient MedRec

Decision point

Reconcile Prior to Admission Medications

Previous Next

This is where you determine which Prior to Admission medications will be ordered as Inpatient medications.

Sort by: Rx Class ☒ Show Details Order All Unselected Hold All Unselected Next

This order was created from diazepam 10 mg tablet

ANTICOAGULANTS, COUMARIN TYPE

warfarin 12.5 mg (COUMADIN)
13 mg, ORAL, ONCE, 1 dose Today at 1500
This order was created from warfarin 7.5 mg Tab 7.5 mg, warfarin 5 mg Tab 5 mg

Order Substitute Hold

BETA-ADRENERGIC AGENTS

albuterol HFA (PROAIR HFA) 90 mcg/actuation inhaler
2 Puffs every 4 hours as needed. Take as directed
Normal, Disp-1 Each, R-0
Refills: 0 ordered **Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337**

Order Substitute Hold Delete

EYE ANTI-INFLAMMATORY AGENTS

Bromfenac Sodium 0.09 % ophthalmic solution
Use 1 Drop in both eyes twice daily...
Print RX, Disp-2.5 mL, R-0
Refills: 0 ordered **Pharmacy: E- RIGHTSOURCE RX - WEST CHESTER, OH 45069 - 9843 WINDISCH RD - 800-967-9830**

Order Substitute Hold Delete

Bromfenac Sodium 0.09 % ophthalmic solution
Use 1 Drop in both eyes twice daily...
Print RX, Disp-2.5 mL, R-0
Refills: 0 ordered **Pharmacy: E- CCF FLORIDA WESTON - INTERNAL ONLY - WESTON, FL 33331 - 2950 CLEVELAND CLINIC BLVD - 954-659-6337**

Order Substitute Hold Delete

Orders Need Reconciliation

Order on Admission
- warfarin 12.5 mg (COUMADIN)

Discontinue on Admission
- Bromfenac Sodium 0.09 % ophthalmic solution

Hold on Admission
- peg 3350-Electrolytes (GOLYTELY) 236-22.74-6.74 gram suspension

Needs review for Admission
- albuterol HFA (PROAIR HFA) 90 mcg/actuation inhaler
- Bromfenac Sodium 0.09 % ophthalmic solution

Inpatient MedRec

New Orders

Select/Release Sign and Held Orders Select Pended Orders New Order Clear All Orders Next

Additional Admission Orders

Search Pref List

Inpatient

ampicillin 1 g in NaCl 0.9% 50 mL Remove
1 g, INTRAVENOUS, at 100 mL/hr, for 30 Minutes, EVERY 6 HOURS, First Dose Today at 1430, Until Discontinued

NaCl 0.9% iv infusion Remove
5-30 mL/hr, INTRAVENOUS, CONTINUOUS starting Today at 1430 Until Discontinued

Previous Edit Multiple Review and Sign

Close F9 Previous F7 Next F8

Order Sets click to open

Add Advanced



Inpatient MedRec

[Previous](#)

This tab displays a summary of all the actions taken in the previous tabs. After you have reviewed this summary, click "Sign" or "Sign & Hold".

Order Mode: Standard Providers Dx Association [Next](#)

Order (New) on Admission

ampicillin 1 g in NaCl 0.9% 50 mL

1 g, INTRAVENOUS, at 100 mL/hr, for 30 Minutes, EVERY 6 HOURS, First Dose Today at 1430, Until Discontinued

Remove

NaCl 0.9% iv infusion

5-30 mL/hr, INTRAVENOUS, CONTINUOUS starting Today at 1430 Until Discontinued

Remove

Order on Admission - Meds

- ampicillin 1 g in NaCl 0.9% 50 mL

- diazepam 10 mg tab(s) (VALIUM)

- NaCl 0.9% iv infusion

Don't Order on Admission

- albuterol HFA (PROAIR HFA) 90 mcg/actuation inhaler

- ALPRAZolam 1 mg/mL Conc

- aspirin, buffered (BUFFERIN) 325 mg buffered tablet

- Bromfenac Sodium 0.09 % ophthalmic solution

- Bromfenac Sodium 0.09 % ophthalmic solution

- Erythromycin-Benzoyl Peroxide (BENZAMYCIN) gel

- FLUoxetine 20 mg capsule

- FLUoxetine 20 mg capsule

- furosemide (LASIX) 20 mg tablet

- peg 3350-Electrolytes (GOLYTELY) 236-22.74-6.74 gram suspension

- sertraline (ZOLOFT) 100 mg tablet

- warfarin 7.5 mg Tab 7.5 mg, warfarin 5 mg Tab 5 mg

Save

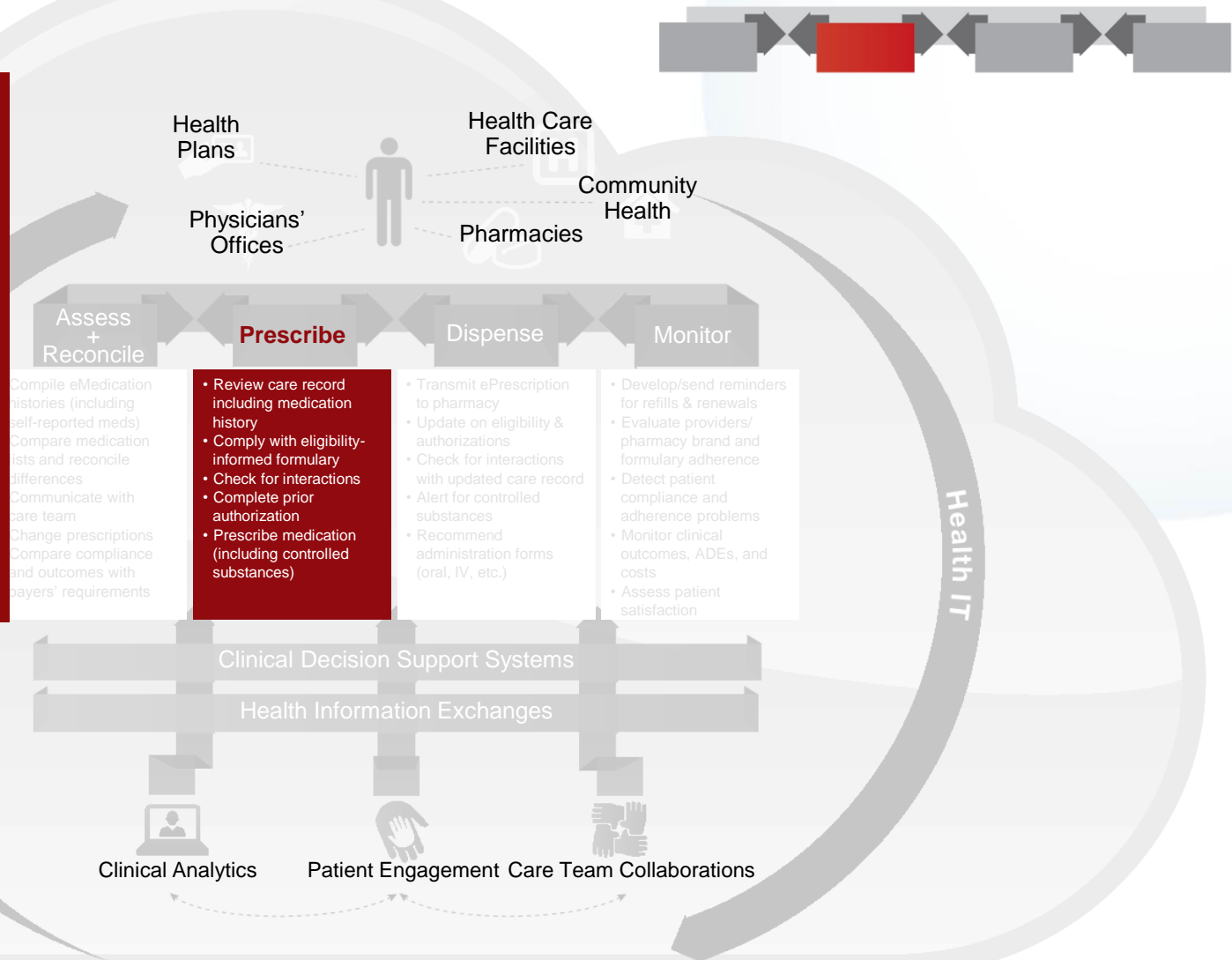
Sign All Orders Now

Cancel

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ANNUAL CONFERENCE & EXHIBITION

eMedication Management

- Review care record including medication history
- Comply with eligibility-informed formulary
- Check for interactions
- Complete prior authorization
- Prescribe medication (including controlled substances)



Formulary Check with Alternatives

Alternative Selection

RHINOCORT AQUA 32 mcg/actuation nasal spray: has alternatives that could be covered by your plan.

Not on formulary

RHINOCORT AQUA 32 mcg/actuation nasal spray Pharmacy Coverage Summary

Coverage for current selected plan: (OPTUMRX)

Plan	Formulary	Copay	Coverage
(OPTUMRX)	Not on Formulary	N/A	N/A

Formulary alternatives

Alternative	Details	Source	Formulary	Copay	Coverage
FLUNISOLIDE 25 MCG (0.025 %) ...		Pharmacy...	Preferred Level 2		
FLUTICASONE 0.05 % TOPICAL ...		Pharmacy...	Preferred Level 2		
FLUTICASONE 0.005 % TOPICAL...		Pharmacy...	Preferred Level 2		
FLUTICASONE 50 MCG/ACTUATI...		Pharmacy...	Preferred Level 2		
FLUTICASONE 0.05 % LOTION		Pharmacy...	Preferred Level 2		
AZELASTINE 0.05 % EYE DROPS		Pharmacy...	Preferred Level 1		
AZELASTINE 137 MCG NASAL S...		Pharmacy...	Preferred Level 1		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		
TRIAMCINOLONE ACETONIDE 0...		Pharmacy...	Preferred Level 2		

Load More...

FLUNISOLIDE 25 MCG (0.025 %) NASAL SPRAY Pharmacy Coverage Summary

Coverage for current selected plan: (OPTUMRX)

Plan	Formulary	Copay	Coverage
(OPTUMRX)	Preferred Level 2	N/A	N/A

Formulary Icon

☒ The medication is covered by the plan. No coverage restrictions will be applied.

☐ The medication is covered by the plan with restrictions. Review

Formulary Level

Preferred Level Higher preferred level is better.

On Formulary, Non-Preferred The medication is on the lowest level of the formulary.

Accept Alternative Continue With Original Order Cancel



Decision Support Alerts

Medication Warnings

Current Warnings

Group by: Importance Type Orders Collapse All Show Summary Show Legend

Type/Significance	Description	Override Reason/Comment
Very High		New (2) + Filtered (1)
Allergy/Cont Level 1	FLUTICASONE-Swelling. ADVAIR D	Hives, [dropdown] [icon]
Allergy/Cont Level 3	BUDESONIDE (No severity specified) Allergy Hives, Swelling. ADVAIR D	[dropdown] [icon] Remove
High		New (1)
Dup Therapy	Orally Inhaled Steroids ADVAIR DISKUS 250-50 mcg/dose DsDv, 2 TIMES DAILY budesonide 0.5 mg/2 mL nebulizer solution, 2 TIMES DAILY	[dropdown] [icon] Remove Discontinue
N/A		New (1) + Filtered (1)
Drug-Drug Severe Interaction	SALMETEROL / ITRACONAZOLE; KETOCONAZOLE Concurrent use of strong inhibitors of CYP P-450-3A4, such as itraconazole or ketoconazole, may result in systemic effects of salmeterol, including QTc prolongation, palpitations, and sinus tachycardia.(1) ADVAIR DISKUS 250-50 mcg/dose DsDv itraconazole 100 mg capsule	[dropdown] [icon] Remove Discontinue

Override Reason [dropdown] [icon] Override Warnings Cancel

Annotations:

- Allergy alert (points to Allergy/Cont Level 1)
- Duplicate therapy alert (points to Dup Therapy)
- Drug-drug alert (points to Drug-Drug Severe Interaction)

Gaps in Clinical Decision Support

- Incomplete information
 - Patient data missing
 - Vendor rules missing/erroneous
- Clinically insignificant alerts
 - Alert fatigue
- Advanced CDS
 - Pharmacogenomics



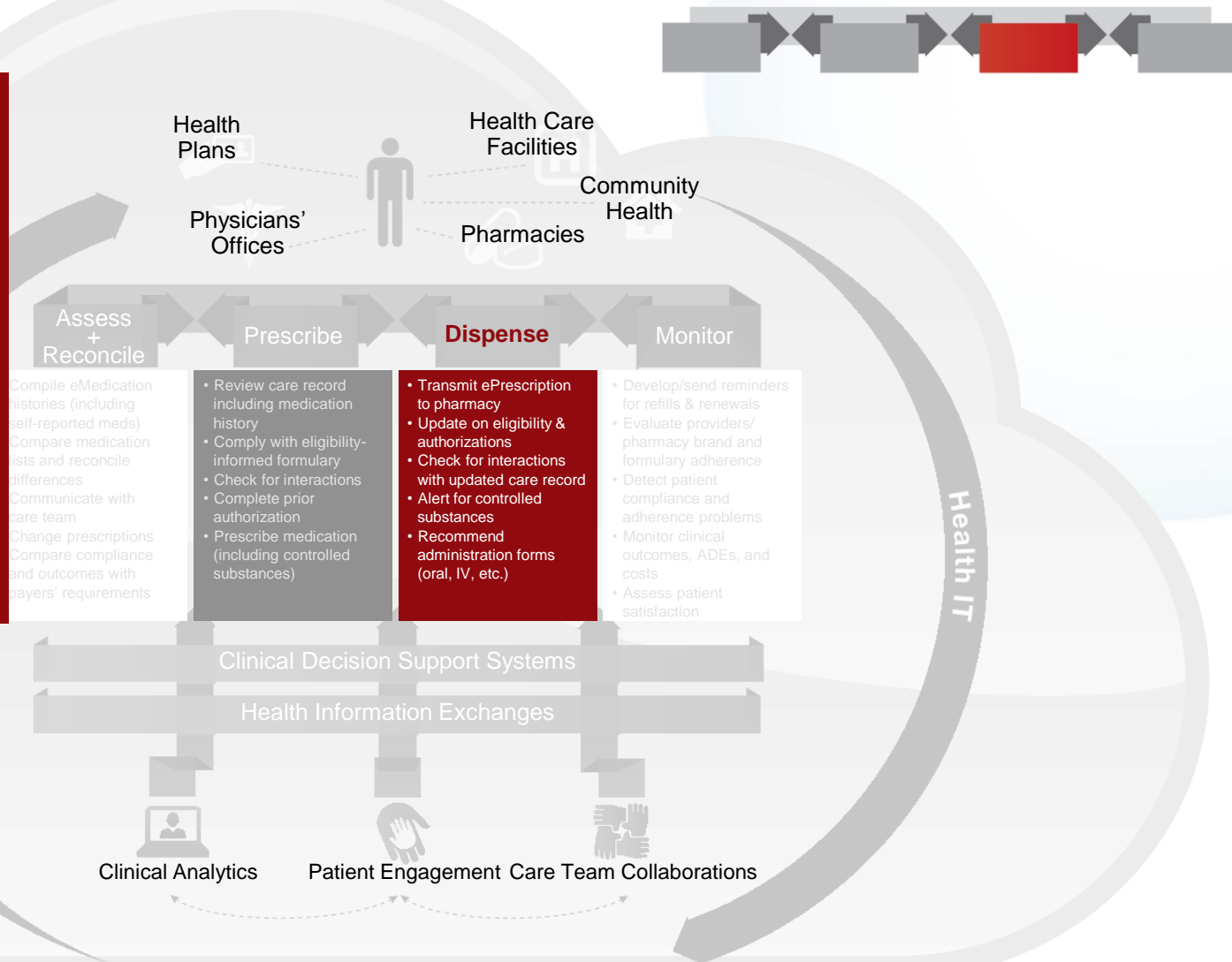
Gaps in ePrescribing

- Prior authorization
- Controlled substances (limited)
- Biologics/Specialty pharmacy
- Home care/infusion



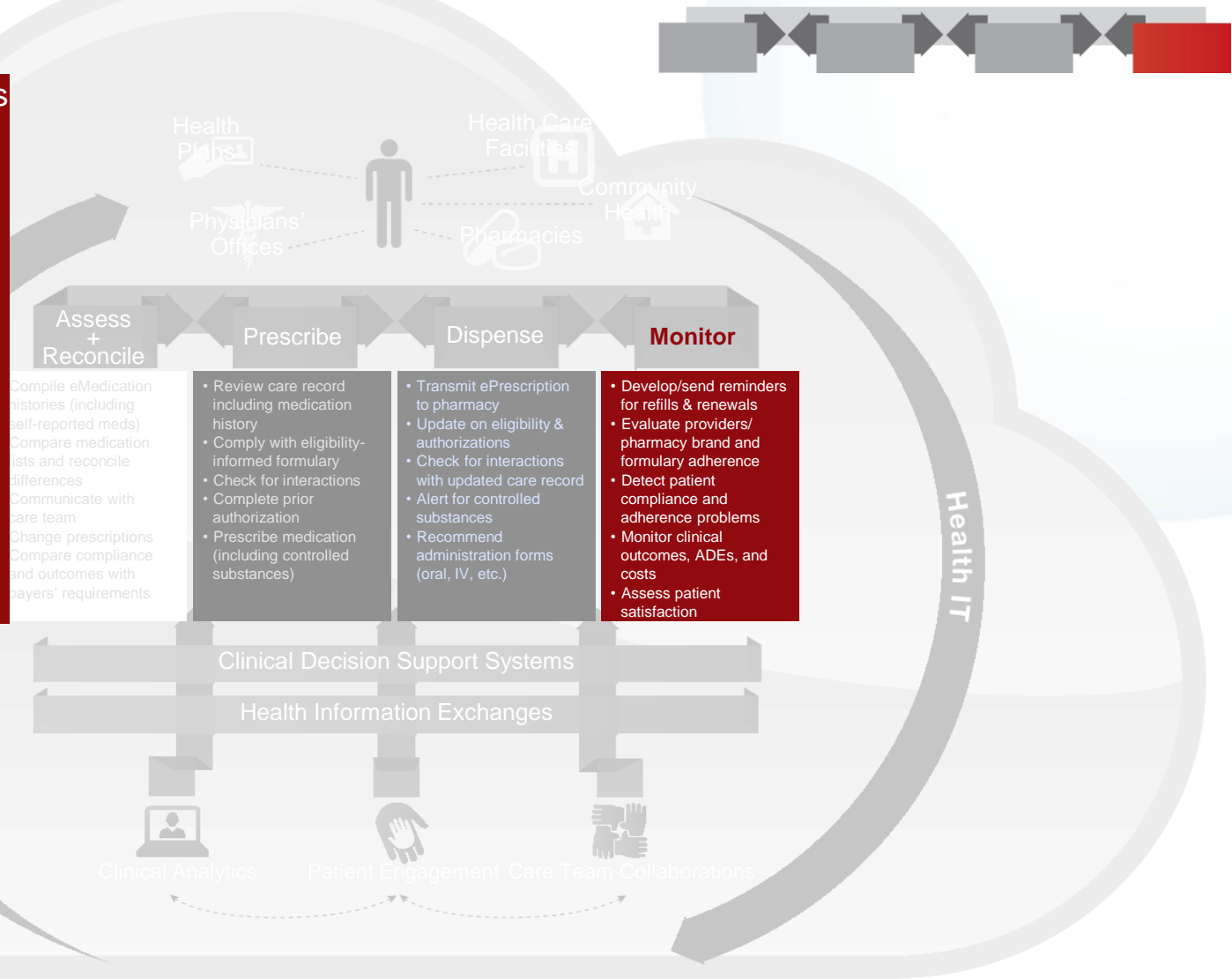
eMedication Management

- Receive ePrescription at pharmacy
- Update on eligibility & authorizations
- Check for interactions with updated care record
- Recommend administration forms (oral, IV, etc.)




eMedication Management

- Develop/send reminders for refills & renewals
- Evaluate providers/ pharmacy brand and formulary adherence
- Detect patient compliance and adherence problems
- Monitor clinical outcomes, ADEs, and costs
- Assess patient satisfaction



Patient Portal

MyChart ID: | MRN: | PCP: Stephen Avallone, MD

 **Cleveland Clinic**

Technical Support · 1.866.915.3383 · 216.444.1740 · mychartsupport@ccf.org

Welcome,

[Home](#) [FAQs](#) [Log Out](#)

Medication information

▼ My Medical Record

- Test Results
- Health Summary
- » Current Health Issues
- » **Medications & Renewal**
- » Allergies
- » Immunizations
- » Preventive Care
- Health Trends
- Hospital Admissions
- Letters

► My Family's Records


► Appointments

► Message Center

► My Health Resources

► Manage My Health Info

► My Preferences

 **Medications**

Click on **About This Medication** to see additional information regarding a medication.

If you have no refills left for a prescription, you may want to [request a renewal](#) of your medication from your physician. You will receive a MyChart message when the renewal request has been processed.

R_x MELOXICAM 7.5 MG TABLET

[About This Medication](#)

Instructions: Take 1 tablet by mouth once daily. take for 2 weeks, then as needed

Prescribed by David N Westerdahl, MD on 1/10/2013

[Request a renewal](#)

R_x RESTASIS 0.05 % OPHTHALMIC EMULSION


[About This Medication](#)

Instructions: Use 1 drop in both eyes twice daily. please dispense 3 month supply (6 trays)

Prescribed by Albert G Caruana, MD on 10/30/2012

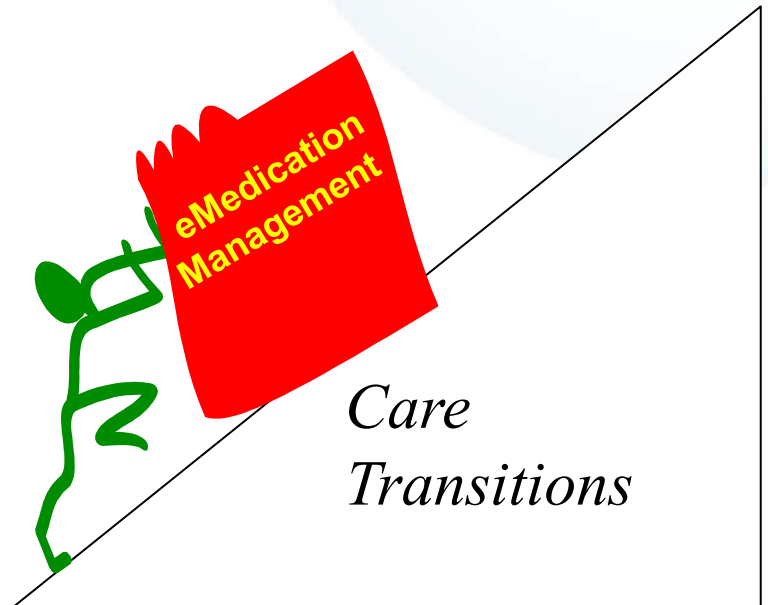
[Request a renewal](#)

Renewal request



Moving Forward

- Close the Gaps
- Opportunities to elevate medication management during Care Transitions to a higher level:
 - Patient engagement
 - Adherence reminders
 - Prior authorization

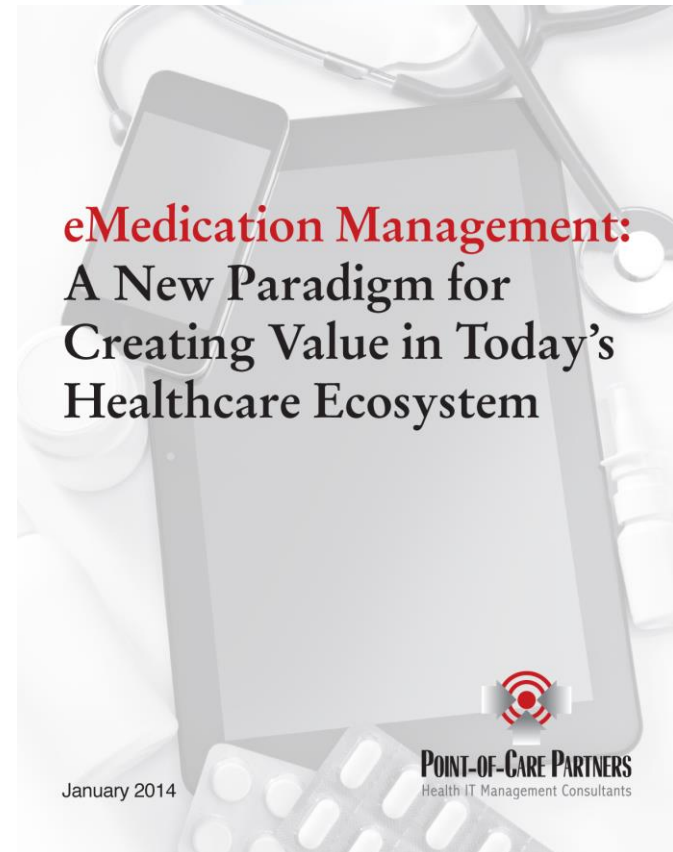


A Review of Benefits Realized for the Value of Health IT

Value Category	Care Transition Measures
Satisfaction	<ul style="list-style-type: none">• Improved patient-provider communication regarding changes to medications at each transition of care• Improved patient satisfaction with explanation of purpose medications and post-discharge instructions (HCAHPS Survey)
Treatment/Clinical	<ul style="list-style-type: none">• Reduction in medication discrepancies• Reduction in medication-related adverse events• Reduced rate of avoidable readmissions• Improved patient medication adherence
Electronic Information / Data	<ul style="list-style-type: none">• Improved sharing of medication history and active medications among providers across the continuum of care
Prevention and Patient Education	<ul style="list-style-type: none">• Better understanding of medications and improved self-management
Savings	<ul style="list-style-type: none">• Reduction in avoidable utilization of care and services post-transition

Resources

1. Coleman EA, Parry C, Chalmers S, Min SJ. The care transitions intervention: results of a randomized controlled trial. Arch Intern Med. 2006 Sep 25;166(17):1822-8.
2. Kwan et al.; Forester et al. as cited in ABIM Foundation (2009). Care Transitions Performance Measure Set.



http://www.pocp.com/PoCP_eMM_WP_Final_1_17_14.pdf

Questions?

For further information, please contact:

Frank J. Eidelman, MD, FRCPC, FAAAAI
Cleveland Clinic Florida
eidelmf@ccf.org

Michael R. Solomon, PhD, MBA
Point-of-Care Partners;
University of Phoenix
michael.solomon@pocp.com

