

# Challenges and Opportunities for Hospital Pharmacists



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# Objectives

- Describe the rationale behind the focus on value in healthcare
- Define population health
- Describe pharmacy services that provide value
- Develop a process for value-based formulary decisions

# What's Driving the Focus on Value?



<http://earthzebra.files.wordpress.com/2011/06/follow-the-dollar.png?w=490>, accessed 11/20/16

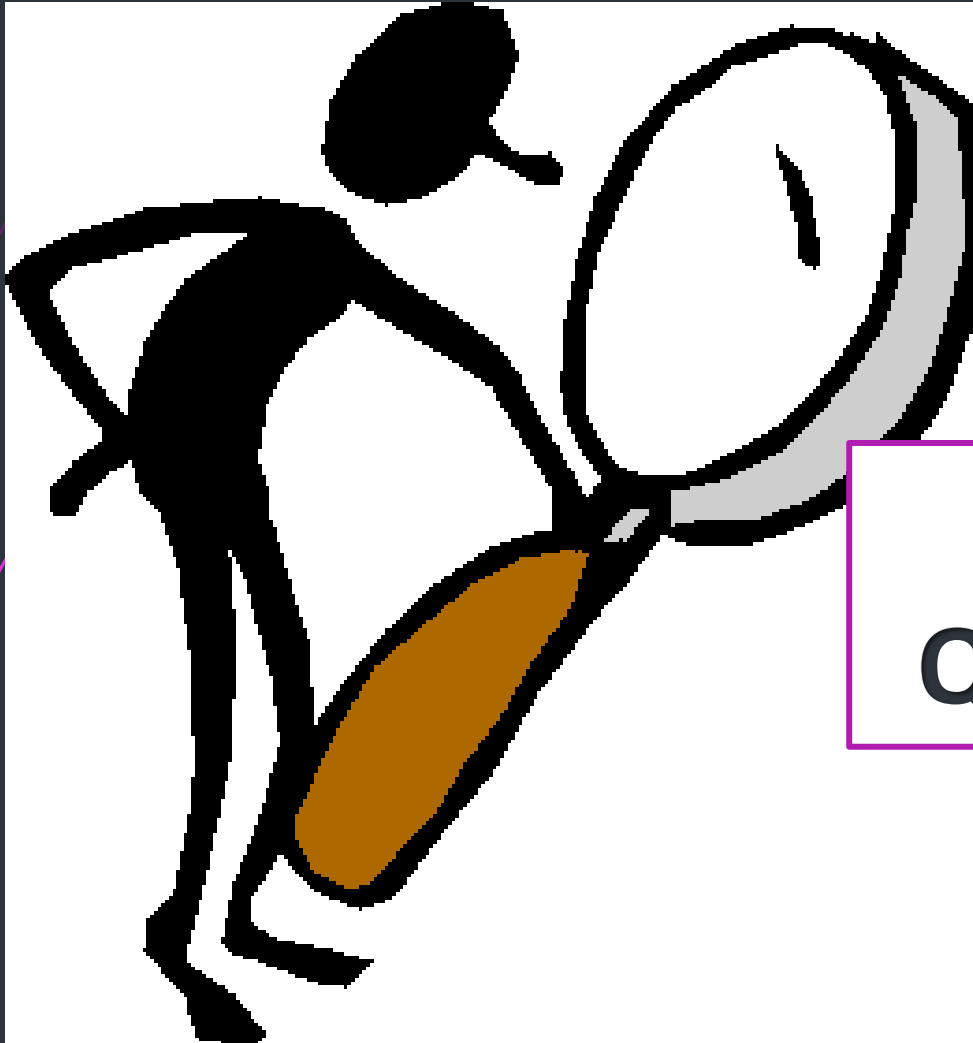
# Inefficiency in the US

- ▶ Payment for volume vs value (episodes of care vs health outcomes)
- ▶ Insufficient attention to health: prevention, primary care, health literacy, and long-term results
- ▶ Lack of information on costs, comparative effectiveness, quality and health outcomes

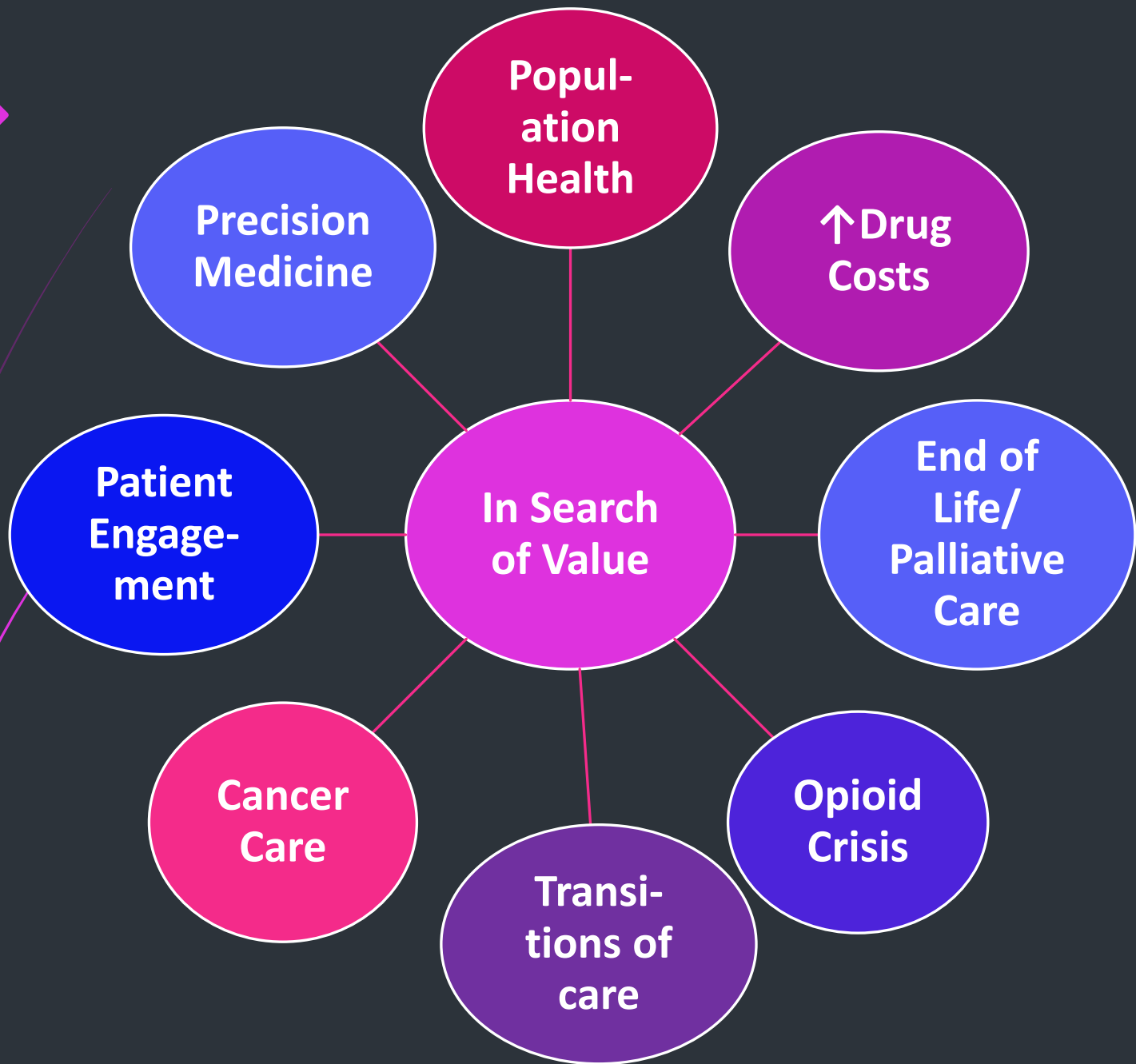
# Inefficiency in the US

- Scientific uncertainty about effectiveness and cost, especially of newer tests and treatments
- Administrative complexity:
  - Multiple forms, regimens, and requirements of different insurers
- Fragmentation of care
- Insufficient involvement of patients in decision-making (as in end-of-life care)

# What is Value?



**Value=**  
**Quality/Cost**



# Population Health

- Programs intended to improve health status of a population of patients
- Driven by payment reform to improve outcomes while lowering costs
- Focus on prevention, reducing readmissions and costs
  - Annual wellness visits
    - Medication evaluation
  - Transitions of care
  - Pre- and post-acute care
  - Palliative/End-of-Life care

Shane R, Deculus CL. P Population Health Management: Aligning incentives to transform care delivery. In: Zellmer WA, ed. Pharmacy forecast 2016-2020: strategic planning advice for pharmacy departments in hospitals and health systems. December 2015. Bethesda, MD: ASHP Research and Education Foundation: 9-12.

[www.ashpfoundation.org/pharmacyforecast](http://www.ashpfoundation.org/pharmacyforecast)



# Population Health Pyramid

## Characteristics

- Super-utilizers
- Poly-chronic, frail, elderly, urban poor
- Frequent hospitalizations, emergency visits
- Psychosocial and socioeconomic barriers
- Costs make up 45 – 50 percent

- Limited and stable chronic conditions
- At risk for procedures
- Costs make up 30 – 40 percent

- Healthy
- Minor health issues
- Costs make up 10 – 20 percent

## Population/Risk

5%  
High Risk

35% – 40%  
Medium Risk

50%  
Low Risk

## High-Impact Care Priorities

- Care coordinators (RNs or social workers)
- Address psychosocial and non-clinical barriers
- Community resources navigation
- Intensive transition planning
- Frequent one-on-one interaction

- Reduce practice variation
- Systematic care and evidence-base medicine
- Team-based, coordinated care
- Scalable care team
- Practice at top of license

- Focused coordination and prevention
- Movement toward virtual, mobile, anytime access
- Convenience is critical

# Cancer Care

## Population Health Needs

- Preventing Readmissions
  - All-cause readmission for cancer pts: 14.6%
- Drug-Drug Interactions (DDIs) in 72% of oncology pts
  - 2% of hospitalizations in cancer pts due to DDI
- Adherence
  - Only 64% to 88% of breast cancer patients are adherent
  - Non-adherent chronic myelogenous leukemia pts have poorer outcomes, higher costs, and more treatment resistance

# Cancer Care

## “Inappropriate medication use among older patients with cancer”

- N=248 pts, average age=79.9 yrs
- Geriatric oncology assessment and medication reconciliation by pharmacist
- 87% had solid tumors
- Results
  - Average number of medications: 9.23/pt
  - Inappropriate medication use based on Beers criteria: 40%
  - Excessive polypharmacy: 43%

# Cancer Care

## Preventing Harm with New Therapies

### Immunotherapy delayed reactions


- ▶ Talimogene for melanoma
  - ▶ First oncolytic viral therapy-modified herpes simplex
  - ▶ Indication: inoperable melanoma
  - ▶ Pseudoprogression at 3 month post treatment-increased size of lesion associated with response to therapy
  - ▶ Employee protection
- ▶ Ipilimumab for melanoma
  - ▶ Colitis 5 weeks and hepatitis 6-12 weeks after therapy

# American Society of Clinical Oncology Choosing Wisely®

- ▶ Do not use cancer-directed therapy for solid tumor patients with the following characteristics:
  - ▶ **low performance status (3 or 4),**
  - ▶ no benefit from prior evidence-based interventions,
  - ▶ not eligible for a clinical trial,
  - ▶ no strong evidence supporting the clinical value of further anticancer treatment
- ▶ Why target chemotherapy use at the end of life?
  - ▶ Compared with patients receiving standard care for metastatic NSCLC, patients receiving early palliative care had **less aggressive care** at end of life but **improved quality of life** and **longer survival** (Temel, et al. NEJM 2010)

# Determining Performance Status: Eastern Cooperative Oncology Group (ECOG) Score

- Which best describes the patient's performance status?
  - Fully active, able to carry on all pre-disease performance without restriction (ECOG 0)
  - Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature (ECOG 1)
  - Ambulatory and capable of all selfcare but unable to carry out any work activities. Up and about more than 50% of waking hours (ECOG 2)
  - Capable of only limited self-care, confined to bed or chair more than 50% of waking hours (ECOG 3)
  - Completely disabled. Cannot carry on any self care. Totally confined to bed or chair (ECOG 4)



# Cedars-Sinai Medical Center (CSMC) Chemotherapy Stewardship

- Reducing harm at end of life
  - ECOG required on chemotherapy (oral and IV) orders
  - Pharmacist to identify orders for chemotherapy where ECOG>2
  - Case referred for MD review and discussion prior to initiation.

# Oncology Pharmacist Specialist

## Scope of Practice

- Evaluation of orders in context of patient
- Symptom management and supportive care
- Formulary management
- Guideline and order set development
- Cost-savings initiatives
- Drug shortage management
- Safe sterile compounding
- Medication adherence
- Research support
- Policy development
- Medication reconciliation
- Medication safety
- Maintenance of oncology medication–related electronic health records
- Clinician education
- Patient/Family Education
- Palliative/End of Life Care



# U.S. Healthcare Payment Reform



[https://images.search.yahoo.com/yhs/search;\\_ylt=AwrTceE8eDBYx2EAfognnIIQ;\\_ylu=X3oDMTE0MG00dGlibGNvbG8DZ3ExBHBvcwMxBHZ0aWQDUFJEQkNLMl8xBHNIYwNzYw--?p=Payment&fr=yhs-mozilla-001&hspart=mozilla&hsimp=yhs-001#id=18&iurl=http%3A%2F%2Fsuperiornv.com%2Fwp-content%2Fuploads%2F2014%2F04%2FMake-a-payment-on-your-auto-insurance-las-vegas.jpg&action=close](https://images.search.yahoo.com/yhs/search;_ylt=AwrTceE8eDBYx2EAfognnIIQ;_ylu=X3oDMTE0MG00dGlibGNvbG8DZ3ExBHBvcwMxBHZ0aWQDUFJEQkNLMl8xBHNIYwNzYw--?p=Payment&fr=yhs-mozilla-001&hspart=mozilla&hsimp=yhs-001#id=18&iurl=http%3A%2F%2Fsuperiornv.com%2Fwp-content%2Fuploads%2F2014%2F04%2FMake-a-payment-on-your-auto-insurance-las-vegas.jpg&action=close)

# A Journey Through the Bundle Jungle

## 48 Clinical Bundles Proposed

**Goal: Determine whether bundled payments  
↓ costs and maintain/improve quality**





# Cardiac Care

Effective 7/1/17, 98 areas

- Includes medical as well as surgical services with goal of coordination among all health providers: hospital, MDs, SNFs, home health
  - Coronary Artery Bypass Graft (CABG)
  - Acute Myocardial Infarction (AMI)
- Episode of care plus 90 days post-discharge
- Metrics include:

30 day risk-adjusted mortality	ED Visits
Excess days in hospital post MI	Patient satisfaction
1 year mortality	Care deferred after 90 days
Functional performance changes	

# Patient-Centered Care Models

## Focus on Team-Based Care

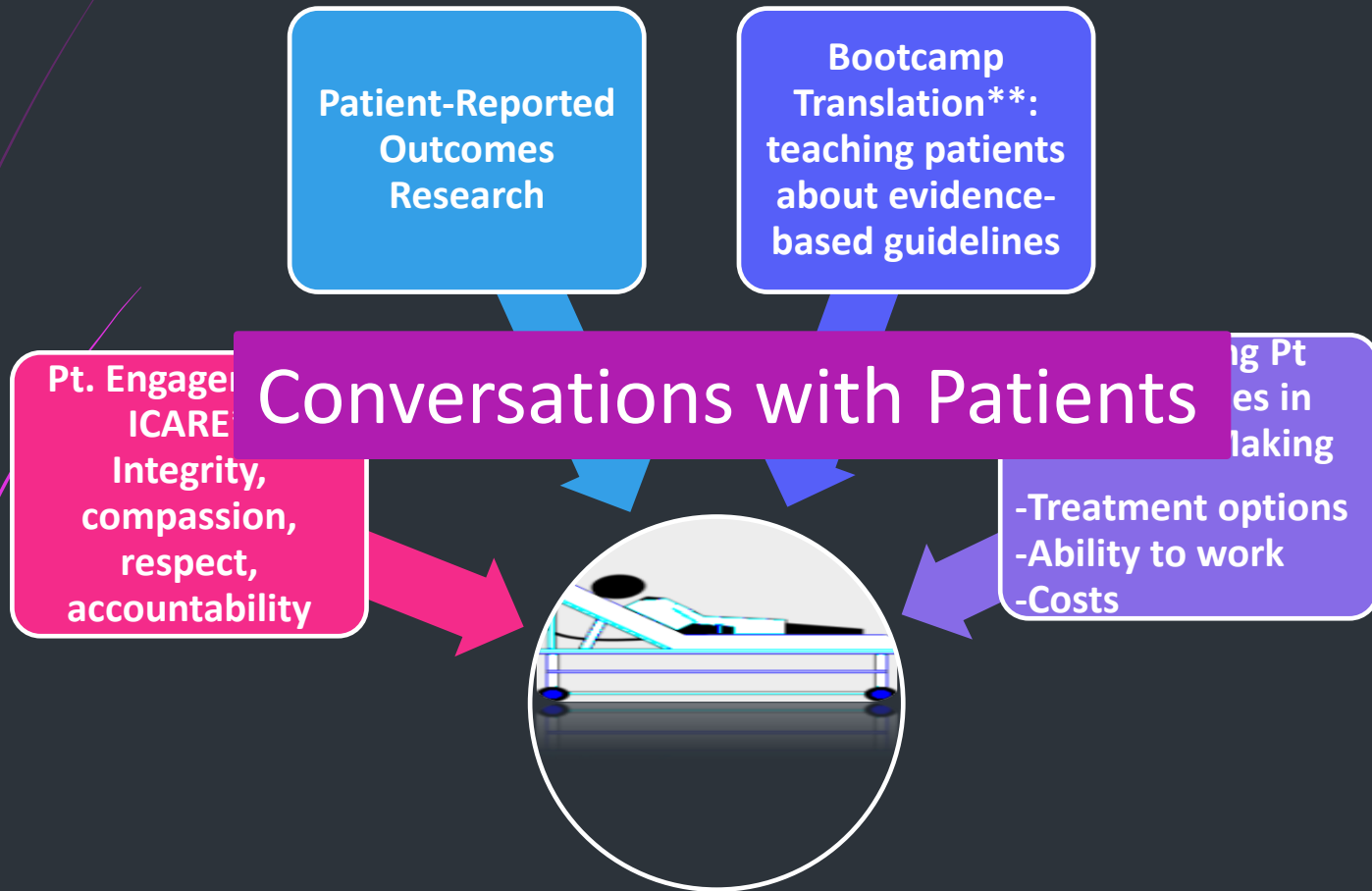


# Healthcare Consumerism



<http://ihearthealthcare.com.files.wordpress.com/2012/07/crop56.jpg>, accessed 11/20/16

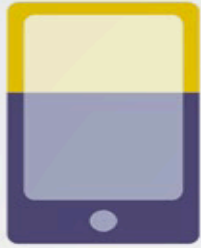
# Patient Engagement Imperative



\*<https://muse.jhu.edu/chapter/1789675>, accessed 11/1/16

\*\*<http://content.healthaffairs.org/content/35/4/613.abstract>, accessed 11/22/16

# Patient Engagement: Digital Health



**63%**

of adult cell owners  
use their phones  
to go online

- Has doubled since 2009
- 34% mostly go online using their cell phone
- 21% do most of their online browsing using their mobile phone—and not some other device such as a desktop or laptop computer



**69%**

of U.S. adults track a  
health indicator like  
weight, diet, exercise  
routine or symptom

- Half track “in their heads”
- One-third keep notes on paper
- One in five use technology to keep tabs on their health status



**35%**

of U.S. adults have  
gone online to figure  
out a medical condition

- Of these, half followed up with a visit to a medical professional

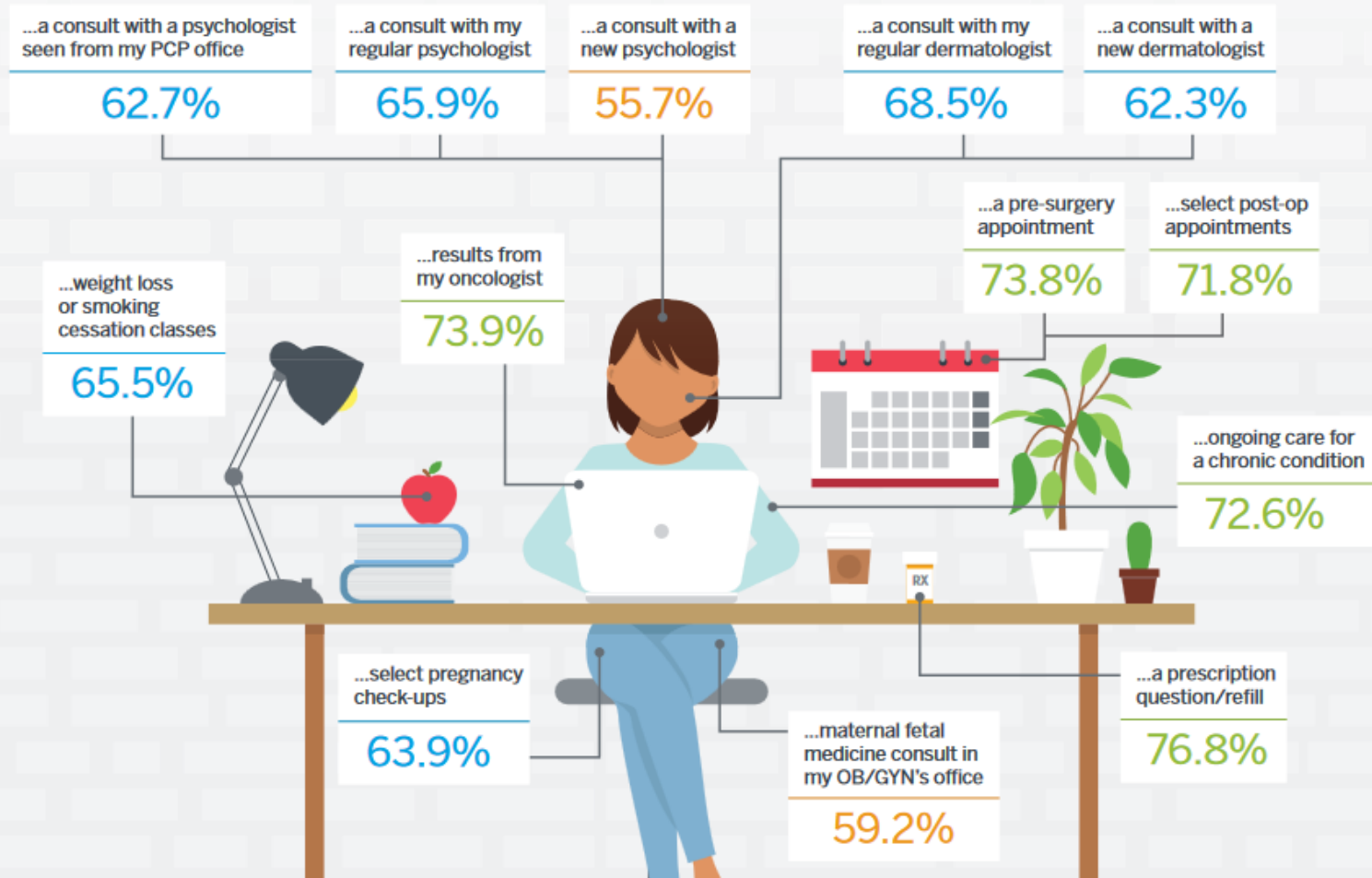


**39%**

of U.S. adults  
provide care for  
a loved one

- Up from 30% in 2010
- Many navigate health care with the help of technology

# % of Consumers Ready for Virtual Visits







## DIAGNOSIS EXPLANATION

2 hr | \$150.00

[Book Now](#)

## WHAT TO EXPECT

2 hr | \$150.00

[Book Now](#)

## TREATMENT MANAGEMENT

2 hr | \$150.00

[Book Now](#)

Founded in 2016 by an oncology pharmacist who completed training at MD Anderson

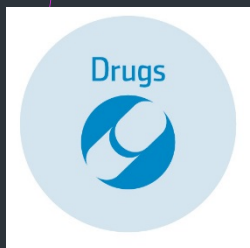
# Healthcare Challenges



- Cost of some drugs jumped as much as 3,600% over 2 years

<http://www.aha.org/advocacy-issues/drugpricing/index.shtml>, accessed 11/3/16  
<https://www.ama-assn.org/ama-supports-changing-fundamentals-drug-pricing>,  
accessed 11/3/16

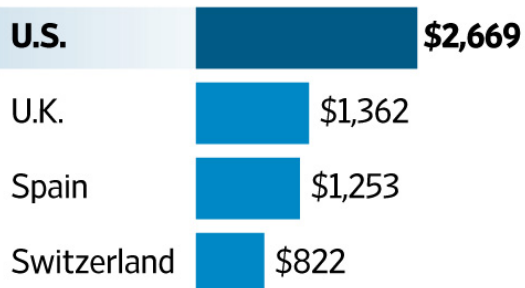
# Who Pays the Most for Medications?



## Humira

Rheumatoid arthritis  
28-day supply

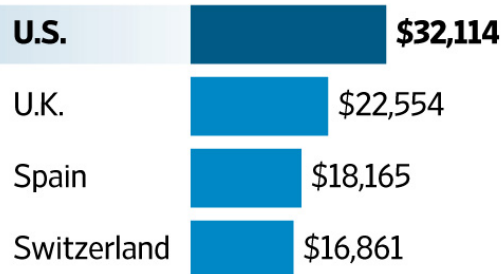
Developed and sold in U.S. by AbbVie,  
spun off by Abbott Laboratories in 2013



## Harvoni

Hepatitis C  
four-week supply

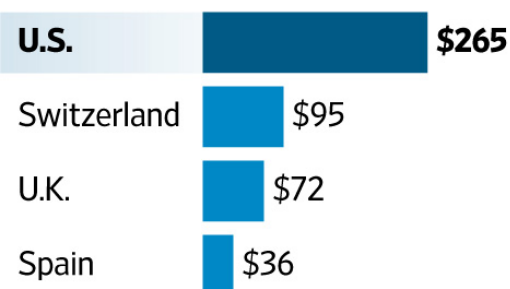
Developed and sold in the U.S. by Gilead  
Sciences. It was approved by the FDA in 2014



## OxyContin

Pain  
30-day-plus supply

Sold by Purdue Pharma, generic versions  
marketed by a variety of companies



# What an IPHONE could cost if it was a medication

28



Percent increase of drug	Cost of an iPhone
50% increase on average by Valeant Pharmaceuticals 2015	\$823.50
91.5% increase in doxycycline in 2014	\$50,755.05
529.9% increase in omeprazole in 2015	\$291,464.10



**500% Price**



**\$600**

- **269 drugs with >50% price increase since 2009**
  - **117 of these have increased by at least 100%**, *Business Insider Sept. 8, 2016*
- Biogen raised the price of its **Avonex drug for multiple sclerosis 21 times over a decade** despite steadily falling prescription demand. *WSJ Oct 5, 2015*
- **Mylan Price Increases**
  - **Mylan Tied Executive Pay to Aggressive Profit Targets**, *WSJ September 1, 2016*
  - **542%** increase for ursodiol, a generic medicine used to treat gallstones.
  - **444%** increase for metoclopramide, a generic drug for GI reflux, *statnews.com June 10, 2016*

# Specialty Pharmacy

Hemolytic  
Uremic  
Syndrome  
\$669,000/year

Multiple  
Sclerosis  
\$63,000/year

Cancer  
\$150,000/year

Orphan Drugs  
>\$300,000/  
year

Inflammatory  
Conditions  
\$24,000/  
year

Hepatitis C  
\$84,000/course

Autoimmune  
Disorders  
\$70,000/year

**61 Orphan Drugs  
approved in past  
5 years**

# Orphan Drugs

31



What are they?

- Drugs for disease states affecting *<200,000 people or ultra-orphan <10,000*
  - 7 year exclusivity, tax credits, waived fees
- **Gaucher's Disease: \$300,000/year**
- **Paryoxysmal nocturnal hemoglobinuria: \$440,000/year**
- **Spinal muscular atrophy: \$750,000 first year (nusinersen)**



# Value-Based Inpatient Formulary Framework

32

## Assess Clinical Evidence

- ☐ Superiority to existing therapies
- ☐ Comparison to existing therapies
- ☐ Level of evidence
- ☐ Endpoints measured in trials
- ☐ Resolves or prevents condition for admission
- ☐ Improves function or alleviates symptoms

## Assess Safety/Tolerability

- ☐ Black Box Warnings and/or REMS
- ☐ Harmful drug interactions
- ☐ Incidence of discontinuation due to ADEs
- ☐ Requires significant lab monitoring
- ☐ Requires ICU or cardiac monitoring
- ☐ Risk in elderly or special populations
- ☐ Available for <1 year

## Cost Considerations

- ☐ Cost/day vs. cost/treatment course vs. cost/QALY
- ☐ Long term cost-effectiveness?
- ☐ Annual budget impact based on estimated volume
- ☐ Patient out-of-pocket costs
- ☐ Costs for any required lab monitoring



# Value-Based Inpatient Formulary Framework

33

## Assess Clinical Evidence

- ☐ Number Needed to Treat
- ☐ Confidence intervals
- ☐ Relative Risk Reduction vs. Absolute Risk Reduction
- ☐ New Drugs: FDA Advisory panel assessment

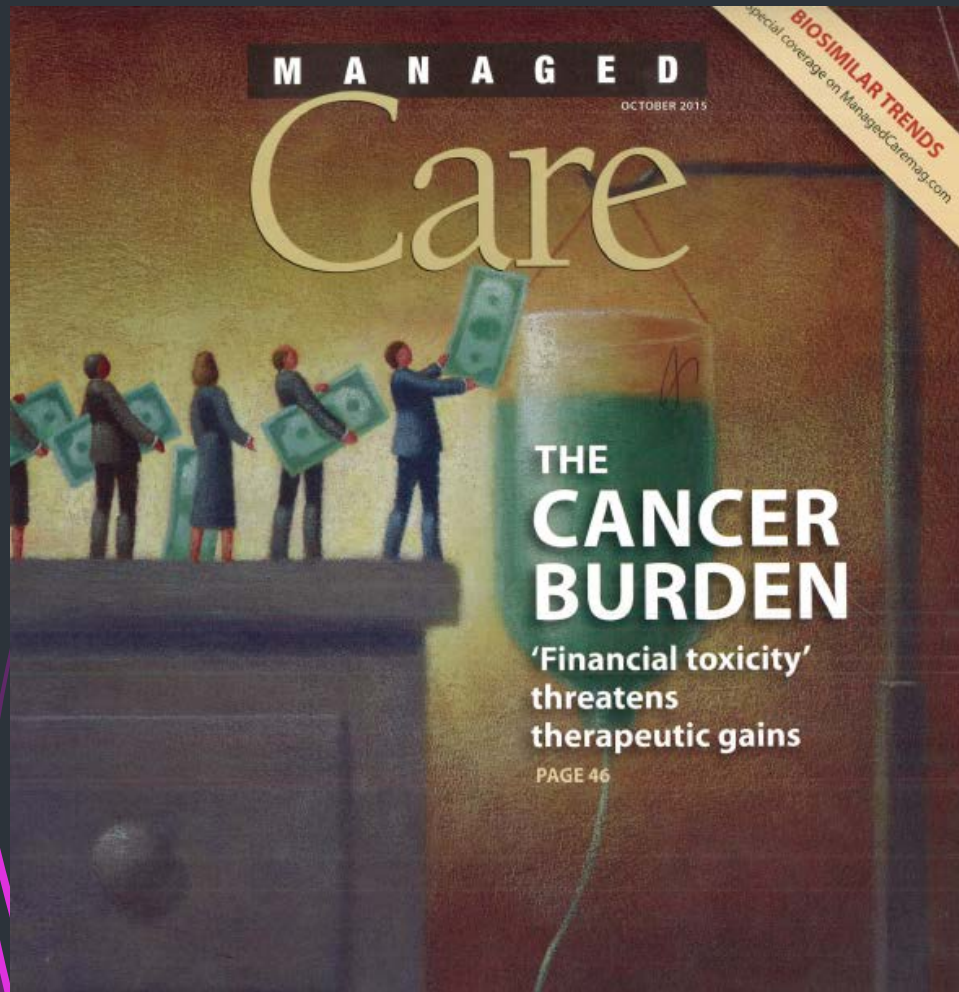
## Site of Care Considerations

- ☐ Is inpatient administration required?
- ☐ Will insurance cover continued doses if needed?

## Monitoring Utilization

- ☐ Pharmacist intervention for usage outside of approved criteria
- ☐ Concurrent physician champion review
- ☐ Retrospective evaluation

# Value in Cancer Care



U.S. cost of oncology medicines in the  
↑\$15.9 billion or  
72% over past 5  
yrs.

Financial Toxicity:  
COST\* Measure  
correlated with  
Health-Related  
Quality of Life

\* Comprehensive Score for Financial Toxicity

<https://www.ncbi.nlm.nih.gov/pubmed/27716900>, accessed 11/30/16

# Value-Based Formulary Management in Oncology

- Development of a standard definition of a “meaningful outcome” for new drugs
  - Minimum 25% improvement in baseline median overall survival using the current standard of care
- ASCO Value Framework: Clinical Efficacy+Toxicity and Cost
- Indication-based pricing for cancer drugs based on Memorial Sloan-Kettering model
  - **Cost per per year of life gained: Nab-paclitaxel**
    - Metastatic breast cancer** improvement in median survival : 0.18 year  
Cost per year of life gained: **\$145,000**
    - Non-small cell lung cancer**: improvement of 0.08 year  
Cost per year of life gained: **\$400,000**

<http://www.wsj.com/articles/new-push-ties-cost-of-drugs-to-how-well-they-work-1432684755>. accessed 1/28//16.

<http://jama.jamanetwork.com/article.aspx?articleid=1915075> accessed 1/28/16

<http://ascopubs.org/doi/full/10.1200/JCO.2016.68.2518?trendmd-shared=0>, accessed 11/24/16

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# CEDARS-SINAI MEDICAL CENTER

## Implication for pharmacy operation:

Complexity	Weight-based dosing/Calculation required?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Laboratory results review prior to each dose	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Special monitoring or observation (extravasation)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Special preparation (For compounded agent only)	Low-protein binding 0.2-1.2 micron in-line filter required?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Any special ancillary supplies (e.g. non-PVC bag, safety-shielded needles) or supplies not currently on standard hospital supplies?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Ambulatory infusion pump (CADD pump)	
	Preparation in BSC-II or better?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Any stability issue (e.g. < 1 hour after preparation)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Any potential compounding issue? If yes, describe issue: _____	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	<input checked="" type="checkbox"/> Single-use vial <input type="checkbox"/> Multi-dose vial	
Storage	Required refrigerator or freezer storage?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	Is the requested drug a controlled substance drug?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
FDA/SMP list?	Look-Alike drug names?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
	High-Alert medication list?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
	"DO NOT CRUSH" list?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No



# CEDARS-SINAI MEDICAL CENTER

## Value of Care Assessment (ADVANCED DISEASE)

Trabectedin vs. Dacarbazine for metastatic liposarcoma or leiomyosarcoma after failure of conventional therapy (Phase III)

### SECTION 1: CLINICAL BENEFIT

	EFFICACY ELEMENTS				BONUS POINT				NCCN evidence block ESQCA score:
	HR for death	Median OS	Median PFS	RR	Tail of the curve	Palliation	QoL	Treatment free interval	
Trabectedin	NR	12.4 mo.	4.2 mo	9.9 %	<input type="checkbox"/> OS <input checked="" type="checkbox"/> PFS	NR	NR	NR	N/A
Dacarbazine	NR	12.9 mo.	1.5 mo.	6.9%	<input type="checkbox"/> OS <input type="checkbox"/> PFS	NR	NR	NR	N/A
Summary	CLINICAL BENEFIT ASSESSMENT: <input type="checkbox"/> HIGH (HR for death or median OS benefit) <input checked="" type="checkbox"/> MEDIUM <input type="checkbox"/> LOW Quality of evidence: Level 1								

### SECTION 2: TOXICITY

	REPORTED TOXICITIES					NCCN "S" score
	Grade 1 and 2 < 10%	Grade 1 and 2 ≥ 10%	Grade 3 and 4 < 5%	Grade 3 and 4 ≥ 5%	Emetogenicity	
Trabectedin	0	16	7	9	<input type="checkbox"/> High <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Low/Minimal	N/A
Dacarbazine	4	12	7	3	<input checked="" type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low/Minimal	
Summary	TOXICITY ASSESSMENT: <input checked="" type="checkbox"/> HIGH <input checked="" type="checkbox"/> MEDIUM <input type="checkbox"/> LOW Seven treatment related deaths (2.1%) were reported in Trabectedin group, compared to none from Dacarbazine group.					

# Precision Medicine

- Precision Medicine Initiative: 2015 Presidential State of the Union Address
  - “The mission of the National Institutes of Health (NIH) is to “enable a new era of medicine through research, technology, and policies ...toward development of individualized care.”
- Population health goal: Reduce variation in care
- Precision Medicine goal: Leveraging understanding about molecular basis of diseases to support treatment decisions for patient subgroups
- >140 medications with pharmacogenomic labeling
- Clinical Pharmacogenetics Implementation Consortium (CPIC) has developed 17 guidelines for medications/classes



# Precision Cancer Medicine

- ▶ Sequencing the entire genome of a tumor and corresponding germline of an individual patient with cancer costs <\$5000 (US)
- ▶ Molecular matching of treatments possible
- ▶ Evidence suggests that a biomarker-based selection of patients, even in the phase 1 setting, is associated with significantly better outcomes.<sup>1</sup>
- ▶ Therapies that matched a patient's molecular aberration had a 27% response rate and a median overall survival (OS) of 13.4 months compared with a 5% response rate and a median OS of 9 months among patients with no matched treatment.<sup>2</sup>

1. <http://jamanetwork.com/journals/jamaoncology/fullarticle/2527365>, accessed 1/28/17

2. <http://clincancerres.aacrjournals.org/content/18/22/6373.long>, accessed 1/28/17



# Opioid Stewardship

- ▶ National focus on opioid epidemic and harm
  - ▶ 32% misuse of opioid prescriptions
  - ▶ Initiation of opioids in hospitals has contributed to epidemic
- ▶ Overuse of opioids in health-systems due to focus on pain
  - ▶ 5th vital sign
  - ▶ Joint Commission requirements
  - ▶ Patient satisfaction
- ▶ Quality, safety and cost benefits of reducing opioid use
  - ▶ ↓ adverse drug events (ADEs): respiratory depression, falls
  - ▶ Reduced length of stay
  - ▶ ↓\$\$\$ across the continuum of care: overuse, addiction, ADEs

# Opioid Stewardship Goals

- Minimize unnecessary opioids in order sets
- Discourage use of opioids for MILD pain and use other modalities and medications
- Minimize use of long acting opioids
- Implement automatic stop orders for opioids
- Standardize & reduce opioid duration of therapy prescriptions at discharge, i.e., 5 days
- Healthcare provider education (MD, RNs, Pharmacist)

# Opioid Stewardship Goals

- Develop and implement pain mgmt. best practices for specific populations, e.g., spinal pts, orthopedics, etc
- Implement multi-modal analgesia
  - Gabapentin + oral acetaminophen
  - COX-2 inhibitors
- Evaluate opportunities associated with PCA/PCEA dosing and opioid monitoring
- Develop program to reduce chronic opioid use

# Patient-Centered Model for Pharmacy Practice

Traditional  
Focus

Resolving the  
Acute Care  
Episode

Medication  
Order  
Management

Patient -  
Centered  
Focus

Why is the  
patient here?  
What do they  
need?

Comprehensive  
Medication  
Management

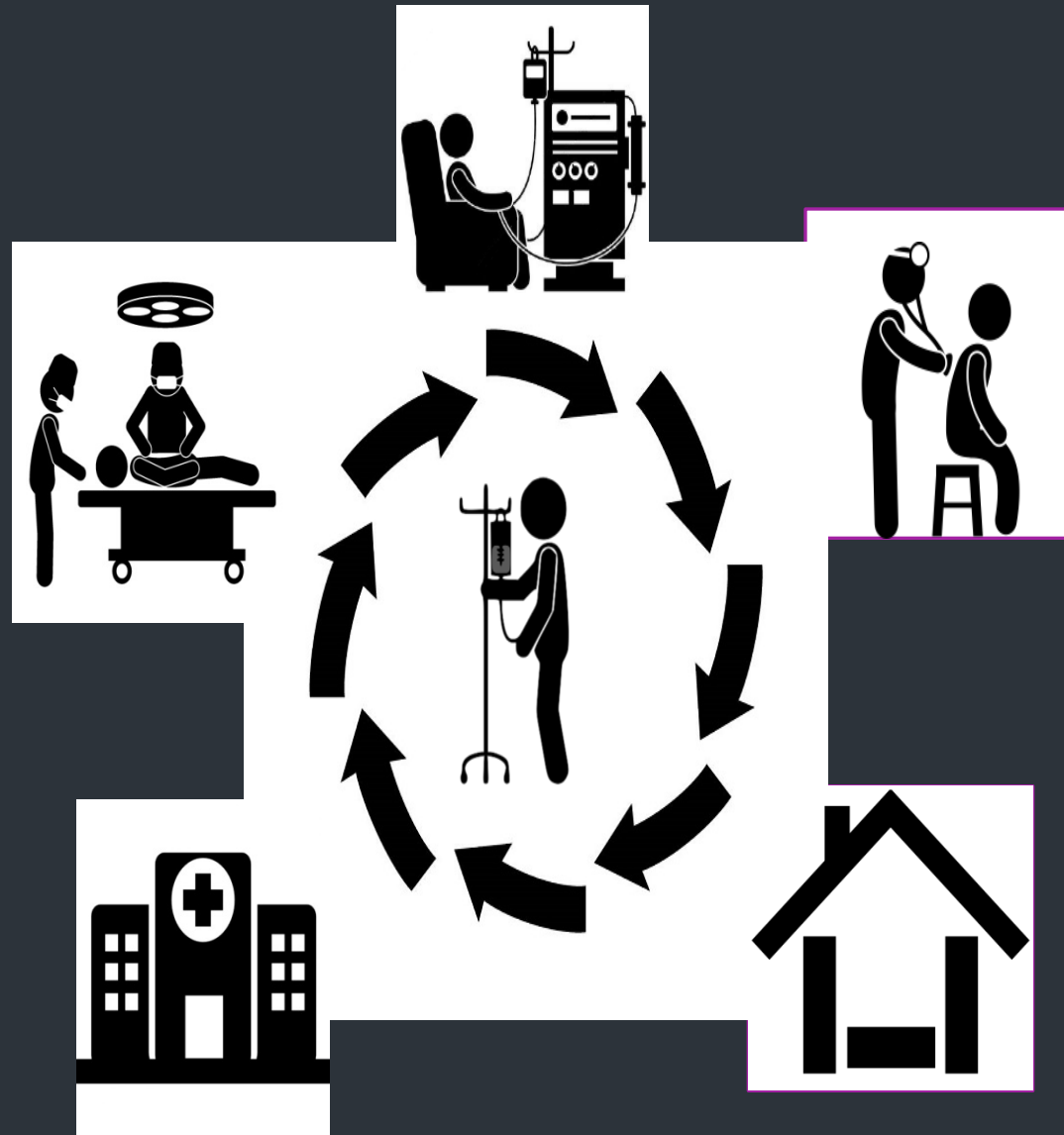
# Comprehensive Medication Management (CMM)

- **Evidenced-based clinical services**
  - Decrease costs and improves chronic disease outcomes by ensuring optimal prescribing, monitoring, education, and use of medications that engages physicians, pharmacists, and patients
- **Population:** Complex high-risk patients
- **Improved outcomes:** quality of life, access, patients' health literacy, physician and team satisfaction and continuity of care

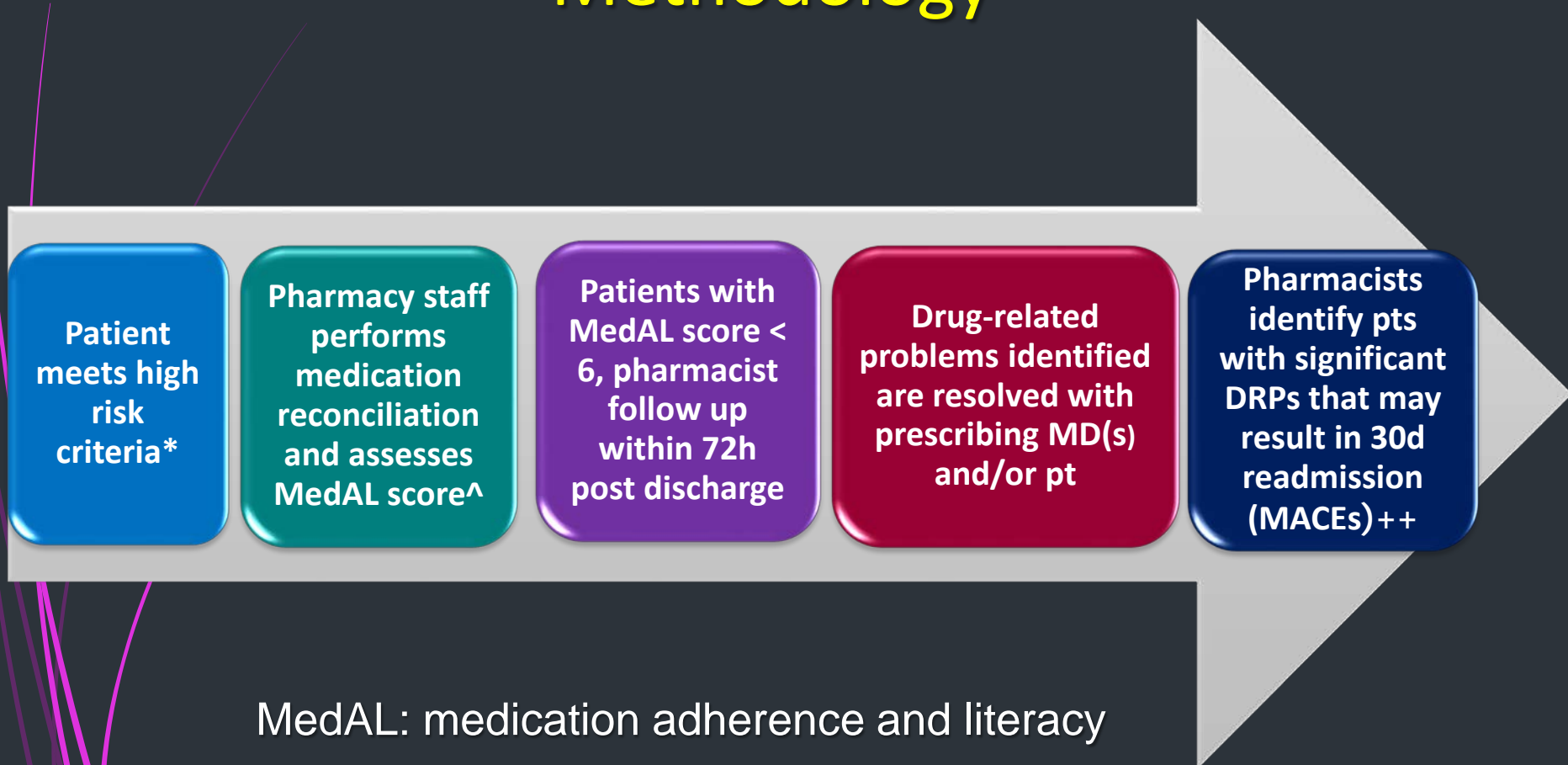
# Examples of CMM Results

- **Pharmacist-Led Anticoagulation Center:**
  - 53% decrease in admissions and 41% less emergency department visits
- **Senior Transitions of Care Program**
  - 60% decrease in 30-day readmissions and annual cost avoidance (inpatient and outpatient) was \$503,278.
- **Heart Failure Continuum of Care Network**
  - 50% reduction in readmissions compared to patients that were not enrolled (12 percent vs. 24 percent,  $p=0.005$ )

# Risks Across the Continuum of Care



# CSMC Safe Medication Transitions Methodology



\*High risk criteria: > 10 chronic meds, on anticoagulant, diagnosis of CHF w/ EF < 40%, pneumonia

^MedAL score: CSMC algorithm to assess patient's medication adherence and medication literacy

++Physician validation of likelihood of readmission



# Pharmacy Impact on Reducing Readmissions

- Transitions of care services established 2010
- Preventing **Medication-related Acute Care Episodes (MACES)** began as a leadership goal in 2014
- Pharmacists contacted high risk patients within 72 hours after discharge
- Results
  - Relative reduction in readmissions by 25%
  - Absolute reduction in readmissions by 5.4%
  - Cost-effectiveness analysis proved this program to be **cost-effective** through 1000 simulations

# Safe Medication Transitions Results

- 7.4 medication history errors/high risk pt on admission
- Pts with low and intermediate adherence have a 2.54-fold higher odds of readmission compared those with high adherence ( $p=0.05$ ).
- 4.3 drug-related problems/patient post-discharge
  - Approximately 50% of problems are pt. related and 50% are prescriber-related

# Preventing Medication-Related Acute Care Episodes (MACES)

## Multi-Center Quality Improvement Project

- **Objective:** Assess the impact of pharmacists' post-discharge follow-up on high risk patients
- **Primary Outcome:** # drug-related problems and % (MACES prevented by pharmacist resolution of drug-related problems confirmed by MDs
- **Study Period:** 6 weeks
- **# of Sites:** 9 academic medical centers

# MACE Toolkit

**Post Discharge Follow-up by TOC Rx**

**Exclude discharges to SNF, patient refused, lost to follow up**

**TOC Rx Review and Severity Rating of DRPs**

**Significant/Life Threatening**

**Low Harm**

**Would the DRPs have led to a MACE?**

**Yes**

**No**

- **TOC Rx** – Transitions of Care Pharmacist
- **DRPs** – Drug-related problems
- **MACE** – Medication-related acute care episode

# MACE Toolkit

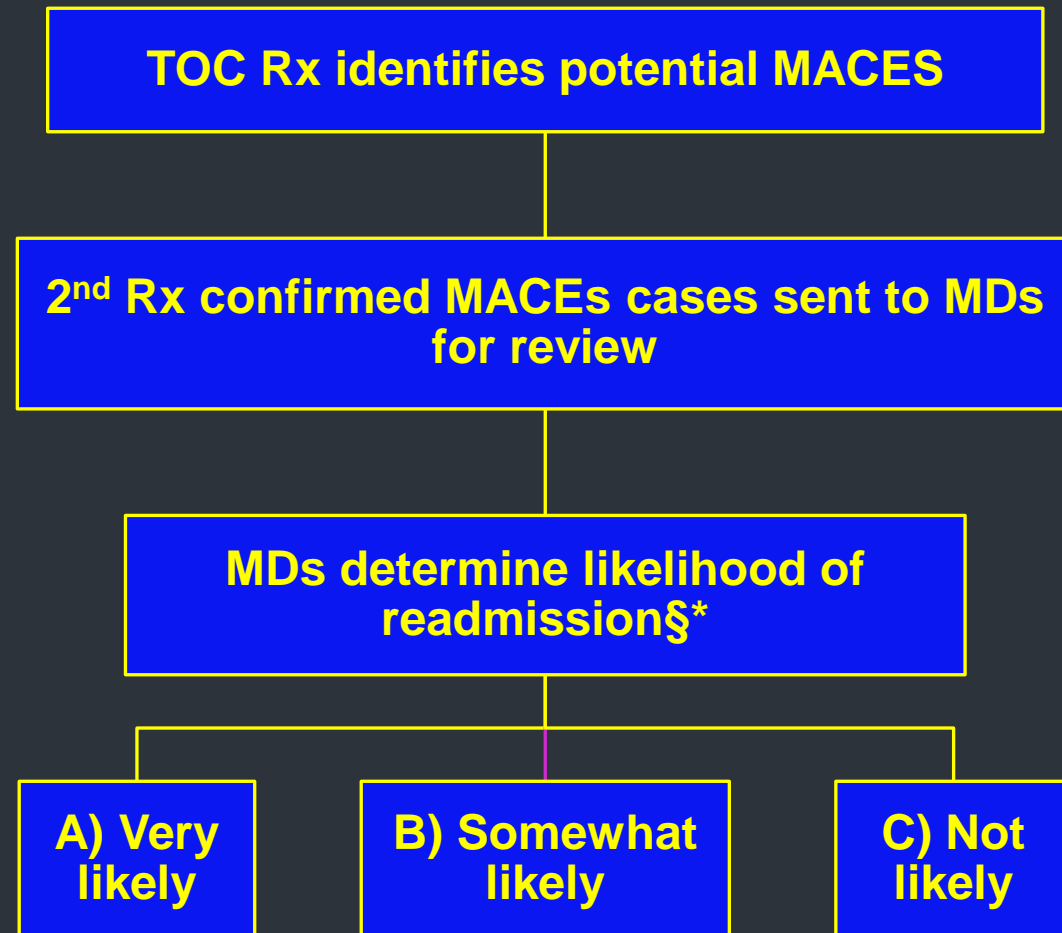
## Pharmacist and Physician Review

### § Key Principles

- Assessment of likelihood of 30-day readmission
- Will be seen by primary MD within 14 days post-discharge

### \* Definitions

- **Yes, Very likely** =  $\geq 50\%$  increase above average risk for readmission
- **Yes, Somewhat likely** = 20-49% increase above average risk for readmission
- **Not likely** = not at significantly increased risk for readmission (0-19%)



# Examples of MACEs

Case	DRPs Identified and Pharmacists Actions	Preventable MACE
<p>91 yo F CC: possible UTI PMH: CVA, afib</p>	<p>1) Metoprolol dose ↑50 mg BID and started on digoxin. Family reports HR in the 40s. 2) Levofloxacin prescribed 5-day course based on dirty UA. Denies symptoms; culture results suggests colonization. 3) Rivaroxaban 20mg daily in pt w/ CrCL 29 ml/min.</p> <p><b><u>Recommendations</u></b></p> <p>1) Hold metoprolol and D/C digoxin or check level. 2) D/C levofloxacin 3) Rivaroxaban dose change to 15 mg daily</p>	<p><b>Yes, Very Likely</b> Readmission due to bradycardia, bleeding</p>
<p>77 yo F CC: hyperglycemia (BG 649 on admission) PMH: DM2, CAD, HTN</p>	<p>1) Insulin: Pt did not pick up insulin glargine and not checking BG. 2) Simvastatin: pt was not taking</p> <p><b><u>Recommendations</u></b></p> <p>1) Called in prescription and educated on compliance 2) Called in prescription for simvastatin, test strips</p>	<p><b>Yes, Very Likely</b> Readmission due to non-compliance with medication</p>

# MACEs Results

## ➤ **Total # post-discharge follow-ups**

- 840 patients

- Average: 93.9 patients/site (range: 29-115 pts/site)

## ➤ **Total DRPs Identified**

- 959 DRPs

- Life threatening: 2.8%

- Serious or significant: 56.6%


## ➤ **% of MACEs prevented**

- 27.9% (range: 9.6% - 93.9%)



# Medication Overload

## WSJ 10/11/16



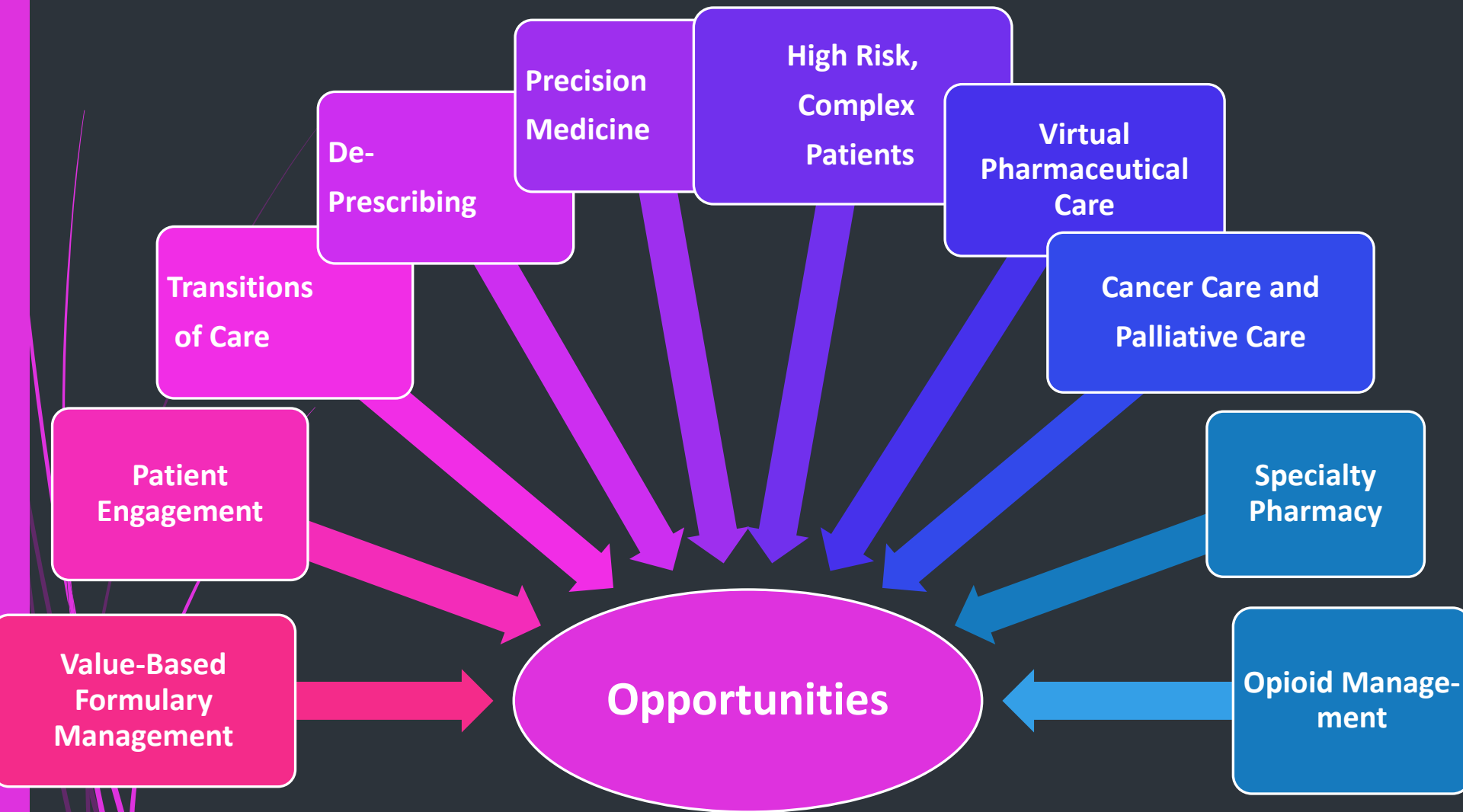
1/6 older pts at risk for major drug interactions

>10%

**Deprescribing<sup>®</sup>**  
**Choosing**  
**Wisely<sup>®</sup>**

40% of older adults on >5 medications,  
18% take >10

Deprescribing.org, accessed 11/20/16  
Choosingwisely.org, accessed 11/20/16





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