

Improving the Management of Chronic Heart Failure during Transitions of Care

Presented as a Live Webinar

Wednesday, September 27, 2017
12:00 - 1:00 p.m. ET

On-demand Activity

Live webinar recorded and archived to be watched at your convenience
Available after October 30, 2017

www.ashpadvantage.com/go/chfcare



Planned by ASHP
Supported by an educational grant from Novartis Pharmaceuticals Corporation

Activity Overview

In part one of the series faculty focus on evidence-based guidelines for chronic heart failure and the pharmacist's role in transitions of care. Faculty also address strategies for reducing hospital readmissions and the use of standard and newer agents for chronic heart failure. This activity serves as a prelude to the clinical case workshop which applies these concepts to patient scenarios in transitions of care. The activity includes a pretest and posttest to assess changes in participants' baseline knowledge.

Learning Objectives

At the conclusion of this knowledge-based educational activity, participants should be able to

- Review evidence-based guidelines for the pharmacologic management of patients with chronic heart failure, including the role of newer agents.
- Outline the pharmacist's role in transitions of care, including the evidence for improving patient outcomes.
- Discuss practice pearls for reducing hospital readmissions for patients with chronic heart failure.

Continuing Education Accreditation



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This activity provides 1.0 hour (0.1 CEU – no partial credit) of continuing pharmacy education credit.

Live activity ACPE activity #: 0204-0000-17-436-L01-P

On-demand activity #: 0204-0000-17-436-H01-P

Participants will process CPE credit online at <http://elearning.ashp.org/my-activities>. CPE credit will be reported directly to CPE Monitor. Per ACPE, CPE credit must be claimed no later than 60 days from the date of the live activity or completion of a home-study activity.

Webinar Information

Visit www.ashpadvantage.com/go/chfcare/webinar1 to find

- Webinar registration link
- Group viewing information and technical requirements
- [CPE webinar processing information](#)

Faculty

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Robert J. DiDomenico, Pharm.D., FCCP, is Clinical Professor in the Department of Pharmacy Practice, and Faculty of the Center for Pharmacoepidemiology and Pharmacoeconomic Research at the University of Illinois at Chicago (UIC). He is also Cardiovascular Clinical Pharmacist at the University of Illinois Hospital & Health Sciences System with a practice site in inpatient cardiology. Dr. DiDomenico serves as Residency Program Director for the UIC PGY2 Cardiology Pharmacy residency. Since 2008, he has chaired the Educational Policy Committee at the UIC College of Pharmacy.

Dr. DiDomenico received his Pharm.D. and completed three years of post-doctoral training (Pharmacy Practice Residency, Cardiovascular Pharmacotherapy Fellowship) at UIC.

Dr. DiDomenico has authored more than 80 peer-reviewed articles, book chapters, and abstracts on topics related to cardiovascular pharmacotherapy and has gained national recognition as a key opinion leader in the areas of heart failure, anticoagulation, and coronary artery disease. He is also an active member of several organizations including the American College of Clinical Pharmacy, American College of Cardiology, and the Heart Failure Society of America.



Improving the Management of
Chronic Heart Failure:
Focus on the Importance
of **Transitions of Care**

Improving the Management of Chronic Heart Failure During Transitions of Care

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Provided by ASHP
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1.0 hr.

Disclosures

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- Robert J. DiDomenico
 - Amgen, Inc.: drug monograph author

Learning Objectives

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Abbreviations

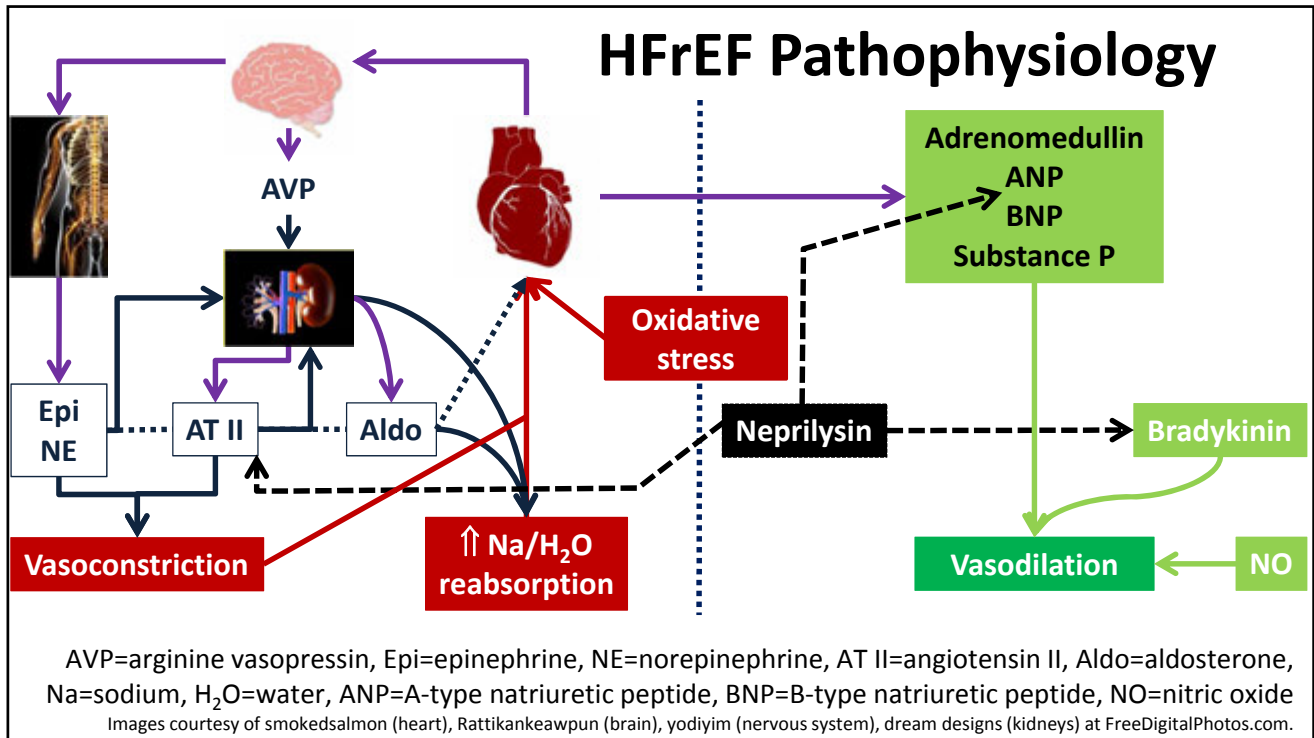
- CMS=Centers for Medicare & Medicaid Services
- GDMT=Guideline-directed medical therapy
- HFrEF=Heart failure with reduced ejection fraction
- ISDN=isosorbide dinitrate
- NYHA=New York Heart Association
- Important trials
 - RALES
 - EPHESUS
 - EMPHASIS
 - Paradigm-HF
 - SHIFT

Heart Failure: The Cold Hard Facts

- 5.7 million adults in U.S. have heart failure (HF) (2012)
 - Prevalence will increase 46% by 2030
 - 960,000 new cases annually
 - At 45 years-old, lifetime risk ~20– 45%
- Mortality
 - ~30% at 1 year
 - ~50% at 5 years
- Hospitalizations
 - ~1 million annually
- Annual Cost
 - \$30.7 billion (2012)

Benjamin E et al. *Circulation*. 2017; 135:e146-e603.

Pathophysiology of Heart Failure with Reduced Ejection Fraction (HFrEF)



Management of Chronic HFrEF

Treatment of HFrEF

Goals of Therapy

- Symptoms need to be controlled
- Prevent hospitalization and reduce mortality
- Provide optimal patient education
- Optimize guideline-based pharmacotherapies

Yancy C et al. *Circulation*. 2013; 128:e240–e327.

Drug Therapy Options to Treat HFrEF

Neurohormonal mediators

- Anti-renin-angiotensin-aldosterone system (RAAS) drugs
 - Angiotensin converting-enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs)
 - Mineralocorticoid receptor antagonists (MRAs)
 - Angiotensin receptor-neprilysin inhibitors (ARNIs)
- Beta-blockers
- Nitrates/hydralazine

Non-neurohormonal therapies

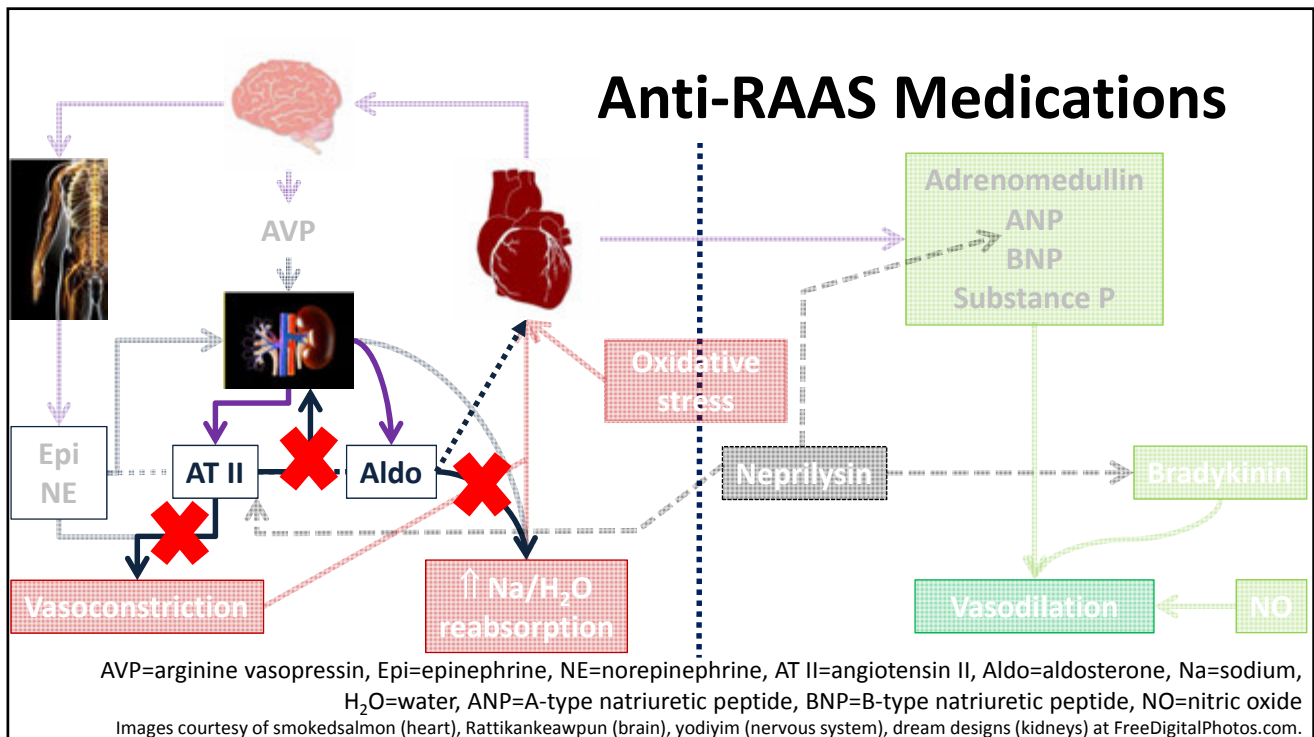
- Ivabradine
- Digoxin
- Diuretics

Yancy C et al. *J Am Coll Cardiol*. 2013; 62:e147-239. Yancy C et al. *J Am Coll Cardiol*. 2017; 70:776-803.

Recommendation Class and Evidence Level

Class (Strength) of Recommendation (COR)	Level (Quality) of Evidence (LOE)
Class I (Strong): BENEFIT >>> RISK Is recommended/beneficial	Level A High quality evidence from > 1 RCT
Class IIa (Moderate): BENEFIT >> RISK Is reasonable; can be beneficial	Level B-R (RANDOMIZED) Moderate quality evidence from ≥ 1 RCT
Class IIb (Weak): BENEFIT \geq RISK May/might be reasonable; benefit is unknown/unclear/uncertain	Level B-NR (NONRANDOMIZED) Moderate quality evidence from ≥ 1 NRCT
Class III: No Benefit (Moderate): BENEFIT = RISK Is NOT recommended/beneficial	Level C-LD (LIMITED DATA) Randomized or nonrandomized observational or registry studies with limitations
Class III: Harm (Strong): RISK > BENEFIT Is NOT recommended; potentially <u>harmful</u>	Level C-EO (EXPERT OPINION) Expert opinion based on clinical experience

RCT=randomized controlled trial, NRCT=nonrandomized controlled trial
 Yancy C et al. *J Am Coll Cardiol.* 2017; 70:776-803.

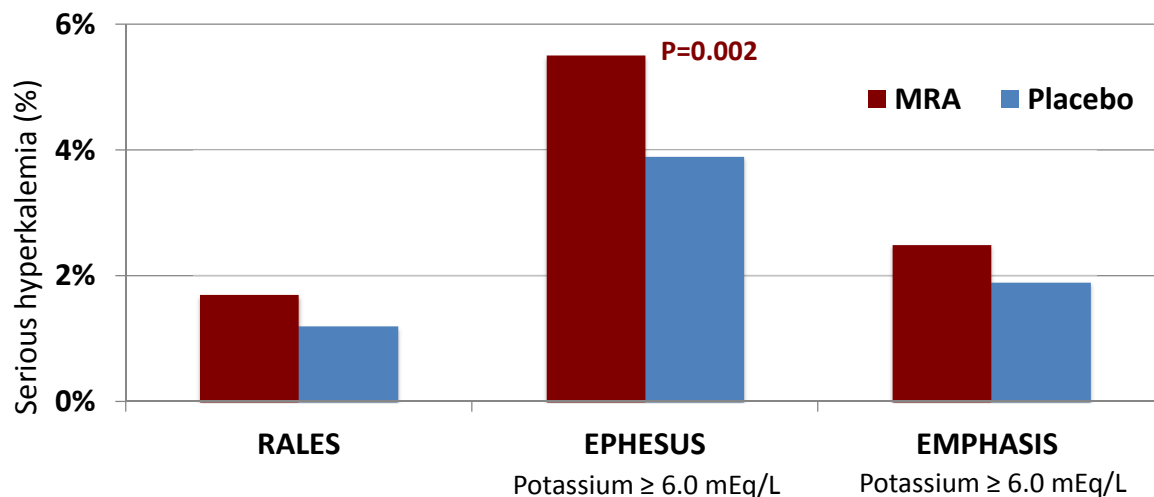


Efficacy of ACEIs, ARBs, & MRAs for HFrEF

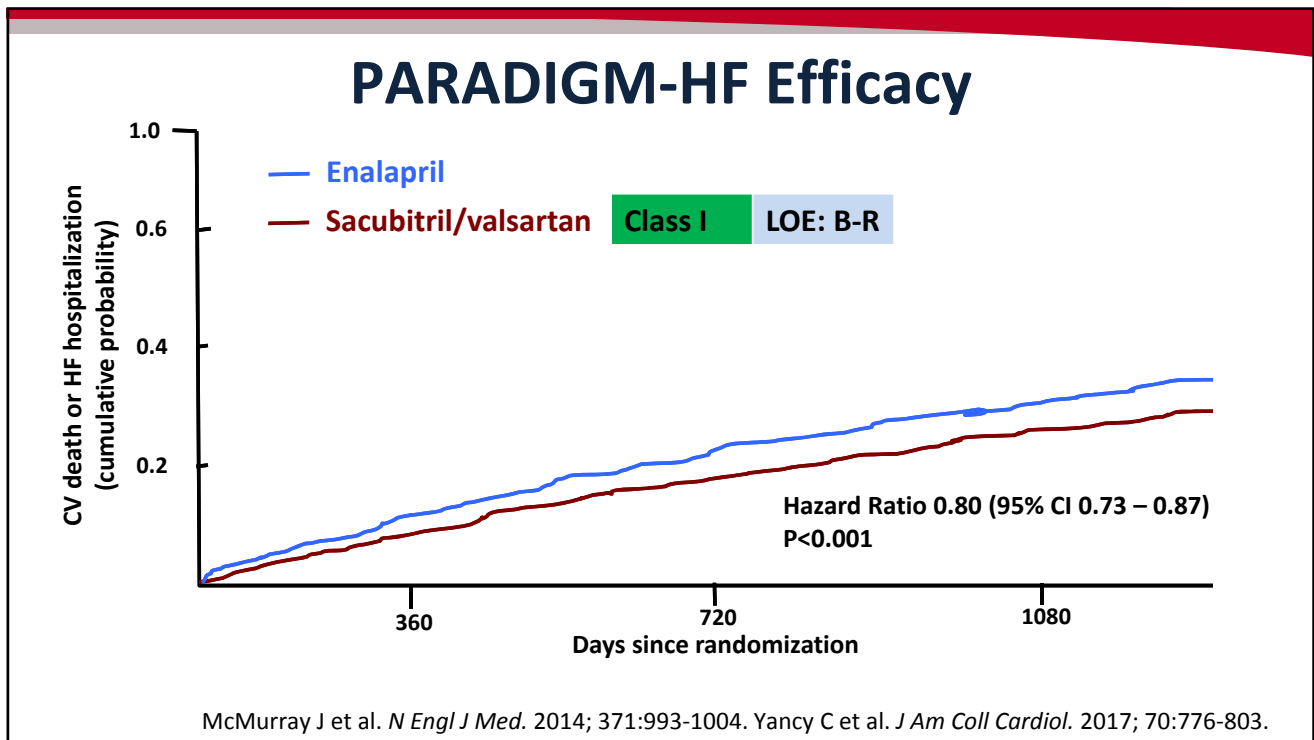
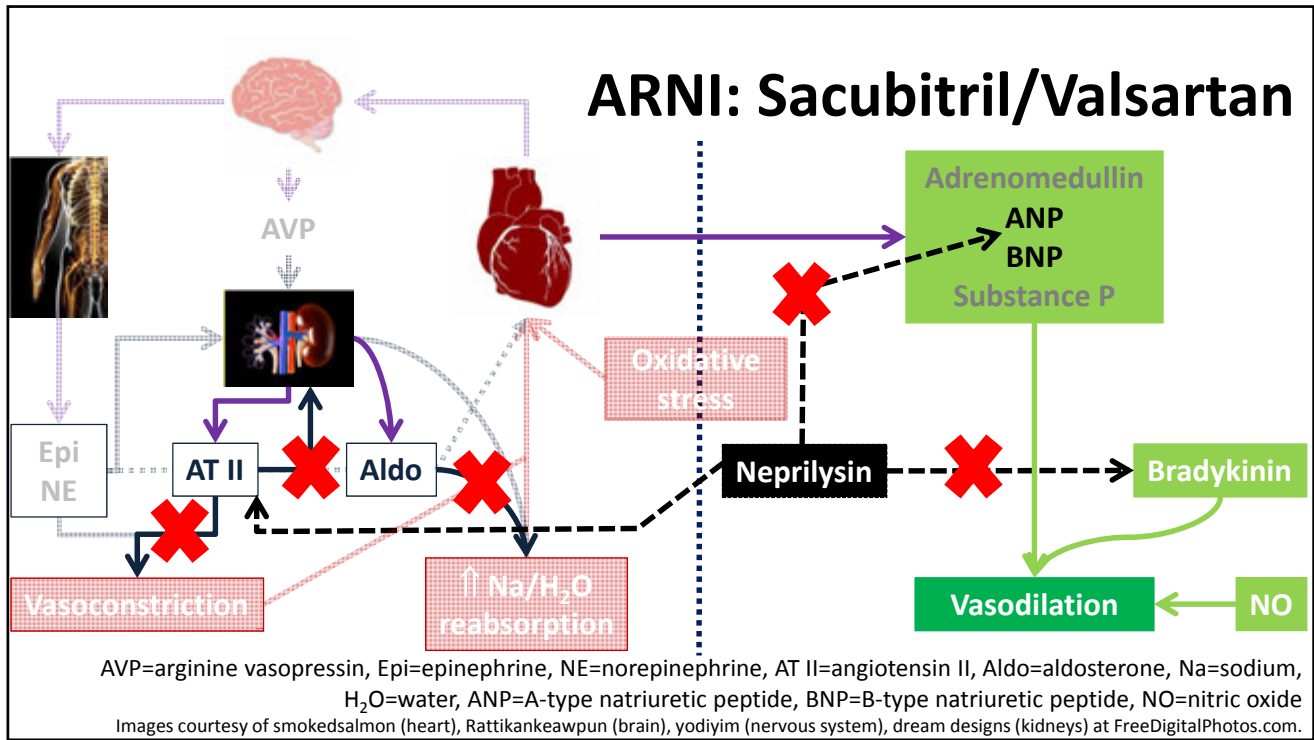
Drug Class	Endpoint (vs. placebo)	Odds Ratio (OR)	95% CI	P value
ACEIs Class I LOE: A	All-cause mortality	0.77	0.67-0.88	<0.001
	All-cause mortality or HF hospitalization	0.65	0.57-0.74	<0.001
ARBs Class I LOE: A	All-cause mortality	0.83	0.69-1.00	0.05
	HF hospitalization	0.64	0.53-0.78	<0.001
MRAs (HFrEF) Class I LOE: A	All-cause mortality	0.81	0.75-0.87	No report
	CV hospitalizations	0.76	0.64-0.90	

Garg R, Yusuf S. *JAMA*. 1995; 273:1450-6. Lee V et al. *Ann Intern Med*. 2004; 141:693-704. Berbenetz N. *BMC Cardiovasc Disord* 2016; 16:246. Yancy C et al. *J Am Coll Cardiol*. 2013; 62:e147-239.

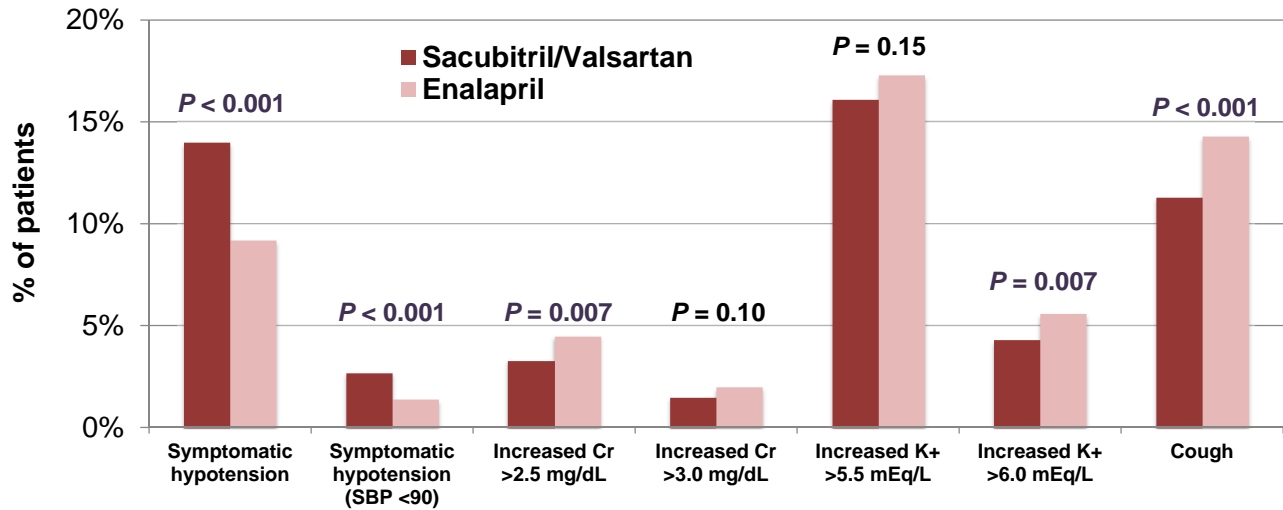
Safety of MRAs for HFrEF - Serious Hyperkalemia



Pitt B et al. *N Engl J Med*. 1999; 341:709-17.
Pitt B et al. *N Engl J Med*. 2003; 348:1309-21. Zannad F et al. *N Engl J Med*. 2011; 364:11-21.



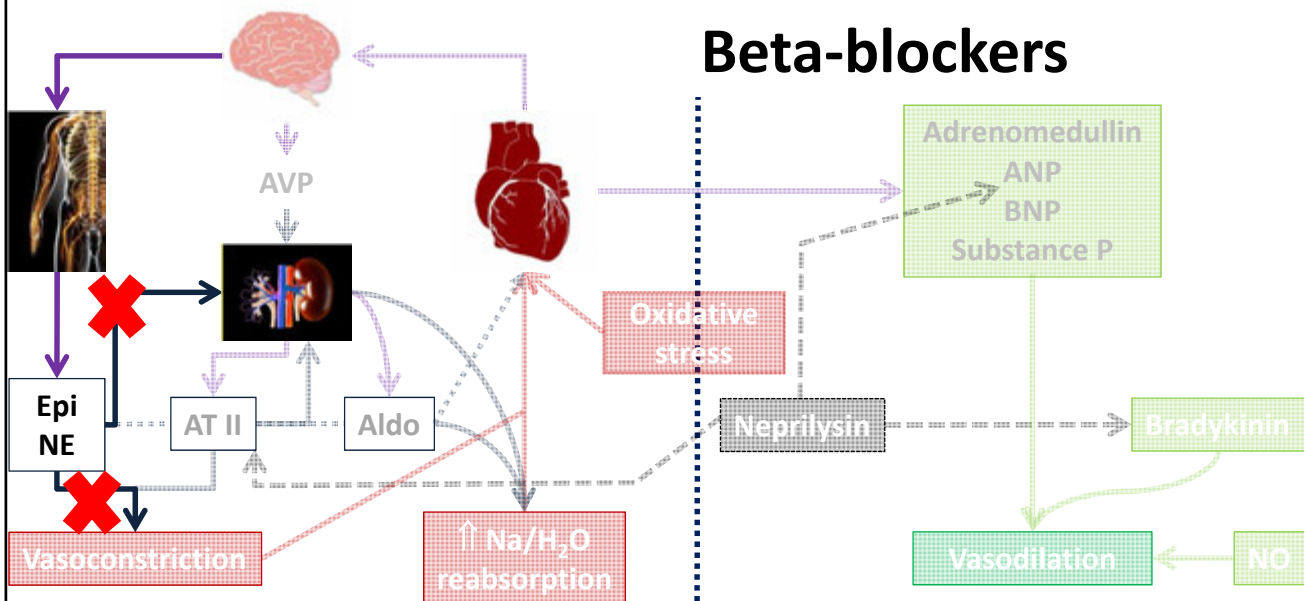
PARADIGM-HF Adverse Effects



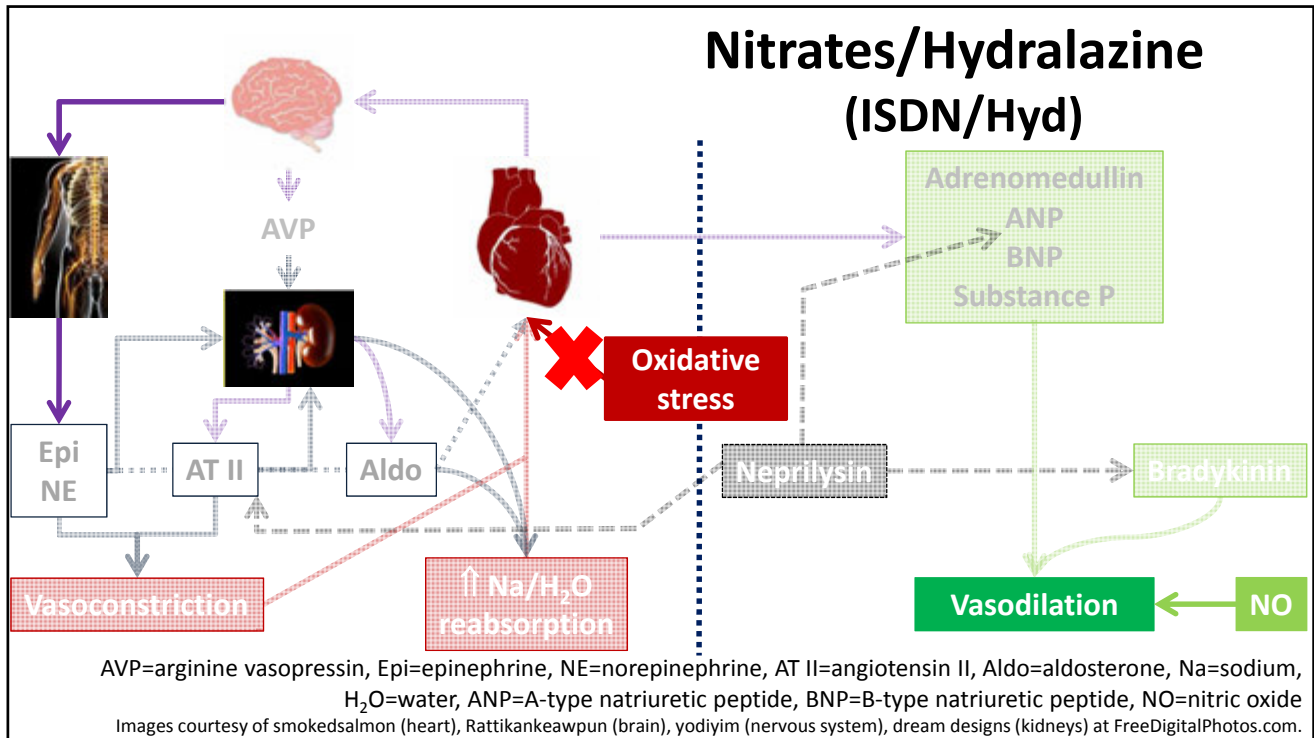
SBP=systolic blood pressure, Cr=creatinine

McMurray J et al. *N Engl J Med.* 2014; 371:993-1004.

Beta-blockers



AVP=arginine vasopressin, Epi=epinephrine, NE=norepinephrine, AT II=angiotensin II, Aldo=aldosterone, Na=sodium, H₂O=water, ANP=A-type natriuretic peptide, BNP=B-type natriuretic peptide, NO=nitric oxide
 Images courtesy of smokedsalmon (heart), Rattikankeawpun (brain), yodiyim (nervous system), dream designs (kidneys) at FreeDigitalPhotos.com.



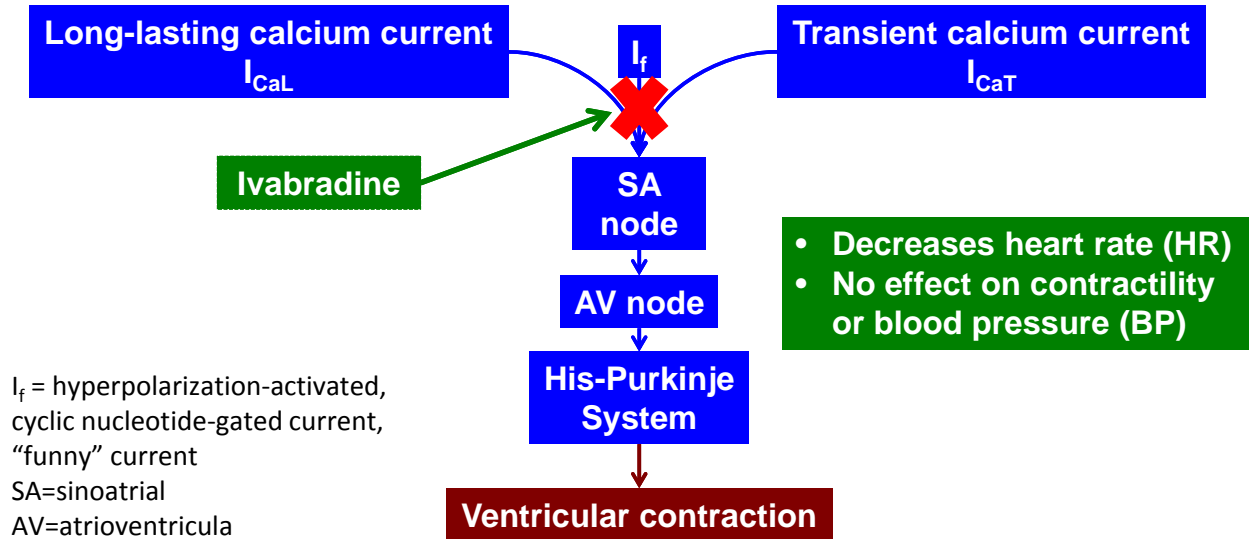
Survival Effect of Beta-blockers & Nitrates/Hydralazine in HFrEF

Drug Class	Control	Odds Ratio (OR)	95% CI	P value
Beta-blocker Class I LOE: A	All-cause mortality	0.71	0.64-0.80	<0.001

Farang M et al. *Int J Cardiol.* 2015; 196:61-9.

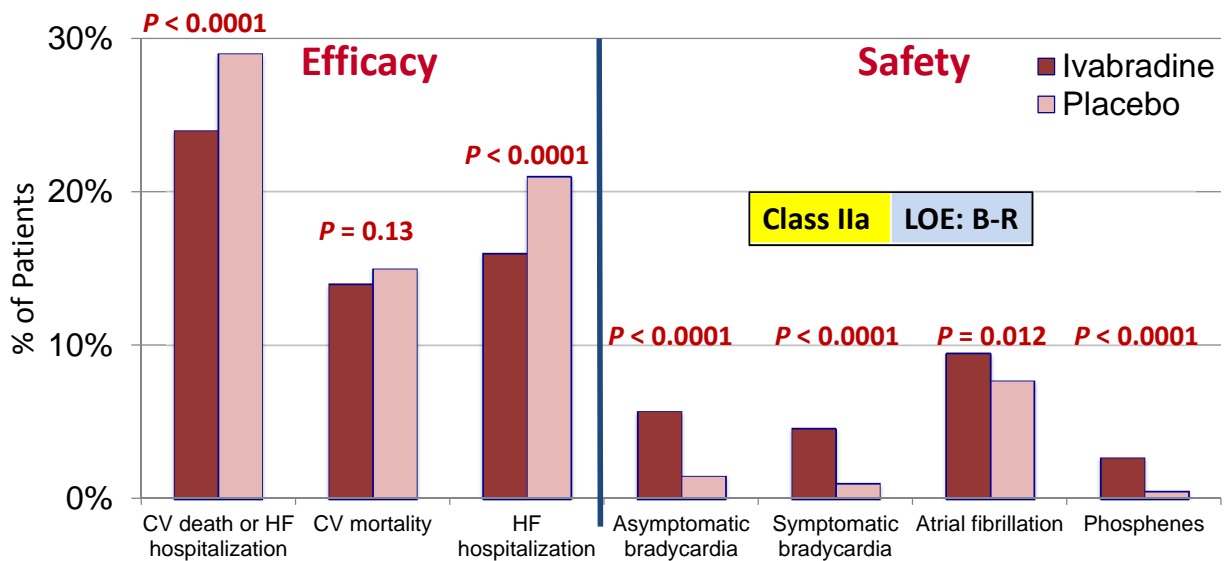
Chatterjee S et al. *BMJ.* 2013; 346:f55. Yancy C et al. *J Am Coll Cardiol.* 2013; 62:e147-239.

Ivabradine Mechanism of Action



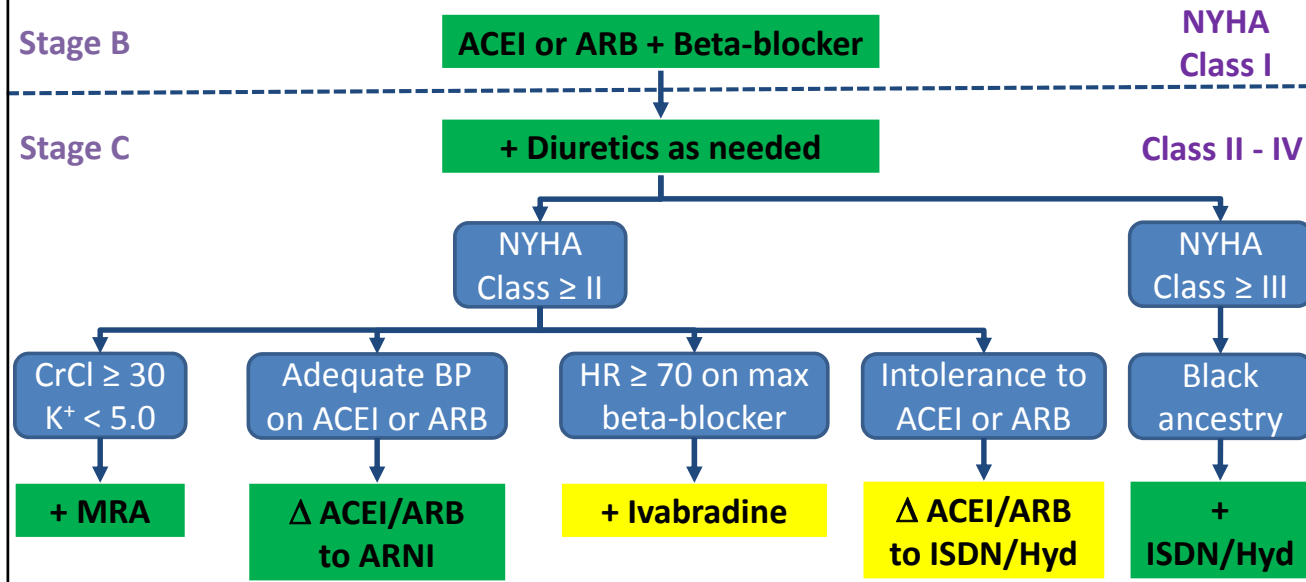
DiFrancesco D et al. *Drugs*. 2004; 64:1757-65. Hanigan S et al. *J Pharm Pract*. 2016; 29:46-57.

SHIFT Clinical Outcomes



Swedberg K et al. *Lancet*. 2010; 376:875-85. Yancy C et al. *J Am Coll Cardiol*. 2017; 70:776-803.

HFrEF GDMT Algorithm



CrCl=creatinine clearance in mL/min, K+=serum potassium in mEq/L, HR=heart rate (bpm)

Yancy C et al. *J Am Coll Cardiol.* 2013; 62:e147-239.
 Yancy C et al. *J Am Coll Cardiol.* 2017; 70:776-803.

Use Evidence-Based Heart Failure Medications

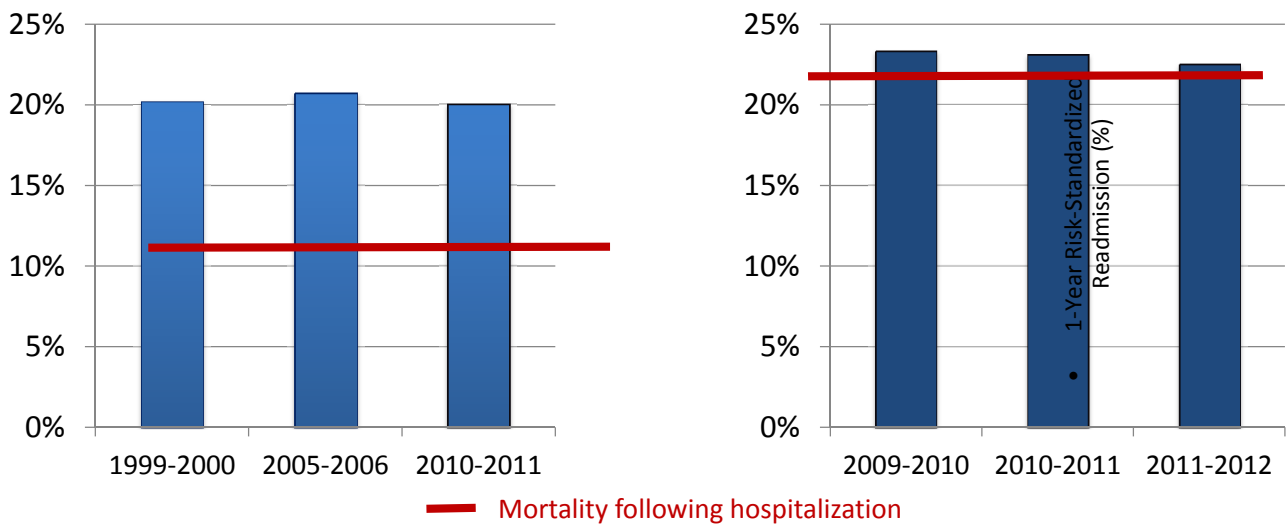
- Initiate at low doses
- **Titrate to target dose not “therapeutic response”**
 - **Dosing tables provided in appendix**
- Renal function threshold for inclusion in “anti-RAAS” trials
 - Creatinine ~2.0 – 2.5 mg/dL
 - eGFR <30 mL/min/1.73 m²
- **Monitoring**
 - Vital signs & symptoms
 - ACEIs & ARBs
 - K⁺ & renal function (1 – 2 weeks)
 - MRAs
 - K⁺ & renal function
 - 2-3 days, then 7 days, then monthly x 3, then every 3 months
- **Education!!!**

eGFR=estimated glomerular filtration rate

Yancy C et al. *J Am Coll Cardiol.* 2013; 62:e147-239.

Causes & Impact of Hospital Readmissions for Heart Failure

HF Readmissions Over Time



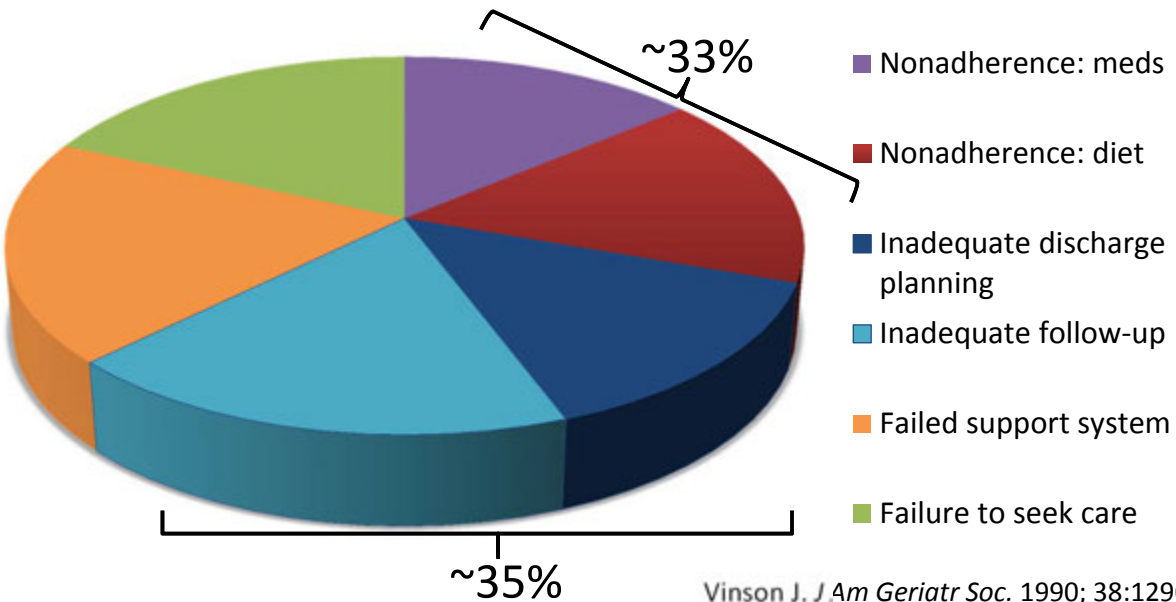
Loehr L. *Am J Cardiol.* 2008; 101:1016-22.
Krumholz H. *Circulation.* 2014; 130:966-75. Suter L. *J Gen Intern Med.* 2014; 29:1333-40.

HF Readmissions & Transitions of Care (TOC) What's All the Fuss About?

- 30-day readmission & mortality (risk-standardized)
 - Added to CMS core measures & publicly reported since 2007
 - Acute myocardial infarction (AMI)
 - HF
- Affordable Care Act (2010)
 - Incentive payments to select hospitals for high-quality care
Funded by reductions in diagnosis-related group payments for ALL hospitals
 - **Fiscal Year 2017 and beyond: 2%**

www.cms.gov/medicare/quality-initiatives-patient-assessment-instruments/hospitalqualityinits/outcomemeasures.html. (accessed 2017 Mar 12). www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Hospital_VBPurchasing_Fact_Sheet_ICN907664.pdf. (accessed 2017 Mar 10).

Causes of HF Readmission in Older Adults



Opportunities for Improvement? Clinical Predictors of HF Readmission

- Acute coronary syndrome (ACS)/ ischemia
- Increasing age
- **Anemia**
- **Arrhythmia**
- **Depression**
- **Hyponatremia**
- Left ventricular ejection fraction (LVEF)
- NYHA class IV symptoms
- **Pneumonia/respiratory process**
- **Suboptimal HF medication regimen**
- **Uncontrolled hypertension (HTN)**
- Worsening renal function

Fonarow G. *Arch Intern Med.* 2008; 168:847-54.

Murray M. *Clin Pharmacol Ther.* 2009; 85:651-8. Annema C. *Heart Lung.* 2009; 38:427-34.

Opportunities for Improvement? Nonclinical Predictors of HF Readmission

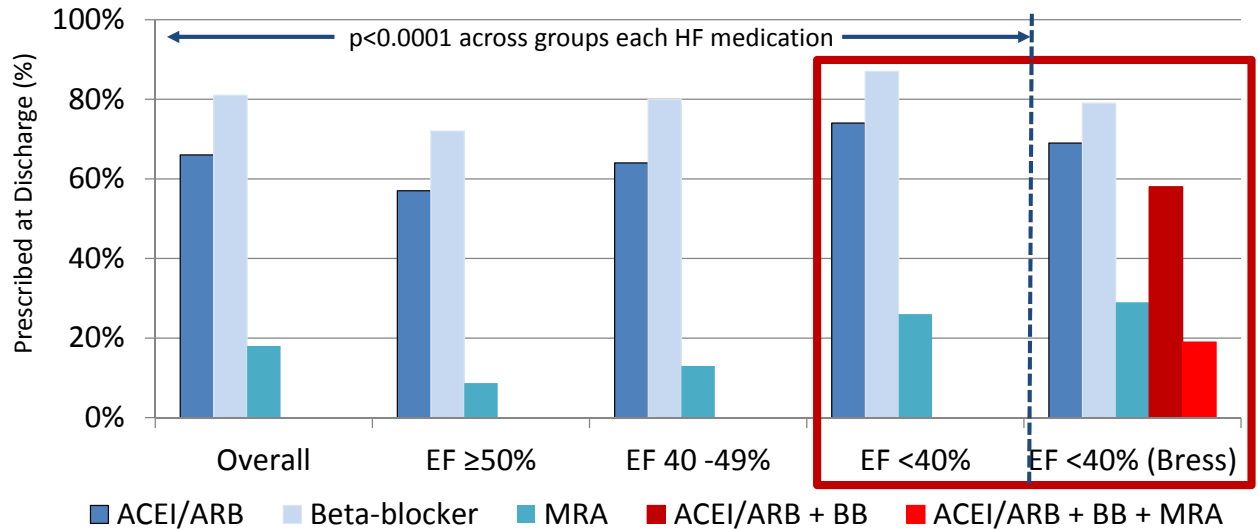
- Socioeconomic
 - Medicaid
 - Income inadequacy
- Psychosocial
 - Poor social support
 - Low health literacy
 - **Prescription label reading score/ability**
 - **Medication/dietary nonadherence**
- Patient-centered & health system
 - Distressing symptoms
 - Disease progression
 - Poor self-care
 - **Low readiness for discharge**
 - **Inconvenient or lack of early follow-up scheduled**

Ashton C. *JAMA.* 1995; 122:415-21. Fonarow G. *Arch Intern Med.* 2008; 168:847-54.

Annema C. *Heart Lung.* 2009; 38:427-34. Murray M. *Clin Pharmacol Ther.* 2009; 85:651-8.

Hernandez A. *JAMA.* 2010; 303:1716-22. Retrum J. *Circ Cardiovasc Qual Outcomes.* 2013; 6:171-7.

Guideline-Directed Medical Therapy (GDMT) for HF at Discharge Are Patients on Near-Optimal Regimens?



EF=ejection fraction

Steinberg B. *Circulation*. 2012; 126:65-75. Bress A. *Pharmacotherapy*. 2016; 36:174-86.

GDMT at Discharge & Outcomes

GDMT at Discharge	Risk adjusted mortality at 60 – 90 days		Risk-adjusted readmission at 60 – 90 days	
	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
ACEI or ARB	0.61 (0.35-1.06)	0.08	0.51 (0.34-0.78)	0.002
Beta-blocker	0.48 (0.30-0.79)	0.004	0.73 (0.55-0.96)	0.02

Fonarow G et al. *JAMA*. 2007; 297:61-70.

Evidence Supporting Pharmacist Intervention in Heart Failure Transitions of Care

Pharmacist TOC Programs in Heart Failure

Studied Countries	Providers	Types of Interventions (may have included ≥1 of the following)	Outcome
7 studies • US • UK • Australia • Ireland	• RPh (n = 5) • RPh + RN (n = 2)	• Patient education • Postdischarge call ± counseling • Identification/resolution of risk factors for readmission • Evaluation/optimization of drug therapy • Contacted community RPh & physicians • Home visit at 1 week • Home-based intensive counseling	• ↑ Adherence • ↑ Exercise capacity • ↔/↓ Readmits • ↓ HF readmits • ↓ Clinical events • ↓ Mortality

Jadad scores ≤2 for all studies, indicating potential for bias

Ponniah A et al. *J Clin Pharm Ther.* 2007; 32:343-52.

Key Components of Successful TOC Programs

Study	Collaborative with Other Providers	Med History (Med Rec)	GDMT Intervention with Physician	Patient Education	Med Adherence	Phone Follow-up
Varma			X	X	X	
Gattis	X	X	X	X		X
Rainville	X			X		X
Gwady-Sridhar	X			X (multidisciplinary)		
Lopez Cabezas				X		X
Gunadi	X	X	X	X		
Walker	X	X		X	X	X

Gwady-Sridhar F et al. *Am Heart J.* 2005; 150:982.

Varma S et al. *Pharmacotherapy.* 1999; 19:860-9. Gattis W et al. *Arch Intern Med.* 1999; 159:1939-45.

Rainville E et al. *Am J Health Syst Pharm.* 1999; 56:1339-42. Gunadi S et al. *Am J Health Syst Pharm.* 2015; 72:1147-52.

Lopez Cabezas C et al. *Farm Hosp.* 2006; 30:328-42. Walker P et al. *Arch Intern Med.* 2009; 169:2003-10.

HF Clinical Pharmacists and Outcomes

Intervention Type	Mortality Odds Ratio (95% CI)	Hospitalization Odds Ratio (95% CI)	Heart Failure Hospitalization Odds Ratio (95% CI)
Pharmacist-directed care	0.92 (0.62–1.38)	0.77 (0.54–1.09)	0.89 (0.68–1.17)
Pharmacist collaborative care	0.69 (0.41–1.17)	0.60 (0.38–0.95)	0.42 (0.24–0.74)
Overall effect	0.84 (0.61–1.15)	0.71 (0.54–0.94)	0.69 (0.51–0.94)

Koshman SL. *Arch Intern Med.* 2008; 168:687-94.

TOC Programs & Outcomes in Heart Failure

Intervention	Duration of Follow-up	Relative Risk of Readmission	95% Confidence Interval
Home visits	30 days	0.54	0.21 – 1.37
	3-6 months	0.75	0.66 – 0.86
Structured telephone support	30 days	0.80	0.38 – 1.65
	3-6 months	0.92	0.77 – 1.10
Telemonitoring	30 days	1.02	0.64 – 1.63
	3-6 months	1.11	0.87 – 1.42
Nurse-led clinic-based	3-6 months	0.88	0.57 – 1.37
Multidisciplinary HF clinic	6 months	0.70	0.55 – 0.89
Primary care clinic-based	6 months	1.27	1.05 – 1.54

Feltner C. AHRQ Publication No. 14-EHC021-EF. Rockville, MD: Agency for Healthcare Research and Quality, May 2014.
www.effectivehealthcare.ahrq.gov/ehc/products/510/1910/heart-failure-readmission-report-130527.pdf

Improving Transitions of Care ACCP White Paper on Pharmacist Roles

1. Medication reconciliation during care transitions
2. Participate in rounds
3. Patient & caregiver education
4. Participate in discharge
 - Discharge patient interviews
 - Follow up on drug-related problems
 - Assess and address adherence issues
 - Post-discharge follow up within 2-4 days
5. Consultant pharmacists medication reconciliation in LTCF & assisted living
6. Community pharmacists
 - Clarify discrepancies & review auto refills post-discharge
7. Ambulatory care pharmacists
8. Collaborate with home health care (HHC) pharmacists & HHC agencies
9. Medically underserved and homeless
 - Services to address adherence, access, & health literacy issues

ACCP=American College of Clinical Pharmacy,
 LTCF=long-term care facility

Hume AL et al. *Pharmacotherapy*. 2012; 32:e326-37.

Practice Pearls For Pharmacists Aimed at Reducing Heart Failure Readmissions

Strategies Associated with HF Readmissions

Lower Readmissions

- Medication reconciliation by RNs
- Partnership with physician groups
- Partnership with other hospitals
- Follow-up appt at discharge
- Discharge summary sent to primary care provider (PCP)
- Hospital staff assigned to follow up on test results available after discharge
- Pacific region of U.S.
- 200–399 hospital beds

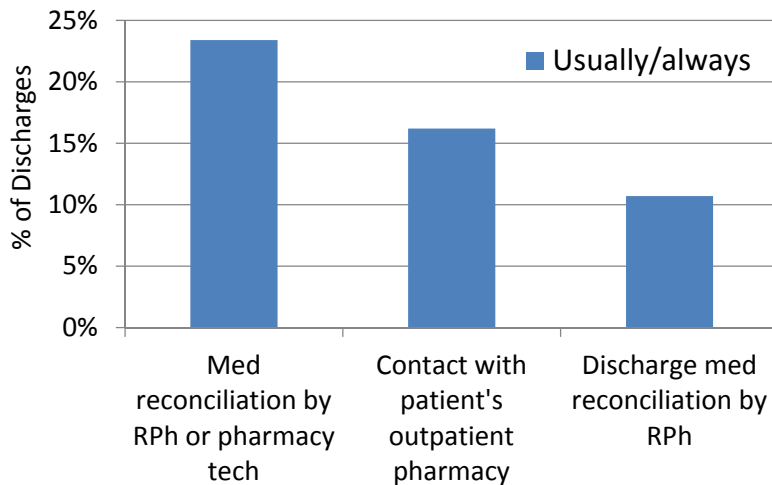
Higher Readmissions

- Electronic linking of outpatient and inpatient Rx records
- Written emergency plan on discharge
- Alert PCP within 48 hours of discharge
- Postdischarge phone call
- Teaching hospital

PHARMACY CALL TO ACTION!

Bradley E. *Circ Cardiovasc Qual Outcomes*. 2013; 6:444-50.

Medication History, Reconciliation, Education Time to Get Back to the Basics



- Separate survey of 950 U.S. hospitals
 - RPh performs < 5% admission medication histories
 - RPh provides medication counseling/patient education in < 50% hospitals

Bradley E. *J Am Coll Cardiol.* 2012; 60:607-14. Bond C. *Pharmacotherapy.* 2006; 26:735-47.

Pharmacy Medication Reconciliation & Outcomes

Outcomes

- ↓ Medication discrepancies
 - 10 of 10 studies
- ↓ Potential adverse drug events (ADEs)
 - 2 of 3 studies
- ↓ Preventable ADEs
 - 1 study
- ↓ Health care resource use
 - 2 of 7 studies

Themes from Successful Programs

- Limit to older adult patients
 - ≥70 or 80 years
- Intensive staff involvement
 - Med history/reconciliation on admission, during hospitalization, and at discharge
- Communication with primary care provider
- Phone follow up after discharge

Mueller S. *Arch Intern Med.* 2012; 172:1057-69.

Core Clinical Pharmacy Services The Most Value (“Bang”) for Your Buck!

- Services with at least two favorable associations with health or economic outcomes
 - **Admission medication histories**
 - Adverse drug reaction (ADR) program/management
 - Collaborative drug management
 - Drug information
 - Participation on medical rounds

Bond C. *Pharmacotherapy*. 2004; 24:427-40.

No Time for Medication Reconciliation? Engage Pharmacy Trainees!

Study	Setting	Observations
Lubowski et al.	Three hospitals Medicine & surgery services Medication history & med reconciliation	922 discrepancies 59 DRPs identified 48% recs accepted
Walker P et al.	Transitional care APPE Medicine services Discharge rounds, screen/interview patients, discharge med reconciliation, education, identify barriers, postdischarge phone call	↑ Pharmacist participation from ~35% of patients to ~73%; 97 interventions; 60 postdischarge calls
Lancaster and Grgurich	Medicine service Admission med reconciliation	68 discrepancies over 12 weeks; 28 interventions

APPE=advanced pharmacy practice experience,
DRP=drug related problems

Lubowski T. *Am J Pharm Educ*. 2007; 71:94. Walker P.
Am J Pharm Educ. 2010; 74:20. Lancaster J. *Am J Pharm Educ*. 2014; 78:34.

Principles to Follow in Discharge Counseling Heart Failure and Post-Myocardial Infarction

- Address existing barriers
- Perform thorough review of medications
- Use inpatient and outpatient settings
- Assess readiness to learn
- Vary teaching methods
- Engage caregivers
- Engage other team members
- Optimize written materials
- Emphasize self-care
- Employ teach-back method
- Assess patient resources
- Refer to disease management programs
- Focus on smooth transitions

Wiggins B. *Pharmacotherapy*. 2013; 33:558-80.

Home-Hospital-Home Care Transitions

One Size Does Not Fit All

Pre-hospital	In-Hospital		Postdischarge
Self-Care Medications	Medication history Admission med rec	Discharge med rec Medication education Prior auth? Refills? ePrescribe? Predischarge dispense?	Refer to pharmacy programs? Medication Therapy Management (MTM) Med Assistance
Physician follow-up	Identify precipitating causes Optimize HF regimen Identify self-care barriers Patient and caregiver education THROUGHOUT hospital stay Assess readiness for discharge		Phone call? In-home visit? <u>Physician follow-up within 7-10 days</u> Refer to disease management team?

Key Takeaways

- Drugs that block the pathologic neurohormonal actions in patients with HFrEF improve survival
 - ACEIs, ARBs, MRAs, ARNIs, & beta-blockers
- Multidisciplinary heart failure transitions of care programs that leverage pharmacists knowledge & skills improve outcomes
- Pharmacists should tailor their transitions of care interventions to institutional and patient-specific needs
 - “Get back to the basics” of performing medication reconciliation and patient education, in addition to advanced clinical interventions

Consider these practice changes.

Which will you make?

- Read the updates to heart failure treatment guidelines.
- Compare my organization’s protocols with the updates to heart failure treatment guidelines.
- Review my organization’s transitions of care initiatives to assess how pharmacists can become more involved.
- Increase the frequency of performing medication histories and discharge patient education for my patients with heart failure.
- Engage my pharmacy students and residents to assist with transition of care activities.

Selected Resources

- Yancy C et al. 2013 ACCF/AHA guideline for management of heart failure. *J Am Coll Cardiol*. 2013; 62:e147-239.
- Yancy C et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. *J Am Coll Cardiol* 2017; 70:776-803.
- Feltner C. AHRQ Publication No. 14-EHC021-EF. Rockville, MD: Agency for Healthcare Research and Quality, May 2014.
www.effectivehealthcare.ahrq.gov/ehc/products/510/1910/heart-failure-readmission-report-130527.pdf

Standardized discharge processes

- Project BOOST
www.hospitalmedicine.org/Web/Quality_Innovation/SHM_Signature_Programs/Mentored_Implementation/Web/Quality___Innovation/Mentored_Implementation/Project_BOOST/Project_BOOST.aspx
- Project RED
www.bu.edu/fammed/projectred/
- The Care Transitions Program
www.caretransitions.org/
- Guided Care Mode:
www.johnshopkinssolutions.com/solution/guided-care-2/