

State of the State: Heart Failure in Arkansas

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Disclosures

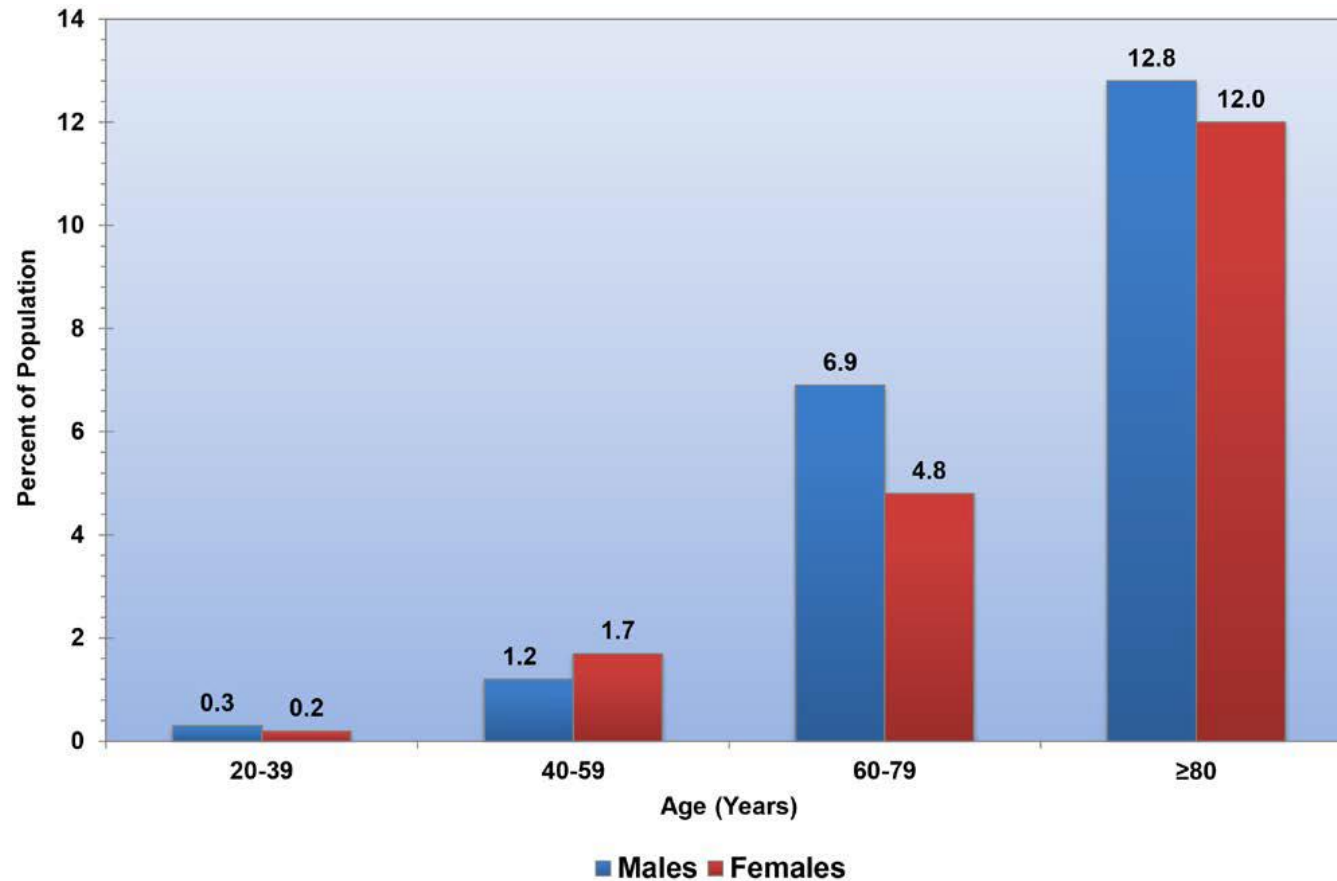
No Financial Disclosures

US Prevalence of Heart Failure (HF)

- About 6.2 million Americans ≥ 20 years of age have HF (NHANES, 2013-2016)
- HF prevalence is estimated to increase 46% by 2030, i.e. >8 million adults with HF

Heidenreich PA et al. Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. *Circ Heart Fail.* 2013;6:606–619.

US Prevalence of HF for adults by sex and age (NHANES, 2013-2016)



Source: National Center for Health Statistics and National Heart, Lung, and Blood Institute.

US Incidence of HF

- HF incidence approaches 21 per 1,000 population after age 65¹
- HF before age 50 is more common among African Americans (AA) vs Whites²
- African Americans have the highest risk of developing HF, followed by Hispanics, Whites, and Chinese Americans (4.6, 3.5, 2.4, and 1.0 per 1,000 person-years, respectively)³

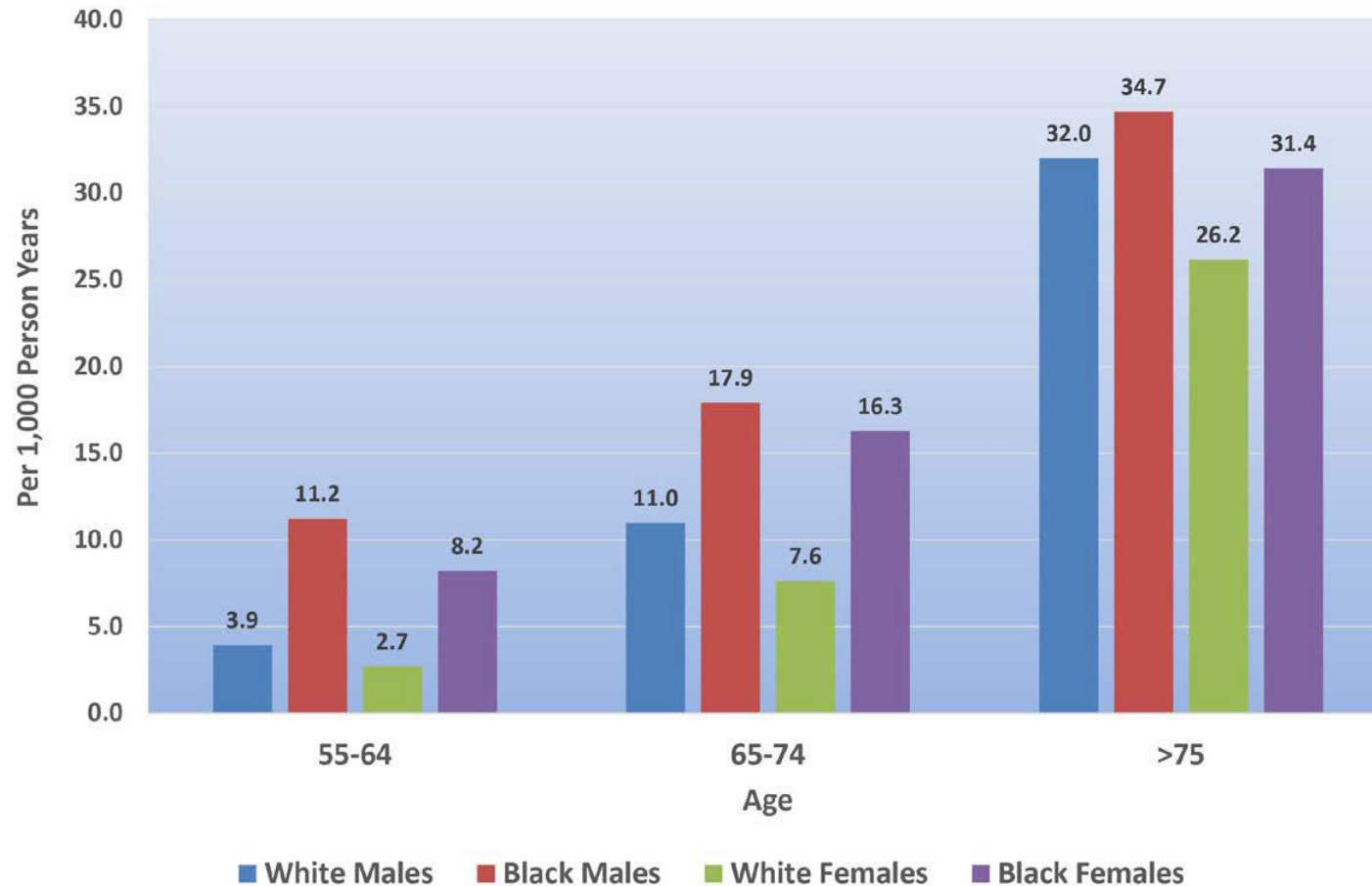
1. Huffman et al. Lifetime risk for heart failure among white and black Americans: cardiovascular lifetime risk pooling project. *J Am Coll Cardiol.* 2013;61:1510–1517.
2. Bibbins-Domingo K et al. Racial differences in incident heart failure among young adults. *N Engl J Med.* 2009;360:1179–1190.
3. Bahrami et al. Differences in the incidence of congestive heart failure by ethnicity: the Multi-Ethnic Study of Atherosclerosis. *Arch Intern Med.* 2008;168:2138–2145.

Lifetime Risk of HF

- Overall lifetime risks of HF are 20-45% for ages 45-95
- Lifetime risks for HF are 30-42% in White males, 32-39% in White females, 20-29% in AA males, and 24-46% in AA females
- People with BMI ≥ 30 kg/m² are at twice the lifetime risk of HF than those with BMI < 25 kg/m²
- People with BP $> 160/90$ mmHg are at 1.6 times the lifetime risk of HF than those with BP $< 120/90$ mmHg

Huffman et al. Lifetime risk for heart failure among white and black Americans: cardiovascular lifetime risk pooling project. J Am Coll Cardiol. 2013;61:1510–1517.

First acute decompensated HF annual event rates (ARIC, 2005–2014)



Source: Atherosclerosis Risk in Communities Study (ARIC) and National Heart, Lung, and Blood Institute.

Risk Factors for HF

- At least 1 risk factor is present in up to 1/3rd of the US adult population¹
- Traditional risk factors are responsible for 52% of incident HF in the population²:
 - CHD: OR 3.1, PAR 20%
 - Hypertension: RR 1.4, PAR 20%
 - DM: OR 2.7, PAR 12%
 - Obesity: RR 2.0, PAR 12%
 - Cigarette smoking: RR 1.4, PAR 14%

1. Kovell LC et al. Stage A heart failure is not adequately recognized in US adults: analysis of the National Health and Nutrition Examination Surveys, 2007-2010. PLoS One. 2015;10:e0132228.
2. Dunlay SM et al. Risk factors for heart failure: a population-based case-control study. Am J Med. 2009;122:1023–1028.

Risk Factors for HF (contd.)

- Better profiles in smoking, BMI, PA, diet, cholesterol, BP, and glucose are associated with a lower lifetime risk of HF¹
- Non-traditional risk factors for incident HF include²:
 - ↑ Serum γ -glutamyl transferase and hematocrit
 - Baseline and changes in high-sensitivity troponin levels
 - WBC count, CRP, albuminuria, HbA1c among individuals without DM, cardiac troponin, PVCs, and SES
 - Plasma N-terminal pro-BNP and MRI-determined LV mass index for incident symptomatic HF

1. Folsom AR et al. American Heart Association's Life's Simple 7: Avoiding heart failure and preserving cardiac structure and function. *Am J Med.* 2015;128:970–6.e2.

2. Benjamin EJ et al. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation.* 2019;139:e56–e528.

Hospital Discharges for HF: US

- Hospital discharges for HF ↓ from 2004-2014, with principal diagnosis discharges of 1.04 and 0.9 millions, respectively¹
- Rates of HF rehospitalization or cardiovascular death were greatest for those previously hospitalized for HF²
- Annual incidence of recurrent hospitalized HF for those ≥ age 50 is 11.6 and 6.6 per 1,000 people, respectively³
- Of incident hospitalized HF events, 53% have HF with reduced EF and 47% have preserved EF³

1. CDC, 2010 National Hospital Ambulatory Medical Care Survey.
2. Bello NA et al. Influence of previous heart failure hospitalization on cardiovascular events in patients with reduced and preserved ejection fraction. *Circ Heart Fail.* 2014;7:590–595.
3. Chang PP et al. Incidence and survival of hospitalized acute decompensated heart failure in four US communities (from the Atherosclerosis Risk in Communities Study). *Am J Cardiol.* 2014;113:504–510.

HF Among Top Principal Diagnoses for Readmissions, 2014

Principal diagnosis at the index stay	Index stays, N	7-day readmissions		30-day readmissions	
		Rank	Rate ^a	Rank	Rate ^a
Total inpatient stays	27,698,101	—	5.0	—	13.9
Schizophrenia and other psychotic disorders	374,097	1	9.0	2	22.9
Alcohol-related disorders	340,076	2	7.5	4	21.5
Congestive heart failure; nonhypertensive	795,709	3	7.4	1	23.2
Heart valve disorders	117,788	4	7.3	14	18.4
Hypertension with complications, secondary hypertension	223,396	5	7.2	6	20.9
Respiratory failure; insufficiency; arrest (adult)	311,005	6	7.2	3	21.6
Aspiration pneumonitis; food/vomitus	128,019	7	7.1	11	19.5
Acute and unspecified renal failure	436,833	8	7.0	8	20.1
Diabetes mellitus with complications	487,947	9	6.9	7	20.5
Complication of device; implant or graft	572,761	10	6.7	10	19.7
Septicemia	1,202,893	11	6.7	13	18.5
Deficiency and other anemia	171,160	12	6.6	5	21.2
Intestinal obstruction without hernia	313,596	13	6.6	25	15.2
Fluid and electrolyte disorders	338,954	14	6.5	12	18.8
Abdominal pain	113,331	15	6.5	18	17.2
Complications of surgical procedures or medical care	417,261	16	6.5	15	17.9
Gastrointestinal hemorrhage	331,739	17	6.5	20	16.9
Pancreatic disorders (not diabetes)	276,534	18	6.2	17	17.2
Chronic obstructive pulmonary disease and bronchiectasis	521,955	19	6.1	9	20.1
Acute myocardial infarction	480,338	20	6.1	29	14.2
Intestinal infection	195,644	24	5.7	16	17.5
Peripheral and visceral atherosclerosis	127,624	22	5.8	19	16.9

Ambulatory Care & ED Visits for HF: US

- In 2015, there were 2.6 million physician office visits with a primary diagnosis of HF¹
- In 2015, there were 4.8 million ED visits for HF²

1. CDC, National Ambulatory Medical Care Survey: 2015 State and National Summary Tables.

2. CDC, National Hospital Ambulatory Medical Care Survey: 2015 Emergency Department Summary Tables.

Ambulatory Care Visits for HF vs Other Chronic Conditions: US

Condition	Total Patients	Visited Primary Care Physician	Percent	Visited Subspecialist	Percent
Hypertension	62,170,492	52,086,268	84%	44,432,708	71%
Diabetes	25,663,376	22,019,702	86%	18,765,232	73%
Asthma	19,047,216	15,723,148	83%	12,700,747	67%
Arthritis	15,379,356	12,487,497	81%	12,831,979	83%
Glaucoma	4,193,069	3,109,622	74%	3,893,425	93%
Congestive Heart Failure	1,976,929	1,675,103	85%	1,786,331	90%
Multiple Sclerosis	695,295	528,726	76%	585,317	84%
Parkinson's	541,854	508,272	94%	521,756	96%

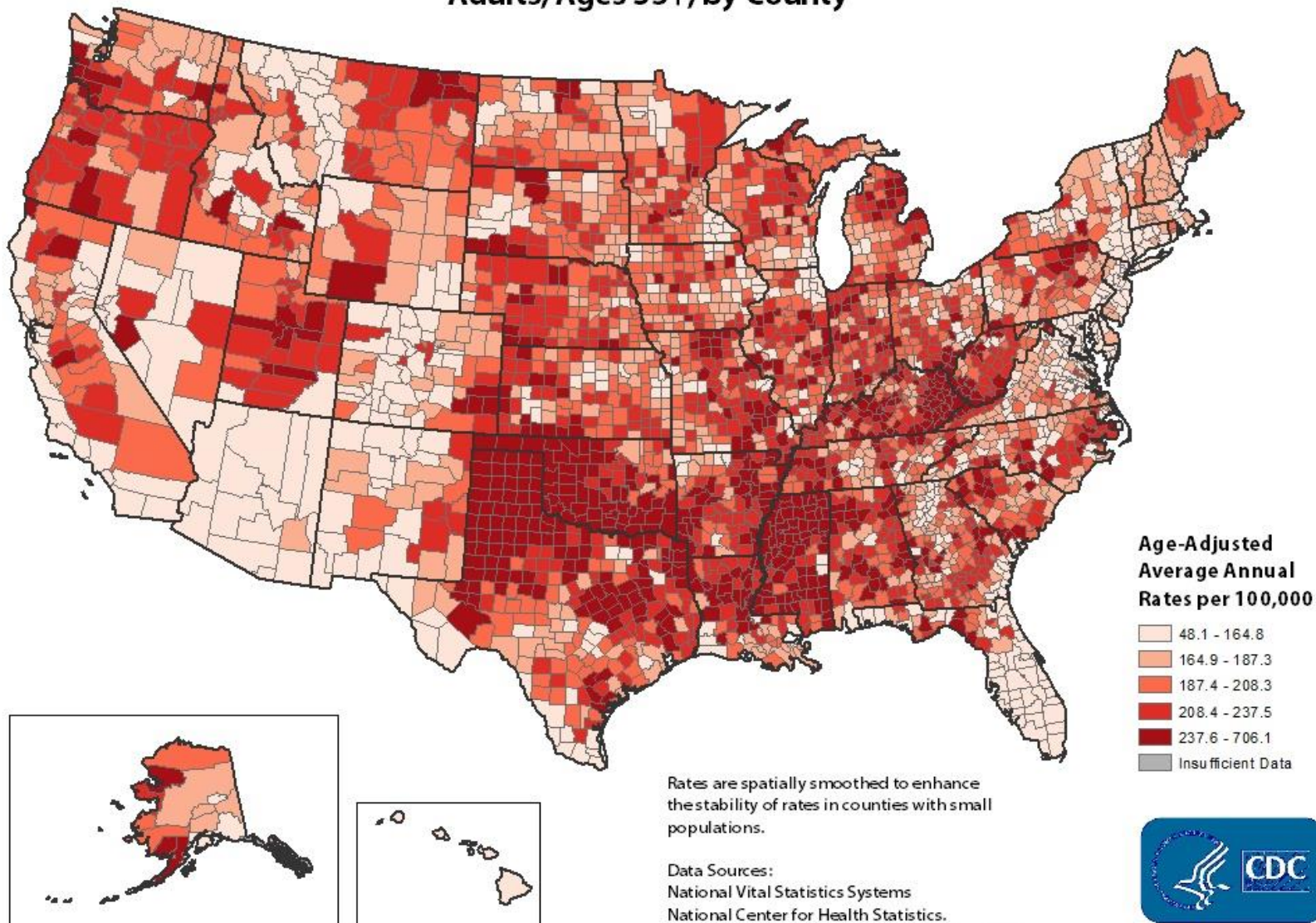
Source: Medical Expenditure Panel Survey (MEPS), 2014.

HF Mortality: US

- Overall 1-year HF mortality rates have shown uneven declines across states¹
- Survival after HF onset has improved in older adults²
- Case fatality rates following hospitalization for HF are³:
 - 10.4% after 30 days
 - 22% after 1 year
 - 42.3% after 5 years

1. Barker WH et al. Changing incidence and survival for heart failure in a well-defined older population, 1970-1974 and 1990-1994. *Circulation*. 2006;113:799–805.
2. Cheng J et al. National and regional trends in heart failure hospitalization and mortality rates for Medicare beneficiaries, 1998–2008. *JAMA*. 2011;306:1669–1678.
3. Loehr LR et al. Heart failure incidence and survival (from the Atherosclerosis Risk in Communities study). *Am J Cardiol*. 2008;101:1016–1022.

Heart Failure Death Rates, 2014-2016 Adults, Ages 35+, by County

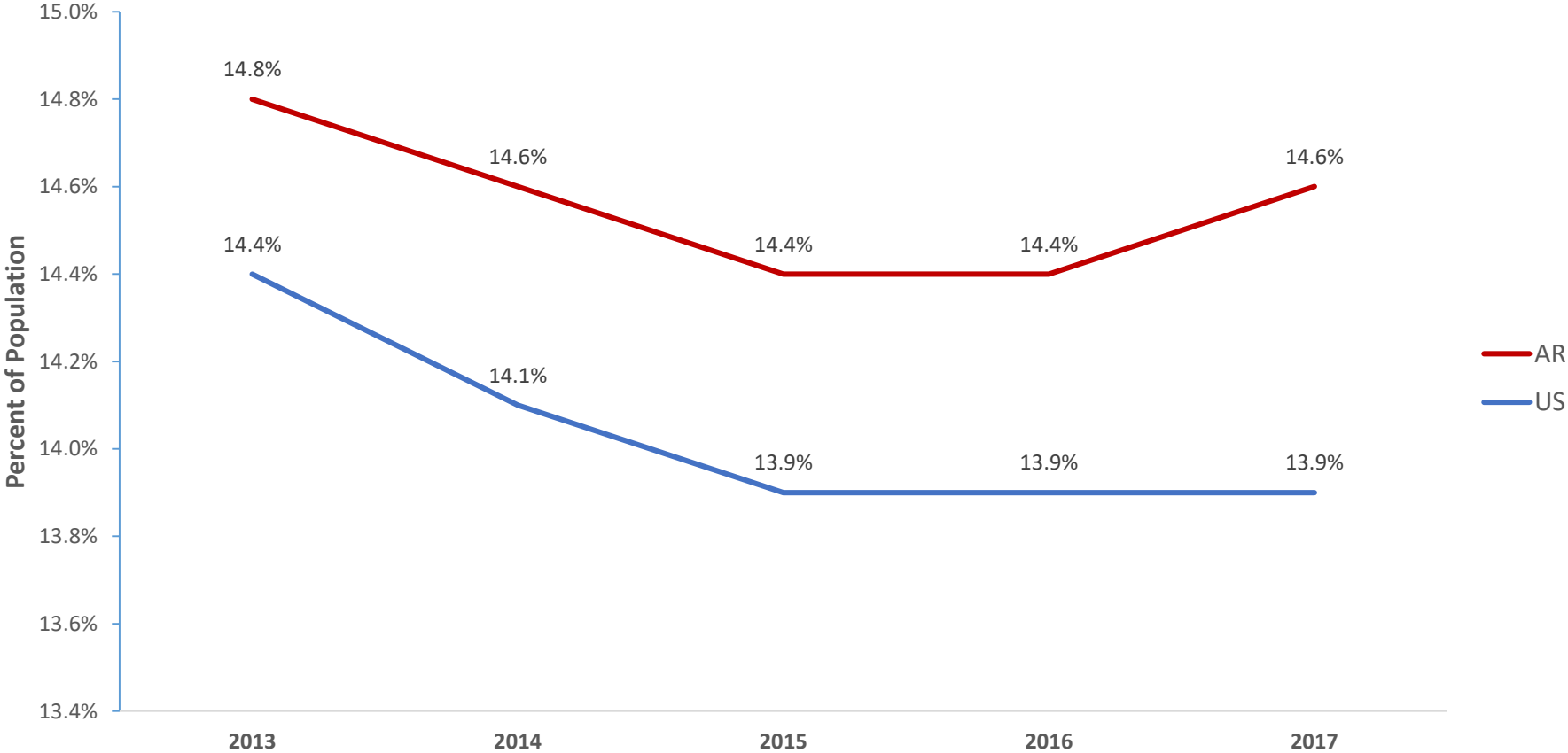


Cost of HF: US

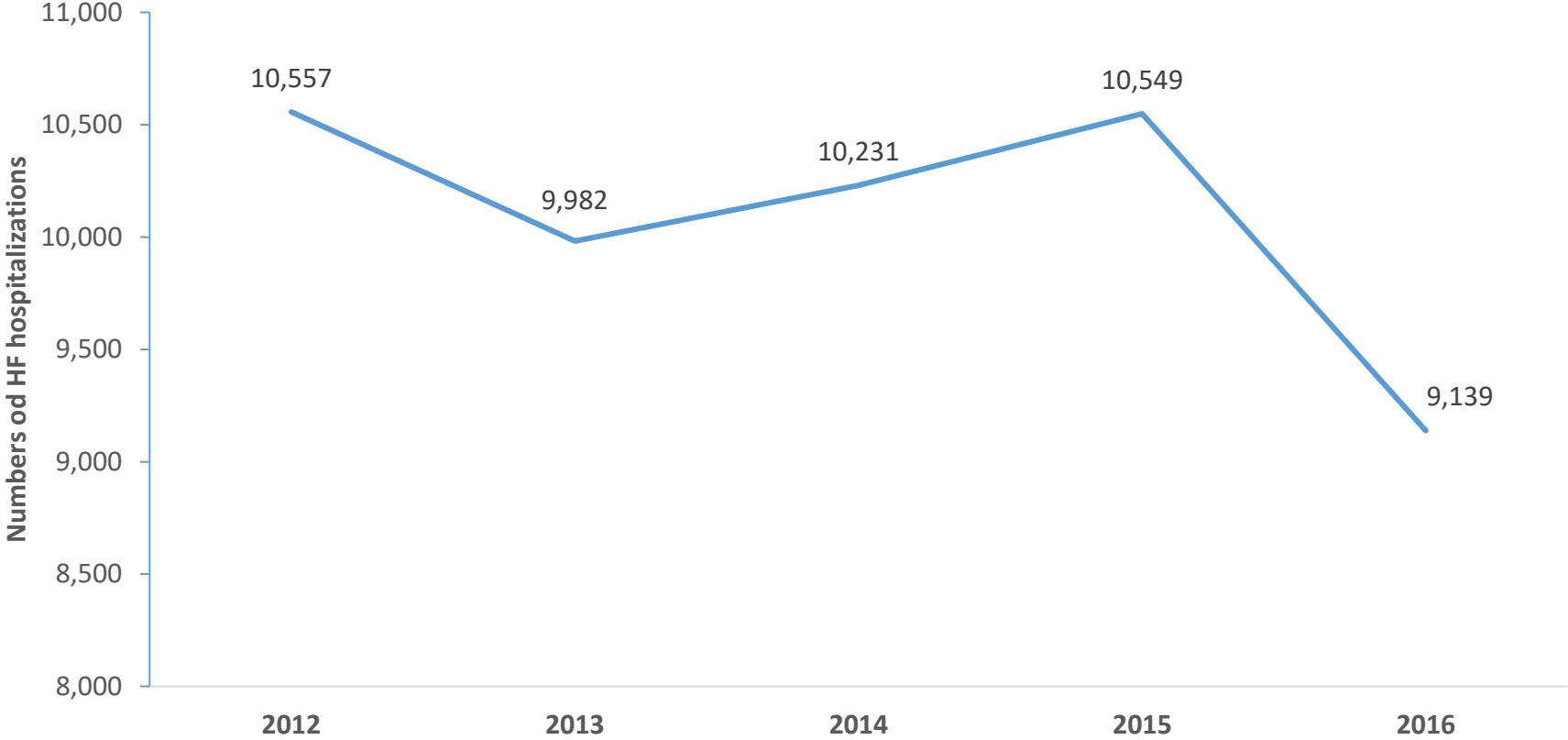
- In 2012, total cost for HF was estimated to be \$30.7 billion¹
- By 2030, the total cost of HF will increase by 127% to \$69.8 billion¹
- Costs associated with treating HF comorbidities and exacerbations in youths is significant at ≈\$1 billion for inpatient care²

1. Heidenreich PA et al. Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. *Circ Heart Fail.* 2013;6:606–619.
2. Nandi D, Rossano JW. Epidemiology and cost of heart failure in children. *Cardiol Young.* 2015;25:1460–1468.

HF Prevalence: AR vs US



HF Hospital Discharges: AR



HF Mortality: AR vs US

HF Mortality Rates, Deaths per 100,000 population, 2013-2017: AR vs US

Year	AR	AR's Rank Among States	US
2013	28.8	5 th	18.0
2014	26.4	8 st	18.6
2015	27.1	8 th	19.9
2016	26.7	9 th	20.3
2017	25.0	11 th	20.4

Centers for Disease Control & Prevention, 2017

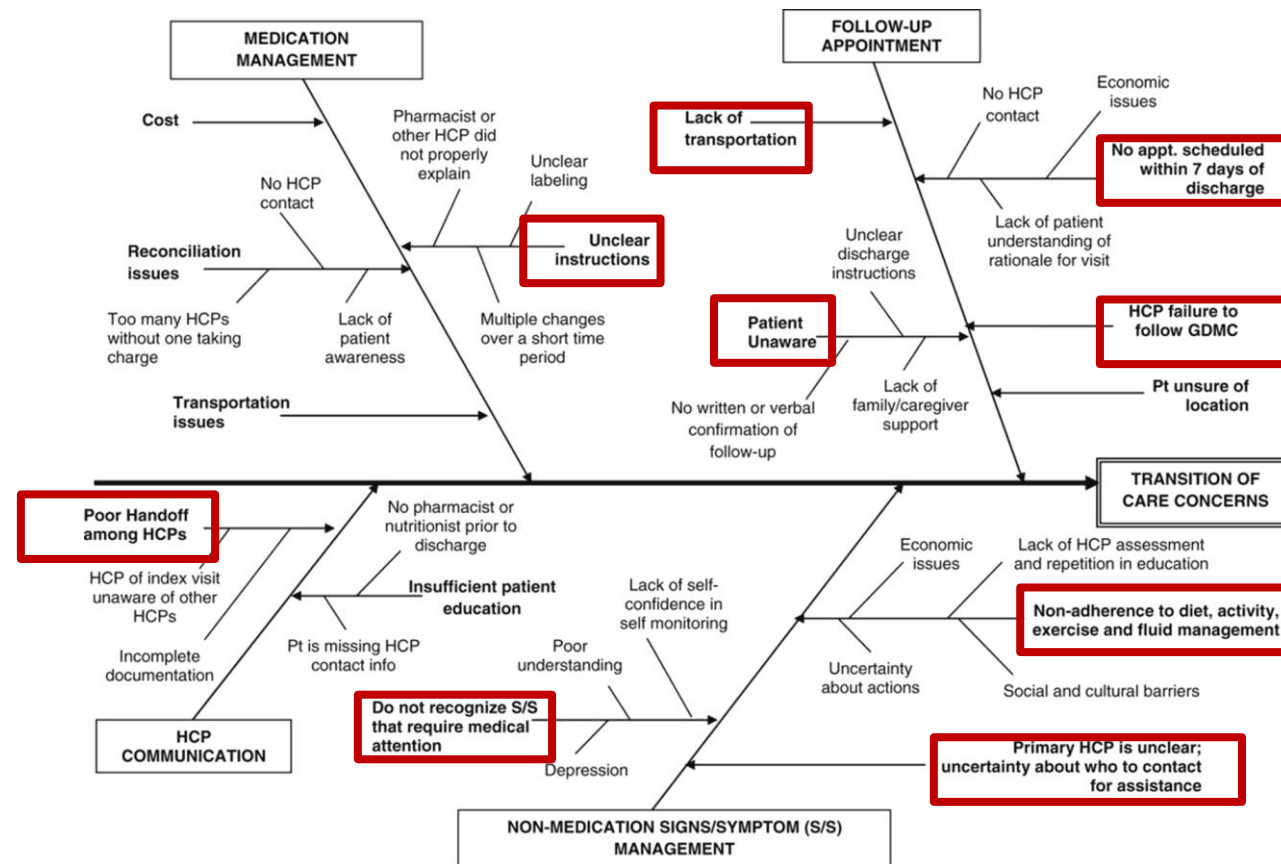
Primary Care Implications for HF

- Gaps in transitions of care (TOC) for patients with HF
- Emphasis should be on early collaborative care between cardiologists and PCPs for ambulatory HF patients discharged from the hospital or ED¹
- Multidisciplinary HF guidelines-based care is associated with increased medication adherence, CVD diagnostic testing, and better outcomes²
- There should also be a focus on clinical risk reduction of HF antecedent risk factors in the patient-centered medical home (PCMH) setting

1. Lee DS et al. Improved Outcomes With Early Collaborative Care of Ambulatory Heart Failure Patients Discharged From the Emergency Department. *Circulation*. 2010;122:1806–1814

2. Yancy et al. 2017 ACC/AHA/HFSA Focused Update of the 2013 ACCF/AHA Guideline for the Management of Heart Failure. *Journal of the American College of Cardiology* Volume 70, Issue 6, August 2017.

TOC Concerns for HF



Nancy M. Albert et al. Transitions of Care in Heart Failure. Circulation: Heart Failure. 2015;8:384–409.

Primary Care Points of View

- Identify the high-risk patient population
- Collaboration with other subspecialties
- Guideline-Directed Medical Therapies
- Transitions of care

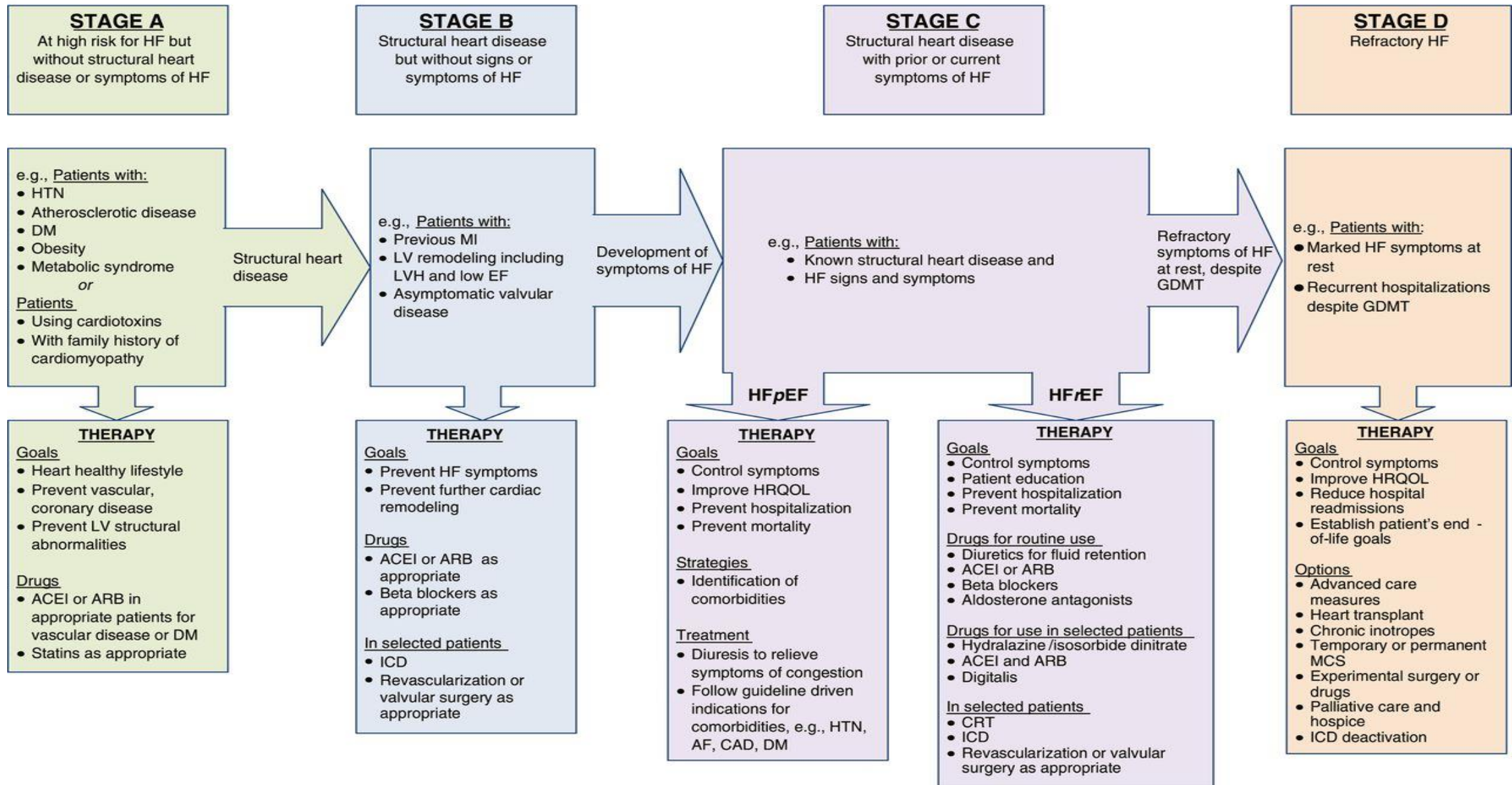
Management of HF

Primary aims of therapy

- Improve symptoms and quality of life
 - Relieve circulatory congestion
 - Increase tissue perfusion
- Prolong life by slowing disease progression
 - Reduce vasoconstriction
 - Inhibit activation of the renin-angiotensin-aldosterone system and the sympathetic nervous system
 - Inhibit progressive enlargement or remodeling of the left ventricle

At Risk for Heart Failure

Heart Failure



CENTRAL ILLUSTRATION: Characterization of HFpEF, HFmrEF, and HFrEF

	Characteristics			Outcomes		Guideline-Directed Medical Therapies				
	Older Age	Male Sex	CAD	Morbidity	Mortality	ACEI	ARB	ARNI	BB	MRA
HFpEF (LVEF > 50%)	+++	+	++	++	++	X	✓ (IIB)	?	X	✓ (IIB)
HFmrEF (LVEF 40-50%)	++	++	+++	++/+++	++	?	✓ (IIB)	?	?	✓ (IIB)
HFrEF (LVEF < 40%)	+	+++	+++	+++	+++	✓ (I)	✓ (I)	✓ (I)	✓ (I)	✓ (I)

Hsu, J.J. et al. J Am Coll Cardiol HF. 2017;5(11):763-71.

Coordinating Care for Patients With Chronic HF



Effective systems of care coordination with special attention to TOC should be deployed for every patient with chronic HF that facilitate and ensure effective care that is designed to achieve GDMT and prevent hospitalization.



Every patient with HF should have a clear, detailed and evidence-based plan of care that ensures the achievement of GDMT goals, effective management of comorbid conditions, timely follow-up with the healthcare team, appropriate dietary and physical activities, and compliance with Secondary Prevention Guidelines.



Palliative and supportive care is effective for patients with symptomatic advanced HF to improve quality of life.

Public Health Implications for HF

- Currently there are no dedicated HF prevention programs in AR
- Public health efforts are focused on prevention and control of HF risk factors, such as Hypertension, diabetes, hypercholesterolemia
- ADH's long-term goals are to establish a system of care for HF in the state in collaboration with AHA, cardiologists, PCPs, and other stakeholders
- Plans are to implement a state-wide HF registry in collaboration with AHA's GWTG-HF program, hospitals, and primary care partners to improve the state of HF in AR

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