Rural Urban Differences in Cardiac Prevention

David W Schopfer, MD MAS

Cardiologist & Medical Officer National Heart, Lung, and Blood Institute

Vermont Center on Behavior and Health 8th Annual Conference

October 2020





National Heart, Lung, and Blood Institute





I have no financial disclosures



Overview – Rural health disparities in chronic heart diseases

- Cardiovascular disease in rural patients
 - Epidemiology
 - Factors contributing
- Coronary artery disease management
 - Issues unique to rural patients
 - Opportunities in cardiac rehabilitation







AHA PRESIDENTIAL ADVISORY

Call to Action: Rural Health

A Presidential Advisory From the American Heart Association and American Stroke Association

"...a call to action for AHA and other stakeholders to make rural populations a priority in programming, research, and policy."



Cardiovascular health in rural communities

- Higher prevalence of heart disease
 - Rural 14.2% vs. small metropolitan 11.2% vs urban 9.9%
- Higher CV death rates
 - Declining more rapidly in urban vs. rural
 - Coronary heart disease death higher in rural
- Rural women have higher maternal mortality rates
 - Driven largely by an increase in CV deaths in peripartum period



Major causes of poor CV outcomes among rural individuals

Individual factors

- Traditional risk factors physical activity, diabetes, obesity, hypertension all worse among rural communities
- Mental health and substance abuse worsening more quickly in rural communities
- Social determinants of health
 - Income, education, employment, housing, transportation, food insecurity

Healthcare delivery system

- Limited access to timely acute care (i.e., PCI for AMI)
 - % within 1 hour of PCI-capable hospital unchanged despite increase in PCI-capable hospitals
- Quality? need rural-specific metrics
- Access to providers including specialists



Importance of delays in acute coronary syndromes

- Delays in medical care can result in arrhythmias \rightarrow VF \rightarrow sudden cardiac death
- Ongoing ischemia that is not intervened upon leads to compromised cardiac function and increased risk of heart failure
- Coronary reperfusion with thrombolysis or angioplasty within the first 12 hrs can reduce mortality by 50%
- Reasons for delays in timely treatment:
 - Difficulty with transportation to hospital
 - Facilities not able to provide revascularization
 - Patient delays in seeking care:
 - Poor symptom recognition
 - Competing demands and life challenges
 - Responsibilities that are associated with gender roles
 - Time to reach the medical facility distance, climate



Challenges with diagnosis of acute coronary syndromes

- Difficult in diagnosing ACS:
 - Difficulties accessing specialist advice
 - Atypical presentations that may occur in patients with complex co-morbidities
 - Limitations of troponins and serial testing

Treatment concerns:

- Revascularization within 90 minutes for STEMI
- If fibrinolysis was used, rescue PCI is still indicated if recurrent MI, ischemia, or cardiogenic shock occurs; also with LVEF <40%, heart failure, or ventricular arrhythmias
- Risk of death highest from arrhythmias and adequate monitoring must be available



Access to cardiac catheterization lab

 Hospitals with a cardiac catheterization lab and capable of performing PCI increasing yet rural patients lack access



Transferred patients have significant delays

- Temporal trends in proportion of patients with STEMI receiving primary PCI <90 min
- Presentation at hospitals without PCI capability are associated with delays



10

Masoudi et al. JACC. 2017



Cardiac rehabilitation availability for secondary prevention

- Critical to make lifestyle modifications and receive optimal therapy to reduce chance of recurrence and rehospitalization, and optimize their quality of life
- Cardiac rehabilitation can reduce ACS recurrence, hospital readmission, and mortality and impact increases with duration of participation.
- CR program delivery has traditionally been facility-based
 - Uptake has been suboptimal with lesser uptake for residents located at a distance from a CR center and even more so for those living in rural areas
 - Especially critical if specialist access is limited
- Alternatives to facility-based CR programs have been tested and proposed and shown to result in equivalent benefits
- Landscape of CR is changing for clinicians who manage patients in rural areas



What is cardiac rehabilitation?

Clinical indications

- Myocardial infarction
- PCI
- CABG
- Chronic stable angina
- Valve replacement
- Heart transplant
- Heart failure (reduced EF)

Core components of CR

- Physical activity counseling
- Nutritional counseling
- Weight management
- Blood pressure management
- Lipid management
- Diabetes management
- Psychosocial counseling
- Tobacco cessation

Clinical outcomes







🚹 Quality of life



Why do this study?

 Cardiac rehab programs are underutilized in patients with cardiovascular disease despite evidence of benefit

<20% of all eligible patients participate

- Home-based cardiac rehab has potential to overcome logistical barriers and improve participation
- But does home rehab work?

1662 NIH National Heart, Lung and Blood Institute

Suaya et al. Circulation. 2007;116:1653–1662 Beatty et al. Circulation. 2018;137:1899-1908

13

Limited access to cardiac rehab for rural veterans

9.1 million Veterans currently enrolled in VHA

6.9 million **(76%)** live more than 60 minutes from a VA with an onsite CR center





Major barriers to participation in cardiac rehab



Schopfer et al. J Cardiopulm Rehabil Prev. 2016

Why do cardiac rehab at home?



Many logistic barriers to traditional CR

- Integrate behavior change into daily lifestyle
- Effects may be longer-lasting
- Less fear about being active alone
- Incorporate spouse or family into the changes



Potential benefits of home-based cardiac rehab

Shorter time to enrollment

Reduce capacity issues

Flexible scheduling

No transportation issues

Integrated with regular home routine

Lower cost?

Greater capacity



National Heart, Lung, and Blood Institute

Potential disadvantages of home-based cardiac rehab

Less intensive exercise In short term, but is this sustained?

Less social support Engage family or friends, online support?

Less patient accountab Overcome with technology?

Lack of published stand Work in progress, more data coming

Less monitoring and cc Potential for more with wearables?

Safety concerns for hig Not supported by data, goal to ↑ safety

Lack of reimbursement Not everywhere, new solutions coming



National Heart, Lung and Blood Institute

Rural vs. Urban Participation in Cardiac Rehab



Referrals to home-based cardiac rehab



Reasons for not participating when home option available



Schopfer et al. J Cardiopulm Rehabil Prev. 2020

Categories after including interviews





Schopfer et al. J Cardiopulm Rehabil Prev. 2020

22

PCORI study of home-based vs facility-based cardiac rehab





Schopfer et al. J Am Heart Assoc. 2020;9:e016456

and Blood Institute

Time from event to participation shorter in home cardiac rehab



Schopfer et al. J Am Heart Assoc. 2020;9:e016456

Patients in home cardiac rehab more likely to complete all sessions





Schopfer et al. J Am Heart Assoc. 2020;9:e016456

Patients increased their walking distance more with home cardiac rehab

25



Schopfer et al. J Am Heart Assoc. 2020;9:e016456

Additional improvements





Schopfer et al. J Am Heart Assoc. 2020;9:e016456

26

Subgroup: urban vs rural





Conclusions



- Time to enrollment significantly shorter
- Greater increases in 6-min walking distance at 3 months



Why this matters



- Not everyone can participate in facility rehab (transportation, distance, employment, and other barriers)
- Not everyone wants to participate in a supervised group
- Fills in large gap for potential non-participants



29

Current use of telehealth under COVID-19

- Recent expanded use of telehealth occurring with COVID-19
- Federal government has expanded authorization for reimbursement in Medicare and states in Medicaid programs
 - Congress and CMS receiving many requests to make changes to telehealth guidelines permanent
- Patient use of telehealth increased from 11% in 2019 to 46% in 2020
- 19% "very likely" and 43% "somewhat likely" to use telehealth services after COVID-19



NHLBI research in rural communities

- Risk Underlying Rural Areas Longitudinal (RURAL) study
 - Address gaps in knowledge about heart and lung disorders
 - 4600 participants
 - Assess impact of lifestyle, genetics, poverty, minority status on risk
- Mobile Health Intervention for Rural Atrial Fibrillation
 - Evaluate intervention to improve anticoagulation adherence
- Improved Cardiovascular Risk Reduction to Enhance Rural Primary Care (ICARE)
 - Use of pharmacist supported primary care improves adherence to some CV medications



What opportunities to investigate further?

- Rural-Urban disparities in CV health persist despite efforts
- What do we still need to learn about rural disparities in CVD?
- How can we address them?
- Some broad categories to consider investigating further:
 - Quality improvement efforts
 - Interventions to improve quality of care or medication adherence
 - Self-management interventions



Potential solutions

- Address shortage of providers
- Rural focused team-based care
- Sustainable funding and payment models
- Alternative delivery care sites
 - Pharmacy, schools, churches
- Telehealth and digital tools
 - Monitoring of chronic disease
 - Access to more providers
 - Specialty support for primary care





