H2H
HOSPITAL-TO-HOME

The importance of early medication management to reducing readmissions

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Reduce Risk and Cost

- In a study where a nurse educator provided cardiovascular patients with a pharmacological plan (a description of the reason for drug use, mechanism of action, possible drug interactions, and symptom management) in addition to providing a list of medications, dosage, and instructions, participating patients had a ***35% lower risk of readmission or death***.[1]

- Discharge planning and home follow-up including medication management has been shown to ***reduce readmissions and reduce length of hospital stay***. In a study of elderly patients who received medication management discharge planning and follow-up, total Medicare reimbursements for health services in the control group were approximately 1.2 million and only 600,000 in the intervention group.[1]

- It is estimated that issues with medication use and poor medication adherence in cardiovascular treatment ***costs the U.S. $100 billion annually.***[2,3]

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1

Improve Patient Quality of Life

- As patients experience changes in their medication therapy, clinicians can make efforts to keep patients happy and healthy.

- The clinician should keep in mind whether the patient understands any changes in their medication and how to manage medications.

- Medication management is crucial to enhancing patient well-being. Patients perceive their health status to be better if they are on evidence based medications.[11]

3

Medication use correlates with a decrease in patient mortality

Medication use has been proven to reduce morbidity and mortality in patients with Heart failure and AMI.[15,5,13] Heart failure treatment through medication continues to increase and good medication management is imperative.

The increase in cardiovascular medication

Table 1 Continued	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	p Value for Trend	All Years
Use of cardiovascular drugs after MI hospitalization												
Post-MI statin	7.6	9.9	16.3	22.2	27.7	31.9	39.3	45.4	48.2	50.7	<.0001	26.7
Post-MI BB	41.5	45.7	50.5	56.8	59.7	62.7	66.9	67.8	71.3	71.6	<.0001	57.3
Post-MI ACE/ARB	39.2	41.0	42.0	45.3	44.4	43.1	45.4	47.2	49.7	50.0	<.0001	44.1
Post-MI antiplatelet	2.6	7.9	12.3	19.6	26.8	26.6	37.6	44.7	49.2	50.9	<.0001	24.4

Values represent % for categorical variables and mean (SD) for continuous variables. Covariates were assessed during the 12-month period prior to and during the index MI admission. Prior MI does not include the index MI event.
ACE/ARB = angiotensin-converting enzyme inhibitor/angiotensin receptor blocker; BB = beta blocker; MI = myocardial infarction; PCI = percutaneous coronary intervention; PTCA = percutaneous transluminal coronary angioplasty.

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Defining
Medication Management

Medication **Management Defined**

- According to The Joint Commission on Accreditation of Healthcare Organizations, medication management includes *ensuring that self-administered medications are safely and accurately administered*.

- Patients and caregivers must be given information about what *medication they are taking, a description of the method for administering it, expected actions and adverse effects, and the method for monitoring side effects. Follow-up should be used to monitor the treatment.*[24]

- Post-discharge medication management includes the *initial evaluation of the patient's need for medications, the provision of a prescription, and ongoing medical monitoring/evaluation as necessary*.[20]

Medication Management means:
- Medication adherence (system level definition)
- Medication reconciliation (system level definition)
- Optimal medication therapy (clinician-level definition)
- Health literacy (patient-level definition)

Medication Adherence

The importance or adherence

•31-58% of cardiovascular patients are non-adherent in taking medications. [1]
•33% - 69% of medication-related hospital readmissions in the U.S. are due to poor medication adherence.[1]

•Improved medication adherence among HF patients can lead to a decrease in emergency department visits, rehospitalization, and mortality.[34]

•Though the use of evidence-based medication for AMI patients is increasing, there continue to be high rates of discontinuation. Elderly patients especially have high discontinuation rates, thwarting efforts to reduce the treatment gap.[16]
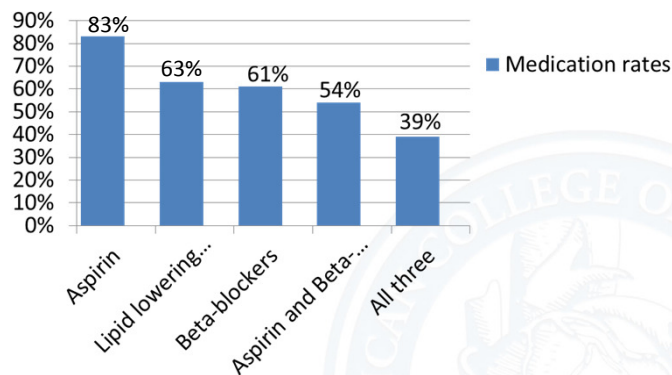
Consequences of Non-Adherence

•Medication non-adherence contributes to 20-64% of heart failure rehospitalizations.[1]

•In MI patients, good medication adherence (a rate of filling or taking medication at least 80% of the time) has been linked to lower rates of subsequent MI and lower mortality rates.[1]

Self-Reported Medication Adherence by Medication Type

Adherence becomes harder to achieve with multiple medications. [1]

Consequences **of Non-Adherence**

Table 1 Potential outcomes of nonadherence to evidence-based medications commonly used to treat patients with clinical heart failure and patients with left ventricular systolic dysfunction after myocardial infarction

Drug class	Examples	Potential outcomes of nonadherence
Angiotensin-converting enzyme inhibitor[13]	Captopril Enalapril Lisinopril Ramipril Fosinopril Quinapril Trandolapril	Activation of renin-angiotensin-aldosterone system ↑ Systolic blood pressure ↑ Myocardial oxygen demand ↑ Preload ↑ Afterload ↓ Heart function Ventricular hypertrophy and remodeling ↓ Exercise tolerance ↑ Hospitalization and mortality
Angiotensin receptor blocker[14]	Losartan Candesartan Valsartan	
Aldosterone antagonist[15,16]	Eplerenone Spironolactone	Activation of renin-angiotensin-aldosterone system ↓ Heart function Ventricular hypertrophy and remodeling Sodium retention ↑ Hospitalization and mortality
β-Blocker[17,18]	Carvedilol Carvedilol CR Bisoprolol Metoprolol succinate	Activation of sympathetic nervous system ↓ Heart function ↑ Heart rate ↑ Blood pressure Ventricular remodeling ↑ Ventricular arrhythmias ↓ Exercise tolerance ↑ Hospitalization and mortality
Digoxin[19, a]	Digoxin	↓ Heart muscle contraction ↑ Heart rate ↑ Atrioventricular node conduction ↓ Exercise tolerance ↑ Hospitalization
Loop diuretic[20]	Furosemide Bumetanide Torsemide	Signs of fluid retention (rales, S₃ heart sound, edema, jugular venous pressure elevation, weight gain, ↓ serum sodium level) Symptoms of fluid overload (dyspnea, orthopnea, paroxysmal nocturnal dyspnea, fatigue)
Thiazide/thiazide-like diuretic[20]	Hydrochlorothiazide Metolazone	↑ Electrolytes (potassium, magnesium) ↑ Blood pressure ↑ Hospitalization
Statins[21]	Atorvastatin Pravastatin Simvastatin Rosuvastatin	↑ Low-density lipoprotein cholesterol Loss of pleiotropic benefits

[a] Only in heart failure.

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1. Albert, N.M. (2008). Critical Care Nurse. 28:54-64

Medication **Reconciliation**

- Medication error and patient ***confusion most commonly occur during care transitions*** (during admission, transfer, or discharge from a health care facility).[27,18]

- "Medication reconciliation is the process of comparing a patient's medication orders to all of the medications that the patient has been taking. This reconciliation is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions. It should be ***done at every transition of care*** in which new medications are ordered or existing orders are rewritten."[27]

- Reconciliation of medication needs to be done during hospital admission, discharge, and in follow-up to make certain that all of the patient's healthcare providers know what the patient's medications are at time of transition. A successful transitional medication management program ***can reduce heart failure patient readmissions, length of stay, cost of hospitalization, and mortality rates***.[7]

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Medication Reconciliation

According to the Joint Commission's Hospital Patient Safety Goals, hospitals must:

- Find out what medicines each patient is taking.

- Make sure that it is healthy for the patient to take any new medicines with their current medicines.

- Give a list of the patient's medicines to their next caregiver or to their regular doctor before the patient goes home.

- Give a list of the patient's medicines to the patient and their family before they go home. Explain the list.

- Some patients may get medicine in small amounts or for a short time. Make sure that it is healthy for those patients to take those medicines with their current medicines.

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Optimal Medication Therapy

Optimal Medication Therapy is a process which includes prescribing safe, effective, and efficient medication for a specific patient.[35] The optimization of drug therapy is a crucial step to helping patients manage their medications. The appropriate drugs and appropriate doses should be prescribed.[35]

Medication type:
Aspirin, beta-blockers, and aggressive reperfusion therapy have improved the area of medication management by reducing one-year mortality after myocardial infarction.[22]

Monitor the dose:
Drugs such as ACE inhibitors and B-adrenergic blocking agents are often not prescribed in optimal doses due to their need to be titrated up.[35]

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Health Literacy

- Health literacy describes an individual's cognitive and social skills determining their motivation and ability to gain access to, understand and use information for improving and maintaining health. **Health literacy creates empowerment** through increasing access to health information and increasing a person's ability to use information.[33]

- In a study of heart failure patients, an intervention provided **support from a pharmacist, verbal instructions, written materials developed at a low literacy level, and communication between the pharmacist and the patient's healthcare providers**. The intervention group had greater medication adherence, fewer ED visits, hospitalizations, lower costs, and increased patient satisfaction than the control group.[12]

Barriers to Successful Medication Management

Barriers to Successful Medication Management

Medication-Related Barriers:[23,19,22,34]
- Complex medication regimens
- Side effects or adverse effects from the medication
- Taking multiple mediations at the same time
- Length of therapy
- Pharmacy wait time

Clinician-Related Barriers:[23,19,22,34]
- Poor relationship with clinician
- Poor communication with clinician
- Cultural, health, and/or religious beliefs— disparity between clinician and patient
- Lack of feedback and ongoing reinforcement from clinician

Patient-Related Barriers:[23,19,22,32,14,9,31,34]
- Forgetfulness
- Lack of knowledge about medication and its use
- Cultural, health, and/or religious beliefs about the medication
- Denial or ambivalence regarding conditions
- Length of therapy
- Financial challenges
- Lack of health literacy
- Lack of social support
- Lack of transportation to appointments and/or pharmacy
- Confusion about prescription labels
- Difficulty swallowing medication
- Depression

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Barriers to Medication Adherence

Medication Complexity
The *number of medications prescribed to HF patients continues to increase.* Patients can benefit from reducing the number of times per day that they take medication and the number of pills they take. Polypills provide two or more medications in one pill.[1]

Cost
The *cost of medication continues to increase*. Generic medications can be used to decrease the cost. Patient discharge can include a conversation about a drug payment plan.[1]

Table 2 Factors that influence medication nonadherence

Failure to initiate therapy during hospitalization
Poor communication and education at discharge of the importance of medications
Complexity of medication regimen
  Polypharmacy
  Frequent dosing
Medication cost
Adverse effects
  Lack of knowledge about possible adverse effects

Side Effects
Empowering patients through education on possible side effects can improve adherence. They are better equipped to deal with side effects that they understand, especially if they *know which side effects are temporary and which are permanent.*[1]

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Provider Communication

- In a study of adult AMI patients, communication with health care professionals caused confusion about AMI severity and medication treatment. ***Patients mistakenly interpreted symptoms as a result of medication instead of as a result of having had a heart attack.[4]***

- Healthcare professionals can address barriers by ***helping patients to understand HF symptoms, review the effectiveness of medication to manage symptoms, develop environmental cues to form a habit of taking medications, and establish a positive relationship*** between patients and their healthcare providers.[34]

- "When screening for appropriate medication use, ***communicate in an empathetic, non-judgemental, collaborative way*** and ask open-ended questions. This will improve the chance of the patient talking about his/her barriers to medication use as prescribed."[23]
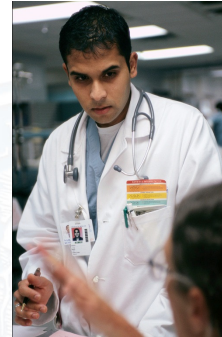
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Cost and Access

- Coverage of prescription medications is an important factor in helping patients to have access to their medications.[17] Costs of heart failure medications continue to increase. [1] In addition, many heart failure patients are on medications for other conditions. [1] Patients may be avoiding taking medication because they cannot afford it. [1] It is important for healthcare professionals to be knowledgeable about the cost of medications. [1] Medicare Part D, for example, will likely require substantial out of pocket costs.[1]

- ***Healthcare providers can help their patients by focusing on what patients can do to over come perceived and real barriers instead of strictly providing them with information.[22]*** Discuss any opportunities for assistance with transportation and cost.

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Understanding Prescription Labels

It is often difficult for patients to understand drug labels.

- Single-step instructions are easier for patients to understand than multiple-step instructions on medication labels.[32]

- Lower levels of literacy and taking many medications increase misunderstanding of prescription drug labels.[14]

- Patient comprehension increases with more precise wording on labels.[9]

- Drug label instructions are generally awkwardly phrased and vague, creating patient misunderstanding.[31]

Patient Knowledge of Medications

- In a study about patient awareness of medications prescribed during a hospital visit, *44% of patients believed they were receiving a medication they were not, and 96% were unable to recall the name of at least one medication* that they had been prescribed during hospitalization.[30]

- In an intervention where nurses contacted patients every 90 days, knowledge of prescribed medications improved.[29]

- Heart failure patients more accurately understand what they are taking better when they have specific written instructions.[21]

Facilitators and Interventions

Interprofessional Teams

Medication management is best accomplished by teams of clinicians.[22]

•In a study on nurse-led management, readmission rates were 4 times higher in patients who did not receive an education intervention through comprehensive discharge planning from a nurse prior to discharge and in follow-up.[1]

•"Bringing together the knowledge, skills, and perspectives of a multidisciplinary team of physicians, nurses, physician assistants, nurse practitioners, and others where appropriate provides the expertise and synergy to optimize medication therapy decisions, educate patients, implement and monitor medication therapy, enhance adherence, and measure and achieve quality clinical outcomes."[35,6]
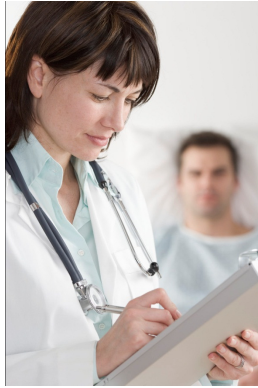
Teams can include:

•Physicians
•Nurses
•Pharmacists

The Role of Physicians

- Physicians can be a key source of support for HF patients. Many patients struggle with negative emotions and complexity of the self-care regimen. ***Physicians have an important role in providing social support to patients and increasing their motivation*** to engage in healthy behaviors such as medication adherence.[25]

- It is also important for the physician to ***put HF patients in touch with social workers, counselors,*** and other care providers who can provide support to the patient for managing their medications.[25]

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Nurse Participation

Nurse-directed patient education should include[1]:
- Comprehensive counseling about discharge medications
- Rationale for use in heart failure or after myocardial infarction
- Dose, how to take, when to take, what to do if a dose is skipped
- Anticipated or transient adverse effects, serious adverse effects
- When to contact a health care provider, which health care provider to contact
- Food, other drugs, or over-the-counter therapies that could affect drug effectiveness

Include patients' family members/caregiver in education session(s)[1]:
- Review of medications
- Review of possible adverse effects and serious adverse effects

Outpatient reinforcement of educational information[1]:
- Patient reminders: written, telephone
- Home visits
- Clinical visits

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Pharmacist **Participation**

- Pharmacists are accessible and have the skills and knowledge to help patients manage their medications. ***Pharmacists are in a position to optimize medication use***, reduce or prevent medication-related problems, and improve patient health.[35]

- Patients who received recommendations from clinical pharmacists were more likely to not have issues such as medication non-adherence, untreated indications, suboptimal medicine choices and cost-ineffective drug treatments.[2]

- Pharmacists can play a key role in reconciliation of medications. A study comparing a discharge routine involving only doctors and nurses to a team of doctors, nurses, and pharmacists showed that ***the team including a pharmacist significantly reduced the risk of medication discrepancies and prescription errors in*** patients with heart failure within the first month after discharge.[10]

Percent of Discrepancies or Prescription Error per patient and per medication in a pharmacist intervention
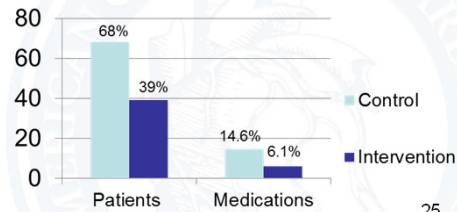
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Assess **Patient Readiness**

Patients need to feel ready and able to make healthy changes in order to adhere to their treatment.   A healthcare professional should take the time to establish whether a patient is motivated to change their habits and accept a new form of therapy.

•Ask the patient about their understanding of their condition.

•Ask about their personal reasons and specific goals for wanting to recover or control their condition.

•Ask what you can do to help.

•If a patient is not ready to make change, it is best to educate them more on their condition and benefits of treatment.

•If a patient is not sure if they are ready to change, remind them why change is important and educate them on the skills and tools to achieve behavior change.

•If a patient is ready to make changes to improve their health, help them to set goals, create a medication plan. Continue to motivate them and recognize their achievements during each visit.[23]

•Discuss barriers to change and help the patient identify solutions.

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Patient Counseling

Counseling can help to individualize addressing a patient's barriers to medication management.[1] It can also provide the opportunity to address a patient's misperceptions about their condition and treatment, and improve adherence.[22,26]

Education and counseling for patient and family/ caregiver should include:[22]
- Basic drug information, dose, and possible side effects.
- What to do with other prescriptions from previous physician visits or hospitalizations.
- Possible natural remedies and vitamins
- How to best manage a complicated medicine regimen
- Issues related to the cost of medication
- Strategies to facilitate adherence
- Discuss barriers and how to overcome them

Methods and Tools:[22]
The teach-back method has shown positive results in patient self-management. Visual aids such as medication schedules have shown improving patient understanding, reducing in medication errors, and improving health outcomes.
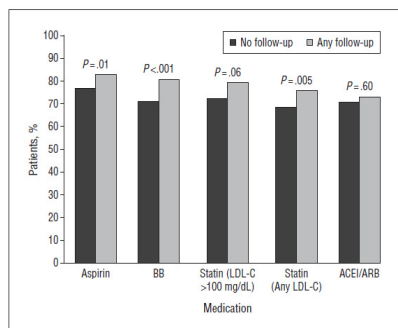

Intervention is Needed

- Intervention through a patient-centered message has been shown to change beliefs of HF patients about the benefits and barriers to taking medications.[28]

- Patients who receive early follow-up are more likely to be prescribed evidence-based drug therapies and more likely to use them.[8]

Follow-up Increases Medication Use

Figure 2. Unadjusted medication use at 6 months among candidates for each therapy according to 1-month follow-up status. ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, β-blockers; and LDL-C, low-density lipoprotein cholesterol (to convert LDL-C to millimoles per liter, multiply by 0.0259).
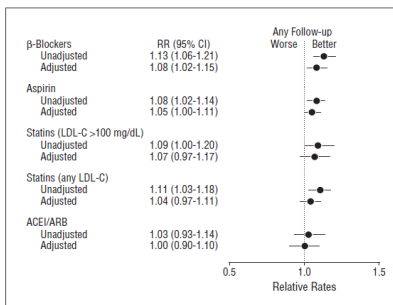
Figure 3. Unadjusted and adjusted likelihood of 6-month medication use (adjusted for study site, baseline demographics, socioeconomic factors, patients' avoidance of medications or care because of cost, psychosocial factors, medical history, clinical status on admission, cardiac rehabilitation participation, myocardial infarction characteristics, and discharge medications). ACEI indicates angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; CI, confidence interval; LDL-C, low-density lipoprotein cholesterol; RR, relative risk. To convert LDL-C to millimoles per liter, multiply by 0.0259.

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Daugherty. (2008). Association of early follow-up after acute myocardial infarction with higher rates of medication use. *Arch Intern Med,* **168(5), 485-491.**

A Comprehensive **Intervention**

A successful intervention should be comprehensive[23,22,1,19]

•Identify and target patients who are at high risk for rehospitalization
•*Assess and address patient factors that affect adherence to regimens and ability to engage in self-care*
•*Simplify dosage regimens*
•*Educate about the medication, its benefits, side-effect management, duration of therapy, and what a patient can expect is provided*
•*Schedule Follow-up care and send reminders*
•Create positive relationships with healthcare providers
•Involve patients in the decision-making process
•Ensure that patients and providers work together to set goals
•Give rewards for achieving goals
•Dispense ongoing reinforcement, motivation, and support at every step in the health care system
•Foster social support, include family members and caregivers in education
•Administer self-care management training to increase the patients ability to understand and promote patient self-care
•Teach self-care skills, don't just present information

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"Mind Your Meds" Success

The clinician is successful if:

1. HF and MI patients are prescribed appropriate medications, dose, type, and frequency.

2. Medication reconciliation is performed accurately as appropriate for every patient AND is documented in the medical record.

3. Possible external barriers to obtaining prescribed medications are identified in advance, addressed, and documented in the medical record.

4. Possible barriers to patients remembering/ understanding the need to take medications and taking medications as prescribed are identified in advance, addressed, and documented in the medical record.

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"Mind Your Meds" Success

The clinician is successful if (continued):

5. Patient/Caregiver is provided with documented instructions and prescriptions for all their medications, especially when and how they should be taken, during the discharge process.

6. Patient/Caregiver can demonstrate they understand the importance of taking their medications, of adhering to their medication as prescribed, and of adhering to any changes to their prescriptions – especially medications that are added or discontinued.

7. Patient/Caregiver can demonstrate they understand possible side effects and symptoms that may be related to their medications, and who to call if they have symptoms that may be related to medications.

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"Mind **Your** Meds" Success

The patient is successful if:

8. Patient/Caregiver remembers to take all their medications as prescribed (i.e., dose, type, frequency).

9. Patient/Caregiver can demonstrate they understand what each medication does, why the medication is important to take as prescribed, and what potential side effects there may be for medicines.

10. Patient/Caregiver brings his/her medications or a medication list to each and every clinic visit.

11. Patient/Caregiver can discuss any challenges, problems, issues, side effects, or questions about medications with clinician.

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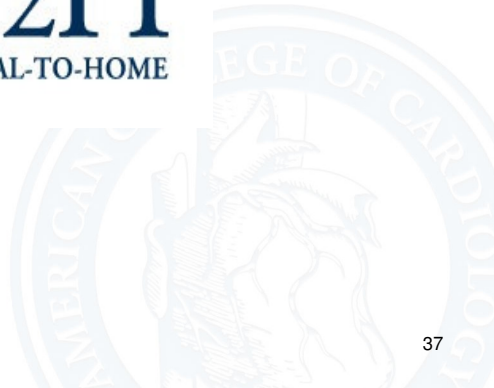*Helping Cardiovascular Professionals*
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Thank You

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