

# DOCUMENTATION RATE OF LEFT VENTRICULAR EJECTION FRACTION IN A CARDIOVASCULAR REGISTRY AND IN ELECTRONIC HEALTHCARE RECORD (EHR) SYSTEMS

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## BACKGROUND + INTRODUCTION

Left ventricular ejection fraction (LVEF) is an important indicator of heart function in at-risk cardiac patients. Measurement of LVEF may be used to optimize medication treatment for patients with coronary artery disease (CAD), hypertension, and atrial fibrillation. Many performance measures have been endorsed and adopted by medical organizations, payor groups and government agencies<sup>1, 2, 3</sup> as the gold standard for quality healthcare and for provider reimbursement purposes (see Examples A and B). In this study, documentation of left ventricular ejection fraction (LVEF) in an ambulatory cardiovascular registry was compared with LVEF available in structured fields of three general-purpose electronic health records systems.

### Example A | Outpatient Atrial Fibrillation/Flutter Measures Requiring LVEF

#### 2016 ACC/AHA Clinical Performance and Quality Measures for Adults With Atrial Fibrillation or Atrial Flutter<sup>2</sup>

**SHORT TITLE: QM-11 Beta Blocker Prescribed (When LVEF  $\geq$ 40)**

**QM-11: Atrial Fibrillation/Atrial Flutter: Beta Blocker Prescribed (When LVEF  $\geq$ 40)**

**Measure description:** Percentage of patients, age  $\geq$ 18 y, with a diagnosis of AF or atrial flutter and with an LVEF  $\geq$ 40 who were prescribed a beta blocker during the measurement period.

**Numerator** Patients with a diagnosis of AF or atrial flutter and with an LVEF  $\geq$ 40 for whom a beta blocker was prescribed\* during the measurement period  
\*Prescribed—Also satisfied by documentation in current medication list

**Denominator** All patients with AF or atrial flutter and with an LVEF  $\geq$ 40

**Denominator exclusions**

- Patients age <18 y
- Patients who are on comfort care measures only

**Denominator exceptions**

- Documentation of a medical reason for not prescribing a beta blocker
- Documentation of a patient reason for not prescribing a beta blocker
- Patient currently enrolled in a clinical trial related to AF/atrial flutter treatment

**Measurement period** Reporting year

**Sources of data** Medical record or other database (e.g., administrative, clinical, registry)

**Attribution** Measure reportable at the facility or provider level

**Care setting** Outpatient

#### Rationale

AF, whether paroxysmal, persistent, or permanent, and whether symptomatic or silent, significantly increases the risk of thromboembolic ischemic stroke. Nonvalvular AF increases the risk of stroke 5 times, and AF in the setting of mitral stenosis increases the risk of stroke 20 times over that of patients in sinus rhythm.

Rate control in AF is an important strategy. It impacts quality of life, reduces morbidity, and decreases the potential for developing tachycardia-induced cardiomyopathy.

Multiple agents, including beta blockers and nondihydropyridine calcium channel blockers, and certain antiarrhythmic drugs, including amiodarone and sotalol, have been evaluated with regard to efficacy in attaining rate control. When considering which agent(s) to use, clinicians must consider the patient's degree of symptoms, hemodynamic status, presence or absence of HF, and potential precipitants of AF.

In general, beta blockers are the most common agents used for rate control, followed by nondihydropyridine calcium channel blockers, digoxin, and amiodarone. Patient comorbidities must be understood to avoid medications that may precipitate adverse events, such as decompensation of HF, exacerbation of chronic obstructive pulmonary disease, or acceleration of conduction in patients with preexcitation.

#### Clinical Recommendation(s)

2014 ACC/AHA/HRS Guidelines for the Management of Patients With Atrial Fibrillation (23)

1. Control of the ventricular rate using a beta blocker or nondihydropyridine calcium channel antagonist is recommended for patients with paroxysmal, persistent, or permanent AF (5B-GD). (Class I, Level of Evidence: B)

ACC indicates American College of Cardiology; AF, atrial fibrillation; AHA, American Heart Association; HF, heart failure; HRS, Heart Rhythm Society; LVEF, left ventricular ejection fraction; and QM, quality measure.

### Example B | Outpatient CAD Measures requiring LVEF

#### ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Coronary Artery Disease and Hypertension<sup>3</sup>



**PERFORMANCE MEASURE 7:  
Beta-blocker Therapy:  
Prior MI or left ventricular systolic dysfunction**

Percentage of patient aged  $\geq$ 18 with a diagnosis of coronary artery disease seen within a 12-month period who also have prior myocardial infarction or a current or prior LVEF < 40% who were prescribed beta-blocker therapy



**PERFORMANCE MEASURE 8:  
ACE inhibitor/ARB therapy:  
Diabetes or left ventricular systolic dysfunction (LVED <40%)**

Percentage of patients aged  $\geq$  18 years with a diagnosis of coronary artery disease seen within a 12-month period who also have diabetes or a current or prior LVEF < 40% who were prescribed ACE-inhibitor or ARB therapy

## METHODS

- Documentation of LVEF was assessed in the outpatient cardiovascular PINNACLE Registry®. Data for the registry are extracted from structured fields in participating practice's EHR systems. LVEF was also assessed for structured fields sourced from three general-purpose ambulatory EHRs comprising Veradigm's Health Insights database.
- Eligible patients included those patients with a history of CAD, hypertension and atrial fibrillation with at least one outpatient encounter in the time period from April 1, 2014 to March 31, 2019.
- Performance measures were evaluated for the capture and use of LVEF value in the measures (e.g. <40%)

## RESULTS

In the registry data LVEF was documented for 42.8% of patients. In the ambulatory EHRs, documentation ranged from <1% to 11.3% (Table 1).

Table 1 | Documentation of LVEF Completion

ASSESSMENT TYPE	N SIZE	LVEF CAPTURED	PERCENTAGE
PINNACLE Registry <sup>a</sup>	8,012,174	3,425,596	42.8%
EHR 1	1,261,13	7142,408	11.3%
EHR 2	1,800,394	59,843	3.3%
EHR 3	871,806	1,109	<1%

## DISCUSSION

- The cardiovascular registry has a quality focus with a number of known performance measures that are regularly evaluated. This may have led to higher documentation of LVEF.
- Among the general purpose EHRs representing half primary and half specialty care – only a small portion of the latter are cardiologists – it is not surprising that documentation of LVEF was lower.
- In both cases, lack of specific documentation of LVEF in structured EHR fields does not necessarily mean that LVEF is not available at the practice level. It may be that LVEF is available as unstructured text in the source systems and/or as a document stored elsewhere containing echocardiogram results.

## CONCLUSION

- LVEF is a valuable indicator of cardiovascular function for patients with CAD, hypertension or atrial fibrillation. Documentation of LVEF was higher in the cardiovascular registry than in the general purpose, ambulatory EHRs.
- Documentation of LVEF in structured EHR fields would make it more readily available for use in patient care as well as for use in quality measures. More complete readily available documentation may lead to better quality of care.

## REFERENCES

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2. Heidenreich PA, Solis, et al. 2016 ACC/AHA Clinical Performance and Quality Measures for Adults With Atrial Fibrillation or Atrial Flutter J Am Coll Cardiol. 2016 Aug, 68 (5) 525-568. DOI: <https://doi.org/10.1016/j.jacc.2016.03.521>
3. Drozda J, Messer, J, et al. ACCF/AHA/AMA-PCPI 2011 Performance Measures for Adults With Coronary Artery Disease and Hypertension J Am Coll Cardiol. 2011 Jul, 58 (3) 316-336. DOI: <https://doi.org/10.1016/j.jacc.2011.05.002>