

Incidence of Arrhythmias in Patients with Obesity Detected by Long-Term Ambulatory ECG Monitoring

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Background

- Patients with overweight or obesity have higher rates of cardiovascular comorbidities.
- Data relating weight status to incidence of cardiac arrhythmias is limited.

Objective

- We evaluated arrhythmia incidence in a large US population of patients with overweight or obesity receiving long-term ambulatory ECG (AECG) monitoring.

Methods

Study Design

- Retrospective cohort study of long-term continuous (LTCM) or mobile cardiac telemetry (MCT) AECG devices prescribed in the US from 2018-2022.
- Devices included a patient-activated button to document symptoms.

Population

- Inclusions: Patients ≥18 years, ≤ 14 days of AECG monitoring (Zio[®] XT or AT; iRhythm Technologies, San Francisco, CA).
- Exclusions: Prior arrhythmia diagnosis or 100% AF.

Comparison Groups

- Weight class from ICD-10 diagnosis codes: Normal/Underweight, Overweight, Obese, Severely Obese.

Data Sources

- [iRhythm clinical data warehouse](#): ECG data analyzed using an FDA-cleared deep learning algorithm and confirmed by qualified cardiographic technicians.
- [Claims](#): Linkage to commercial fee-for-service and Medicare Advantage data.

Statistical Analysis

- Arrhythmia incidence compared by weight class using logistic regression models adjusted for age, sex, and baseline comorbidities.

Results

Cohort Description

- **Total N=162,531 patients**
- 12.5% Normal/Underweight
- 22.5% Overweight
- 46.7% Obese
- 18.3% Severely Obese
- Overall 65% White race; 35% Black/Asian/Other/Unknown.
- % Black increased (6.7% to 11.8%) and % Asian decreased (3.9% to 1.2%) as BMI increased from normal/underweight to severely obese.
- Increased weight associated with greater baseline comorbidity burden ([Table 1](#)).

Patient Characteristics and Effect of Weight Status on Rhythm Findings

Table 1. Patient Characteristics

	Normal/Underweight (n=20,280)	Overweight (n=36,504)	Obese (n=75,957)	Severely Obese (n=29,790)
Age and Sex				
Age (years), Mean (SD)	59.7 (19.2)	61.3 (16.3)	57.2 (16.3)	54.9 (15.0)
Sex, female (%)	71.6%	58.4%	63.4%	70.8%
Top 5 Monitoring Indications				
Palpitations	47.1%	46.0%	45.4%	46.1%
Syncope and collapse	10.9%	9.5%	8.4%	7.5%
Unspecified tachycardia	4.4%	3.9%	4.7%	5.2%
Unspecified bradycardia	4.4%	4.7%	4.2%	3.7%
Dizziness and giddiness	4.0%	4.3%	4.1%	3.6%
Major Baseline Comorbidities				
Chronic kidney disease	7.2%	8.2%	8.4%	9.6%
Coronary artery disease	11.0%	14.2%	13.3%	11.6%
Congestive heart failure	5.9%	6.3%	7.9%	11.6%
Diabetes	9.4%	15.9%	22.4%	28.9%
Hypertension	36.4%	46.4%	49.0%	53.6%
Obstructive sleep apnea	1.8%	4.5%	10.0%	17.1%
Stroke/TIA	7.2%	6.1%	6.2%	5.3%

Figure 1. Absolute (Unadjusted) Incidence

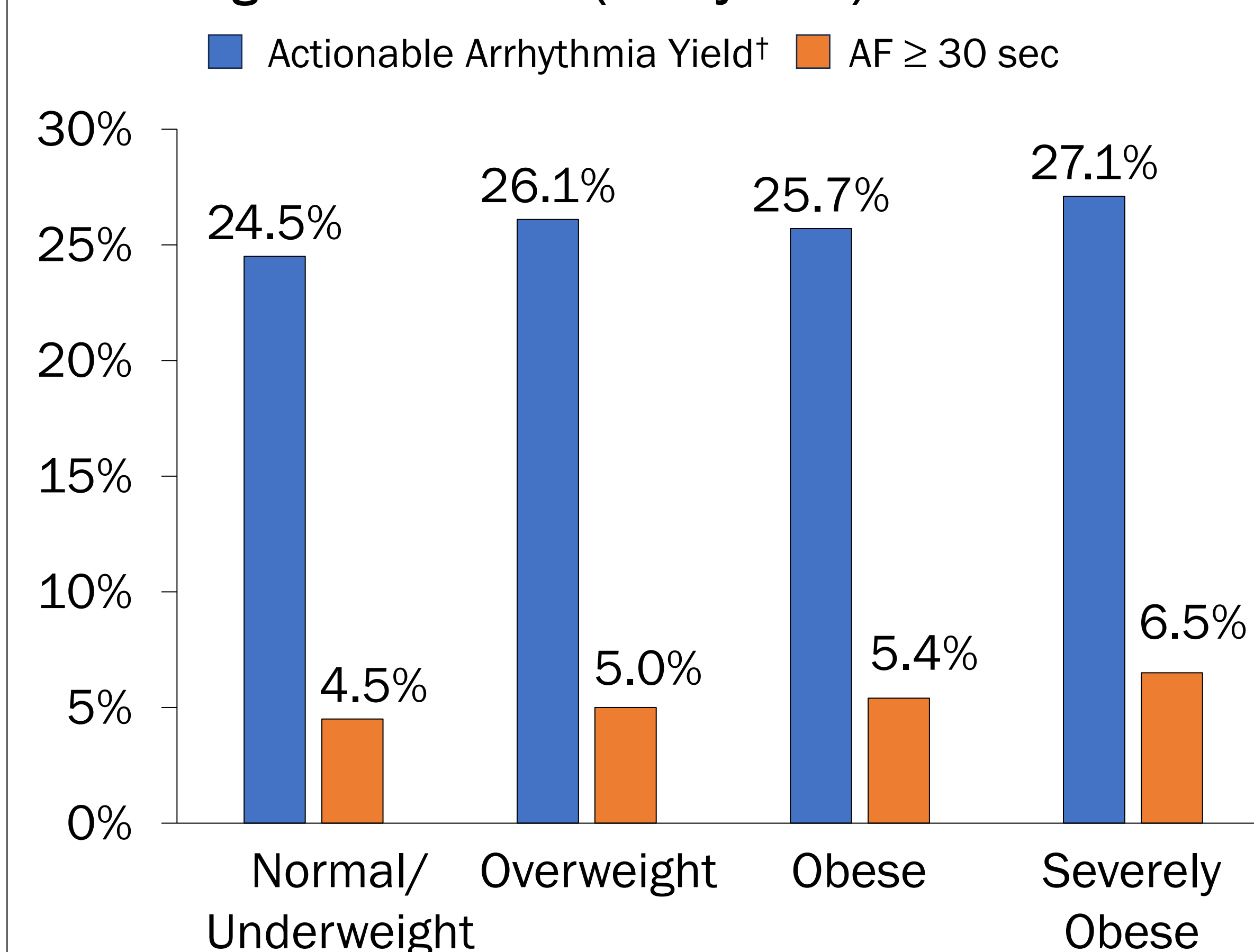
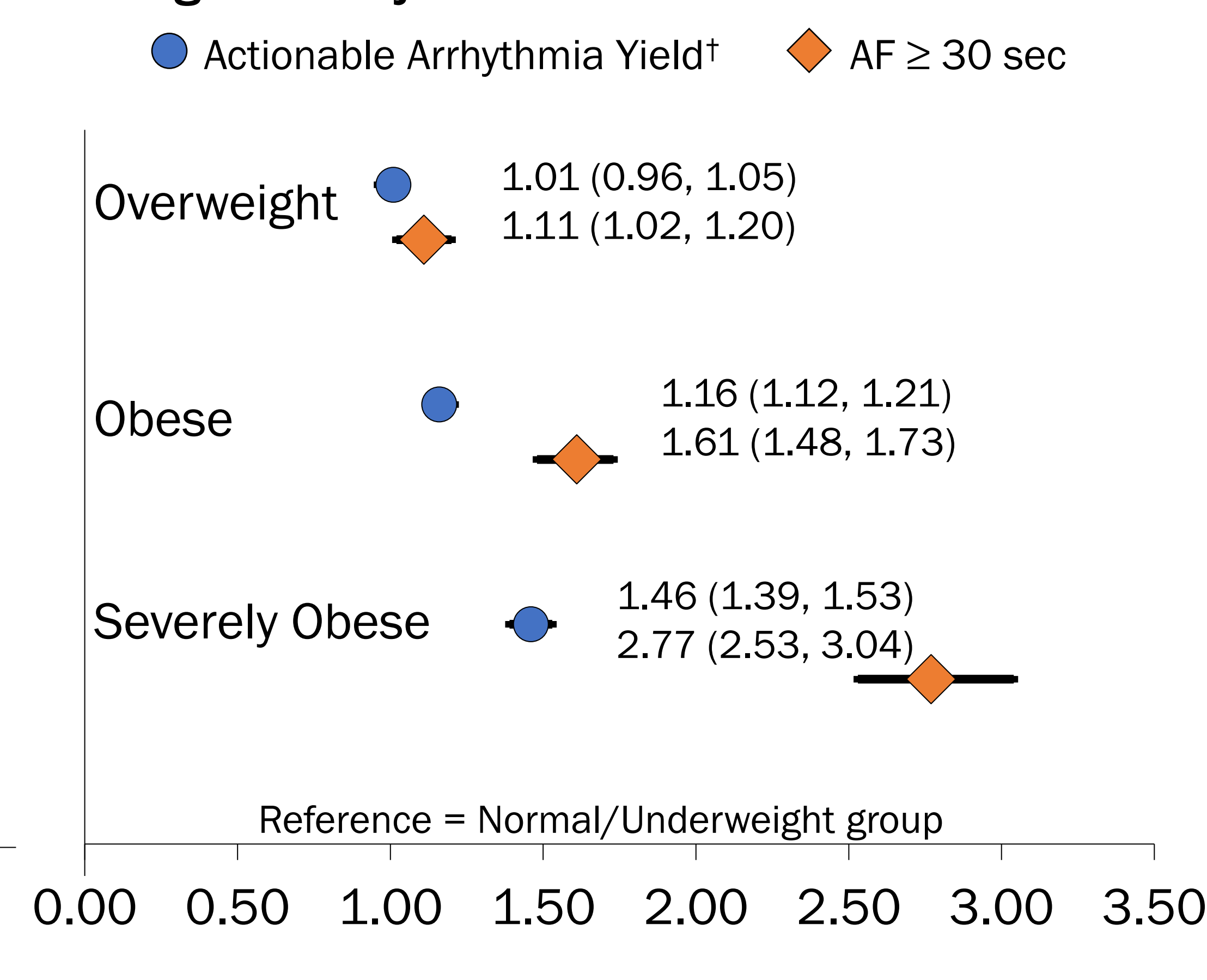


Figure 2. Adjusted Odds Ratios and 95% CI



†AF ≥ 30 sec, SVT ≥ 90 bpm & ≥ 30 sec, VT ≥ 100bpm & ≥ 4 beats, any ventricular fibrillation, pause ≥ 3 sec, and AV block (any 2nd deg or complete heart block).
 Figure 1: All p<0.0001 compared to Reference group (Normal/Underweight).

Discussion

- Absolute rates of AF increased with increasing weight ([Figure 1](#)).
- Increasing weight was associated with increased incidence (Adjusted OR (95% CI)) of ([Figure 2](#)):
 - AF ≥30 sec
 - Overweight: 1.11 (1.02, 1.20)
 - Obese: 1.61 (1.48, 1.73)
 - Severely Obese: 2.77 (2.53, 3.04)
 - Moderately increased actionable arrhythmia yield.

Limitations

- Retrospective observational design.
- Weight classifications were identified using administrative claims, which may result in misclassification.
- Unmeasured confounders (e.g., medication use, weight management, glycemic control) may influence observed differences.

Conclusions

- **Overweight and obesity are independently associated with higher AF incidence on AECG compared to normal/underweight patients.**
- **These data support targeted rhythm surveillance and management strategies based on weight status.**

Disclosures

- AJ Battisti, V Fokin, and JM Ashburner are employees of and have received equity from iRhythm Technologies, Inc.
- S Schmitt has received compensation from iRhythm.
- Dr. Turakhia has received equity from iRhythm, Connect America, Evidently, PocketRN, AliveCor, and Hippocratic.ai. Dr Turakhia is an employee and corporate officer of iRhythm Technologies Inc.