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# Determining the Predictors for Cardiac Etiology on a syncope patient in the ED

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## Background

Syncope is defined as a transient loss of consciousness with accompanying loss of postural tone and spontaneous recovery. True syncope has many potential etiologies, which can be grouped into at least three main groups: neurologic, cardiac, and orthostasis. These groups can be further delineated into specific etiologies which are used on a daily basis in the ED.

Recent studies have shown that nearly 3% of the ED visits and approximately 6% of hospital admissions are attributable to either syncope or near-syncope (1,2). According to a study by Probst et al. trends in resource utilization for diagnosis of syncope, most notably imaging, appears to have increased significantly from 2001 to 2010, which accounts for nearly \$2.4 billion spent on syncope workup annually in the United States (2). According to a study performed by Daccarett et al. in 2011 (3), there is a significant number of patients being inappropriately admitted to hospitals instead of being discharged with no significant adverse event.

Nowadays, with rising of healthcare costs and a greater need for efficacy, hospitals are being forced to find ways to decrease costs without compromising patient outcomes. As a result, a large portion of studies have been published demonstrating the need for standardization in the management of syncope across the Emergency Department (ED).

## Project Goals

The goal of this study is to determine which combination of variables in the clinical encounter at bedside can better predict among all patients presenting to the ED with syncope, who is likely to have a cardiac diagnosis for their syncopal episode.

## Methods of Implementation

This study used a retrospective chart review done on a random sample of cases presenting to the ED with a chief complaint of syncope or loss of consciousness between 2014 and 2016.

## Outcomes

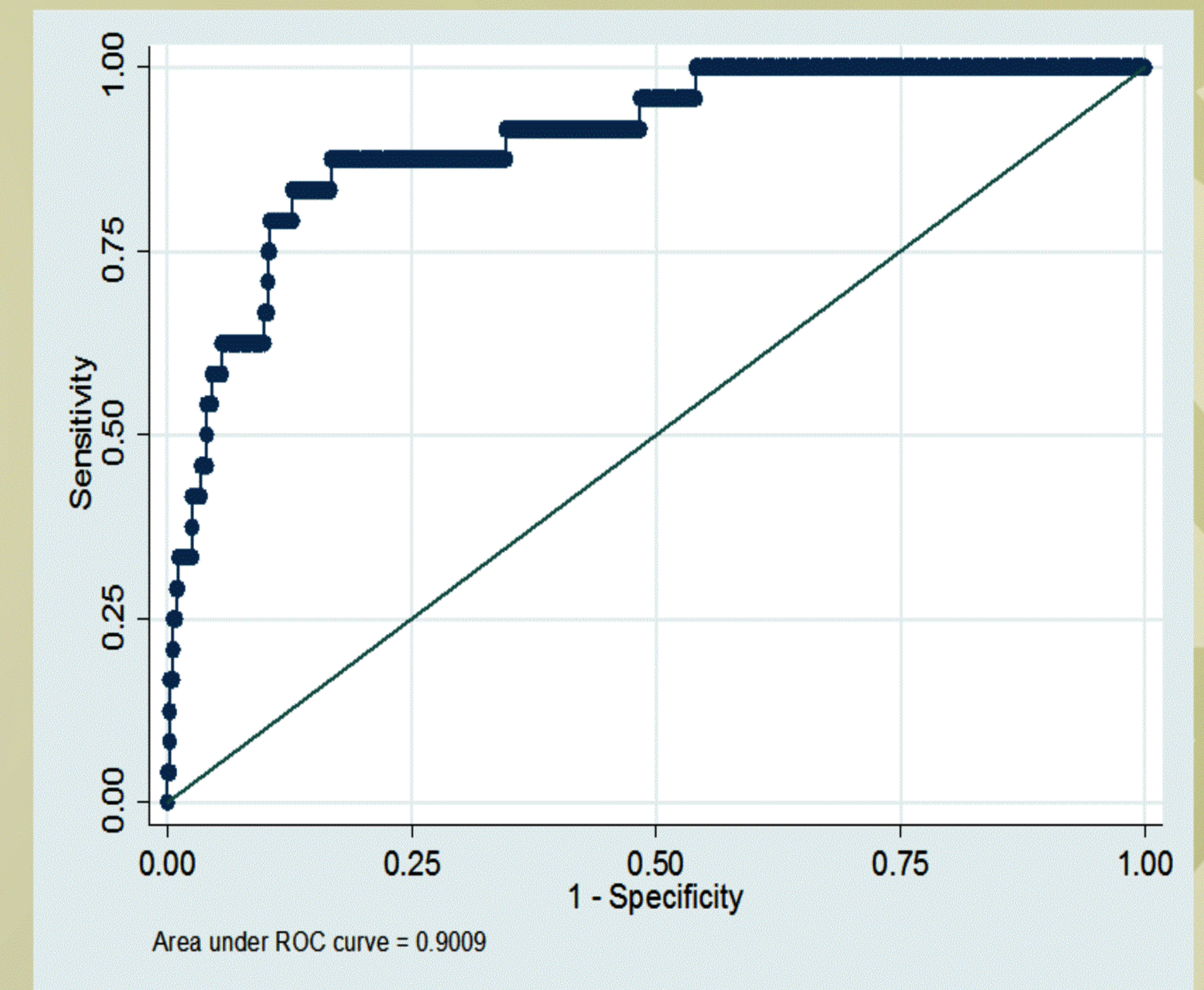
The final model created for predicting cardiac diagnosis included the following variables: age, gender, co-occurrence of palpitations, history of coronary artery disease, heart rate, bradycardia noted on EKG, QRS segment more than 120ms, and presence of stenosis on echocardiogram.

Table 1: Significant predictors of cardiac etiology

Variable	Odds ratio	95% confidence interval
Age	1.05	[1.01-1.09]
Male gender	2.93	[1.11-7.72]
Palpitations	24.43	[1.33-137.90]
History CHD	3.63	[1.35-9.77]
Bradycardia	4.24	[1.29-13.90]
QRS >120ms	5.06	[0.86-29.89]
Stenosis	7.35	[1.61-33.53]
Pulse	0.99	[0.95-1.02]

When all of these variables were included in the model, the area under the ROC curve was 0.901, thus indicating the relatively high usefulness of this model.

Figure 1: ROC curve for model predicting cardiac etiology



## Discussion

In regards to predicting a cardiac outcome for syncopal episodes, the presence of palpitations and valvular stenosis were found to have the most drastic increase in odds of obtaining a cardiac etiology. These two findings are in accordance to the pathophysiology of cardiac mediated syncopal episode, especially the latter. This model shows potential to create a risk score for cardiac outcomes in patients presenting to the ED with a chief complaint of syncope.

## References

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