

# Evaluation of Coronary Artery Disease: Variations in Practice Patterns Across Six Countries

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## BACKGROUND

Significant advances in cardiovascular medicine have resulted in the development of several diagnostic procedures and imaging technologies that are beneficial to patients in the evaluation of coronary artery disease (CAD). These advances are summarized in the American College of Cardiology and American Heart Association (ACC/AHA) guidelines recommendations.<sup>1</sup> Accurate diagnosis of CAD and confirmation of disease severity is essential to ensure proper risk stratification, maximal therapeutic benefit, and cost-effective use of therapy.<sup>2</sup> Substantial variation has been observed in the rates of therapies administered for acute myocardial infarction (AMI) from one US center to another,<sup>3,4</sup> leading to the hypothesis that regional variations may also exist in the diagnostic evaluation of CAD

## OBJECTIVES

We sought to determine if regional variations exist in the rate and sequence of diagnostic procedures performed during the initial evaluation of CAD.

## STUDY DESIGN

Design: A prospective cohort study was initiated in six countries (France, Germany, Italy, Spain, UK, US). Three hundred and twenty cardiologists participated and each site enrolled up to 5 consecutive patients (N= 2,002): France (301), Germany (308), Italy (302), Spain (304), UK (299), US (488).

Inclusion Criteria: Symptomatic patients 18 years and older presenting to a cardiologist for evaluation of coronary artery disease

- Participating Sites:
- Cardiologists with 3 to 29 years of experience;
  - See at least 30 patients at intermediate or high risk of CAD per month;
  - Mix of private practice (office setting) and hospital based

## METHODS

- Each site enrolled up to 5 consecutive patients
- Patients were assigned to categories of Low, Intermediate, or High pre-test risk for CAD based on clinician assessment
- Weight categories were defined according to BMI: Underweight (BMI<18.5); Normal weight (BMI 18.5-24.9); Overweight (BMI 25-29.9) Obese (BMI 30-35); Morbidly Obese (> 35);
- Patient demographics were compared using bivariate tests commensurate with their distribution.

## METHODS (Cont.)

- Outcomes of interest were:
- Proportions of patients according to country (Table 1)
  - Proportions of patients according to baseline risk category (Table 1)
  - Order of tests and proportion of tests by gender (Figure 1)
  - Order of tests and proportion of tests by country (Figure 2)

## RESULTS

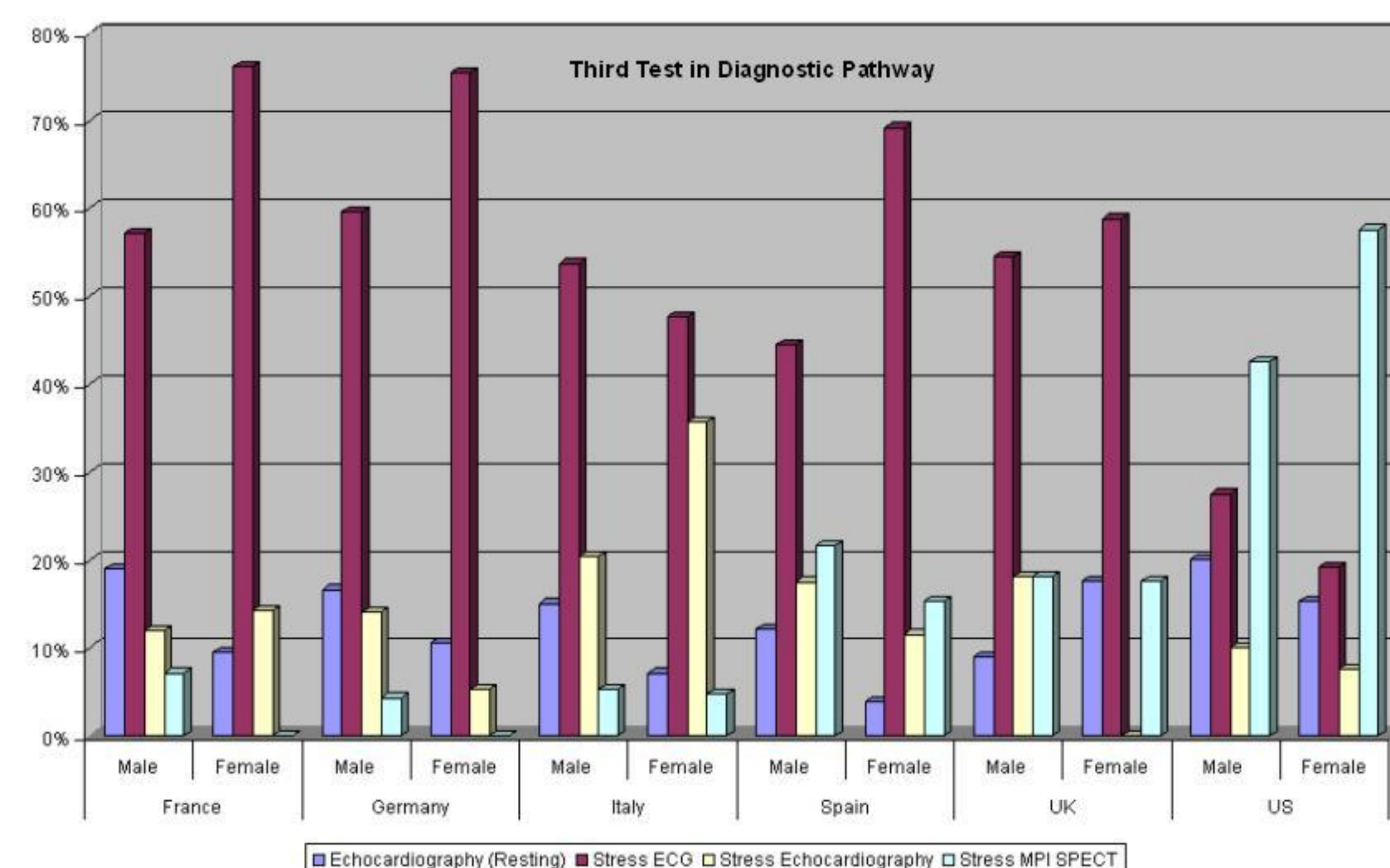
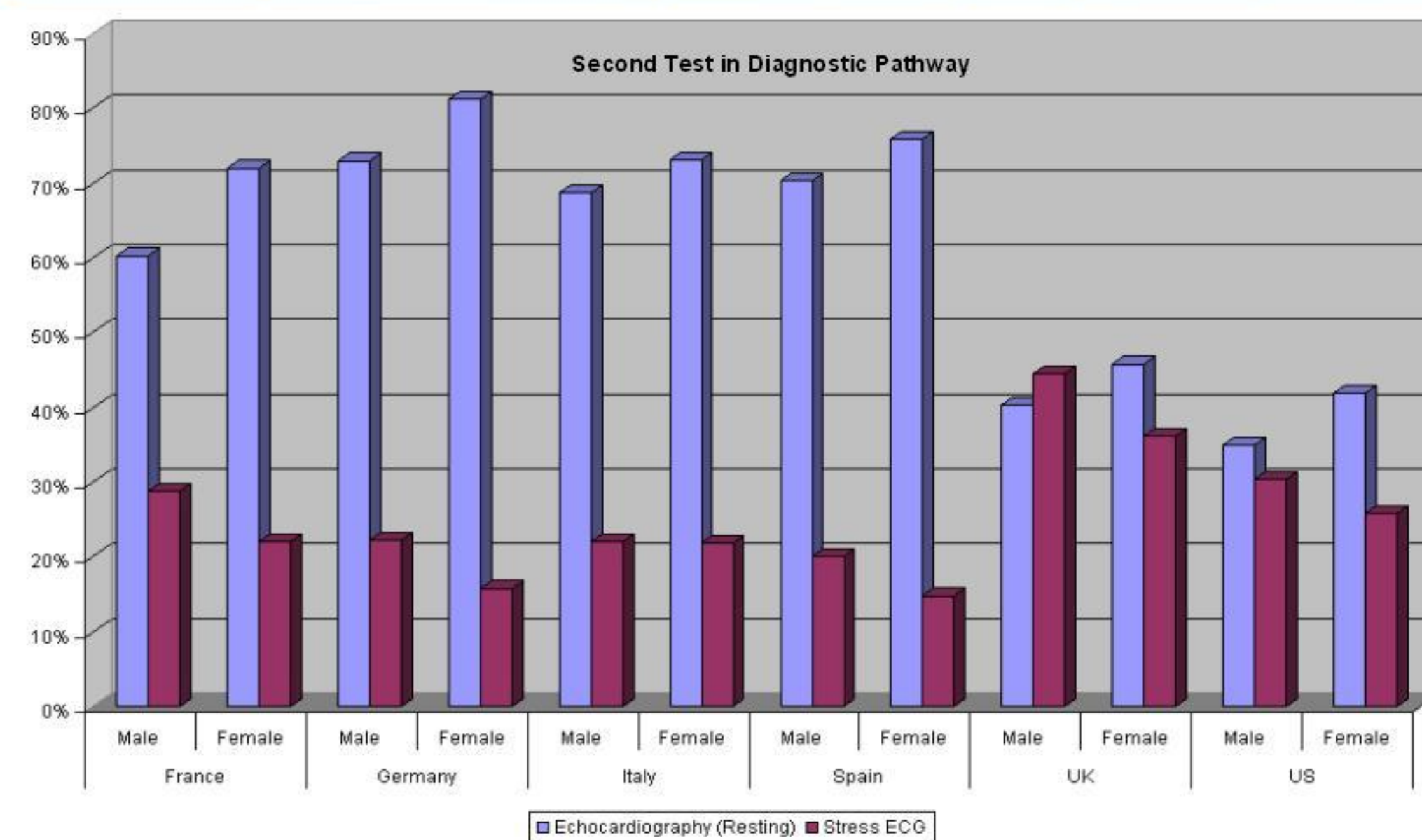
Table 1: Baseline profile of patient cohort

	France	Germany	Italy	Spain	UK	US	Total
Sample (N)	301	308	302	304	299	488	2,002
Male	69.7%	64.6%	68.8%	70.7%	63.8%	65.7%	67.1%
>60	59.8%	55.8%	52.3%	58.9%	57.5%	55.1%	56.6%
Low Risk	7.6%	20.5%	9.6%	12.5%	13.0%	7.8%	11.8%
Intermediate Risk	45.9%	61.0%	58.0%	57.9%	51.8%	58.0%	55.4%
High Risk	44.9%	18.2%	32.5%	29.6%	32.4%	34.0%	31.9%

Table 2: Total tests performed by stage

	France	Germany	Italy	Spain	UK	US	Total
Initial test	301	308	302	304	299	488	2,002
Second test	161	296	268	189	191	232	1,337
Third test	63	171	135	100	39	66	574
Fourth test	3	87	15	7	2	2	116

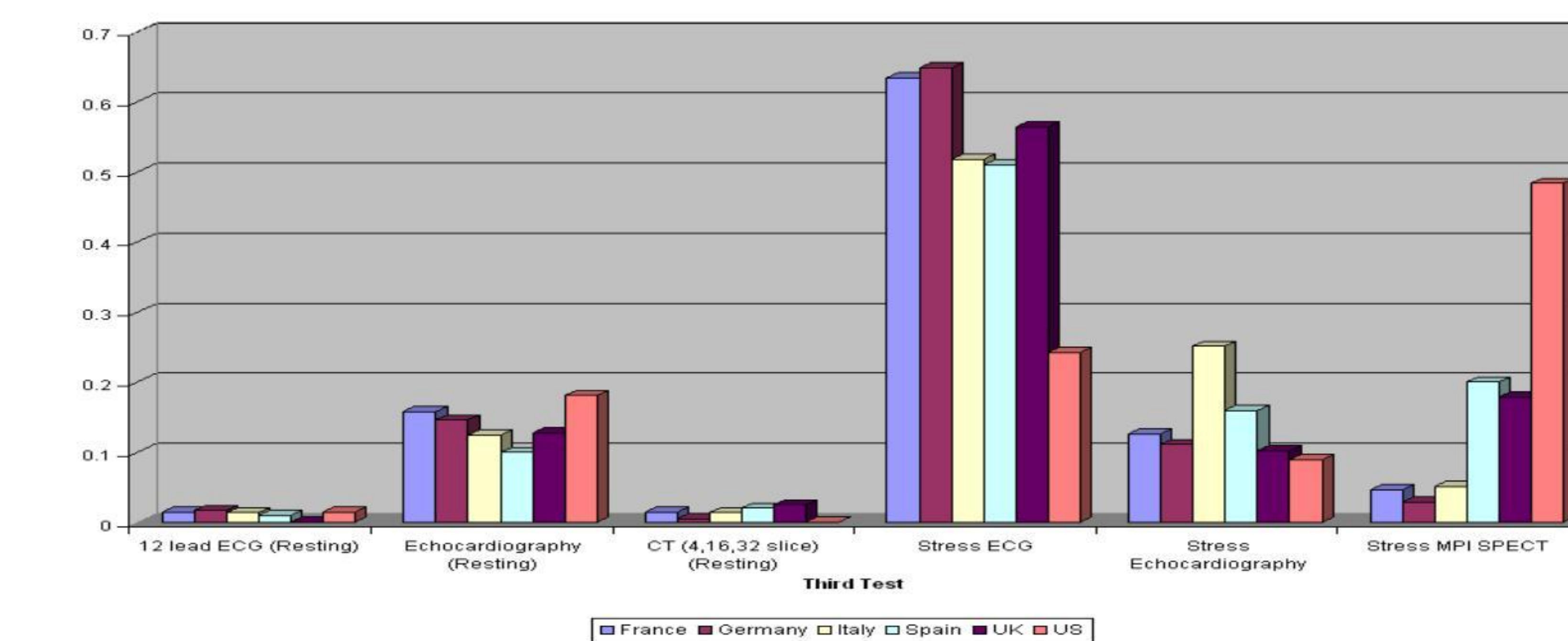
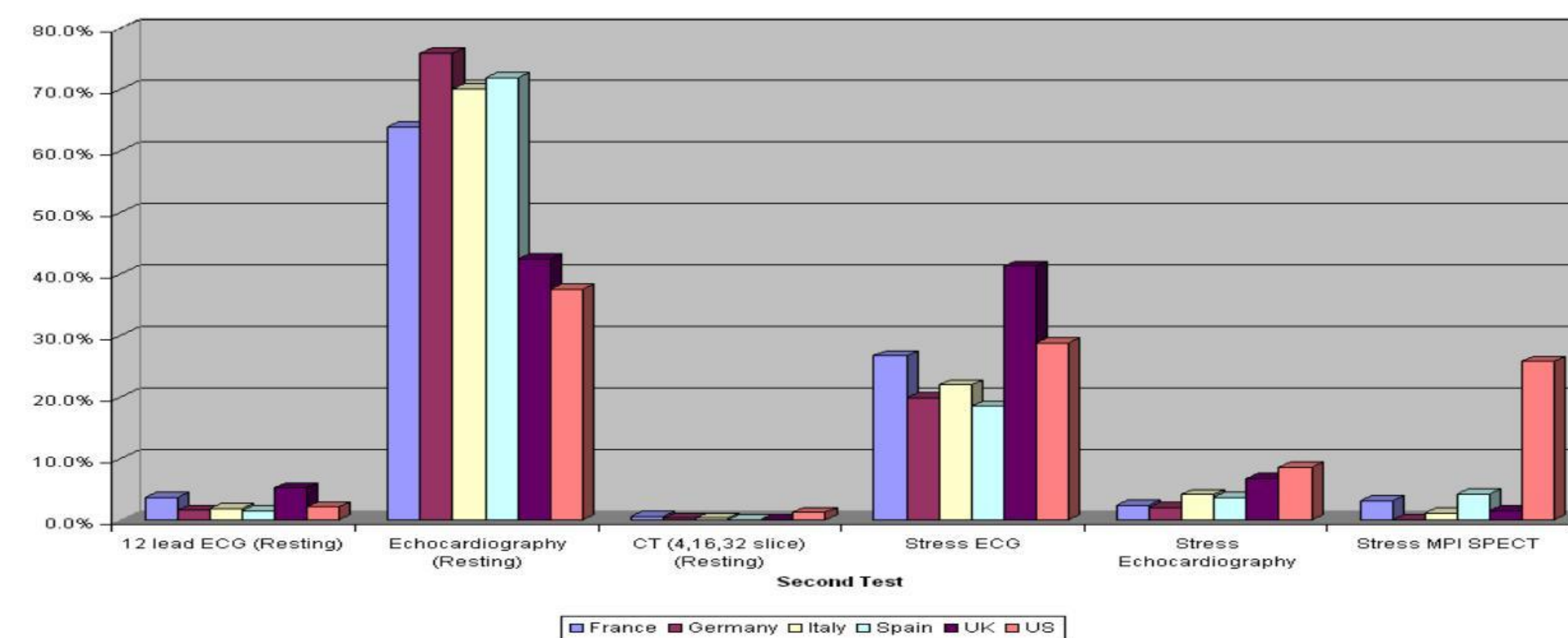
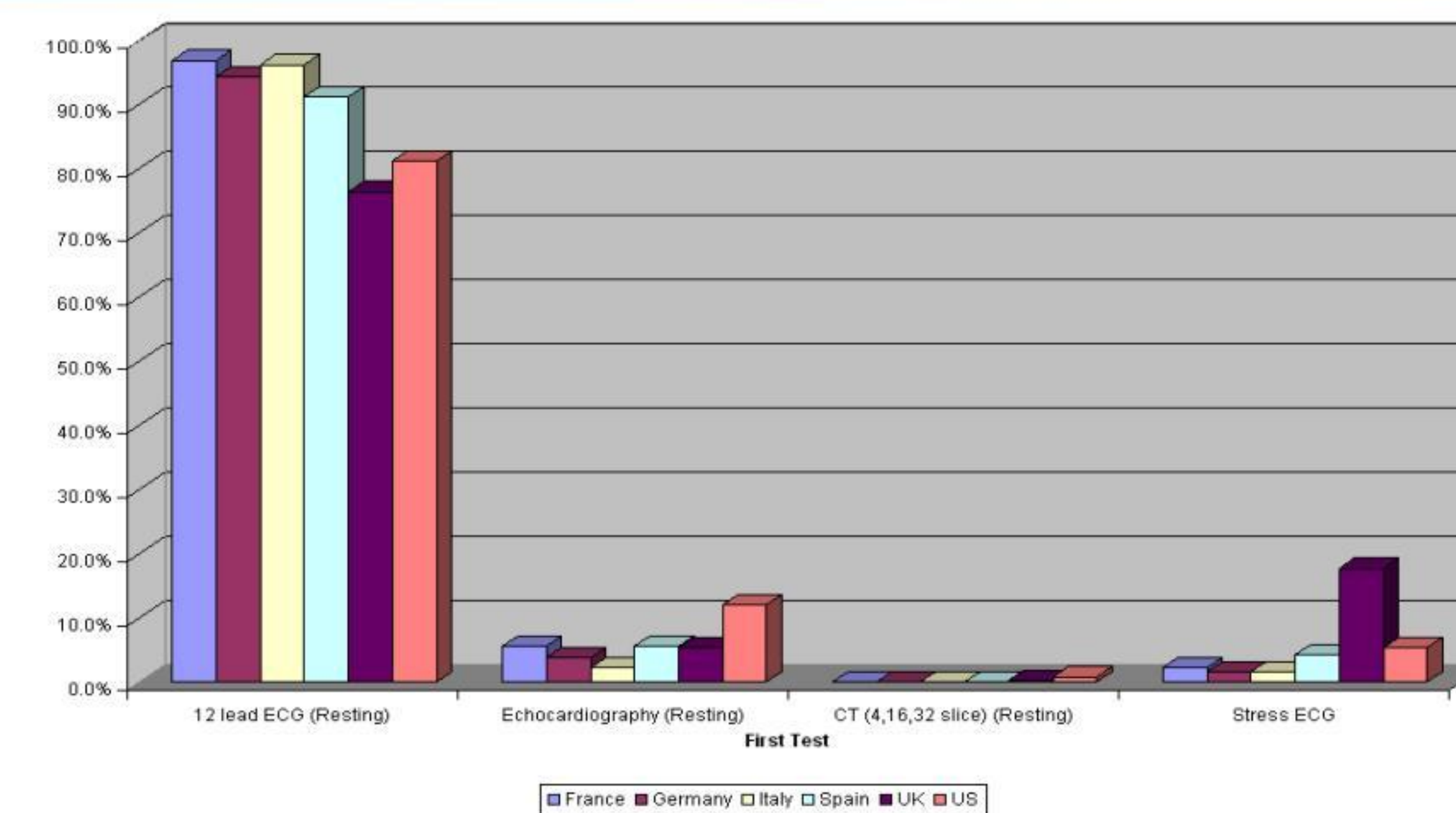
Figure 1: Proportion of tests performed by stage and gender



## RESULTS (cont.)

- Descriptive statistics were used to analyze variations among the six country patient populations
- Age distribution <50 (13.9%), 51-60 (28.8%); 61-70 (31.2%), 71-80 (19.8%), 80+ (5.5%) (P=0.08) and gender (67.1% male) (P=0.32) did not vary significantly across the six countries
- The baseline cardiovascular risk profile for the entire cohort was low (11.5%), intermediate (55.7%), and high (32.1%)
- First test evaluation with a 12-lead resting ECG ranged from 76% (UK) to 97% (France) (P<0.0001)
- Second test evaluation with resting echocardiography ranged from 38% (US) to 76% (Germany) (P<0.0001) and stress ECG ranged from 19% (Spain) to 41% (UK) (P<0.0001)
- Third test evaluation with stress ECG ranged from 24% (US) to 65% (Germany) (P<0.0001) and stress myocardial perfusion ranged from 3% (Germany) to 48% (US) (P<0.0001)
- When risk profile was stratified by country, intermediate-risk patients ranged from 45.9% (France) to 61.0% (Germany) (P=0.0016) and high-risk ranged from 18.2% (Germany) to 44.9% (France) (P<0.001)

Figure 2: Proportion of tests performed by stage and country



## CONCLUSIONS

- Across the six countries, wide variations exist in the diagnostic evaluation of CAD
- Future research should quantify and compare the healthcare costs, adverse cardiovascular events, and negative predictive value of optimal versus non-optimal diagnostic pathways in the evaluation of CAD

## References

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