significant and independent predictor of these events when compared with clinical variables. Multiple logistic regression analysis compared to normal scans (normal = 1.0) demonstrated that the defect size predicted a progressively increased likelihood of cardiac events as well as need for other cardiac hospitalizations (Figure). There was a low event rate with small defects (similar to normal scans) while the highest event rates occurred in patients with large defects.

Conclusion: Defect size with IV dipyridamole Tc99m Sestamibi SPECT myocardial perfusion imaging is an independent predictor of future cardiac events (death, MI) and other cardiac hospitalizations. This information may have important implications regarding the selection of patients for interventions.

10:45

708-2 Are All Defects Created Equal? Relative Prognostic Implications of Fixed and Reversible Hypoperfusion in Patients with Temporally Remote Myocardial Infarction

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Little is known regarding the prognostic implications of exercise myocardial perfusion scans in patients late after myocardial infarction (MI). Thus, we studied 399 patients who underwent rest Tl-201/exercise sestamibi SPECT more than one year after MI (mean 9 ± 7, range 2–37 years) who were followed up for more than 1 year (mean follow-up 21 ± 6 months). Exercise and rest scans were visually assessed in 20 myocardial segments using a 5 point scale (0 = normal, 4 = no uptake). An infarct zone was defined as a region within a vascular territory with a rest score of >1. A difference ≥1 between stress and rest scores for a segment was defined as ischemic. All patients were followed up for at least one year after their test. 25 hard events (HE; cardiac death or repeat MI) occurred (6.3% HE rate). A large proportion of patients had ischemia by scan (66%, 263/399) or subendocardial MI (no fixed defects; 44%, 177/399). Patients with ischemia outside an infarct zone (n = 209) and inside an infarct zone (n = 85) both had an event rate of 7%. HE rates were as follows:

	Reversible Defects			
	>2	6/66 (9%)	3/51 (6%)	4/53 (7.5%)
	1–2	3/31 (10%)	0/19 (0%)	4/45 (9%)
	0	2/80 (2.5%)	0/15 (0%)	3/39 (8%)
Fixed Defects		0	1–2	>2

There was no difference in HE rates between patients with only large fixed defects and only reversible defects. *Conclusions:* (1) In patients with temporally remote infarction, the presence of large fixed defects confers high HE rates similar to reversible defects (possibly due to the risks of late infarct remodeling). (2) Ischemia within and outside infarct zones denotes similar high risk for adverse outcomes.

11:00

708-3 Impact of Exercise SPECT Thallium Imaging on Patient Management and Outcome

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This study examined the impact of exercise thallium imaging on patient (pt) management (the need for coronary angiography and revascularization) and outcome (hard cardiac event: cardiac death or non fatal acute myocardial infarction) in 2700 pts being evaluated for diagnostic purposes. None of the pts had prior coronary angiography, PTCA or CABG or Q-wave myocardial infarction. The SPECT images were normal in 2027 pts (Group 1) and abnormal in 673 pts (Group 2). The exercise ECG was positive in 190 pts (9%), negative in 1461 pts (72%) and non-diagnostic in 376 pts (19%) in Group 1. The corresponding numbers were 218 pts (32%), 240 pts (36%) and 215 pts (32%) in Group 2. Within 6 months after thallium imaging, 53 pts in Group 1 (3%) and 242 pts in Group 2 (36%) underwent coronary angiography (P = 0.0001). The pts who underwent cardiac catheterization in Group 1 had higher pre-test probability of coronary disease (48 ± 39% vs 39 ± 27%) and lower exercise workload (7.1 ± 3.2 vs 9.4 ± 4.4 METs) than the pts who did not. The pts in Group 2 who underwent coronary angiography had more perfusion defects (8.8 ± 4.8 vs 6.3 ± 4.4 abnormal segments, P = 0.0001) than pts who did not. Coronary revascularization within 3 months of coronary angiography was performed in 1 of the 53 pts in Group 1 (2%) and in 87 of 242 pts (30%) in Group 2 (P = 0.0001). Among the remaining pts who had angiography and were treated medically there were no events in Group 1 and 15 events in Group 2. The event-free survival was significantly worse in Group 2 than Group 1 (Mantel-Cox statistic = 5, P = 0.02). Thus, the results of exercise SPECT thallium imaging are important in pt management and outcome. Coronary angiography, coronary revascularization and events are rare in pts with normal images.

11:15

708-4 Can the Results of SPECT Scintigraphy Safely Guide Clinical Management of Patients with Active CAD?

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Myocardial perfusion scintigraphy is increasingly used to categorize risk in pts with known or a high likelihood of CAD. This strategy will only be cost-effective if: 1) cardiologists will largely reserve further testing such as angiography (angio) to high-risk subsets; and 2) it is shown that less severe patterns of abnormality can be safely managed medically. We previously reported angio rates after all 4, 162 SPECT studies (excluding those with angio within 90 days *before* SPECT) at our cardiology practice-based nuclear lab: 4% (69/1663) in pts with fixed defects only and/or no ischemia; 60% (682/1141) in pts with high-risk ischemia (2 of multivessel or LAD distribution ischemia and abnormal lung uptake); and 9% (123/1352) for pts with mild-moderate ischemia. In this study, we determined outcome of the 1229 pts with mild-moderate ischemia who did not have referral for angio. Patient characteristics: mean age 65 yrs; known CAD = 1061 (86%); prior CABG = 344; prior MI = 575; prior PTCA = 674; angina = 592. Twenty-eight (2%) pts were lost to follow-up. The remainder were followed for a mean of 18 months. There were 22 hard events (MI = 15; cardiac death = 7) (1.8%) and 54 pts required PTCA or CABG (total event rate 6.3%). Mean time to any event was 13.2 months from SPECT. Freedom from hard events at 1 yr was 99% and at 2 yrs 97%. Freedom from any event was 97% at 1 yr and 91% at 2 yrs.

Conclusions: 1) SPECT can be a highly effective strategy for selecting pts for angio; 2) Even in a self-referral setting angio is largely reserved for pts with high-risk scans; and 3) Pts with mildly-moderately abnormal scans can be treated safely with medical therapy and close follow-up.

11:30

708-5 The Prognostic Value of Exercise Thallium-201 Tomographic Imaging in a Community Population

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Prior studies that have demonstrated the prognostic utility of exercise thallium-201 (Tl) imaging have been performed in tertiary care centers and potentially may have been influenced by patient-referral bias. To evaluate the prognostic value of Tl imaging in a community-based population, 250 residents (age 58 ± 12 yrs, M164, F86) of Olmsted County, MN who underwent exercise Tl tomographic imaging were followed for a median duration of 5.3 years. There were 32 initial cardiac events—5 deaths, 15 nonfatal myocardial infarctions (MI), and 12 "late" revascularization procedures performed >3 mos after the Tl study. Five-year event-free survival was 87%. The following table shows the univariate association with time to an event by Cox proportional hazards analysis:

Variable	χ^2	p
Age	25.0	<0.001
Gender	3.0	NS
Prior MI	22.8	<0.001
Chest pain class	0.4	NS
Exercise duration	8.7	0.003
Magnitude ST depression	0.9	NS
Exercise angina score	4.2	0.04
Any Tl redistribution	6.8	0.009
#segments with Tl redistribution	13.0	<0.001
#abnormal Tl segments post exercise	27.9	<0.001
Increased lung uptake of Tl	0.7	NS

By multivariate analysis the only variables independently associated with outcome were age (χ^2 = 13.3, p = <0.001) and the # abnormal Tl segments post exercise (χ^2 = 8.0, p = 0.005).

Conclusion: As demonstrated previously for referral populations from tertiary care centers, exercise Tl imaging is also useful for prognostic purposes in a community-based population.