

Table 5. Summary of Recommendations for Supplemental Preoperative Evaluation

Recommendations	COR	LOE	References
The 12-lead ECG			
Preoperative resting 12-lead ECG is reasonable for patients with known coronary heart disease or other significant structural heart disease, except for low-risk surgery	IIa	B	137–139
Preoperative resting 12-lead ECG may be considered for asymptomatic patients, except for low-risk surgery	IIb	B	37, 138–140
Routine preoperative resting 12-lead ECG is not useful for asymptomatic patients undergoing low-risk surgical procedures	III: No Benefit	B	35, 141
Assessment of LV function			
It is reasonable for patients with dyspnea of unknown origin to undergo preoperative evaluation of LV function	IIa	C	N/A
It is reasonable for patients with HF with worsening dyspnea or other change in clinical status to undergo preoperative evaluation of LV function	IIa	C	N/A
Reassessment of LV function in clinically stable patients may be considered	IIb	C	N/A
Routine preoperative evaluation of LV function is not recommended	III: No Benefit	B	146–148
Exercise stress testing for myocardial ischemia and functional capacity			
For patients with elevated risk and excellent functional capacity, it is reasonable to forgo further exercise testing and proceed to surgery	IIa	B	132, 135, 136, 162, 163
For patients with elevated risk and unknown functional capacity it may be reasonable to perform exercise testing to assess for functional capacity if it will change management	IIb	B	162–164
For patients with elevated risk and moderate to good functional capacity, it may be reasonable to forgo further exercise testing and proceed to surgery	IIb	B	132, 135, 136
For patients with elevated risk and poor or unknown functional capacity it may be reasonable to perform exercise testing with cardiac imaging to assess for myocardial ischemia	IIb	C	N/A
Routine screening with noninvasive stress testing is not useful for low-risk noncardiac surgery	III: No Benefit	B	165, 166
Cardiopulmonary exercise testing			
Cardiopulmonary exercise testing may be considered for patients undergoing elevated risk procedures	IIb	B	171–179
Noninvasive pharmacological stress testing before noncardiac surgery			
It is reasonable for patients at elevated risk for noncardiac surgery with poor functional capacity to undergo either DSE or MPI if it will change management	IIa	B	183–187
Routine screening with noninvasive stress testing is not useful for low-risk noncardiac surgery	III: No Benefit	B	165, 166
Preoperative coronary angiography			
Routine preoperative coronary angiography is not recommended	III: No Benefit	C	N/A

COR indicates Class of Recommendation; DSE, dobutamine stress echocardiogram; ECG, electrocardiogram; HF, heart failure; LOE, Level of Evidence; LV, left ventricular; MPI, myocardial perfusion imaging; and N/A, not applicable.

heart disease, except for those undergoing low-risk surgery.^{37,138–140} (*Level of Evidence: B*)

Class III: No Benefit

1. Routine preoperative resting 12-lead ECG is not useful for asymptomatic patients undergoing low-risk surgical procedures.^{35,141} (*Level of Evidence: B*)

In patients with established coronary heart disease, the resting 12-lead ECG contains prognostic information relating to short- and long-term morbidity and mortality. In addition, the preoperative ECG may provide a useful baseline standard against which to measure changes in the postoperative period. For both reasons, particularly the latter, the value of the preoperative 12-lead ECG is likely to increase with the risk of the surgical procedure, particularly for patients with known coronary heart disease, arrhythmias, peripheral

arterial disease, cerebrovascular disease, or other significant structural heart disease.^{137,138}

The prognostic significance of numerous electrocardiographic abnormalities has been identified in observational studies, including arrhythmias,^{48,142} pathological Q-waves,^{37,142} LV hypertrophy,^{139,142} ST depressions,^{137,139,142} QTc interval prolongation,^{138,143} and bundle-branch blocks.^{140,142} However, there is poor concordance across different observational studies as to which abnormalities have prognostic significance and which do not; a minority of studies found no prognostic significance in the preoperative ECG.^{141,144,145} The implications of abnormalities on the preoperative 12-lead ECG increase with patient age and with risk factors for coronary heart disease. However, a standard age or risk factor cutoff for use of preoperative electrocardiographic testing has not been defined. Likewise, the optimal time interval between obtaining a 12-lead ECG and elective surgery is unknown. General