

# Presurgical Cardiac Screens Are Often Unneeded

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BALTIMORE — Preoperative screening to identify potential cardiac complications is often unnecessary and may not help a surgeon to map out how to reduce risk during an elective procedure, said Dr. Richard Lange at a cardiovascular conference sponsored by Johns Hopkins University, Baltimore.

There are many reasons to focus on pa-

tients who are at highest risk for complications. Nuclear stress testing alone costs about \$10 billion each year, said Dr. Lange, chief of clinical cardiology at Johns Hopkins. There are 27 million people who undergo noncardiac surgeries each year in the United States, but only 8 million have coronary artery disease or risk factors, and 50,000 will have a perioperative myocardial infarction, he said.

Patients undergoing low- or intermediate-risk procedures aren't likely to need

stress testing, he said. Endoscopic, superficial, cataract, and breast procedures are considered low risk, with a less than 1% complication rate. Procedures with an intermediate risk (1%-5% complication rate) include carotid endarterectomy, as well as head and neck, intraperitoneal, intrathoracic, orthopedic, and prostate procedures.

The highest-risk procedures—with complications occurring in more than 5%—include emergent major operations, especially in elderly patients, in the aorta or

other major vessels, in peripheral vasculature, and in procedures with large fluid shifts or blood loss, Dr. Lange said.

Usually, older patients and those who have rhythm disorders, abnormal ECGs, a low functional capacity, or uncontrolled hypertension are considered to be at risk for cardiac complications. But none of these is an independent risk factor, he said.

However, six predictors have been identified as independent risk factors: a high-risk surgical procedure; a history of ischemic heart disease; a history of heart failure; a history of transient ischemic attack or stroke; insulin therapy; and a preoperative serum creatinine level greater than 2 mg/dL (Circulation 1999;100:1043-49). According to this Revised Cardiac Risk Index, the focus for work-ups should be on patients who have more than three of these risk factors.

Not all tests provide valuable information, either. A 2003 metaanalysis of the predictive ability of noninvasive tests found varying sensitivity and specificity re-

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Results (Heart 2003;89:1327-34). Perfusion imaging, for instance, had a high sensitivity, but low specificity. Dobutamine stress echocardiography had an 85% sensitivity and 70% specificity. Tests should provide a high positive predic-

tive value, and—more importantly—should give the clinician information beyond what can be determined by the clinical risk factors, Dr. Lange said. And tests should lead to a strategy that reduces the risk of perioperative MI. If a diagnostic test seems warranted and indicates increased risk, it's not always advisable to perform coronary revascularization, he said. Several studies have shown that patients who had a percutaneous coronary intervention (PCI) or coronary bypass artery graft (CABG) to minimize risk actually ended up in worse condition. The Coronary Artery Revascularization Prophylaxis trial found that high-risk patients who received a PCI or CABG followed by vascular surgery did no better than those who were given medical therapy (N. Engl. J. Med. 2004;351:2795-804). And, Dr. Lange said, there was a 9% rate of death or myocardial infarction during the revascularization procedure.

Stenting before noncardiac surgery may put patients at even higher risk, he said, citing three trials showing increased major bleeding, cardiac events, and death if the follow-on procedure was done within a few weeks.

Drug-eluting stents may put patients at higher risk because of delayed endothelialization and increased risk of subacute and late thrombosis. The evidence suggests that noncardiac surgery should be done a minimum of 3-6 months after drug-eluting stent placement, he said. ■

## 4. An addictive substance causes physical dependence, as evidenced by withdrawal and relapse

The symptoms of nicotine withdrawal have been clearly identified and confirmed. For most smokers, these symptoms include at least one, if not several, of the following: craving, irritability, insomnia, headache, anxiety, depression, and impaired concentration.<sup>11,14</sup> These withdrawal symptoms have been identified as key contributors to relapse, as the smoker often "self-medicates" with nicotine to return to a perceived state of normalcy.<sup>12</sup>

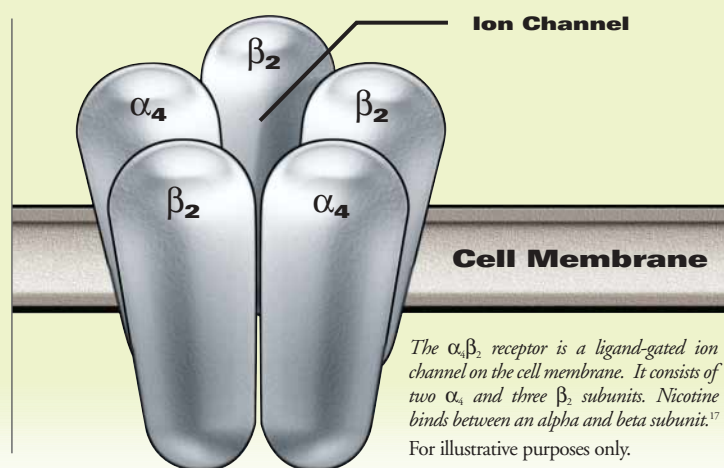
Additionally, chronic stimulation at the receptor site is believed to be responsible for upregulation (an increase) in the number of receptors expressed at the cell surface.<sup>8,10,12</sup> This is likely a result of the brain compensating for the desensitization of existing receptors, as described earlier.

As nicotine leaves the system, however, desensitized receptors can return to an "open" state in which they are once again susceptible to stimulation.<sup>10,11</sup> The combination of these factors—ie, a greater number of available, sensitized receptors—may create "an excess excitability of the nicotinic cholinergic systems of smokers."<sup>12</sup> This hyperexcitable state is believed to contribute to the smoker's motivation to smoke another cigarette (craving).<sup>9,12</sup>

Hyperexcitability may also explain why the first cigarette smoked following a period of abstinence provides a more intense pleasure response for the smoker.<sup>11,12</sup> Note, for example, that most smokers derive the greatest pleasure from their first cigarette of the day.<sup>10,12</sup> **In fact, smoking a single cigarette following a cessation attempt often prompts a complete relapse to heavy smoking.**<sup>10,11</sup>

## The $\alpha_4\beta_2$ receptor

Recent evidence suggests that scientists have identified a specific nAChR in the brain that is believed to act as a primary mediator of the addictive properties of nicotine—the  $\alpha_4\beta_2$  receptor.<sup>15-17</sup> The isolation and characterization of this receptor is a significant advancement in the understanding of the neurobiology of smoking addiction.



## Conclusion

Smoking is a chronic, relapsing condition. For most smokers, the compounding effects of behavioral, psychological, and physical triggers make overcoming their addiction extremely difficult. However, given the high morbidity and mortality related to smoking,<sup>3,8</sup> getting smokers to quit is important. Proactive medical intervention for smokers may be beneficial.<sup>1</sup> Recent advancements in the study of nAChRs—specifically the identification and characterization of the  $\alpha_4\beta_2$  receptor—represent a significant advancement in the understanding of the nature of nicotine addiction.

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