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or alternative treatments. There are many tools available to measure functional status. These can serve as outcome measures and may also be used to guide patient counseling. One such tool, the Short-Form Health Survey (SF-36), was designed to be applicable in a wide range and severity of conditions. Its measures include behavioral functioning, perceived well being, social and role disability, and personal evaluations of general health. It aims to distinguish role changes attributable to physical limitations from those due to mental conditions.

The utility of the SF-36 in longitudinal studies of patients undergoing total hip arthroplasty, non-small cell lung cancer surgery, and thoracic aortic aneurysm repair have been reported. The SF-36 has been found to be a useful tool in the quantification of patient quality of life. It is brief and has gained general acceptance. More important to the researcher is its well-established reliability and validity in a variety of medical conditions and surgery-specific studies.

For the SF-36 to be useful in assessment of patients with lung cancer, it needs to be sensitive not only to the immediate postoperative physical and emotional consequences of surgery, but should also reflect the effects of uncertainty regarding long-term prognosis. At 6 months and 12 months after surgery, lung cancer patients have reported significantly poorer levels of health perception, physical function, bodily pain, and vitality as compared to their preoperative assessment. It has been found that the physical score of the SF-36 is more sensitive than other measures with which it was compared, but that the psychological score was less sensitive to change. It is often necessary to combine the SF-36 with an another tool such as the hospital anxiety and depres-

Quality of Life After Lung Cancer Surgery

A Forgotten Outcome Measure

C urrently, surgery is the preferred treatment for resectable lung cancer. Most surgical reports have focused on preoperative risk factors and operative mortality along with long-term survival. Late functional disabilities following surgical resection are not widely reported and may be more important to the patient. There may exist patients in whom potential persistent impairments in functional status would lead them to consider less invasive approaches or alternative treatments. There are many tools available to measure functional status. These can serve as outcome measures and may also be used to guide patient counseling. One such tool, the Short-Form Health Survey (SF-36), was designed to be applicable in a wide range and severity of conditions. Its measures include behavioral functioning, perceived well being, social and role disability, and personal evaluations of general health. It aims to distinguish role changes attributable to physical limitations from those due to mental conditions.

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sion scale to better assess both physical and psychological well being of patients with cancer.

In this issue of CHEST (see page 21), Handy and colleagues report their prospective survey of 139 patients undergoing surgical resection for lung cancer. This was a study carried out at three hospitals. They compared functional health status and quality of life using the SF-36 and the quality of life index (QLI). They attempted to stratify outcomes and quality of life following thoracic surgery as a function of preoperative FEV1, 6-min walk distance, diffusing capacity of the lung for carbon monoxide (DLCO), use of chemoradiation, extent of resection, and postoperative complications comparing to age-matched control subjects without lung cancer. The authors found that preoperative functional health status in lung cancer patients is significantly impaired and persisted 6 months following lung resection. They further concluded that impaired DLCO, not FEV1, is a poor prognostic predictor of postoperative quality of life. Although the ability of the preoperative lung to perform gas exchange (DLCO) may in fact be more important than its mechanical behavioral properties (FEV1) in determining surgical results, we would caution against the use of DLCO as the sole preoperative measure of surgical candidacy based on the findings of this group. Traditional surgical literature has suggested poorer surgical prognosis with preoperative FEV1 < 60%, and a preoperative FEV1 < 40% should be considered a contraindication to resection. Handy and colleagues stratified their results into preoperative FEV1 of < 40%, 40 to 79%, and > 79% predicted groups. It would be interesting to see other supportive reports using traditional limits for FEV1 in a similar study.

The implications of the study by Handy and colleagues are many. Where surgeons often consider the probability of survival with regards to preoperative risk factors, patients may be more concerned with the possibility of needing home oxygen, poor exercise tolerance, and inability to perform activities of daily living. Information such as this should be reported in the literature and discussed during preoperative patient counseling. In the setting of surgical treatment for a chronic or potentially incurable disease, quality of life must be considered of prime concern and not forgotten.

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Lessening the Punch of Heparin-Induced Thrombocytopenia

While bleeding remains the most common serious complication of heparin use, heparin is also a common cause of drug-related thrombocytopenia. Heparin-induced thrombocytopenia (HIT) occurs either as an acute, transient, and innocuous phenomenon due to nonimmunologic heparin effects (type I HIT), or as a morbid syndrome that usually occurs after a week of heparin therapy and is associated with platelet activation and a high rate of thromboembolism (type II, commonly termed “HIT”). Heparin-associated thromboembolism is a consequence of thrombosis with or without thrombosis. HIT develop at an average of 5 days of therapy after heparin exposure, monitor platelet counts early. HIT must be considered in all heparin-treated patients with a significant fall in platelet count, even in the absence of thromboembolism or actual thrombocytopenia. HIT develop at an average of 12 days (only 6% before day 6). Of the heparin-naïve patients, only those who received heparin in the past 3 months were likely to get HIT before day 5 of heparin. Most HIT cases from heparin reexposure still occurred “late,” after 5 days of heparin. Few HIT cases involved low-molecular-weight heparin (LMWH). Whether this discrepancy was due to limited use of LMWH at the participating centers or due to the lower immunogenicity of LMWH is unclear. However, the preponderance of HIT cases among UFH-treated patients is consistent with two prospective studies of heparin prophylaxis in orthopedic patients, which revealed significantly less HIT in the LMWH-treated patients compared to those treated with UFH.

How can the study of Lubenow and colleagues help us improve our early diagnosis of HIT? HIT antibody test results may take days. Stopping heparin while awaiting assay results may be unnecessary. Using the findings of Lubenow and colleagues, decreasing platelet counts are likely not due to HIT for a heparin-naïve patient in the first 5 days of heparin treatment for an acute thrombosis. However, deciding whether a patient is heparin naïve may not be simple. Heparin from hemodialysis, IV catheter flushes, and even on heparin-coated central venous catheters can cause HIT. In heparin-naïve patients, platelet monitoring would be of little value before day 5 of heparin, yet should be instituted daily for patients exposed to any heparin in the prior 3 months. If one cannot rule out recent heparin exposure, monitor platelet counts early. The conclusions of this study are consistent with those of another retrospective study of the temporal aspects of HIT with a different definition of thrombocytopenia (>50% fall in platelet count). HIT must be considered in all heparin-treated patients with a significant fall in platelet count, even in the absence of thromboembolism or actual thrombocytopenia. While most HIT patients in the lepirudin trial database had a significant fall in platelet count, thromboembolic events due to HIT in that and other studies clearly can occur with platelet counts in the normal range, yet all such HIT patients had a significant fall in platelet count.

The incidence of thromboembolism in HIT reflects platelet activation, formation of cross-linked platelet aggregates via platelet Fc receptors, platelet microparticle generation, and thrombin activation that occur after specific IgG (or IgM) antibodies bind to a complex of platelet factor 4 and heparin on