In the general medical population, it has been well established that preprocedural hemostasis laboratory testing serves little purpose unless patients have a history of bleeding or an inherited bleeding disorder or are using antithrombotic drugs.[65] Because patients with cirrhosis often do have a bleeding history and because of the known hemostatic abnormalities of these patients, preprocedural hemostasis testing is very common. In the following sections, we argue that there is little evidence that correction of hemostatic laboratory abnormalities before common procedures decreases bleeding risk.

Platelet Interventions and Therapies Targeting Primary Hemostasis

In vitro data have been interpreted to suggest platelet levels >55,000/μL[66] improve hemostasis in patients with cirrhosis. However, these *in vitro* data have only assessed platelet procoagulant activity and have not accounted for potential compensation by VWF and other endothelial-based components. In addition, this threshold has not been validated clinically. Data suggest that platelet transfusions do not substantially improve thrombin generation capacity or viscoelastic markers of bleeding risk.[67] Furthermore, despite modest rises in absolute platelet counts, they carry a potential for the transfusion-related lung injury syndromes.[68]

The data on a threshold platelet level for bleeding risk minimization before procedures are mixed. Some studies have shown no predictive value of preprocedural peripheral platelet count on procedural bleeding complications.[69,70] In a prospective cohort study of critically ill patients, of whom 211 had cirrhosis, the most common bleeding events were spontaneous gastrointestinal or variceal bleeding; however, 10 events (occurring in 4.7% of the entire cohort of patients with cirrhosis) were postprocedural or postoperative.[71] In this cohort, although a peripheral platelet count of <30,000/μL was associated with bleeding, most of the bleeding was attributable to portal hypertension. Another study of 50 LT candidates with platelet counts <125,000/μL (52% with counts <75,000/μL) were followed for procedural complications.[33] There were 10 (20%) bleeding complications after procedures, all of which occurred in patients with a platelet count <75,000/μL. Despite this finding, patients in this study who received prophylactic platelet transfusion before the procedures were paradoxically more likely to experience bleeding. Therefore, this suggests that the low platelet count may have been merely a reflection of advanced portal hypertension and not a causative risk factor for bleeding.

There are three medications approved by the U.S. Food and Drug Administration (FDA) for increasing platelet counts in patients with cirrhosis. All of these agents are TPO receptor agonists and stimulate bone marrow production of platelets. Eltrombopag has the obsolete indication for treatment of thrombocytopenia related to interferon-based hepatitis C therapy and is now rarely used in the prophylactic role. However, an early study of this agent designed to produce platelet counts in the "healthy normal" range before invasive procedures in patients with cirrhosis was discontinued early because of excess thrombotic events, particularly PVT, in the treatment arm, possibly related to excessively high platelet counts.[72] Avatrombopag[35] and lusutrombopag[34] are indicated for the treatment of thrombocytopenia in adult patients with chronic liver disease who are scheduled to undergo a procedure. Each of these oral agents requires completion of a 2- to 8-day course preceding the scheduled procedure. These agents are superior to placebo in achieving a target platelet count ≥50,000/μL before the procedure, with no statistical differences in thrombotic complications compared to placebo. Of note, there were no statistical differences in postprocedural bleeding events in these studies between treatment arm and placebo, and therefore routine use of these agents to prevent procedure-related bleeding cannot be recommended.

There are no high-quality data on appropriate platelet thresholds before procedures, and general interventions to increase platelet counts to prevent bleeding are not evidence based and cannot be recommended. Given the low bleeding risk of many common procedures, potential risks of platelet transfusion, lack of evidence that elevating the platelet count reduces bleeding risk, and ability to use interventions, including transfusion and hemostasis procedures on an as-needed basis if bleeding occurs, it is reasonable to perform both low- and high-risk procedures without prophylactically treating the platelet count. This recommendation deviates from recommendations by