Laboratories, Arvada, CO) using a 1-l wash cycle. Two independent blood samples from different devices were analyzed for heparin using a 4 channel Heparin Assay "Yellow" cartridge (test range, 0.0–1.5 mg/kg) with simultaneous measurement of ACT. A test concentration of 0.0 mg/kg was obtained in both samples. However, on examination of individual channel times in the Hepcon®/HMS cartridge, three out of four recorded channel run times exceeded 400 s. In addition, blood failed to coagulate in ACT channels, exceeding 600 s.

Although the Hepcon®/HMS reported the absence of heparin in both "cell-saver" blood samples, this result was inaccurate. In addition, no warning system existed on the display screen to advise the user that channel run times exceeding 249 s indicated depletion of coagulation factors.

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In Reply: — Dr. Loubser is correct in stating that HPT results with run times longer than 249 s are considered to be invalid in the Hepcon® HMS. However, the most common cause for a prolonged run time is inappropriate cartridge selection as opposed to depletion of coagulation factors. Our Heparin Protamine Titration (HPT) is considered to be a quantitative test and performs very reliably even in cases where the fibrinogen is diluted or depleted to levels considered to be physiologically low (*e.g.*, 50 mg/dl). The HPT will typically perform within specification when patients are bleeding due to coagulopathy and is not considered to be an indicator of coagulopathy, only heparin concentration.

The HMS will provide a warning if the test has exceeded 249 s. Because the design of the HPT is for use with fresh whole blood (not components or citrated samples), any follow up action recommended assumes the use of a fresh whole blood sample. The HPT cartridge can measure a limited range of possible heparin concentrations. If a user selects the incorrect cartridge range, a channel will usually detect, but with a long run time. This is an indication to repeat the test with another test range.[1] This is rarely an indication of coagulation factor depletion, therefore we do not see it as appropriate to indicate such a state in a warning.

Studies from our Sequestra™ and AT 1000™ devices indicate that cell washing generally can remove 90% or more of the residual heparin, plasma, and associated factors from blood,[2] rendering the sample essentially fibrinogen free. This type of sample is not within the scope for which our HPT test was developed.

When asked if the HPT will detect heparin in a washed cell pack, we recommend specific methods that provide adequate fibrinogen to obtain a reliable result. One method suggests measuring residual heparin in the patient's blood after the washed product is returned. A second method utilizes PRP or PPP to provide clotting factors for measuring heparin in a cartridge such as our Theracon HPT. Theracon HPTs can measure very low levels of heparin and can be used with a citrated sample.

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