A 10 year old, 25 kg girl, who was formerly a conjoined twin at the heart, diaphragm, liver, duodenum, bile ducts, and intestine, was admitted for a repeat liver, small bowel, pancreas, and kidney multivisceral transplant after having intestinal and liver failure. Intraoperatively, the patient had excessive bleeding, coagulopathy, and acidosis. Pulse CO-Oximetry was used for continuous monitoring of hemoglobin (Hb) during the procedure. Although noninvasive Hb appeared to follow a trend that correlated with arterial Hb concentration, it did not show accurate agreement with measured values from intermittent blood gas analysis. It may not be reliable during cases with abnormal physiology, rapid blood loss, and massive transfusion.