

Nasogastric decompression and perioperative nutrition. Routine nasogastric decompression is not recommended after aortic surgery. A Cochrane review examined 37 studies involving 5711 patients randomized to routine or selective nasogastric decompression after emergency or elective abdominal surgery.⁶⁰⁶ Selective decompression was associated with a decreased risk of pulmonary complications without untoward adverse effects.⁶⁰⁶ Although postoperative malnutrition is uncommon after EVAR, given the anticipated short length of hospital stay,⁶⁰⁷ a risk for malnutrition exists for patients who undergo open aneurysm repair, particularly those with pre-existing renal insufficiency.⁶⁰⁸ Early feeding reduces the likelihood of malnutrition, as demonstrated in a randomized trial of 128 patients undergoing colorectal and abdominal vascular surgery.⁶⁰⁹

We recommend optimization of preoperative nutritional status before elective open aneurysm repair if repair will not be unduly delayed.	
Level of recommendation	1 (Strong)
Quality of evidence	A (High)
We recommend using nasogastric decompression intraoperatively for all patients undergoing open aneurysm repair but postoperatively only for those patients with nausea and abdominal distention.	
Level of recommendation	1 (Strong)
Quality of evidence	A (High)
We recommend parenteral nutrition if a patient is unable to tolerate enteral support 7 days after aneurysm repair.	
Level of recommendation	1 (Strong)
Quality of evidence	A (High)

Prophylaxis for deep venous thrombosis. Early mobilization and shorter length of stay have reduced the incidence of venous thromboembolism after aortic surgery relative to earlier eras of open aortic repair. Two studies using the NSQIP database determined that the 30-day incidence of venous thromboembolism after open aneurysm repair and EVAR was <2% and 1%, respectively.^{610,611} The risk of postoperative deep venous thrombosis after open aneurysm repair was first highlighted by Olin and associates, who performed postoperative venography in 50 consecutive patients.⁶¹² Although most patients were asymptomatic, 21% had evidence of an acute deep venous thrombosis, predominantly within the calf veins.

Whereas venous thromboembolism risk stratification can be performed using the Caprini or similar scoring scheme, most patients undergoing aneurysm repair will be classified as moderate (Caprini risk score of 3 or 4) or high (Caprini risk score >5) risk.⁶¹³ For example, the majority of patients undergoing aneurysm repair will be 61 years of age or older (Caprini score of 2 points) with planned surgery of >45 minutes (Caprini score of 2

points). These two factors alone yield a Caprini risk score of 4. Nonetheless, recommendations for thromboprophylaxis after aneurysm surgery are not well defined, given the lack of evidence for safety, particularly among patients undergoing OSR, or effectiveness.⁶¹⁴⁻⁶²¹

We recommend thromboprophylaxis that includes intermittent pneumatic compression and early ambulation for all patients undergoing OSR or EVAR.	
Level of recommendation	1 (Strong)
Quality of evidence	A (High)
We suggest thromboprophylaxis with unfractionated or low-molecular-weight heparin for patients undergoing aneurysm repair at moderate to high risk for venous thromboembolism and low risk for bleeding.	
Level of recommendation	2 (Weak)
Quality of evidence	C (Low)

Postoperative blood transfusion. A threshold for blood transfusion after OSR or EVAR has not been established. A number of studies suggest that anemia or a low hemoglobin level is associated with increased mortality after open AAA repair.^{110,152} In a review of a statewide database, transfusion after major vascular procedures occurred in 25% of patients at a median hemoglobin level of 7.7 g/dL. Perioperative transfusion was independently associated with death, MI, and pneumonia.⁶²² A hemoglobin concentration of <7 g/dL has been recommended as a transfusion threshold for a number of high-risk conditions in both critical and ambulatory care.⁶²³ Given the prevalence of coronary artery disease among patients undergoing vascular surgery, blood transfusion for a hemoglobin concentration of <10 g/dL has been a common practice. However, a meta-analysis comparing transfusion thresholds of 7 to 8 g/dL and 9 to 10 g/dL did not discern a difference in outcome for patients undergoing either cardiac or vascular surgery.⁶²⁴ In this regard, motivated by a desire to reduce the established risks of blood transfusion, to decrease blood use, and to lower costs, a recent Cochrane analysis supported more restrictive guidelines for all patients, including those with cardiovascular disease.⁶²⁵ Therefore, on the basis of currently available evidence, in the absence of ongoing blood loss, transfusion during or after OSR or EVAR is recommended only if the hemoglobin concentration is at or below 7 g/dL.

In the absence of ongoing blood loss, we suggest a threshold for blood transfusion during or after aneurysm repair at a hemoglobin concentration of 7 g/dL or below.	
Level of recommendation	2 (Weak)
Quality of evidence	C (Low)

Perioperative pain management. Central regional opioids, systemic opioid patient-controlled analgesia, and peripheral regional techniques are recommended for