Table: Pediatric-specific evidence-based recommendations

Factor	Level of Evidence	Recommendation	References
Temperature	**3****	**Monitor temperature frequently intra-operatively.** The most common times for hypothermia to occur are at the end of a long case and upon arrival in PACU.	41
	4	**For infants and children ≤2 years old, maintain core body temperature at 38°C**	9
	4	**Consider warming the operating room for temperature ≥ 27°C.**	9,40
	5	**Maintain core body temperature >36°C at all times** Expert recommendation. Utilize warming blankets, warmed IV fluids, and/or warmed ventilation circuit to maintain normothermia. Adjust operating room temperature as needed.	3,37-39
Anesthesia	**1****	**Consider sevoflurane for general anesthesia** Sevoflurane recommended "ideal" for pediatric anesthesia induction and maintenance due to its safety profile and rapid induction/emergence. For IV induction, use propofol. Give 1 mg/kg	50,51

		propofol at the end of sevoflurane anesthesia to reduce emergence agitation/delirium	
	5**	**Avoid IV induction of general anesthesia.** Induction with inhalational agents avoids the need for establishing painful vascular access while the child is awake.	[39]
	3**	**Only supplement general anesthesia if an experienced anesthesiologist is available.** Combining epidural or other regional blocks with general anesthesia carries a higher risk of morbidity in children.	[49]
	1**	**Use ultrasound guidance to place regional blocks and epidurals.** Ultrasound guidance reduces decreases time to perform block, reduces number of needle passes, and significantly decreases the rate of failed blocks.	[47,48]
	4	**Use epidural anesthesia for lower extremity procedures** May be used as a supplement to general anesthesia, or in combination with sedation, without increasing the risk of flap complications.	[9,15,32,42,43]
	3	**Implement sympathetic blockade during**	Level 3:

		upper extremity microsurgery Brachial plexus blockade increases arterial flow in digital replants and toe-to-hand transfers, and reduces the rate of reoperation.	[45,46] Level 4: [14,40,43,44]
Fluids and Blood Transfusions	**1****	**Preoperative fasting durations should adhere to the 2-4-6 rule.** Prolonged preoperative fasting should be avoided to reduce the risk of hypoglycemia. Infants and children should fast from clear liquids for only 2 hours prior to surgery, and from breast and non-human milk for 4 and 6 hours, respectively. Multiple European pediatric anesthesia societies recommend shortening fasting time for clear liquids, since no difference in safety. Suggested volume is 3 ml/kg/hr, simplified as ≤55 ml/hr for age 1-5 years, ≤140 ml/hr for 6-12 years, and ≤250 ml/hr if older than 12 years.	Level 1**: [39,50,55,56] Level 3**: [58] Level 5**: [51,57]
	2**	**Administer isotonic crystalloid to maintain perioperative normovolemia but avoid fluid overload. Limit glucose supplementation.** Perioperative fluid infusion should begin at 10	Level 2**: [22,51,59] Level 3**: [39]

		ml/kg/h and then be adjusted for intra-operative needs in long procedures. Avoid the standard 5% glucose supplement and consider solutions containing 1-2.5% glucose to avoid lipolysis, hypoglycemia, and hyperglycemia. Balanced electrolyte solutions are preferable to isotonic normal saline.	
	4	**Maintain fluid supplementation for 5-7 days postoperatively.** 1.5-2 times the maintenance dose of IV fluids should be given for 5-7 days postoperatively to maintain flap perfusion.	Level 4: [38,52,53] Level 5: [3]
	2**	**Limit perioperative colloid use.** Colloid HES 130/0.4 at a dose of ≥20 ml/kg interferes with the coagulation cascade and significantly increases blood loss.	[22,59]
	1, 4**	**Restrict transfusions until hemoglobin <7g/dl or patient has symptomatic anemia.** In hemodynamically stable children, this threshold reduces transfusion-related morbidity without lengthening ICU stay or increasing risk of multiple organ dysfunction or flap loss.	Level 1**: [54] Level 4: [15,38]
Analgesia	**1****	**Utilize a multimodal pain control strategy**	Level 1**:

		that includes acetaminophen and/or NSAIDs. Starting in PACU, give around-the-clock acetaminophen (15 mg/kg PO/PR q6h) and/or ibuprofen (10 mg/kg PO/PR q6h) and/or diclofenac (1 mg/kg PR q8h). This significantly reduces the opiate breakthrough needs in PACU and in the first 24 hours. As a single agent, diclofenac has highest opioid-sparing effect.	[39,49,61] Level 2**: [62] Level 3**: [50,63] Level 5**: [51]
	3	**Consider regional blockade for postoperative pain control** In extremity surgery, carries additional benefit of sustained sympathectomy / vasodilatory effects.	Level 3: [45,46] Level 4: [9,15,32,40,43] Level 5: [60]
Anti-coagulation	**1**, 4**	**Administer VTE prophylaxis based on risk assessment; reserve chemical prophylaxis for high risk patients** Unless altered mobility >48 hours and 2 or more VTE risk factors, consider only early ambulation and sequential compression devices without any chemical prophylaxis. Several pediatric free tissue transfer series have reported reduced bleeding complications and	Level 1**: [64] Level 4: [2,7,15,37,40,52,53,66-69] Level 5: [70-72,89] Level 5**: [65]

		flap failures in the absence of routine postoperative anticoagulation. In these cases, anticoagulation is reserved very small vessel caliber (e.g, children <4 years old), obvious vessel disease / damage, intraoperative thrombosis, or following anastomosis revision.	
	1, 4**	**Consider low molecular weight heparin instead of dextran for chemical VTE prophylaxis** Pediatric free tissue transfer patients are commonly given 3-5 days of low molecular weight dextran-40 (8-10 ml/kg/day), either alone, or with aspirin (75-81 mg/day). However, dextran carries a significant risk of anaphylaxis in children, and premedication with a hapten inhibitor should be considered. Pediatric VTE guidelines recommend low molecular weight heparin, e.g., enoxaparin <5 kg or <2 mos 0.75 mg/kg SQ BID 5-45 kg 0.5 mg/kg SQ BID >45 kg 40 mg SQ DAILY	Level 1**: [22,64] Level 2**: [65] Level 4: [2,42,43,74-77,79,80] Level 5: [12,78]

Vasodilators	**4**	**Consider topical verapamil to treat vasospasm** Several studies report the topical application of either verapamil (0.1-0.125 mg/ml in saline) or 2% lidocaine to treat vasospasm, particularly in extremity reconstruction.	9,14,37,40,42

** Indicates evidence based on studies of otherwise healthy pediatric surgery patients undergoing major surgery, not specifically free tissue transfer.