HYPERTENSION

Preoperative evaluation

- Assess level of blood pressure control.
- Avoid elective surgery in patients with hypertensive urgency or emergency.
- Assess for complications of long-standing hypertension (stroke, hypertensive cardiomyopathy, nephropathy).
- Consider delaying elective surgery in patients with poorly controlled HTN e.g. BP >180/110. See discussion below.
- Advise preoperative medication management:

Beta-blockers	Continue, and take on the morning of surgery
ACE-inhibitors	Hold on the morning of surgery unless patient has poorly controlled HTN at baseline e.g. SBP >180 or DBP >110.
ARBs	Hold on the morning of surgery.
Diuretics	Hold on the morning of surgery.
Calcium channel blockers	Consider holding on the morning of surgery.
Clonidine	Continue, and take on the morning of surgery. Transition to clonidine transdermal preoperatively if expected to be NPO postop.

Postoperative management

- Assess underlying cause of postop hypertension: pain, ETOH withdrawal, beta blocker or clonidine withdrawal, essential hypertension, etc.
- Low blood pressures are common postop due to blood loss, sedation, pain medications, and bed rest. Resume blood pressure medications with caution:

Beta-blockers	Continue. Hold or reduce if symptomatic hypotension or bradycardia. Common hold parameters are for SBP < 100 or HR < 60, but you need to individualize these for each patient.
ACE-inhibitors and ARBs	If given only for HTN, often do not restart if SBP remains below 120 postop.
Diuretics	Consider holding for the first few days postop after major surgery—patients are at risk of hypovolemia and hyponatremia.
Clonidine	Continue either PO or transdermal to avoid rebound HTN.
Calcium channel blockers	Continue. Hold or reduce if symptomatic hypotension or bradycardia.

Postoperative patients are often NPO for prolonged periods of time. The following are IV/transdermal medications used to treat HTN:

Metoprolol	5 mg IV q 4-6 hr. Titrate to desired BP and HR
Labetalol	20-80 mg IV q 5-10 min (up to 300 mg)
Nitroglycerin	IV drip 5 mcg/min, titrate to desired BP 1-2” ointment q6H (works more slowly than drip)
Hydralazine	20 mg IV. Repeat after 20 min if needed. If still no effect, try another agent. Caution in patients with CAD.
Esmolol	500 mcg/kg for first minute, then 50-300 mcg/kg/min. Use only if minute-to-minute titration needed. Longer acting drugs are usually preferred.
Nicardipine	More commonly used in neurosurgical patients.

Discussion

- Hypertension is not a significant risk factor for major adverse cardiac events, but it is a significant risk factor for intraoperative blood pressure lability and the incidence of perioperative myocardial ischemia. These are major reasons for perioperative medical consultation concerning uncontrolled hypertension.
- The traditional cut off of deferring surgery if blood pressure is greater than 180/110 is not well supported by contemporary data, but many anesthesiologists would be unwilling to take a patient into the OR for elective surgery with a systolic BP >180 or a diastolic BP> 110. Some studies show that this may be associated with modest increases in the risk of perioperative stroke. There is no good data that says, however, that deferring surgery for definitive blood pressure control is superior to acute blood pressure control in the preoperative holding area. Blood pressure risk is a continuum and must be balanced by many factors, including the urgency of surgery. Medications can be given in the preop holding area to ameliorate the high pressure without having to cancel surgery. It is best to work with the anesthesiologist.
- There are some surgical procedures that should not be done without better control of hypertension because of the risks of increased intraoperative bleeding. Facial plastic surgery and intraocular surgery are examples. On the other hand, acutely lowering blood pressure in patients with certain types of problems, such as patients with high intracranial pressure, are more dangerous than leaving things alone, even if significant hypertension is present. Again, work with your anesthesiology colleagues.
- It is also important to have an understanding of what happens in the intra-op phase controlled by the anesthesia team. Intra-op SBP can average 50mm Hg below ambulatory levels. Tight control preop may lead to profound hypotension intra-op requiring pressors and extra fluids. A reasonable approach is to hold ACE inhibitors and Angiotensin Receptor Blockers unless the systolic BP is >180 or the diastolic BP is >110 on the morning of surgery.
- When choosing blood pressure agents, consider the patient’s preoperative home medications, and whether they can take PO medications or must remain strictly NPO. Often a patient’s bowel function has returned enough to absorb critical medications, even if the patient is not yet on full diet—discussion with the surgery team is essential. Nitroglycerin is favored over hydralazine in patients with CAD. IV metoprolol or labetalol are useful for blood pressure control in patients who are NPO—however they must be given with caution in patients with severe asthma and generally avoided in decompensated heart failure.

References

1. Spahn, DR, Priebe HJ. Perioperative hypertension: remain wary? “yes” Cancel surgery? “no”. Br J Anaesth. 2004;92(4):461-464.
2. Howell SJ. Hypertension, hypertensive heart disease and perioperative risk. Br J Anaesth. 2004;92(4):570-583.