



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : CPB AND ITS COMPLICATIONS

III RD YEAR

TOPIC : COMPLICATION DURING CPB

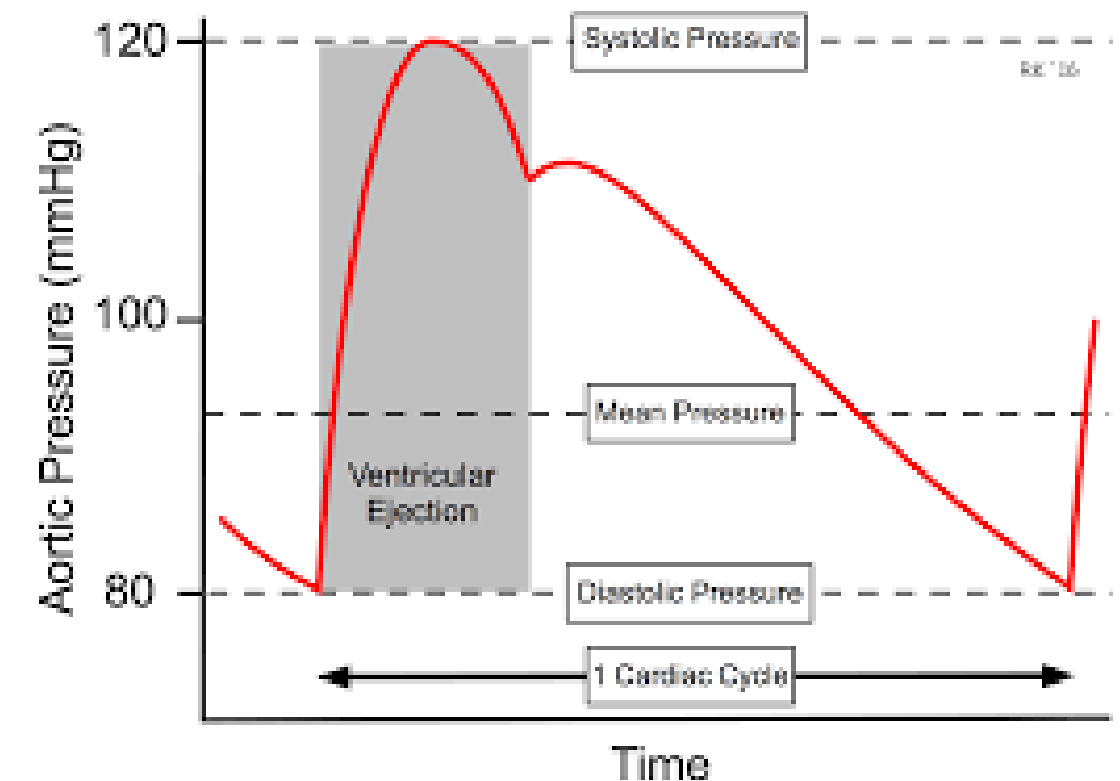


MEAN ARTERIAL PRESSURE



Mean arterial pressure (MAP) is the average arterial pressure throughout one cardiac cycle

- Cerebral blood flow is autoregulated when MAP is above 60mmHg
- The circulating catecholamines epinephrine and norepinephrine levels are decreased at the onset of bypass due to dilution and arterial pressure may experience a transient drop

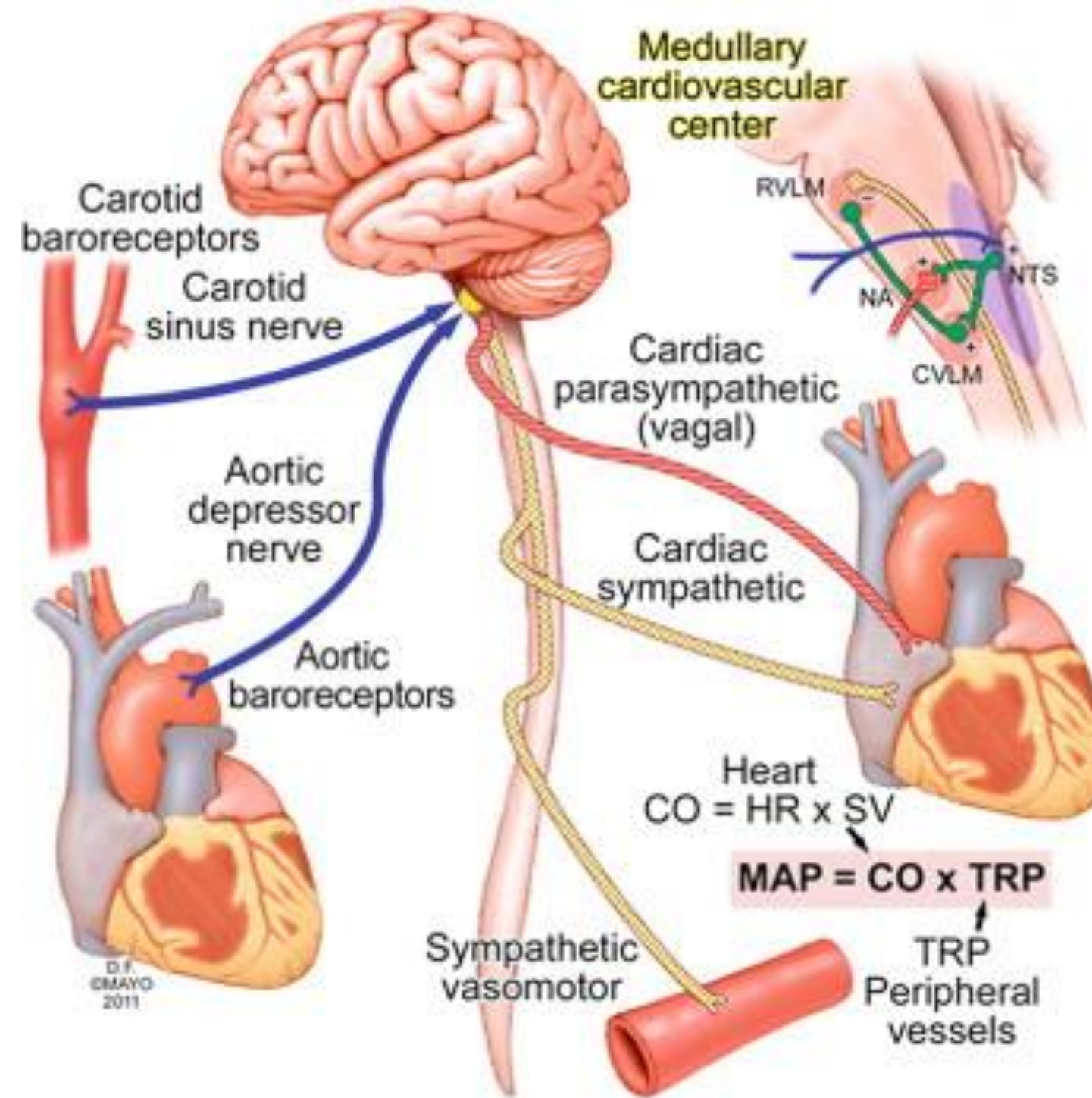




MEAN ARTERIAL PRESSURE



- In the context of acceptable CPB flow rates MAP is generally targeted at 60 to 90 mmHg.
- A higher target may be selected in older patients and those with cerebrovascular or peripheral vascular disease.
- However, use of vasopressors to increase MAP to values >80 mmHg during CPB is not recommended, and MAP should not exceed 100 mmHg.
- Low MAP can cause inadequate blood flow to organs, syncope, and shock.
- Elevated MAP contributes to increased oxygen demand by the heart, ventricular remodeling, vascular injury, end organ damage, and stroke.
- Hypertensive patients and those at risk for stroke require higher flows and perfusion pressures to maintain organ perfusion.





MANAGEMENT OF MAP



- **Moderate hypotension** – If MAP falls below the target range, the perfusionist may **increase the pump flow** (equivalent to increasing cardiac output), particularly if it is <2.4 L/minute/m².
- If hypotension persists after increasing pump flow, a **vasopressor** can be administered as an intravenous (IV) bolus or via continuous infusion.
- Small bolus doses of **phenylephrine** (eg, 40 to 100 mcg) are administered directly into the CPB reservoir to treat hypotension.
- Infusions of phenylephrine at 10 to 200 mcg/minute, vasopressin at 0.04 units/minute, or **norepinephrine** at 0.02 to 0.06 mcg/kg/minute are also commonly employed.



- **Hypertension** — If MAP increases to >90 mmHg during CPB, initial treatment is to ensure adequate anesthetic depth by increasing volatile anesthetic concentration administered via the CPB circuit and/or administering additional IV anesthetic. Occasionally, administration of a vasodilator may be necessary.
- For brief periods, **pump flow may be reduced** while these pharmacologic interventions take effect.



References :



Manual of Clinical Perfusion Bryan V. Lach Second Edition

Cardiopulmonary Bypass Principles and practice Glenn P. Gravlee



THANK YOU