



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

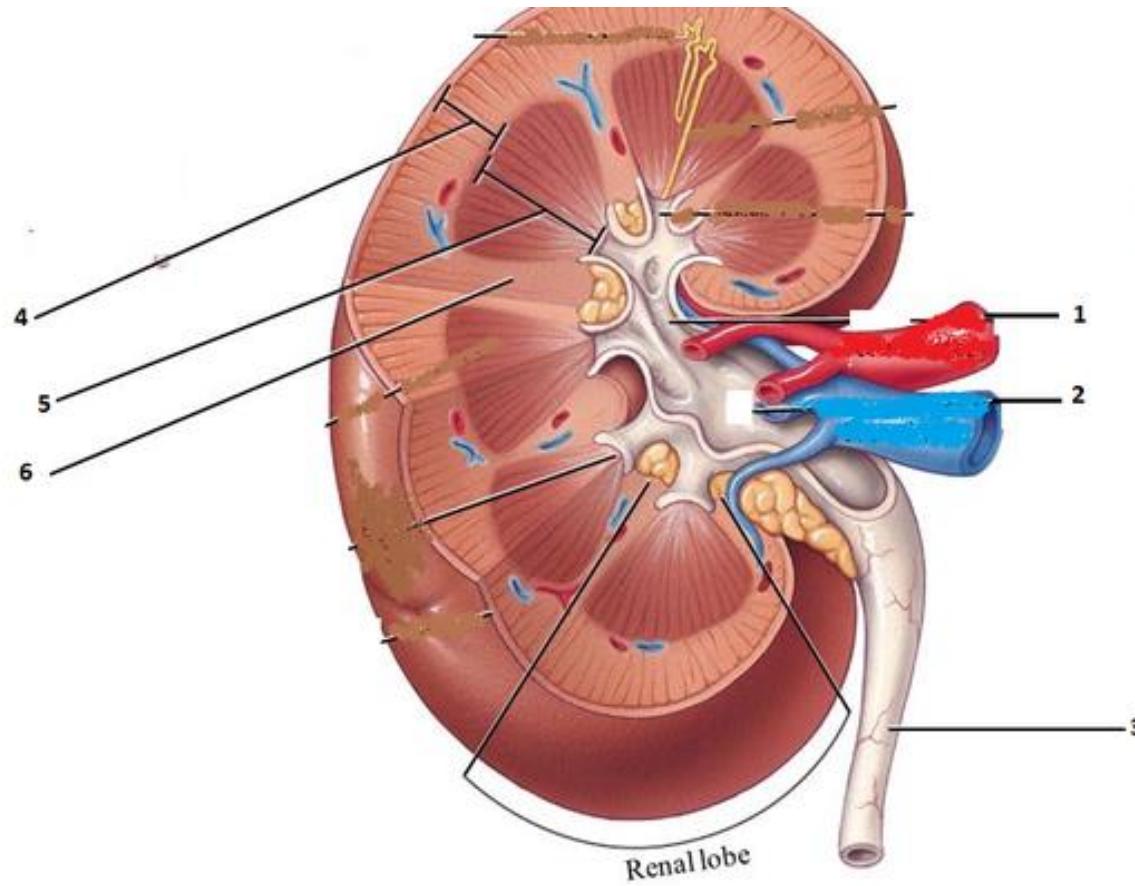


DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME: CPB & Perfusion Technology

TOPIC : Effects of Kidney on Bypass

Pre test

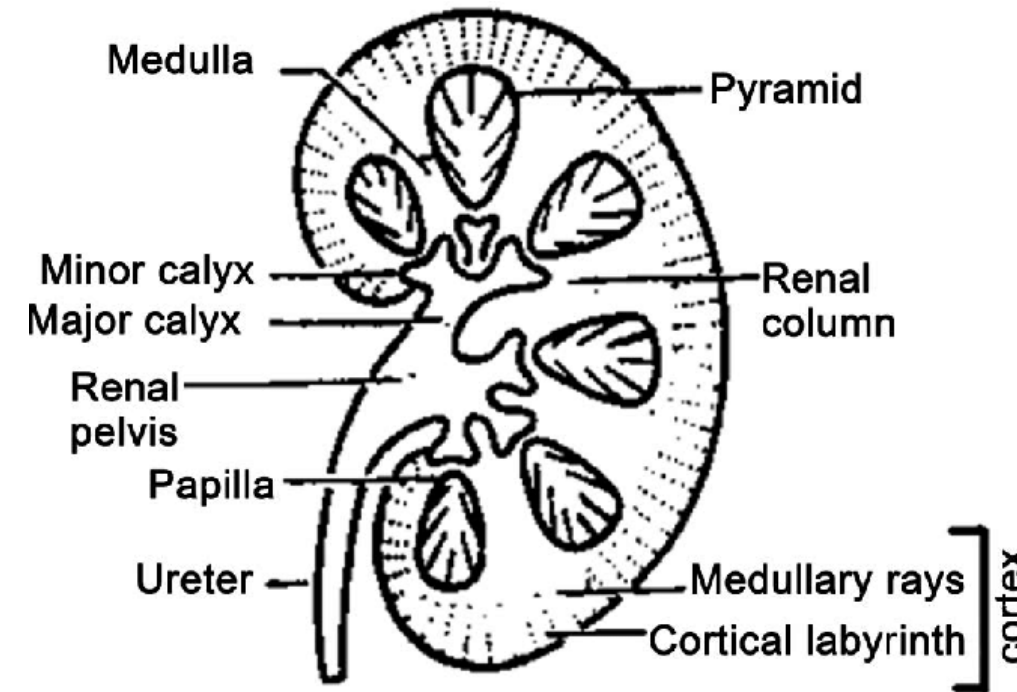




Basics of Kidney



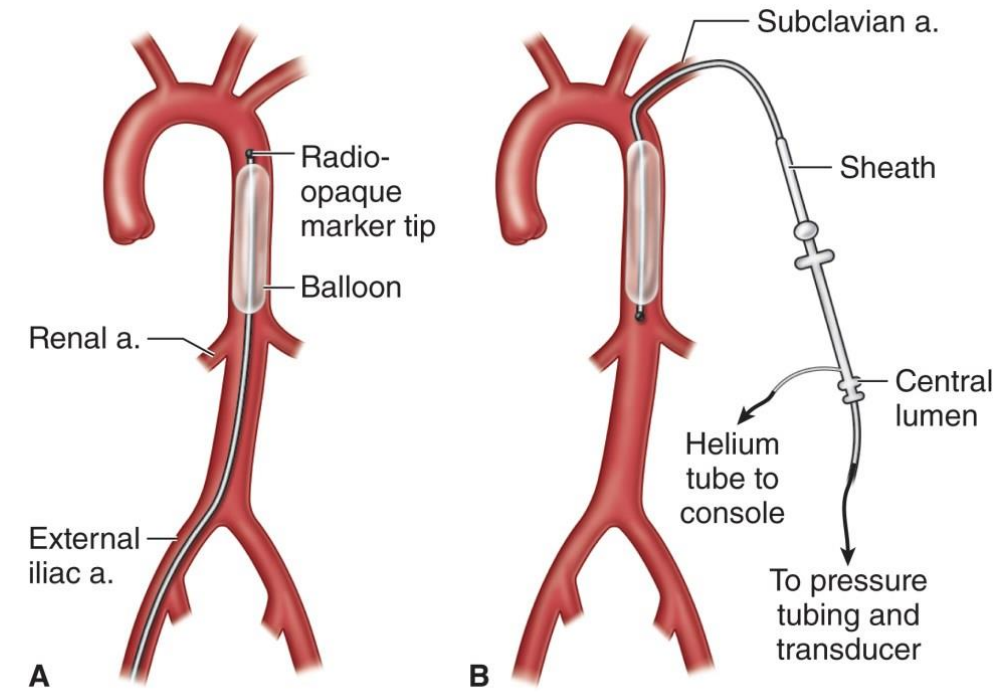
- Renal Dysfunction after bypass is a relatively common occurrence.
- Kidney receive **25% of Cardiac Output**
- Kidney needs adequate perfusion for regulation of water and solutes and controls blood pressure.
- Kidneys are found in retroperitoneal region
- **Cortex** contain tubules and glomeruli
- **Medulla** contain tubules
- **GFR** is the rate in which glomerulus permits passage of water, electrolytes and other small molecules but not blood cells and large proteins.



Causes of Kidney Damage

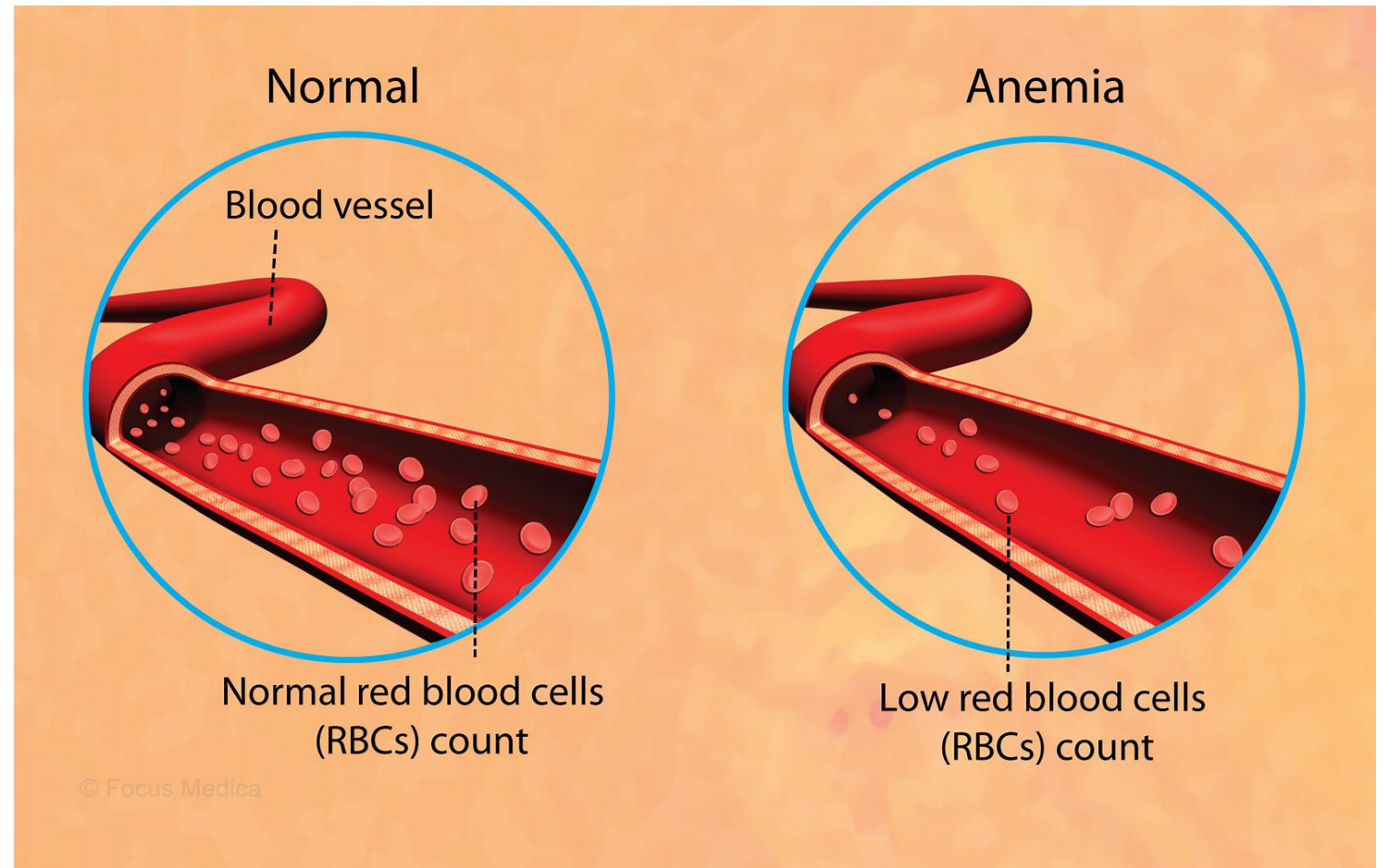
Blood flow through the kidneys is affected by the composition of,

- Pump prime, sympathetic nervous system, and hormones (angiotensin, prostaglandins and bradykinin)
- Low BP/reduces flows --- GFR decreases
- Pre op function is also important
- Use of IABP
- Extended bypass time also contributes
- Multiple exposure to angiographic dyes
- Use of homologous blood
- Excessive albumin addition



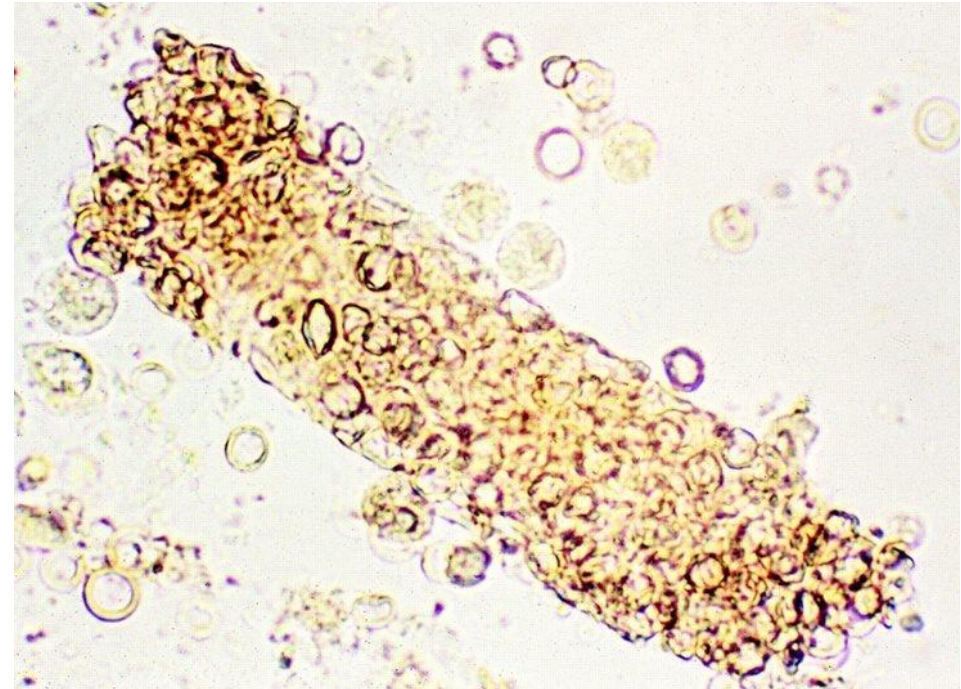
Pre- existing Factors

- DM
- Female gender
- Increasing age
- CHF
- PVD
- Emergency surgery
- Anemia



Fate of RBC causes Renal Failure

- Destruction of RBC
- ↓
- Hemoglobin released to plasma
- ↓
- Hemoglobin Casts
- ↓
- Hemoglobinuria





Assessment of Renal Function



- Serum creatinine level is an excellent indicator of current renal function
- **Normal Creatinine level = 0.6 – 1.2 mg/dl**
- High level indicates renal failure
- Perfusionist should routinely review patient chart for serum creatinine levels.





Management



- Review pre op renal function creatinine, urea, GFR

**Hemodilute
the patient**

**leads to reduce
blood viscosity**

**increase renal
blood flow**

**greater urine
output**



Management



- Addition of diuretics (furosemide and mannitol)
- Maintain proper blood flow
- Dopamine increases renal clearance, sodium excretion and urine output
- Limited administration of albumin to prevent excessive interstitial fluid build-up in edematous patient
- Usage of Ultrafiltration during bypass





Assessment



- Why IABP causes renal insufficiency?
- Why not to administer albumin?
- Why to do Hemodilution?
- Why Haemoglobin casts are formed?
- What is the percentage of Cardiac Output for Kidney?



Thank you



References:

The manual of Clinical Perfusion second edition – Bryan
Cardiopulmonary Bypass and Principles – Sunit Ghosh