

# MICROALBUMINURIA

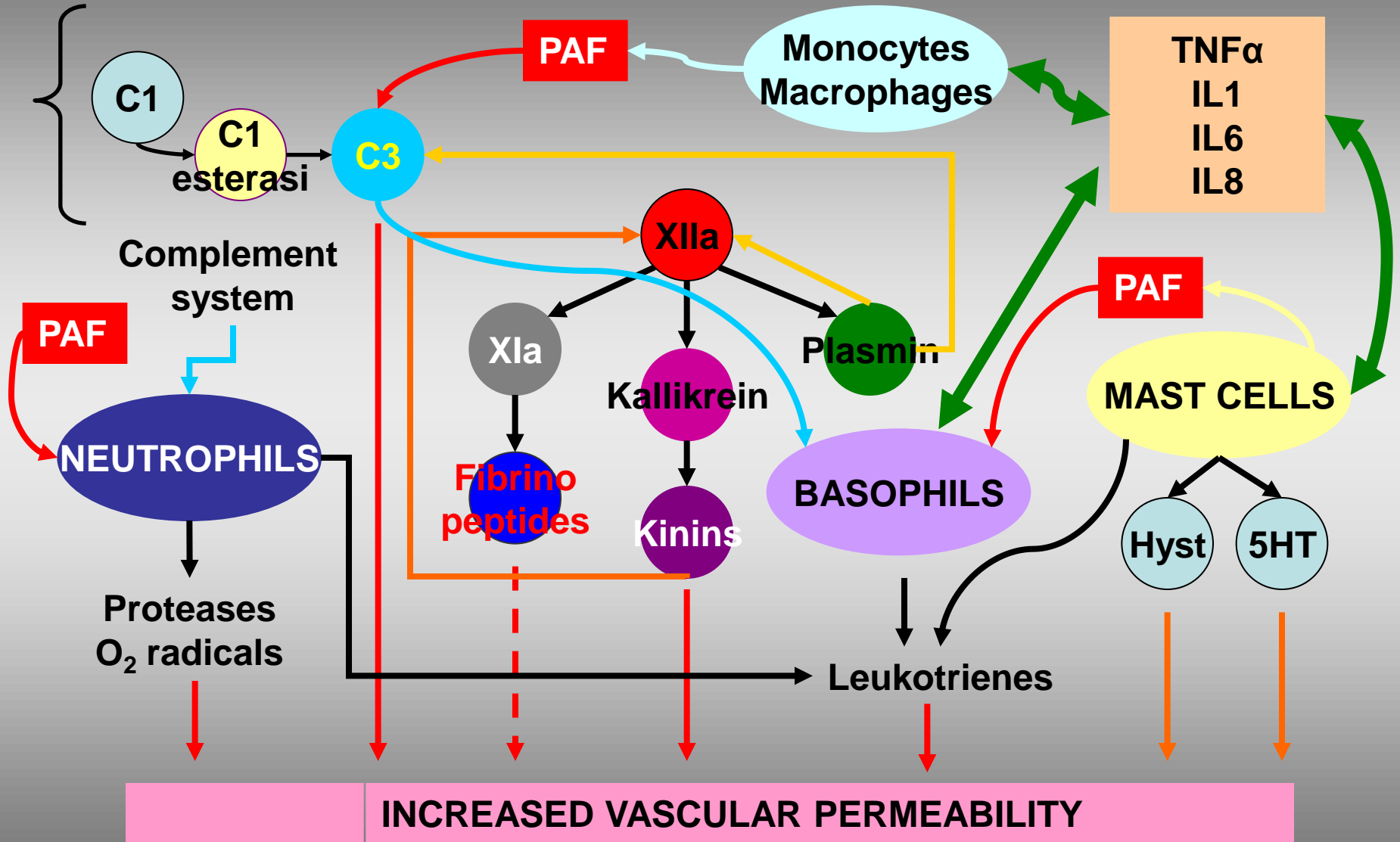
**UNO STRUMENTO SEMPLICE  
MA UTILE PER IL  
TRATTAMENTO  
DELL' IPOALBUMINEMIA**

S. Arlati, P.I. Coppini, I Servizio di Anestesia e Rianimazione  
Ospedale Niguarda Cà Granda - Milano

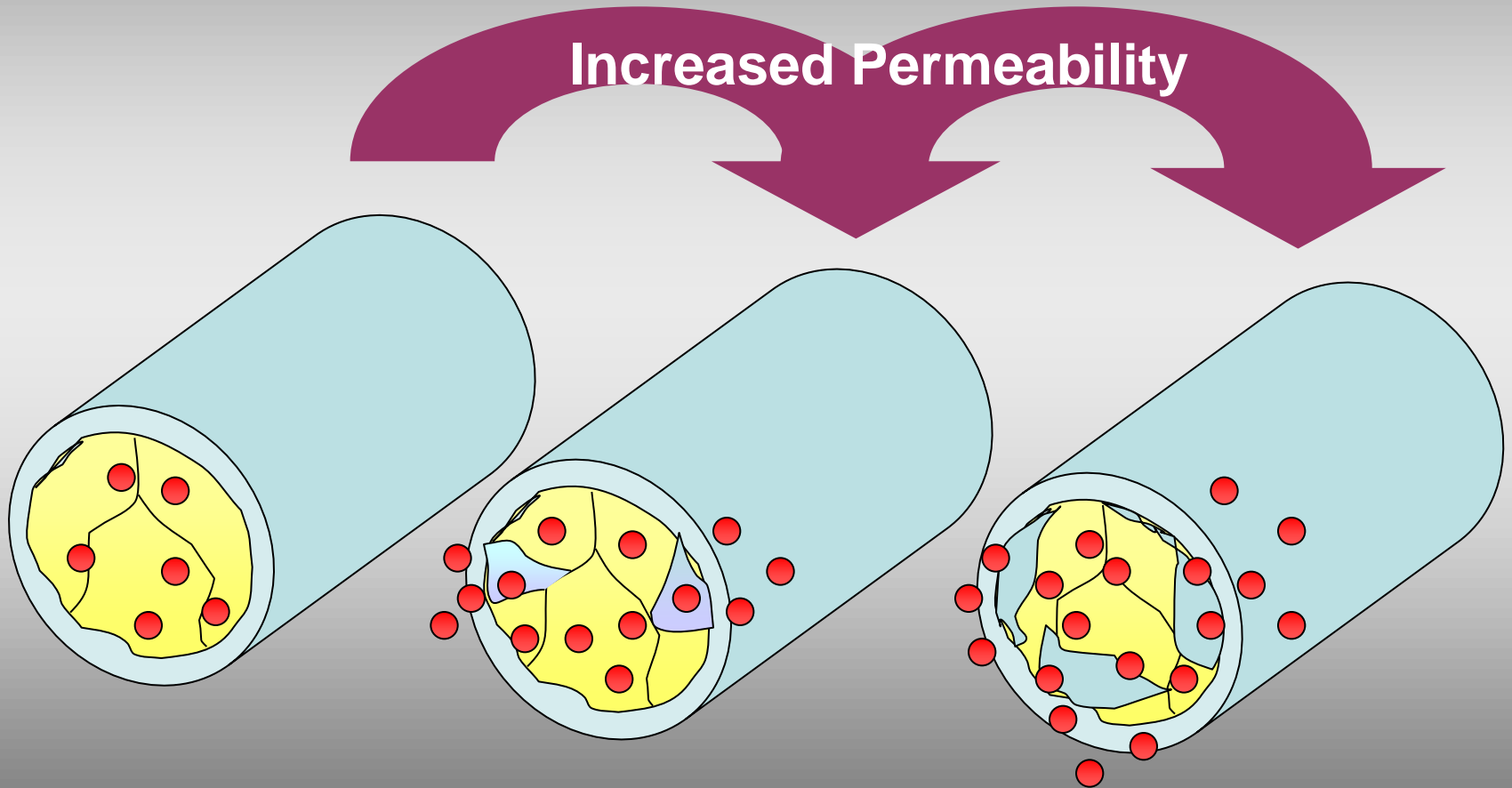
- **MICROVASCULAR PERMEABILITY**
- **ENDOTHELIAL DAMAGE**
- **ALBUMINURIA**
- **PLASMA VOLUME EXPANSION**
- **RESUSCITATIVE REGIMEN**

**INFLAMMATION**  
**ENDOTHELIAL DAMAGE**  
**VASCULAR PERMEABILITY**

# VASCULAR PERMEABILITY



# ENDOTHELIAL DAMAGE



**TRAUMA/BURNS  
SEPSIS  
PANCREATITIS  
ISCHEMIA-REPERFUSION**

**Local  
Inflammatory  
Stimuli**

*Lymph  
Flow*

**Release into  
General  
Circulation**

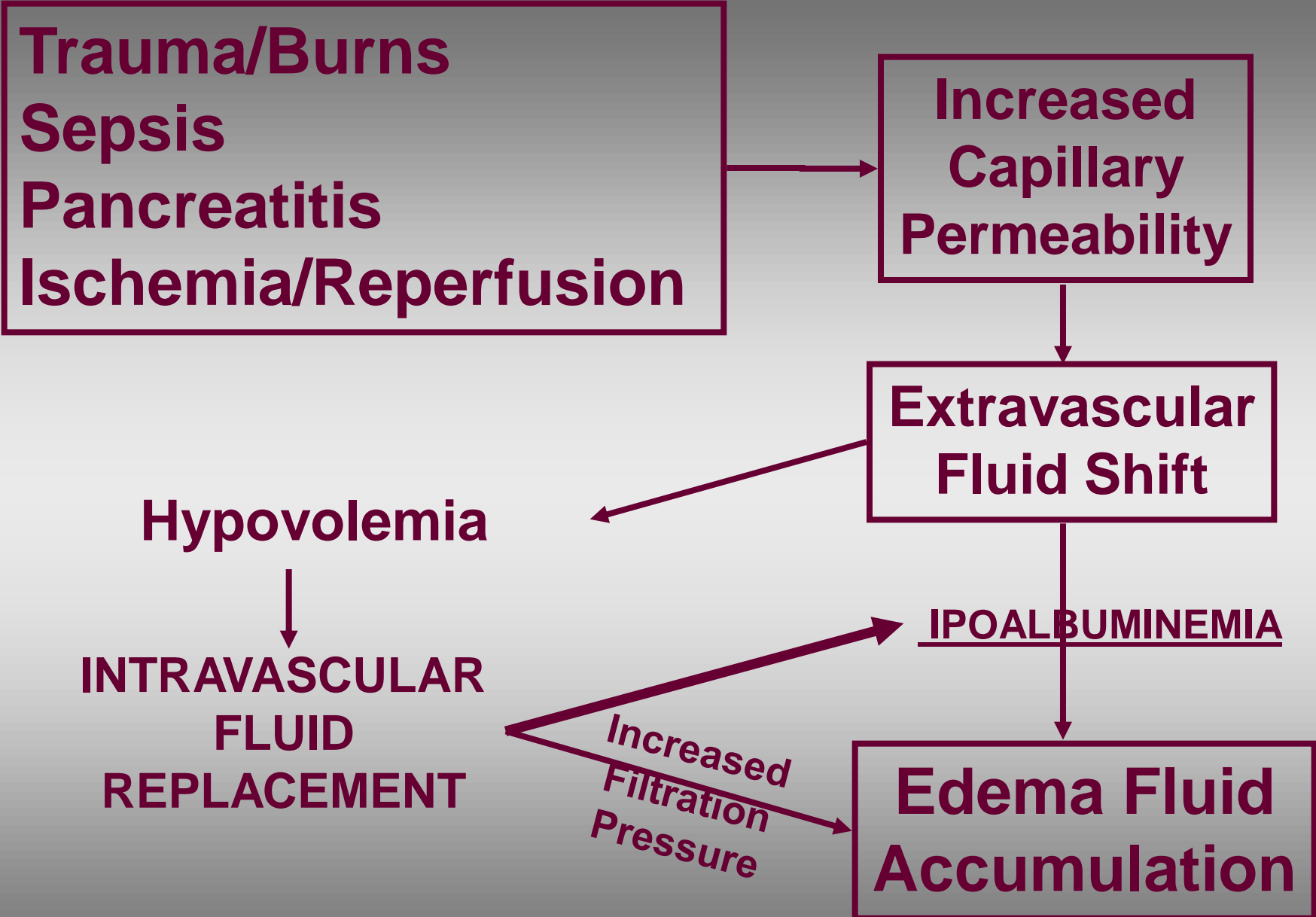
**Systemic  
Inflammatory  
Activation**

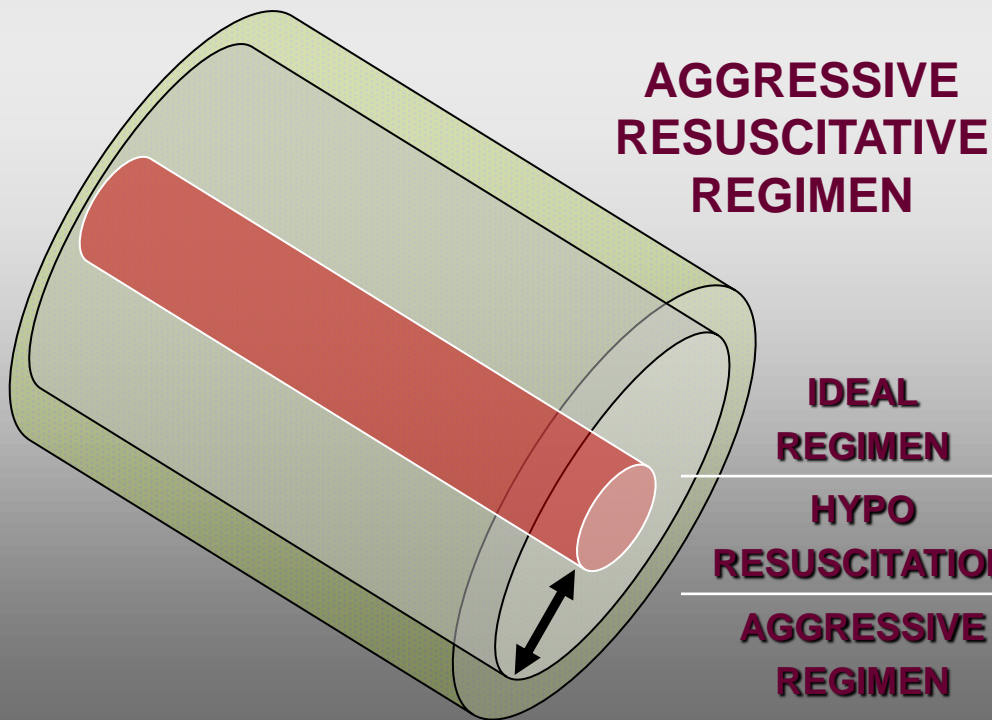
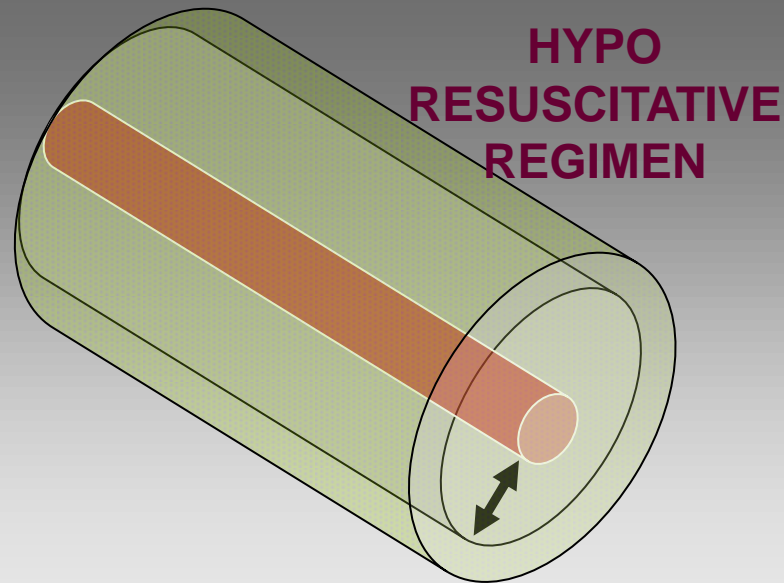
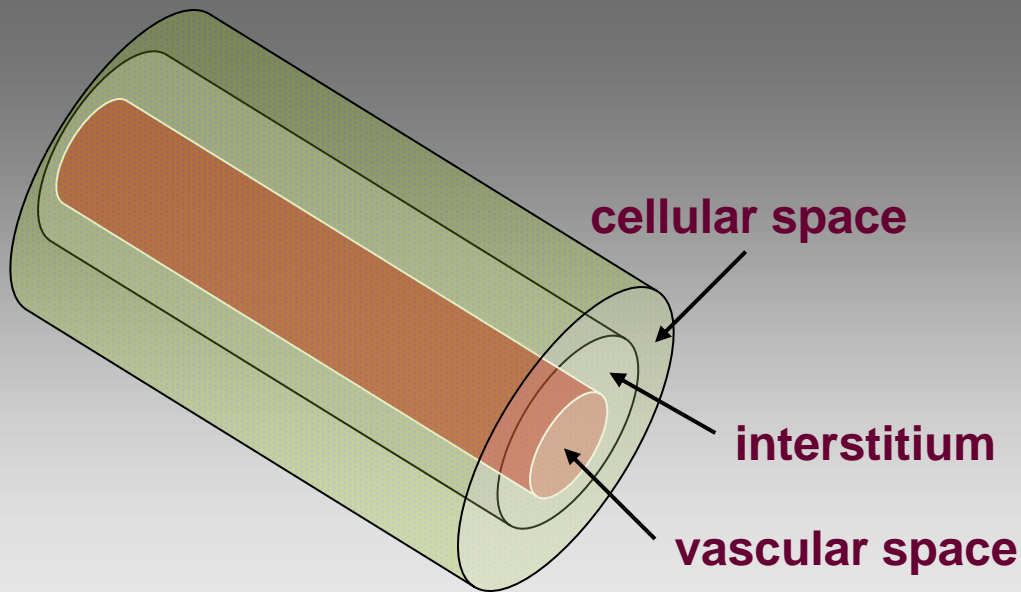
*Increased Vascular Permeability*

*hypoalbuminemia*

*Extra- Vascular Fluid Shift*

**TISSUE EDEMA**





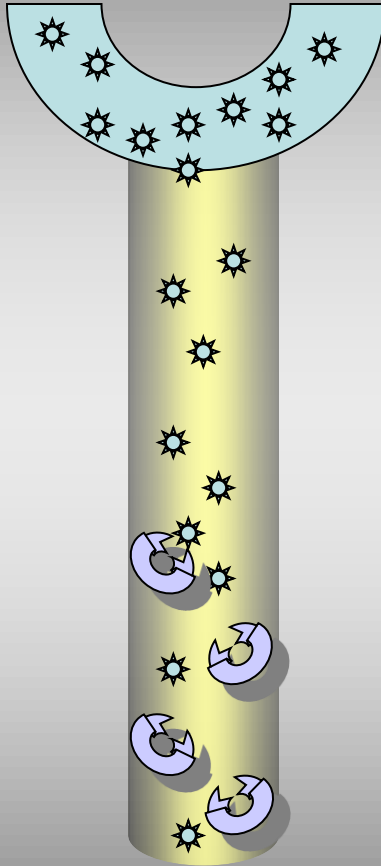
	CELLULAR SPACE	INTERSTITIUM	VASCULAR SPACE
IDEAL REGIMEN	↔	↑	↔
HYPO RESUSCITATION	↑	↑↑	↓
AGGRESSIVE REGIMEN	↑↑	↑↑↑	↔



# **MICROALBUMINURIA**

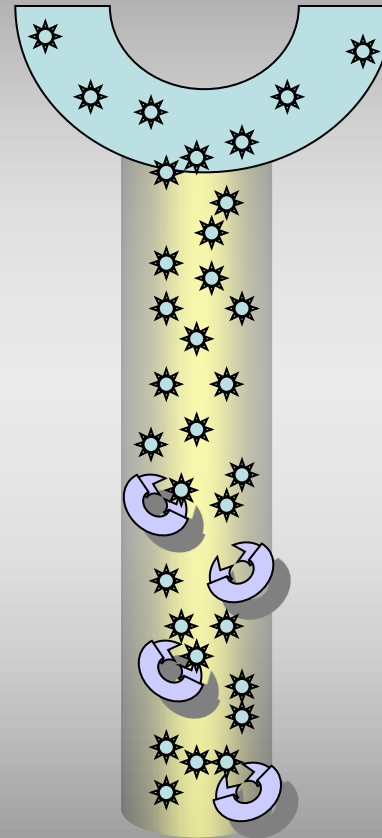
# ALBUMIN AND GLOMERULAR PERMEABILITY

**NORMAL**



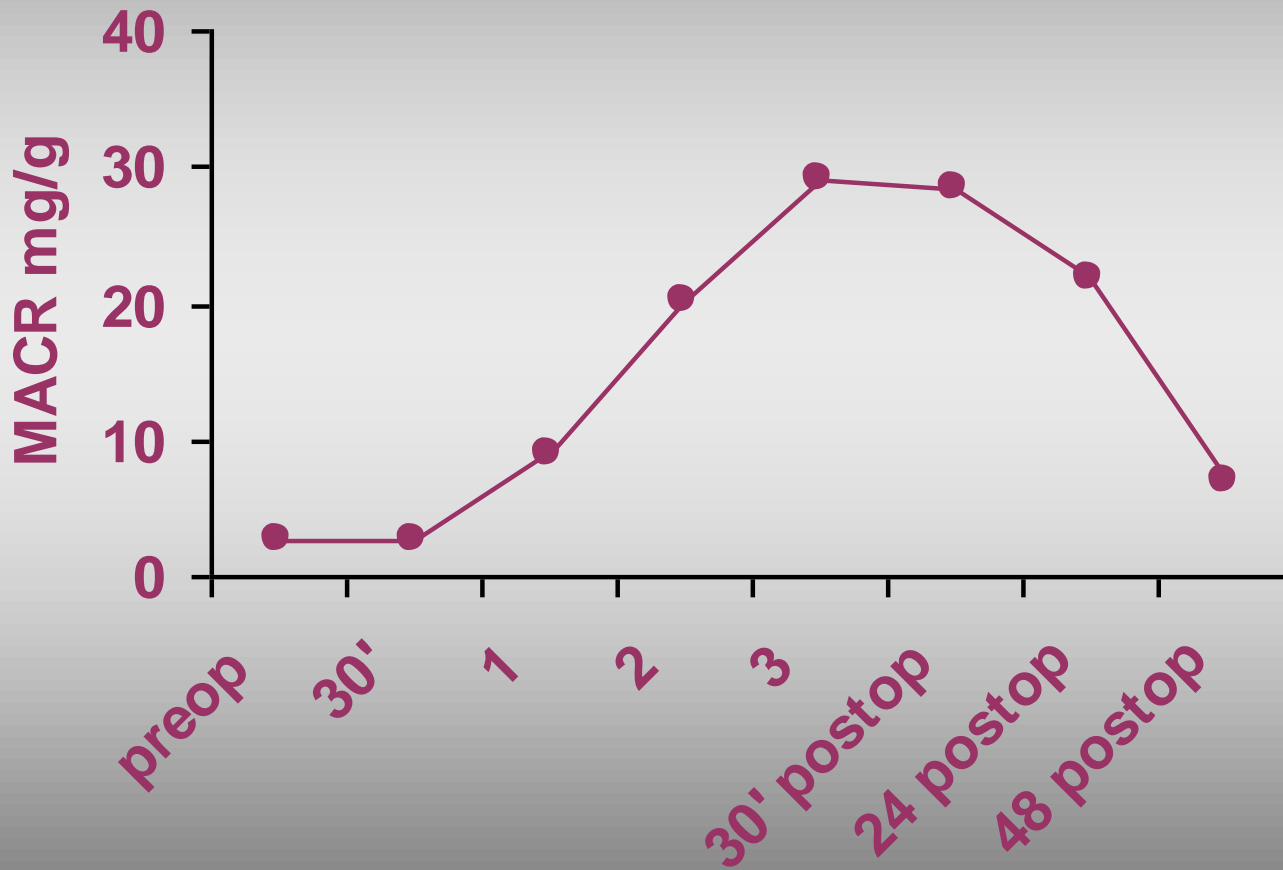
**Microalbuminuria < 30 mg**

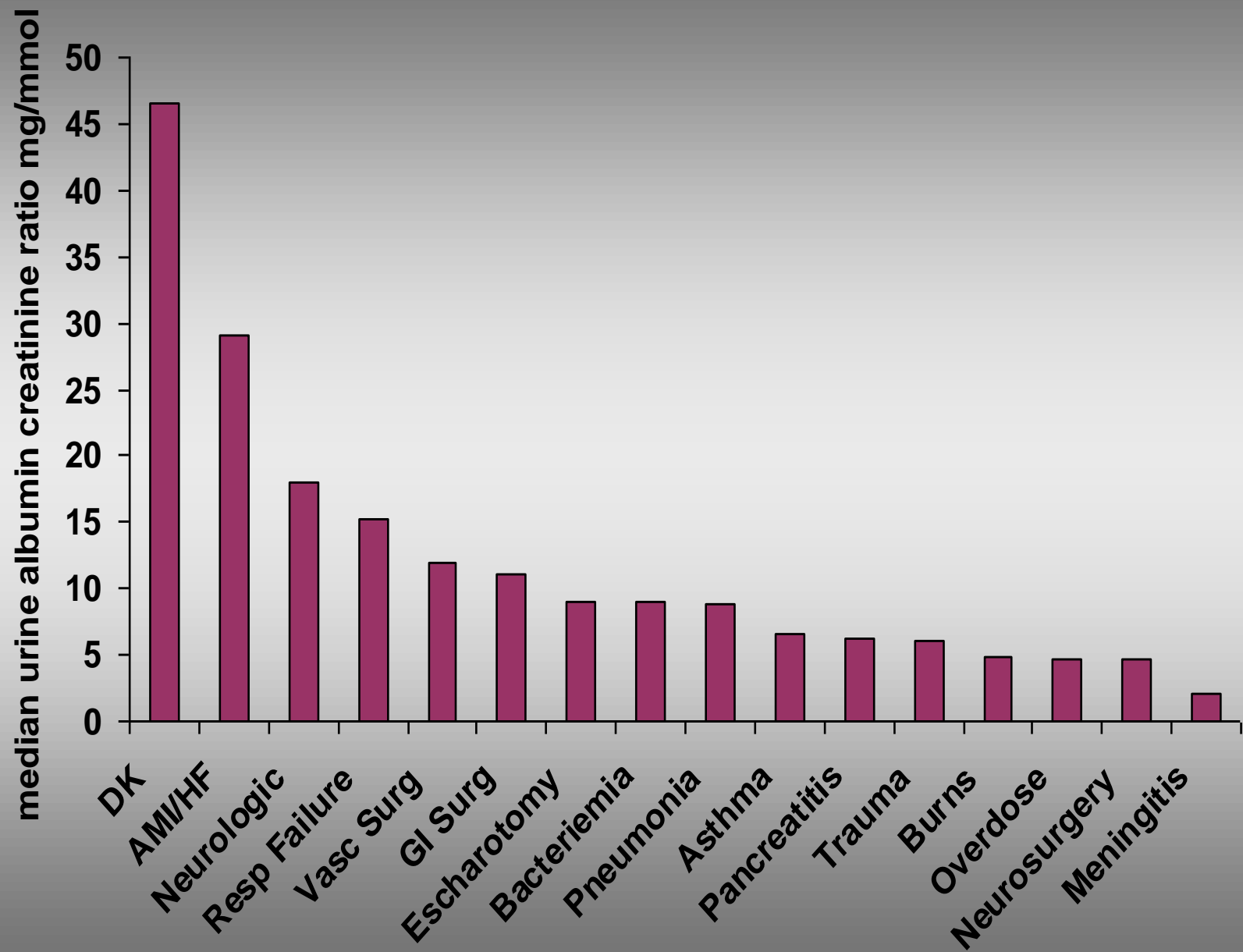
**INCREASED**



**Microalbuminuria 30-300 mg**

# MICROALBUMINURIA





**Does MicroAlbuminuria  
Relate to Systemic  
Inflammatory Response and  
Endothelial Damage?**

# ADMISSION CRITERIA

**Critically ill Patients with  
PCR  $\geq$  5 mg/dL  
on admission**

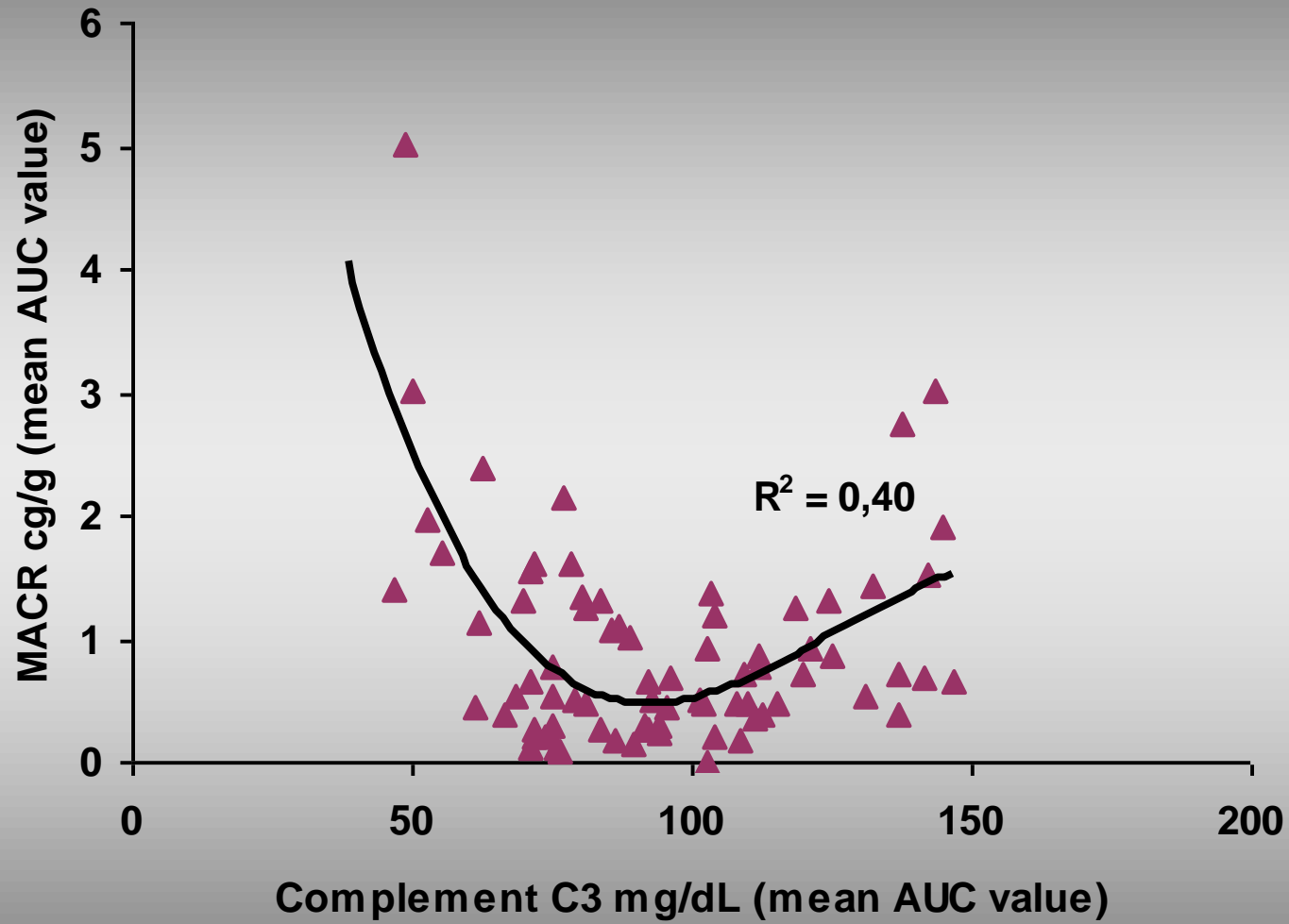
# ESCLUSION CRITERIA

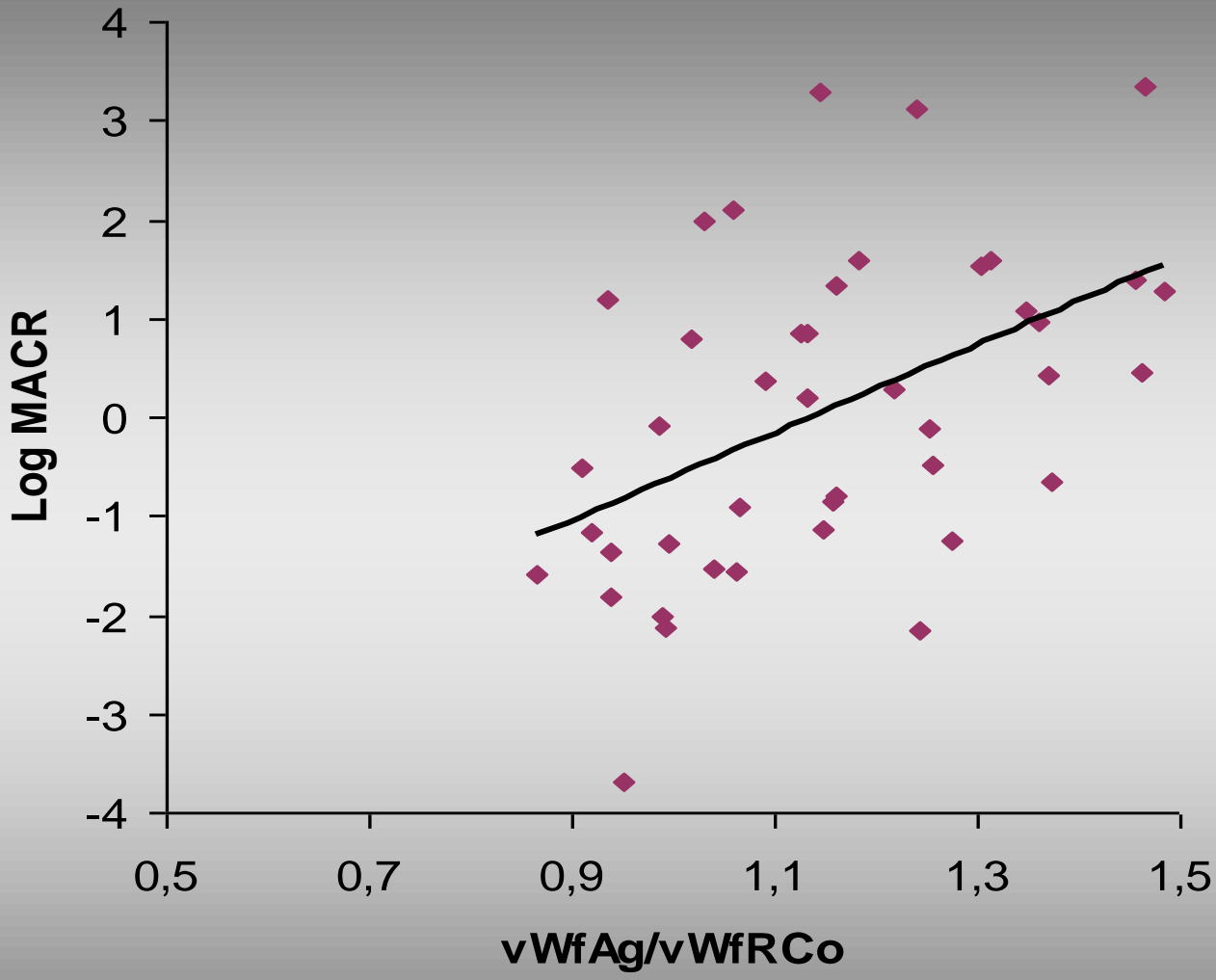
- **Age < 18 years**
- **Pregnancy**
- **Other ICU**
- **Macroscopic Hematuria**
- **Renal or Urologic Trauma**
- **Creatinine > 2 mg/dL**



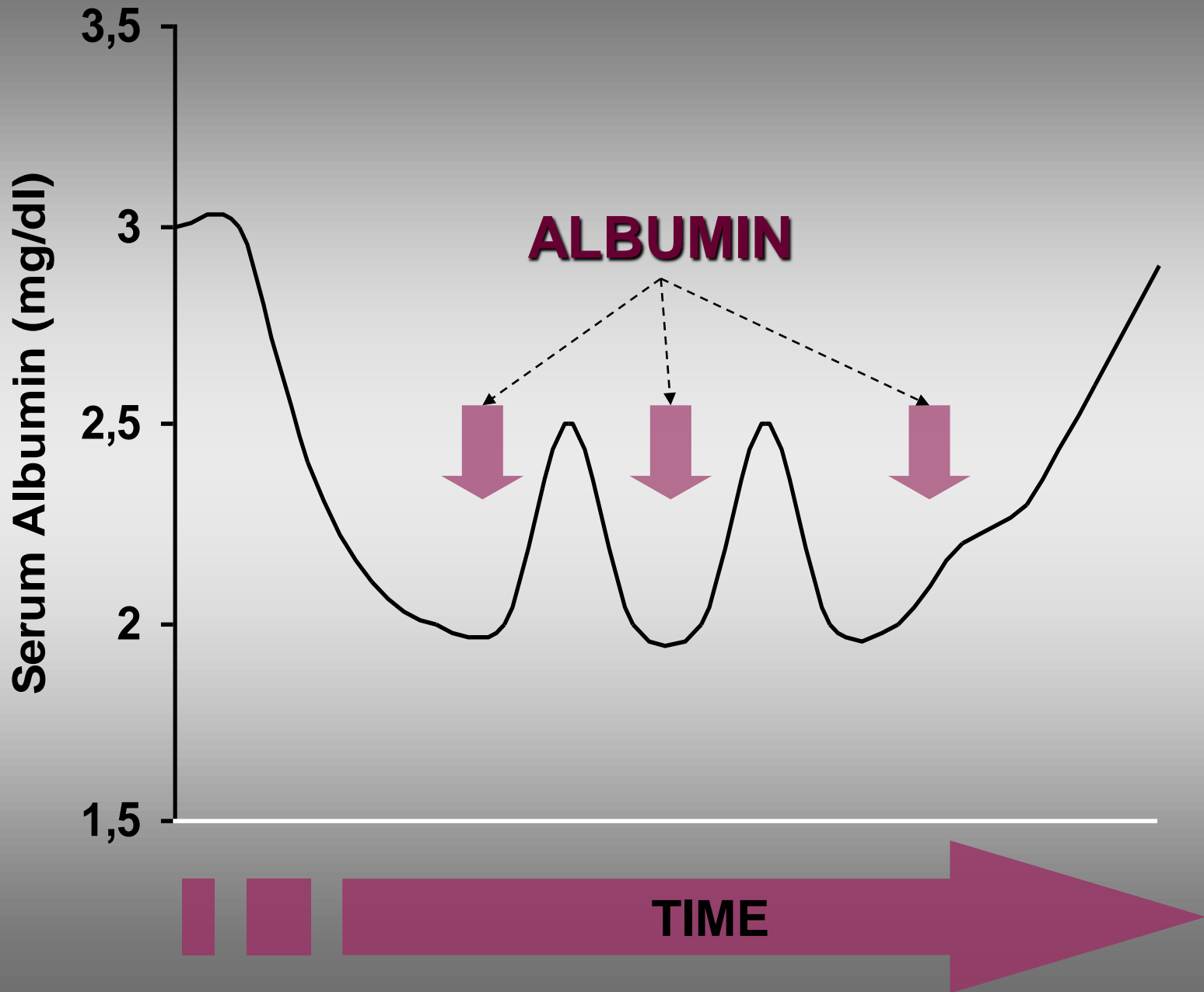


**INFLAMMATION  
and  
MICROALBUMINURIA**

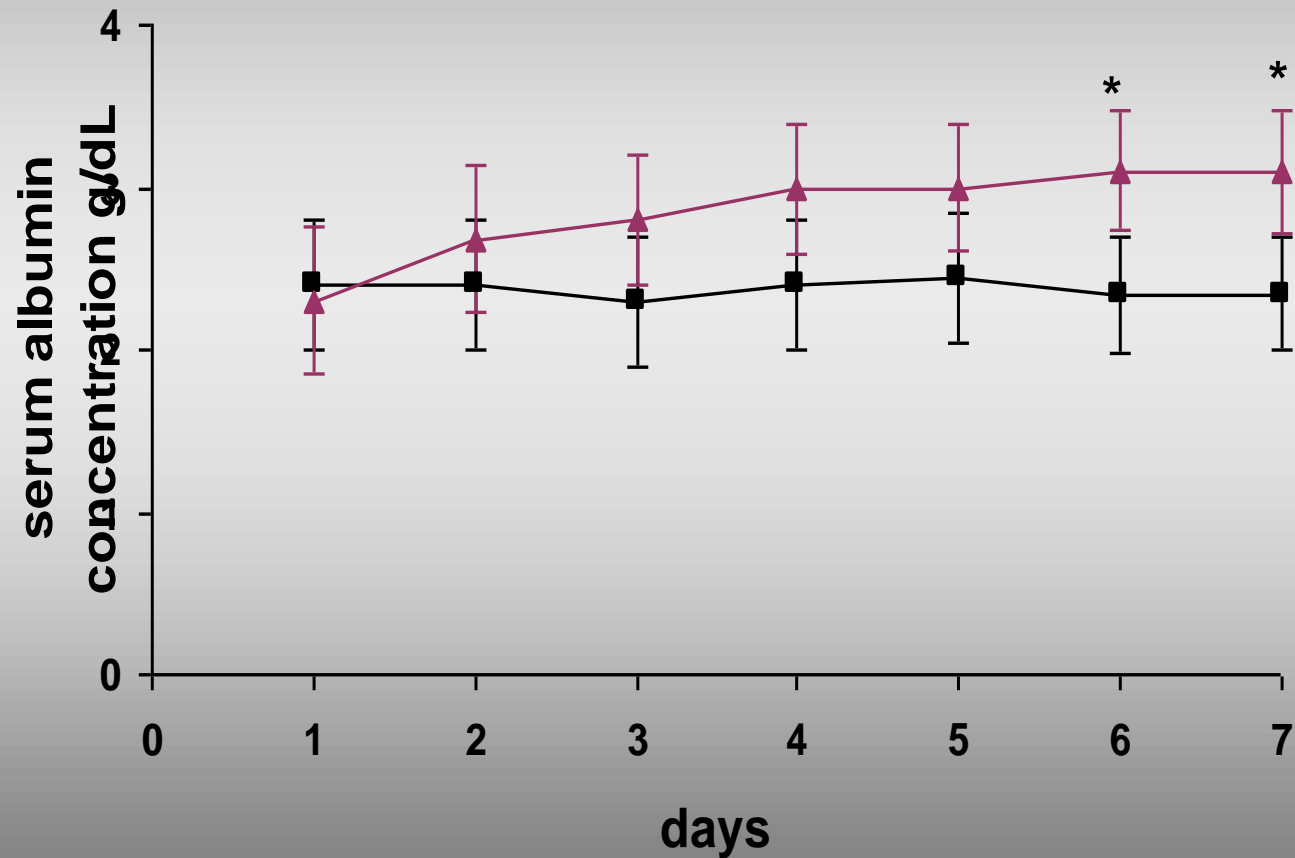




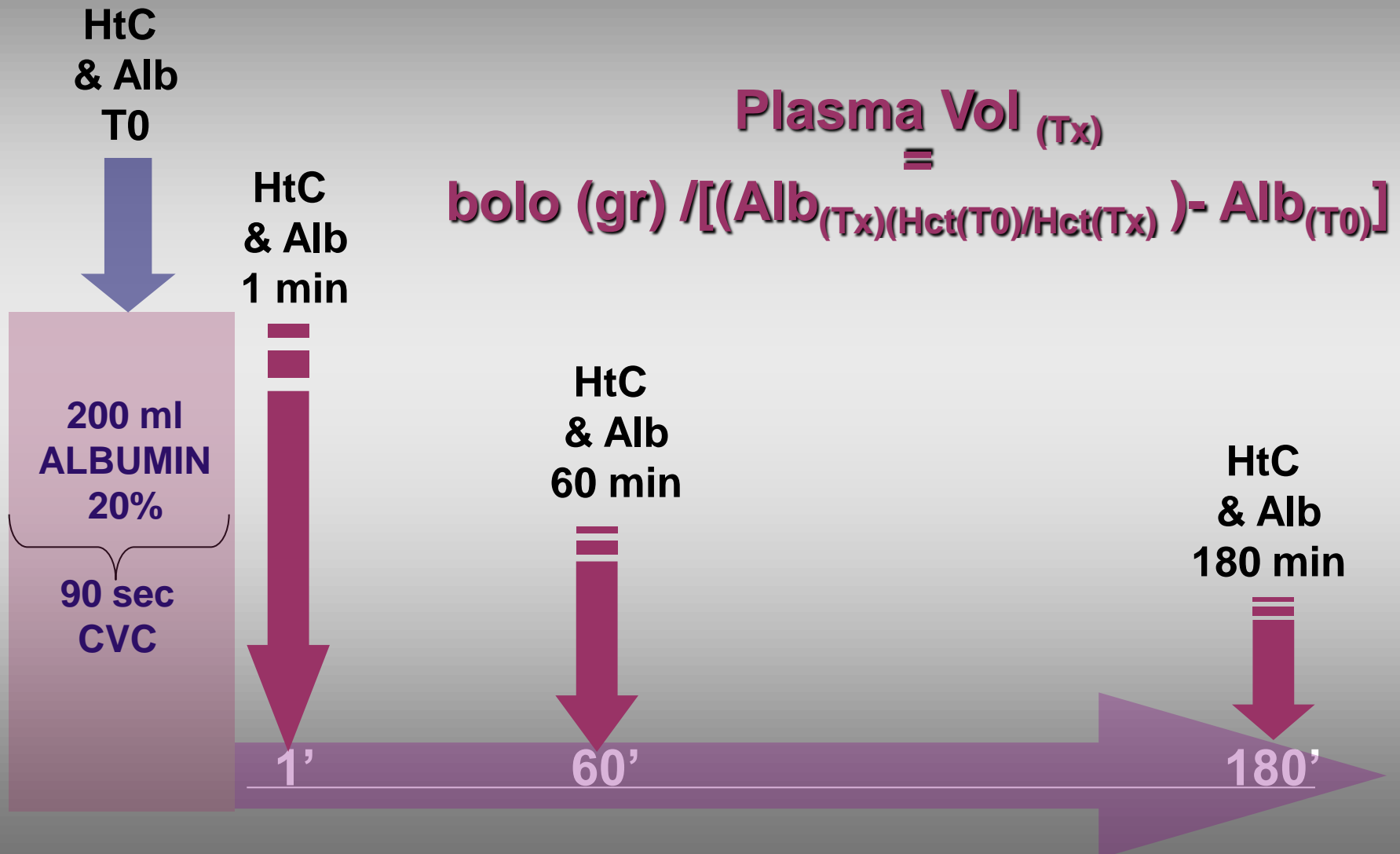
**MicroAlbuminuria and  
Plasma Volume Expansion  
by Albumin administration  
in acute hypoalbuminemia**



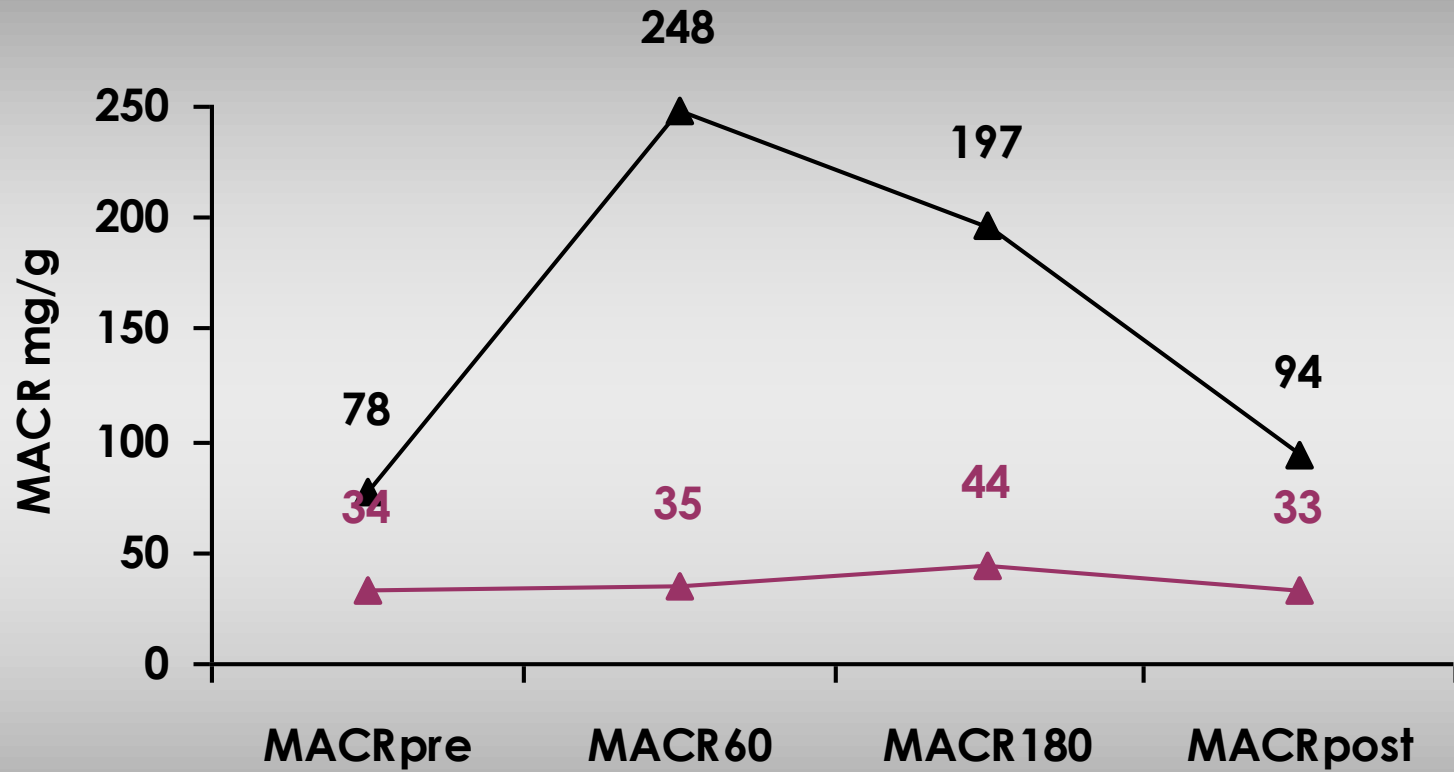
## Daily replacement of serum Albumin in acutely ill patients



# PLASMA VOLUME MEASUREMENT BY 20% HUMAN ALBUMIN

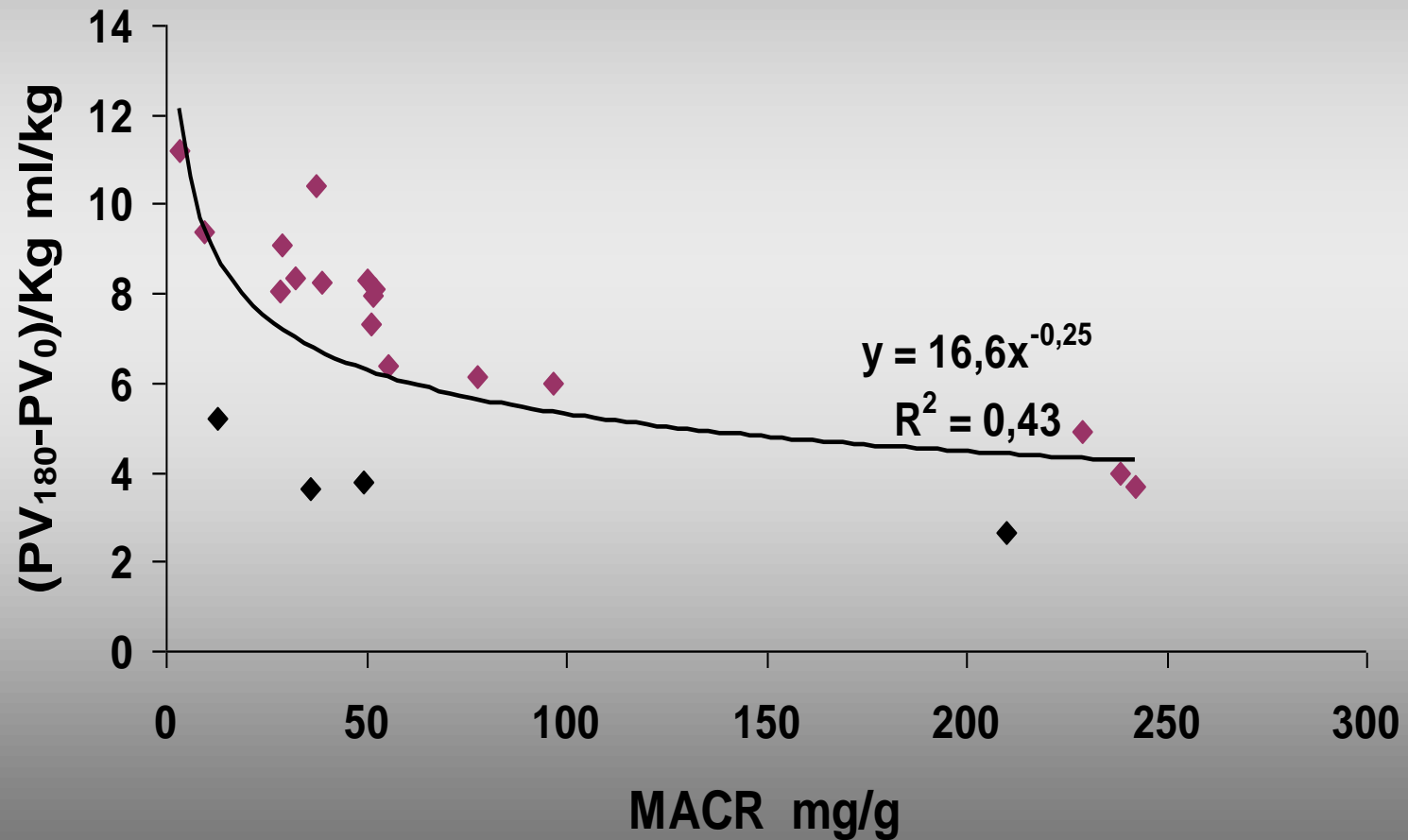


# Time Profile of MACR after 200 ml 20% albumin bolus

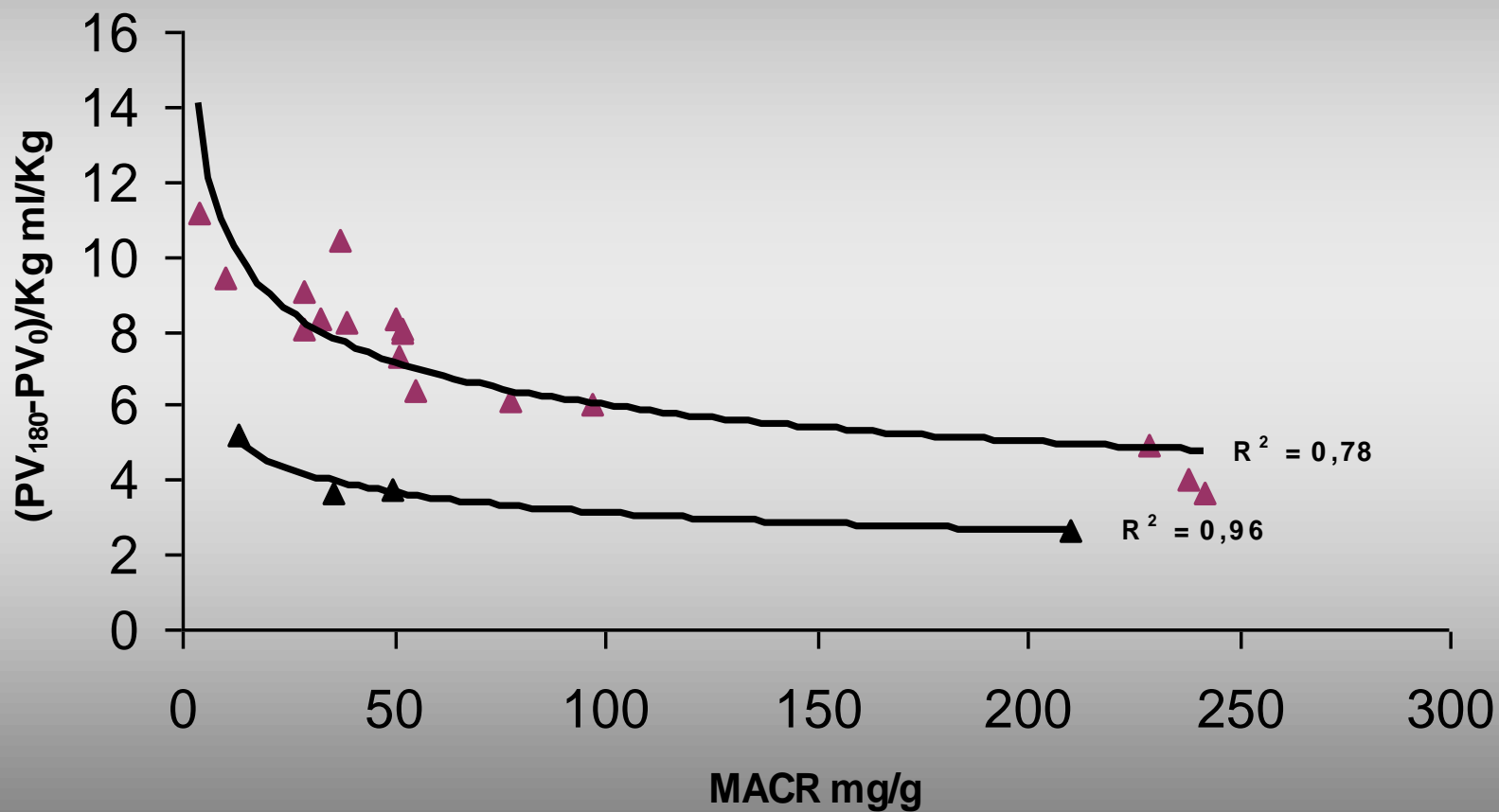




# Plasma Volume Expansion after 200 ml 20% Albumin Bolus

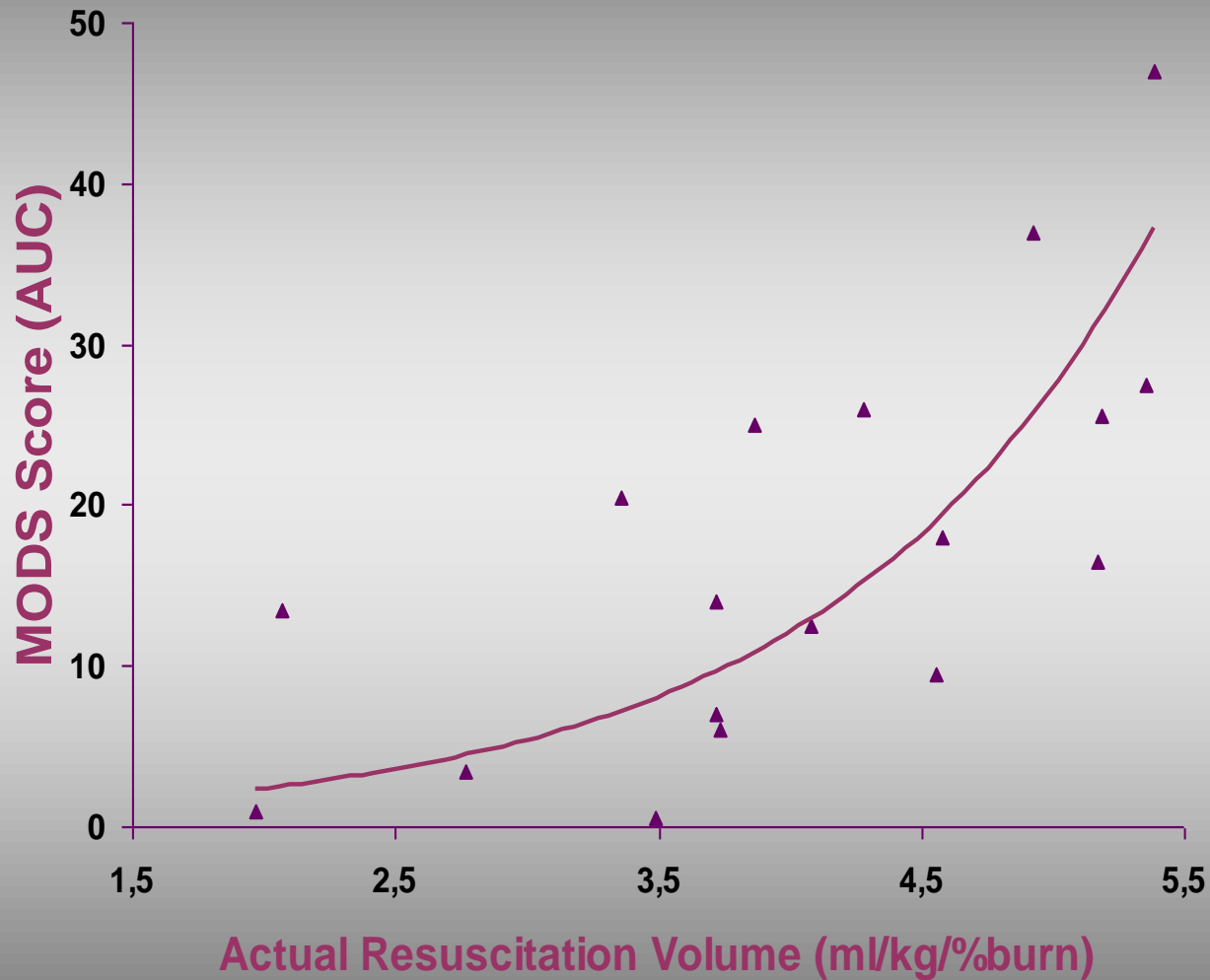


# Plasma Volume Expansion after 200 ml 20% Albumin Bolus

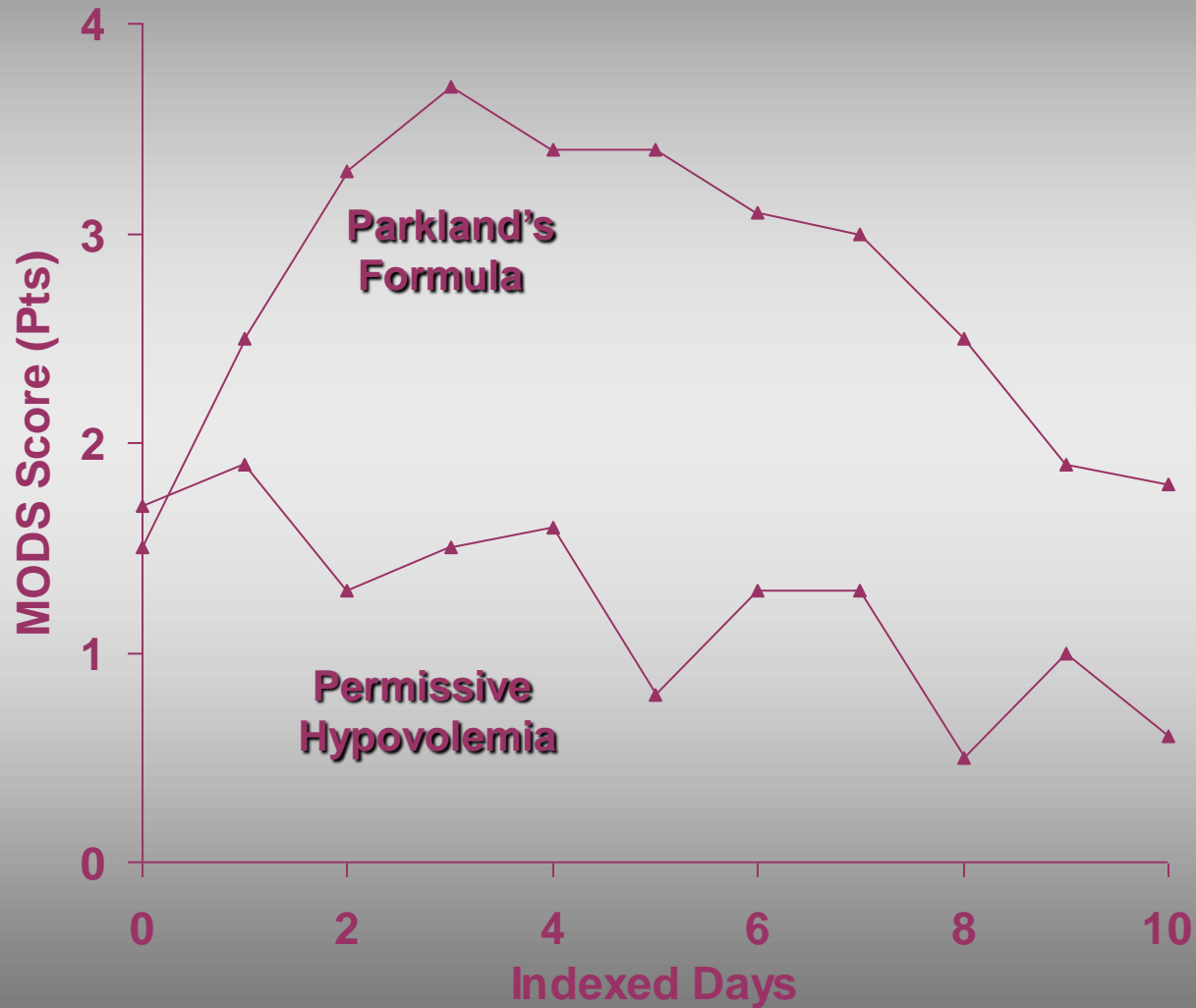


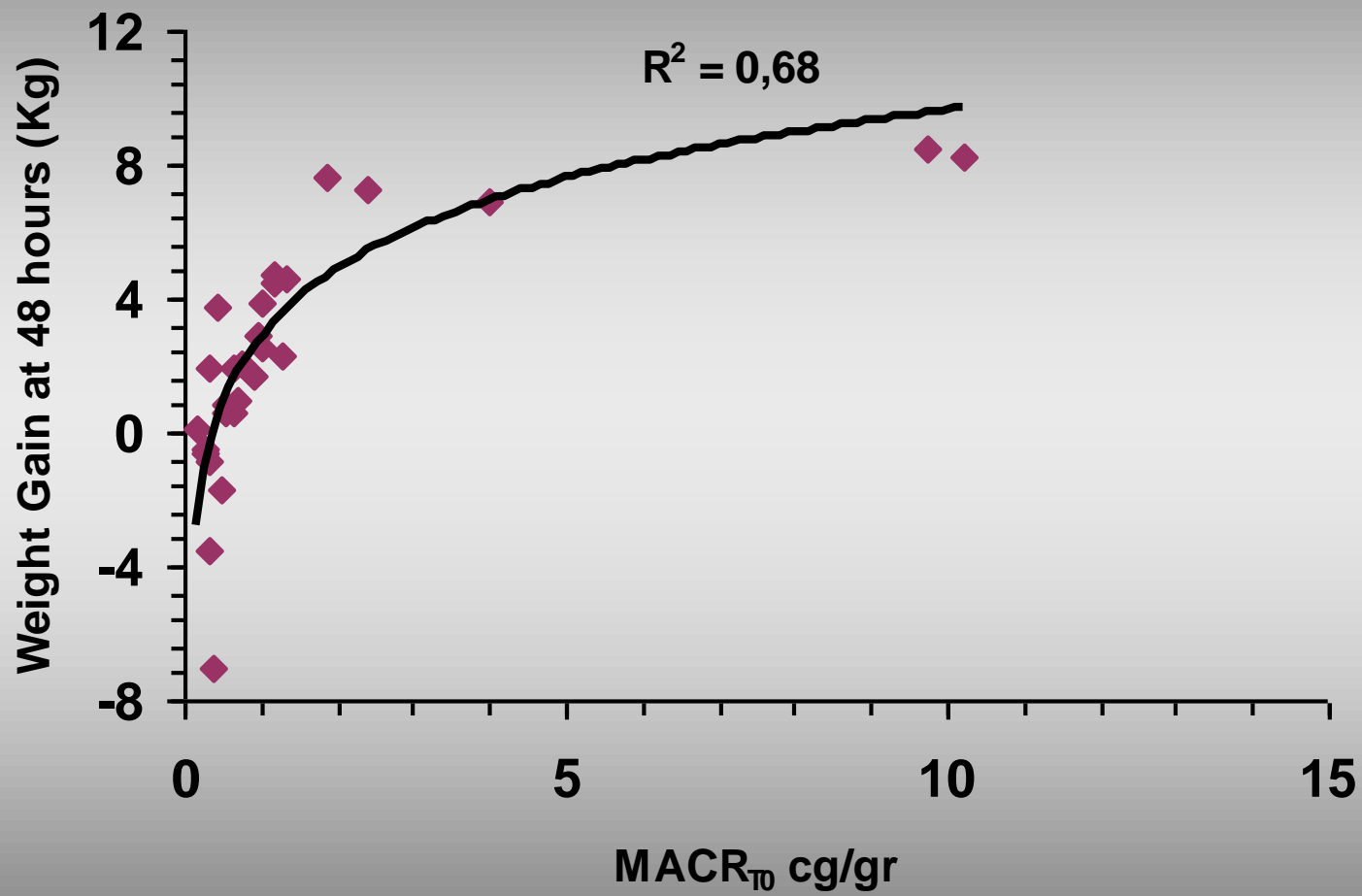
# **Impact of Microalbuminuria on Fluids Resuscitation**

# RESUSCITATIVE REGIMEN - MULTIPLE ORGAN DYSFUNCTION -



# - RESUSCITATIVE REGIMEN - MULTIPLE ORGAN DYSFUNCTION





# Something to Take-Away

- **Microalbuminuria reflects the extent of generalized microvascular permeability and endothelial damage.**
- **Microalbuminuria reliably predicts the expansive power of intravenous albumin in acute hypoalbuminemia.**
- **Early Microalbuminuria allows for prediction of the impact of fluids resuscitation in critically ill patients**