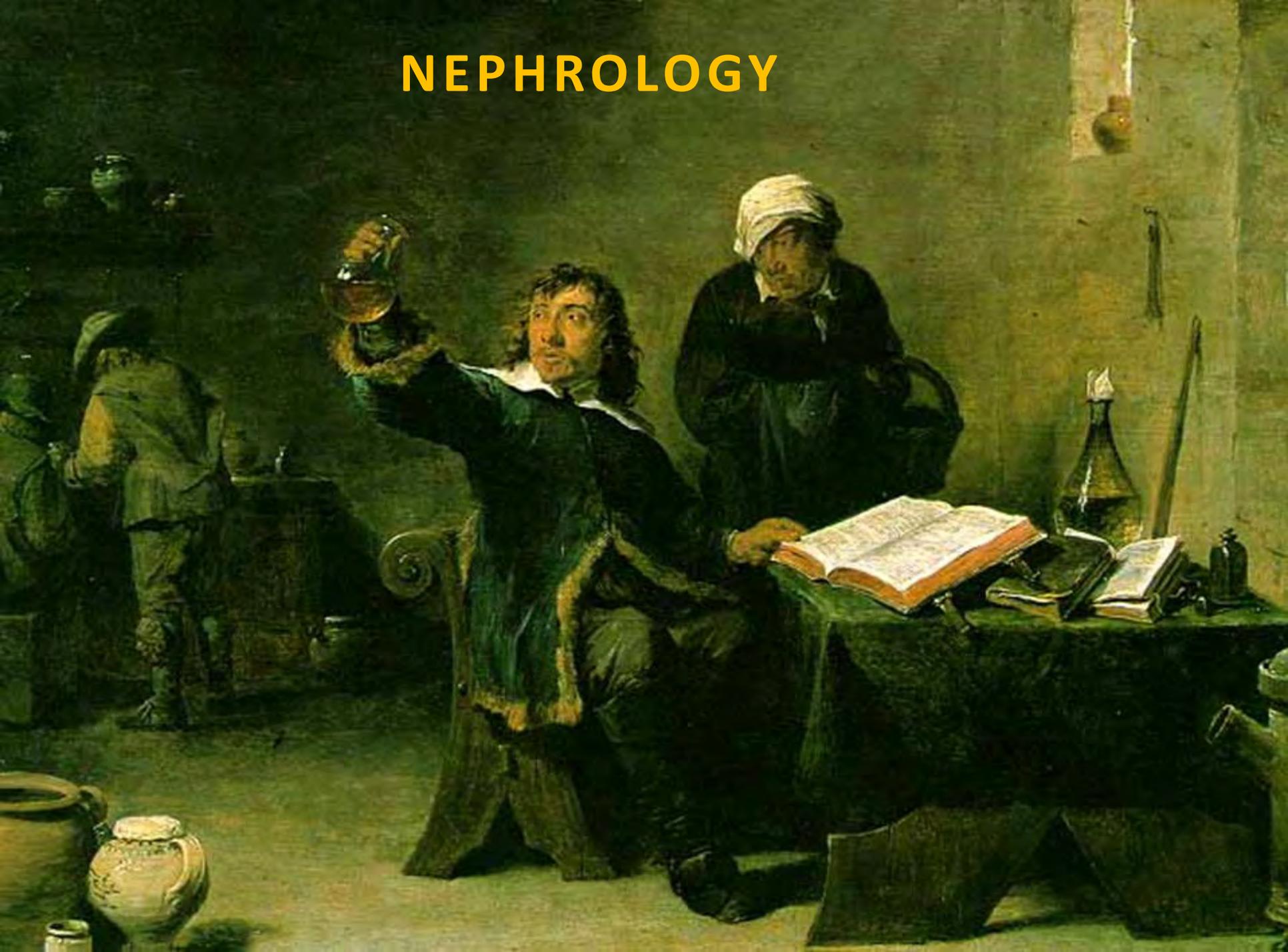


THE KIDNEY AND SLE

LUPUS NEPHRITIS

JACK WATERMAN DO FACOI
2013

NEPHROLOGY





SIR RICHARD BRIGHT

TERMINOLOGY

- RENAL INSUFFICIENCY
- CKD (CHRONIC KIDNEY DISEASE)
- ESRD (ENDSTAGE RENAL DISEASE)
- GLOMERULONEPHRITIS
- UREMIA
- PROTEINURIA
- NEPHROTIC SYNDROME
- HEMATURIA

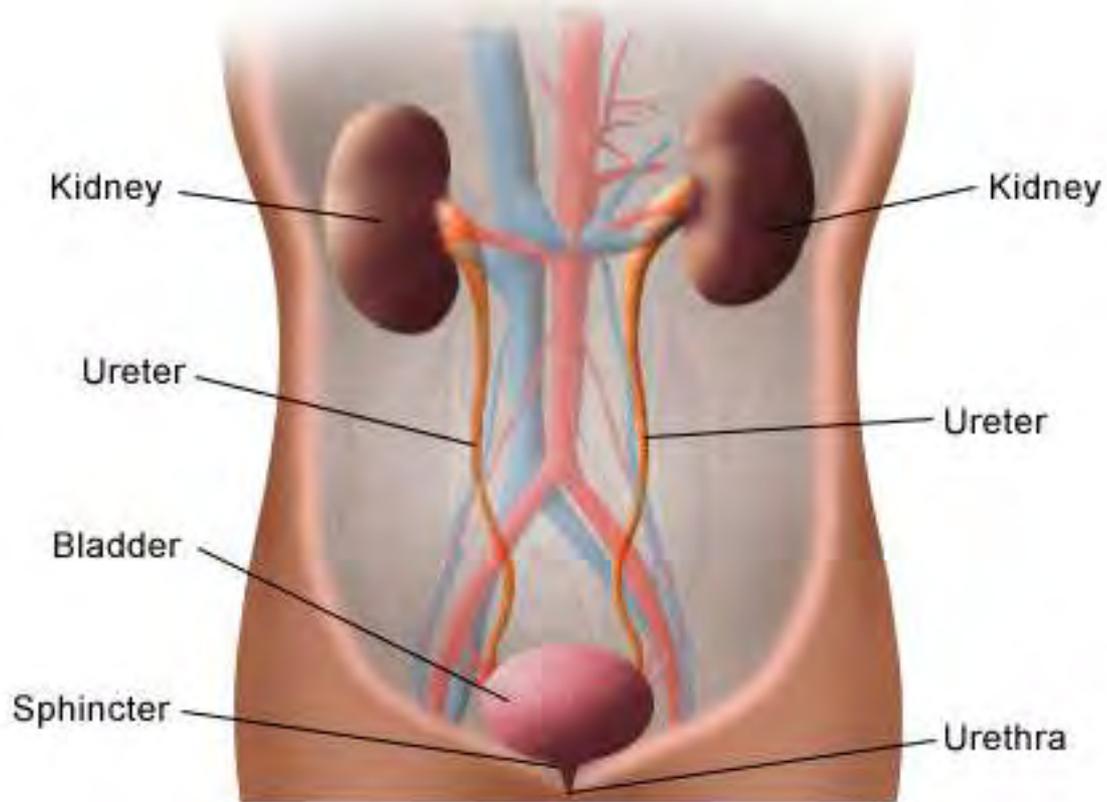
ANATOMY AND PHYSIOLOGY

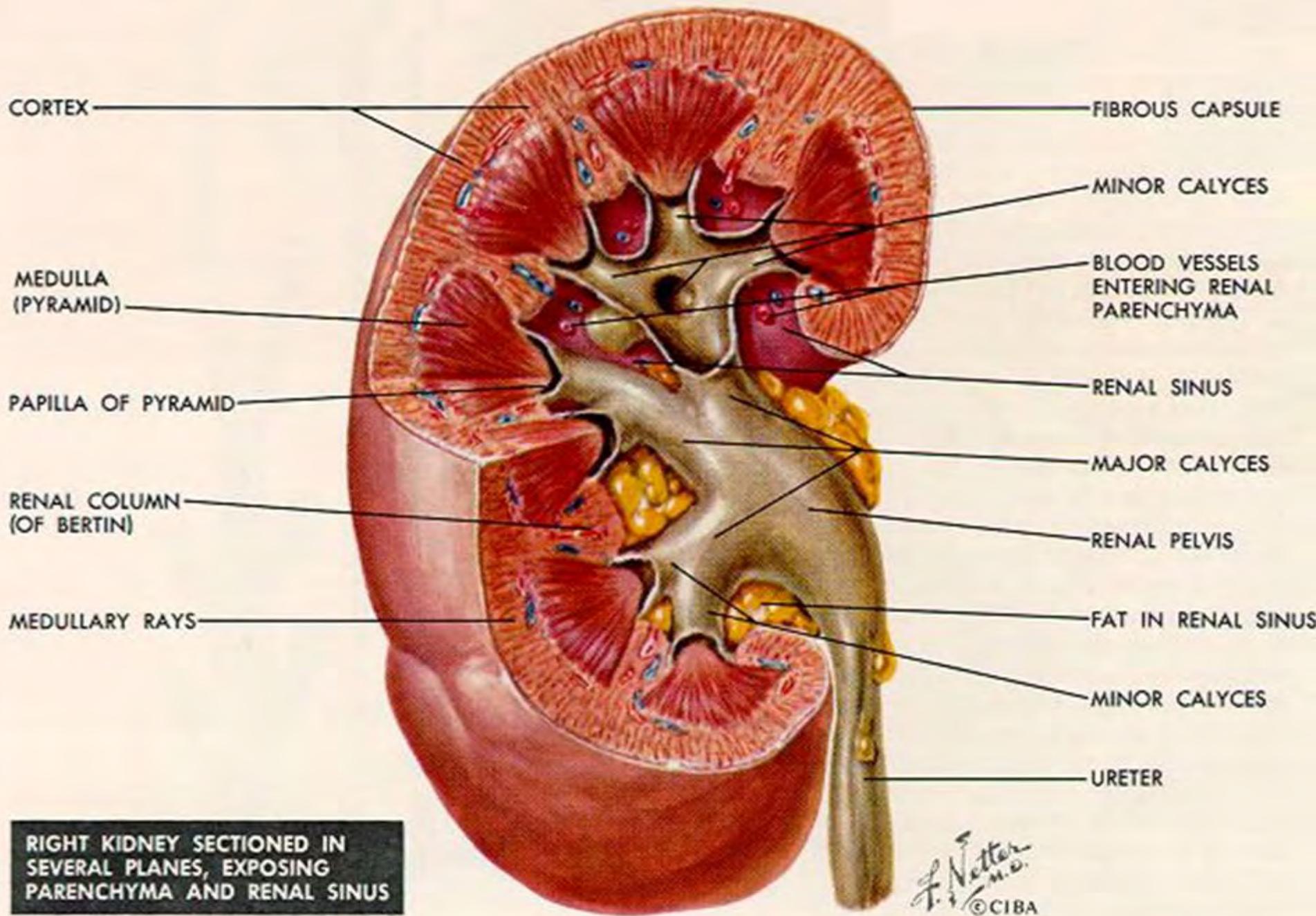
OF THE

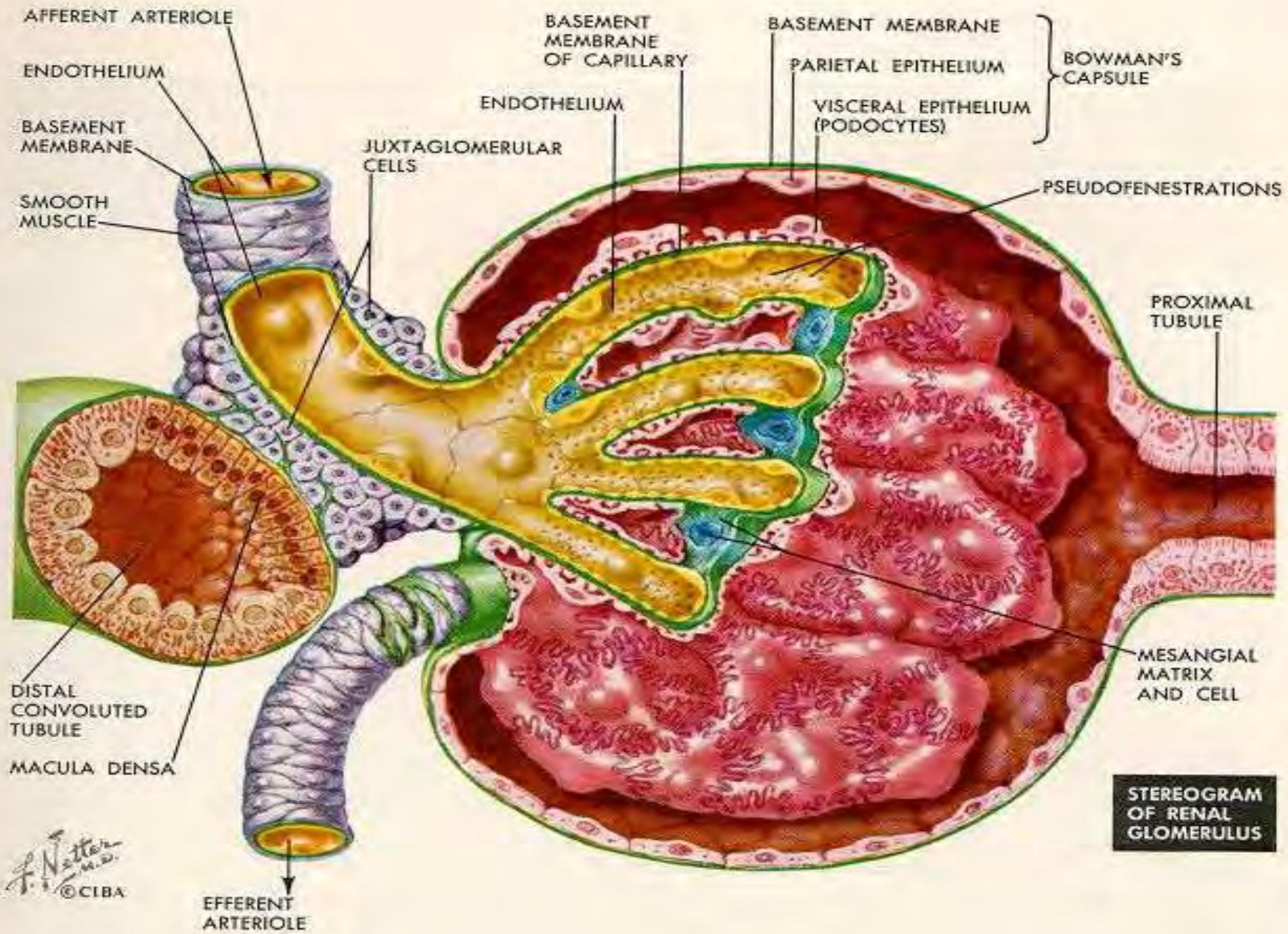
KIDNEY

ANATOMY

Front View of Urinary Tract







F. Netter M.D.
© CIBA

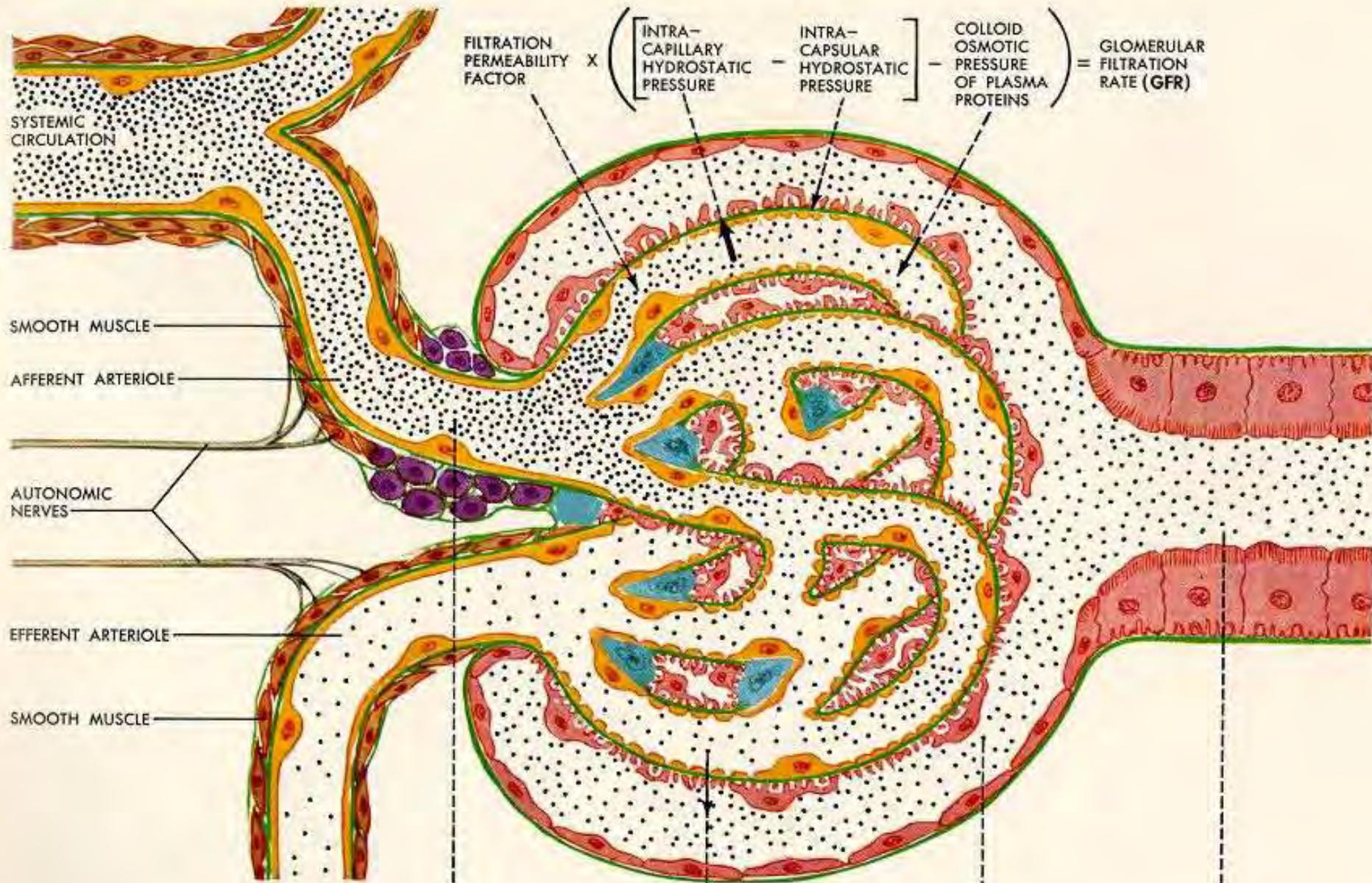


**225,000-900,000 NEPHRONS
IN EACH KIDNEY. BASED
ON URETERIC BUD
MORPHOGENESIS**

**ULTIMATELY DETERMINES
HOW WELL THE KIDNEY
RESPONDS TO
PHYSIOLOGIC DEMANDS**

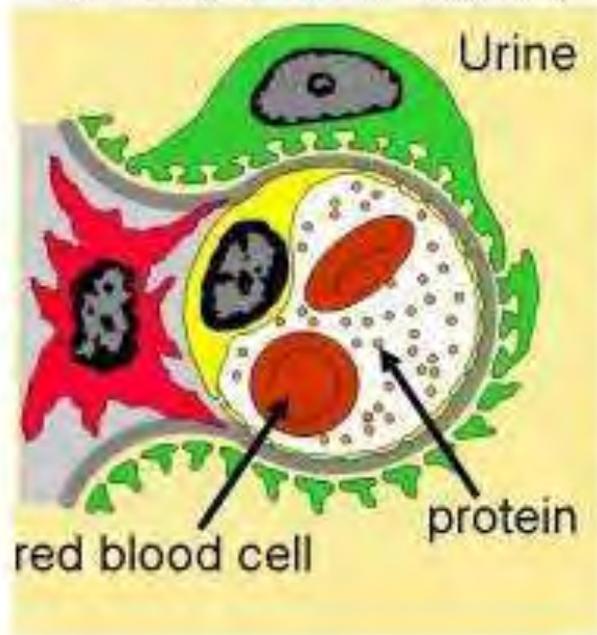
GLOMERULUS



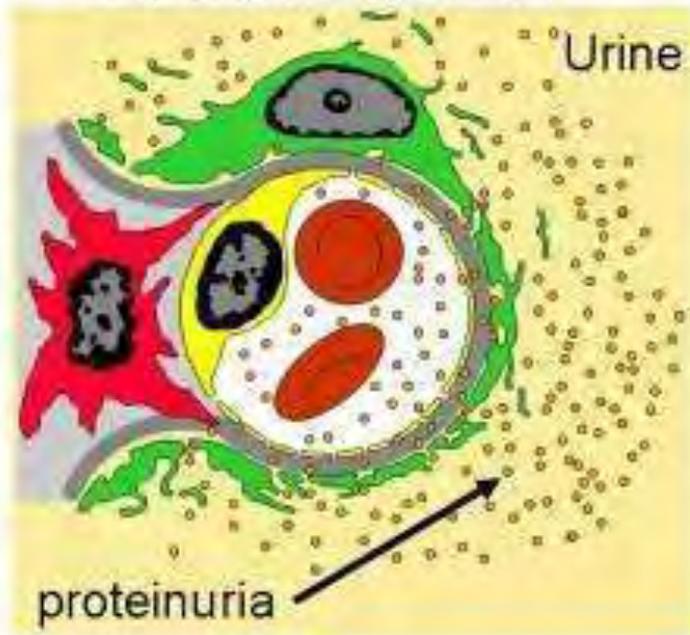


F. Netter, M.D.
 © CIBA

Normal glomerular capillary



Capillary with proteinuria



FUNCTIONS OF THE KIDNEY

EXCRETORY

**ELIMINATES METABOLIC WASTES AND
TOXINS**

SECRETORY

**PRODUCES HORMONES WHICH AFFECT
OTHER ORGANS**

**ERYTHROPOIETIN
1,25 VITAMIN D
RENIN
PROSTAGLANDINS**

HOW TO EVALUATE KIDNEY FUNCTION

- SYMPTOMS AND PHYSICAL FINDINGS
- BLOOD TESTS
- URINE TESTS
- IMAGING STUDIES

**SYMPTOMS ARE VARIABLE AND MOST
OFTEN SILENT**

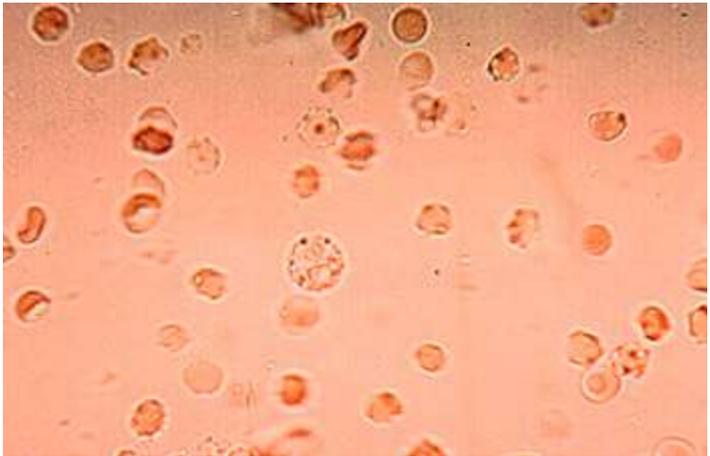
**PHYSICAL FINDINGS ARE COMMONLY
EDEMA AND HYPERTENSION**

BLOOD TESTS

- BUN (BLOOD UREA NITROGEN)
- CREATININE
- eGFR (ESTIMATED GLOMERULAR FILTRATION RATE)
- ANTI-DNA, C3,C4,CH50

URINE TESTS

- URINALYSIS
- URINE MICROALBUMIN/CREATININE RATIO
- URINE PROTEIN/CREATININE RATIO
- 24 HOUR URINE FOR CREATININE CLEARANCE AND TOTAL PROTEIN



PROTEINURIA

<150 mg/24 hours-	normal
<1000 mg/24 hours-	mild
1000- 3000 mg/24 hours-	moderate
>3500 mg/24 hours-	nephrotic

edema

hypoalbuminemia

hyperlipidemia

IMAGING STUDIES

- RENAL ULTRASOUND
- CT SCAN
- NUCLEAR SCAN
- MRI
- ARTERIOGRAM

AAA, AAA
P.B.G. MEDICAL CENTER

99/11/12:134510
C5-2 Abd/Renal

12 Nov 99
1:48:33 pm
TIs 0.3 MI 1.3
Fr #28 16.6cm

Map 3
150dB/C3
Persist Med
Fr Rate Med
2D Opt:Gen

ULTRASOUND

ATL



AAA, AAA
P.B.G. MEDICAL CENTER

99/11/12:134510
C5-2 Abd/Renal

12 Nov 99
1:49:30 pm
TIs 0.7 MI 1.1
Fr #18 16.6cm

Map 3
150dB/C3
Persist Med
Fr Rate High
2D Opt:Gen
CPA 84% Map 1
WF Med
PRF 1000 Hz
Flow Opt: Med V

ATL



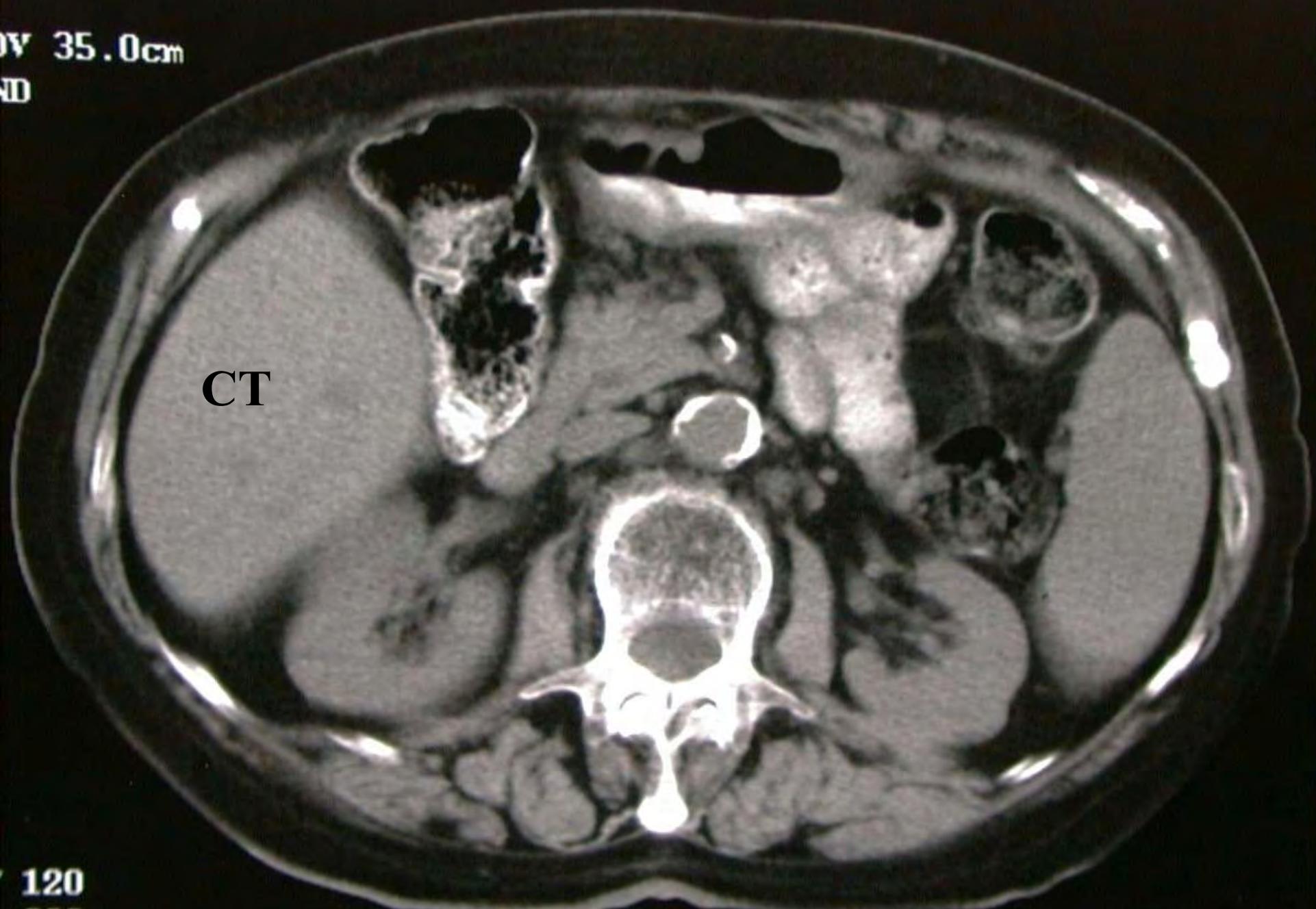
CPA

13

35.0cm
ND

CT

120



7740

Posterior

09/28/99

NUCLEAR SCAN

L

R

INJECTION

6 SEC

9 SEC

12 SEC

15 SEC

18 SEC



21 SEC

24 SEC

27 SEC

30 SEC

33 SEC

36 SEC



39 SEC

42 SEC

45 SEC

48 SEC

51 SEC

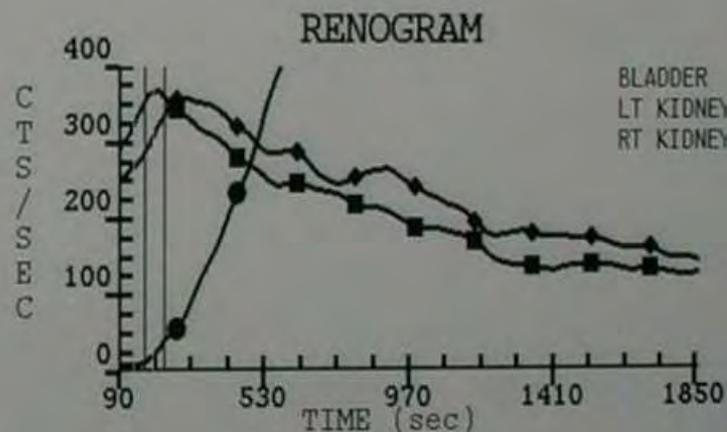
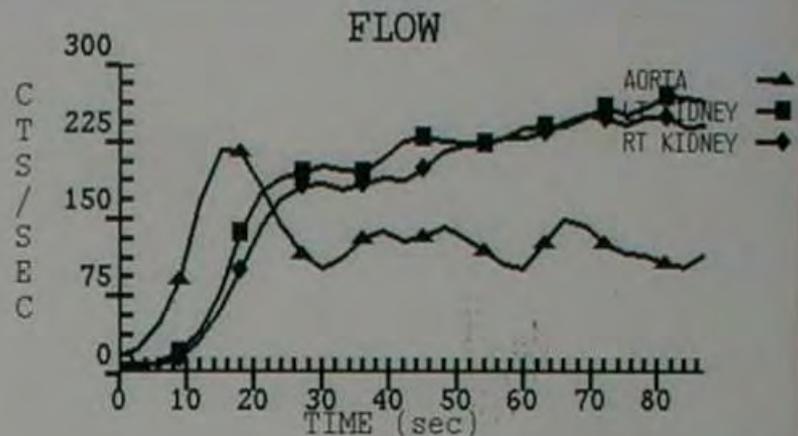
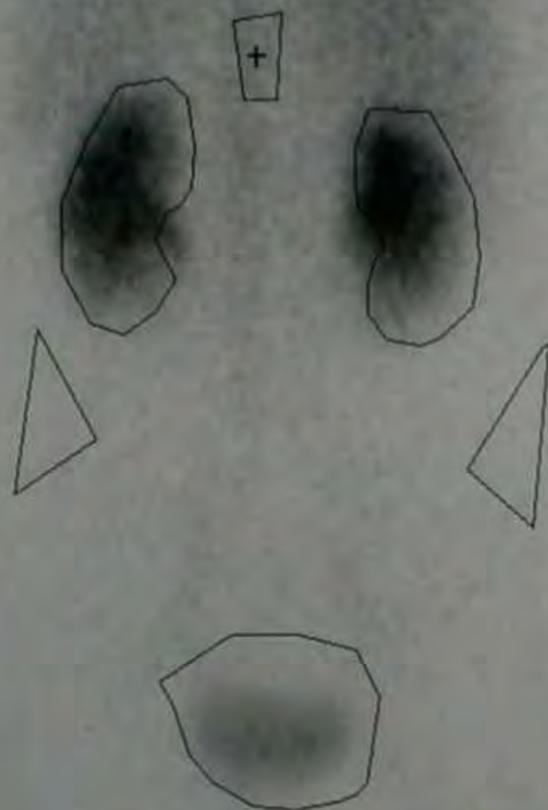
54 SEC

3 SECOND IMAGES

RENAL FLOW



60 SEC



PATIENT'S NAME XXXXXXXXXXXXXXXXXXXX
 PATIENT'S ID : 7740
 STUDY DATE : 09/28/1999

	LEFT	RIGHT
Peak Time(sec):	210	270
1/2 Peak Time :	780	960
Diff Perfusion :	55%	45%

RENAL SCAN/FLOW STUDY

P. B. G. MED. CENTER.

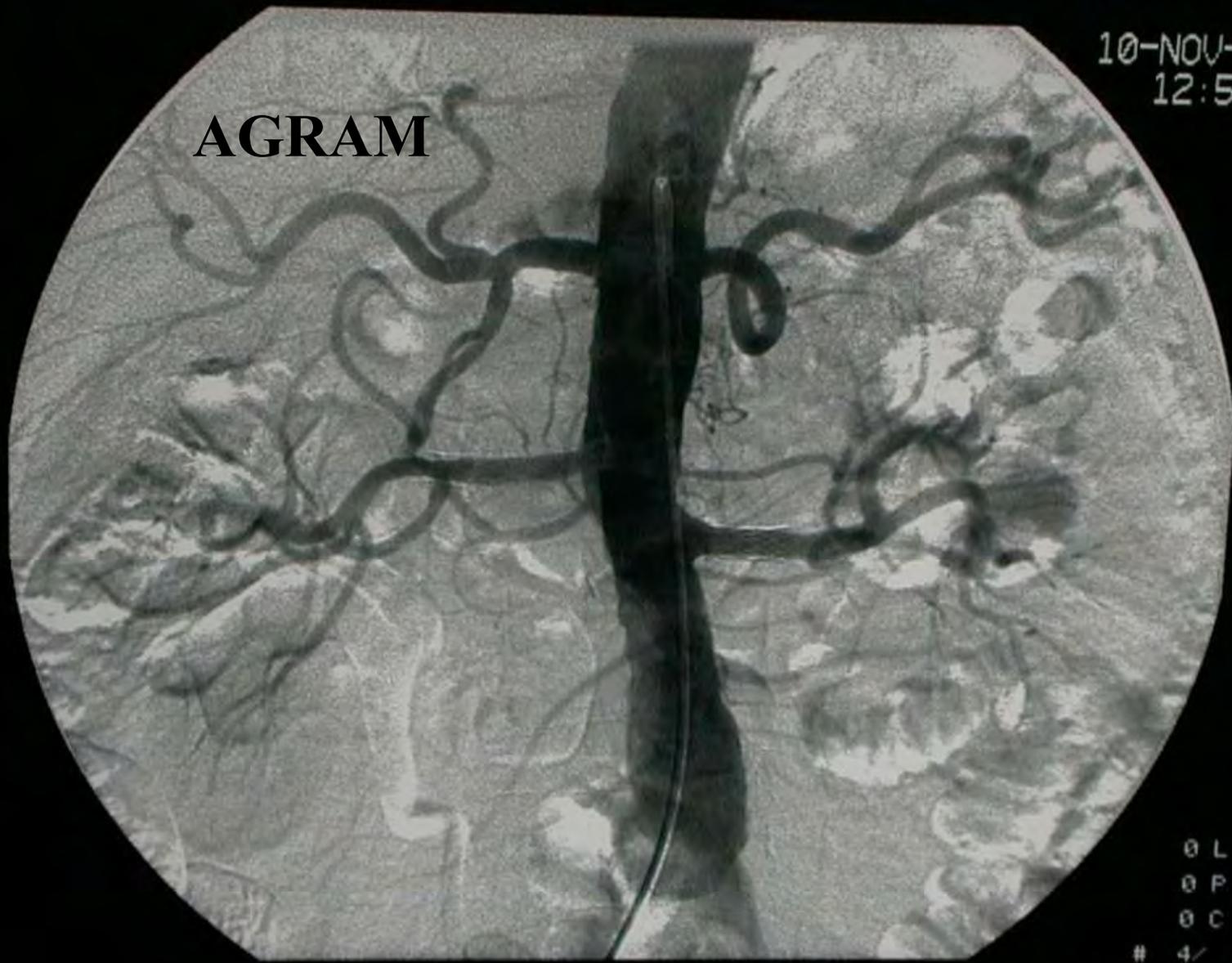
DSA/AGRAM

10-NOV-1999
12:57:07

AGRAM

R

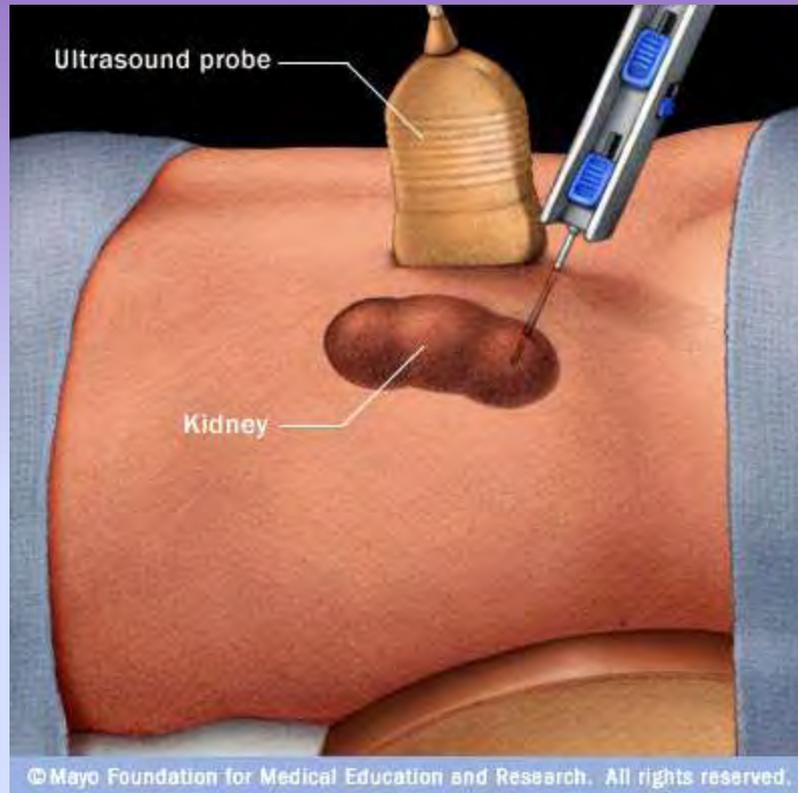
R



POST STENT X 3

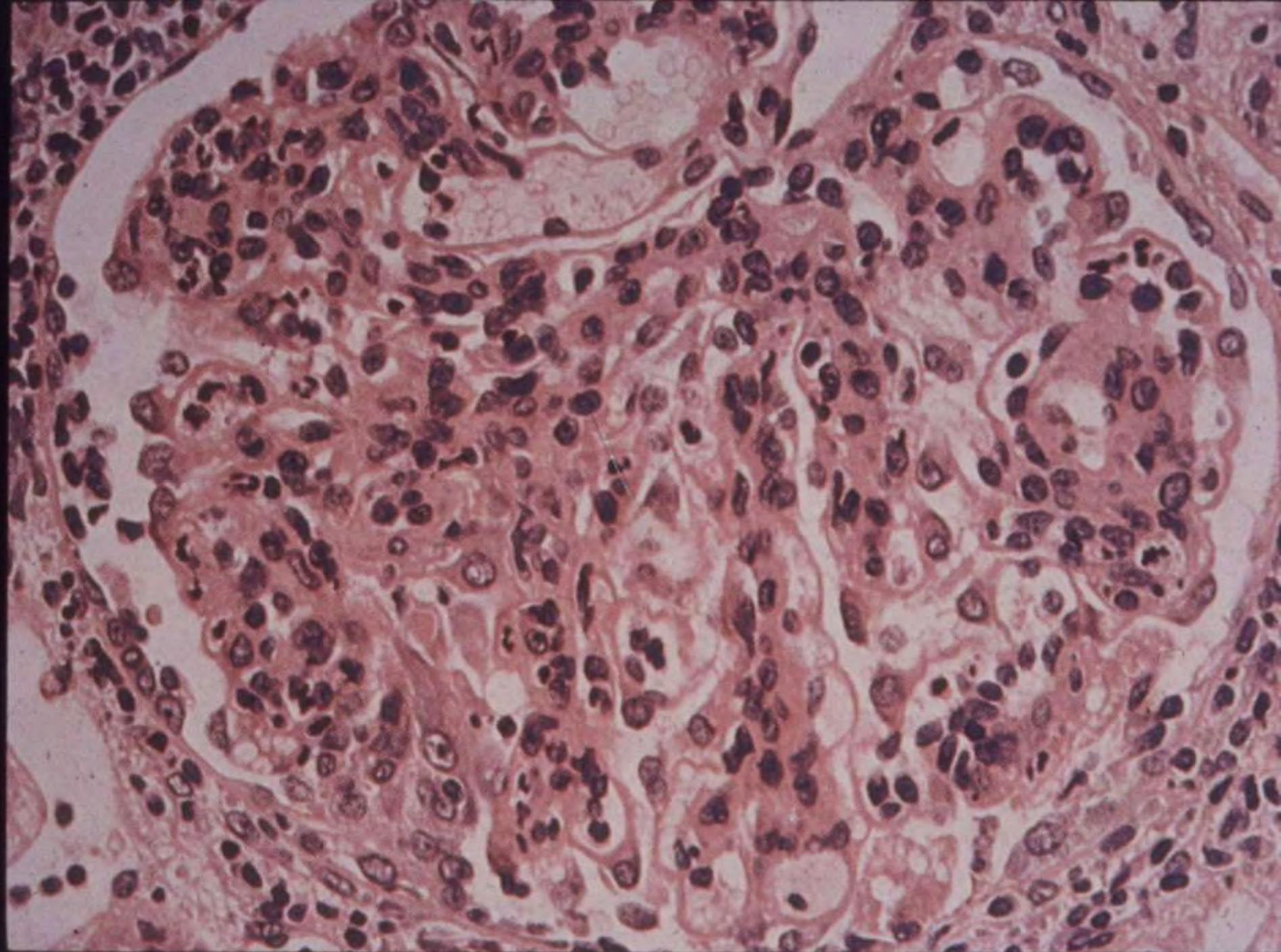
0 L
0 P
0 C
4 / 4
FRM 12 / 29
MASK 2
TIME 3.46s

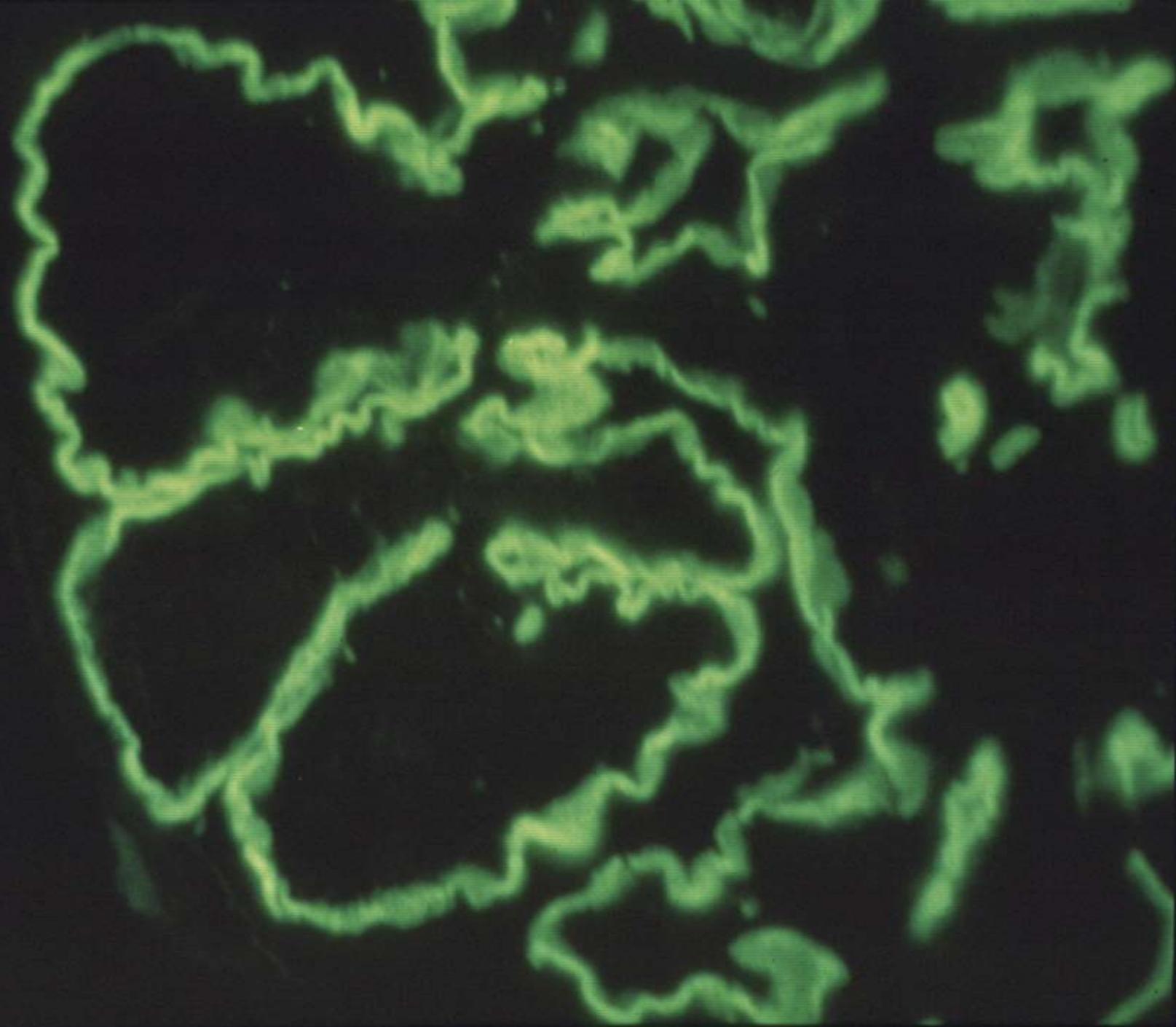
BIOPSY

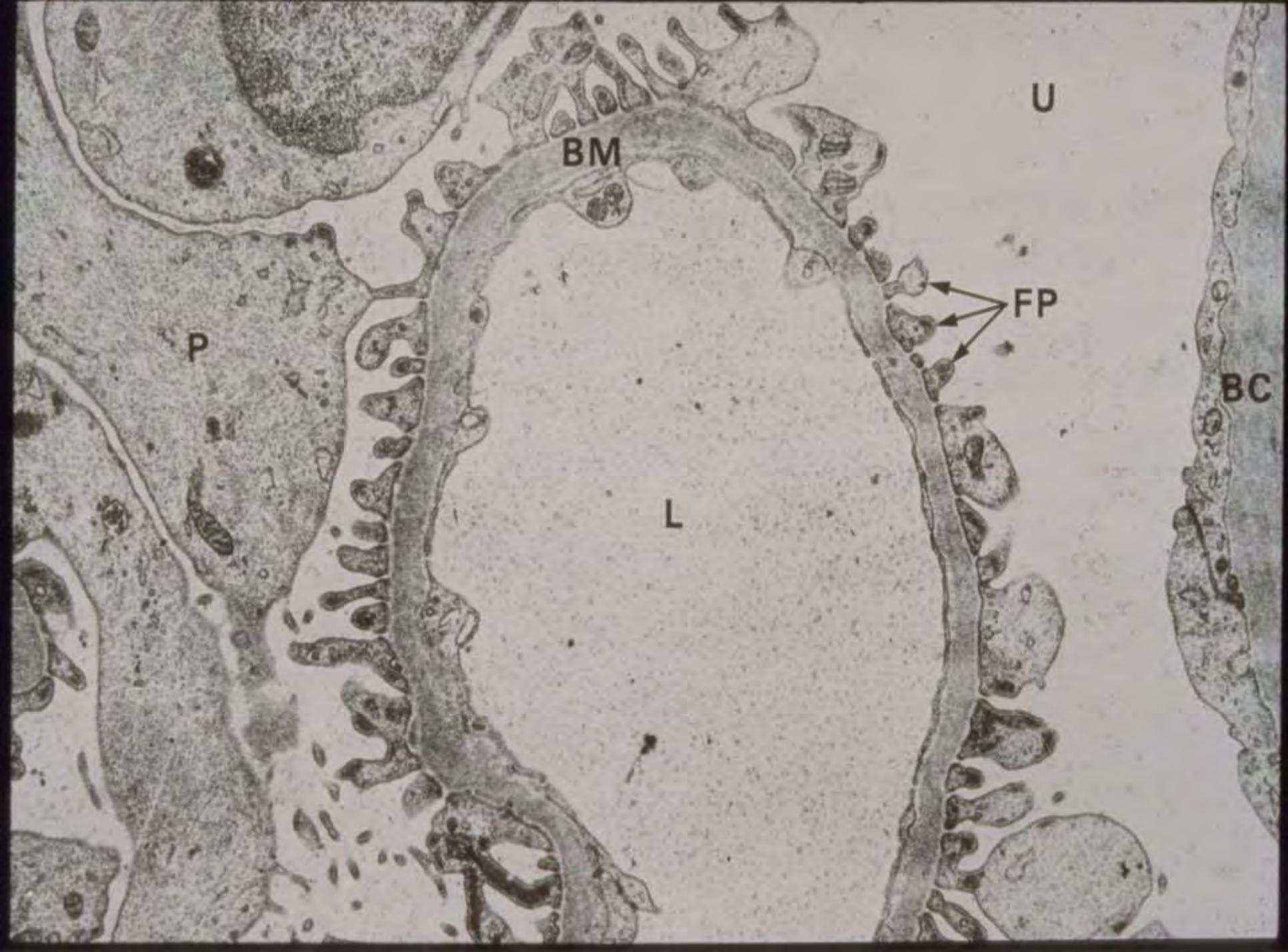


BIOPSY









KIDNEY DISEASE MAY BE

ACUTE (AKI)

SUBACUTE OR

CHRONIC (CKD)

> 3 MONTHS DURATION

ETIOLOGIES OF CKD

- DIABETES MELLITUS 33.8%
- HYPERTENSION 28.3%
- GN 12.0%
- CYSTIC DISEASE 3.0%
- INTERSTITIAL NEPHRITIS 3.0%
- OBSTRUCTIVE DISEASE 2.0%
- ISCHEMIC RENAL DISEASE
- ATHEROEMBOLIC DISEASE
- ETC.

CKD RISKS

- **ATHEROSCLEROSIS**
- **END STAGE RENAL DISEASE**

TREATMENT

TREAT UNDERLYING CAUSE

CONTROL COMORBID CONDITIONS

DIETARY MODIFICATION

DIURETICS

**ACE INHIBITORS & ANGIOTENSIN RECEPTOR
BLOCKERS**

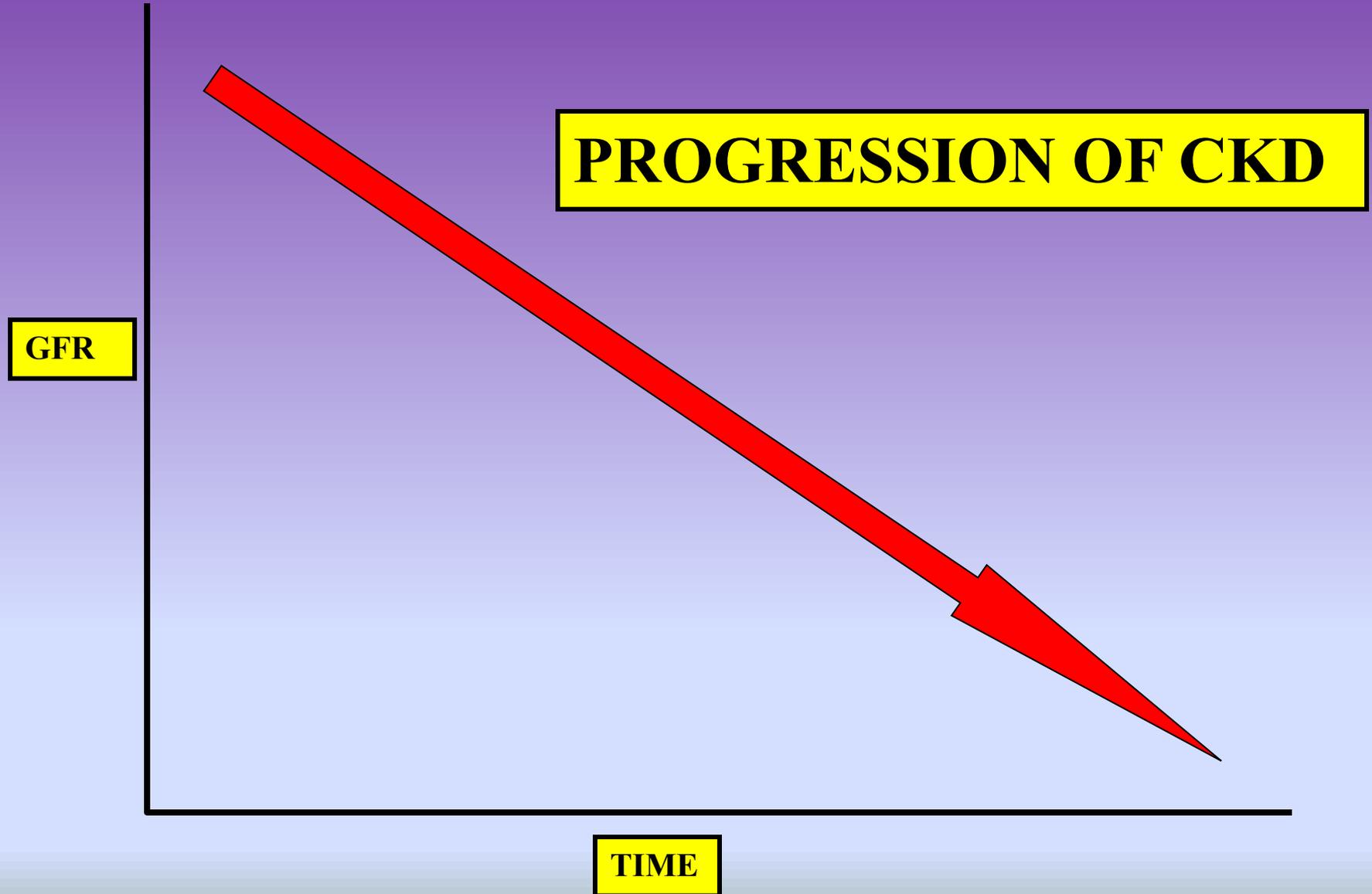
ADJUST DRUG DOSAGES

AVOID NEPHROTOXINS

RENAL REPLACEMENT THERAPY



EPIDEMIOLOGY



ESRD PROGRAM 2008

547,982 PTS ENROLLED IN ESRD PROGRAM

350,617 PTS ON IN-CENTER HD

3,826 PTS ON HOME HEMODIALYSIS

26,546 PTS ON PERITONEAL DIALYSIS

17,413 NEW KIDNEY TRANSPLANTS

COST \$39.46 BILLION

ESRD PROGRAM 2008

INCIDENCE 111,476 NEW BENEFICIARIES

DIABETES	49,482	}	72.5%
HYPERTENSION	31,349		
GLOMERULONEPHRITIS	7,482		
CYSTIC KIDNEY DISEASE	2,671		
UROLOGIC DISEASE	1,567		
OTHER	19,925		

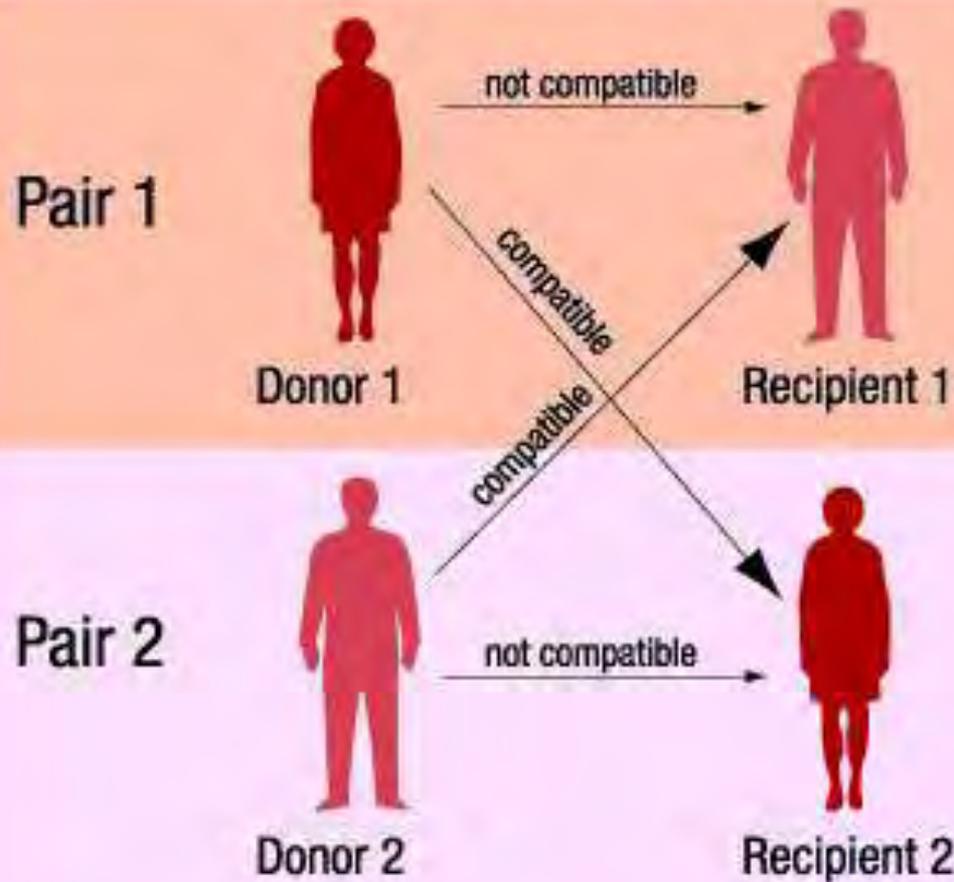
ESRD PROGRAM 2008

87, 820 PTS AWAITING KIDNEY TRANSPLANTS

NUMBER OF TRANSPLANTS PERFORMED PER YEAR

2008: 17,413
2007: 17,519
2006: 18,059
2005: 17,450
2000: 14,629
1990: 10,035
1980: 3,786

Paired Donation

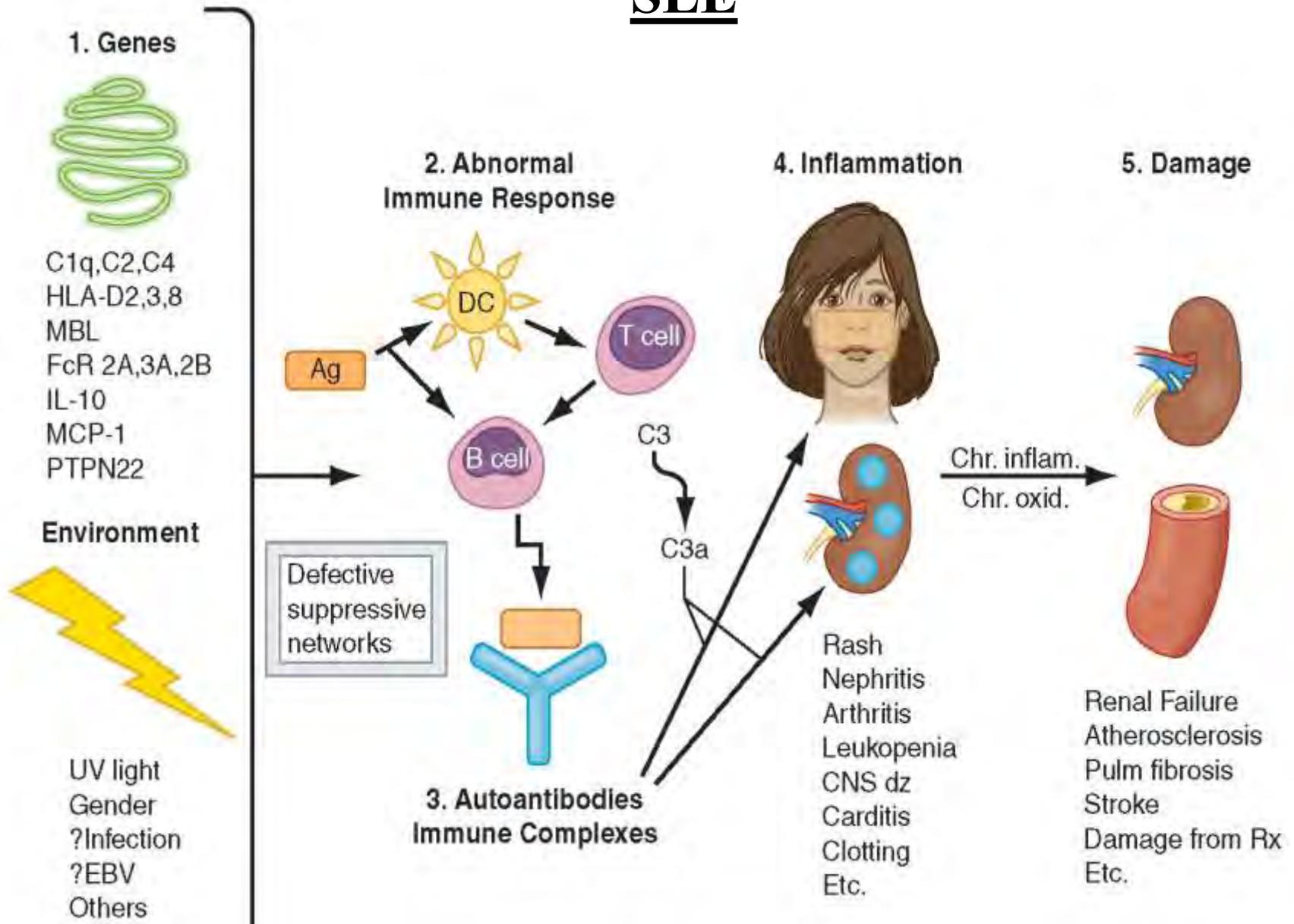


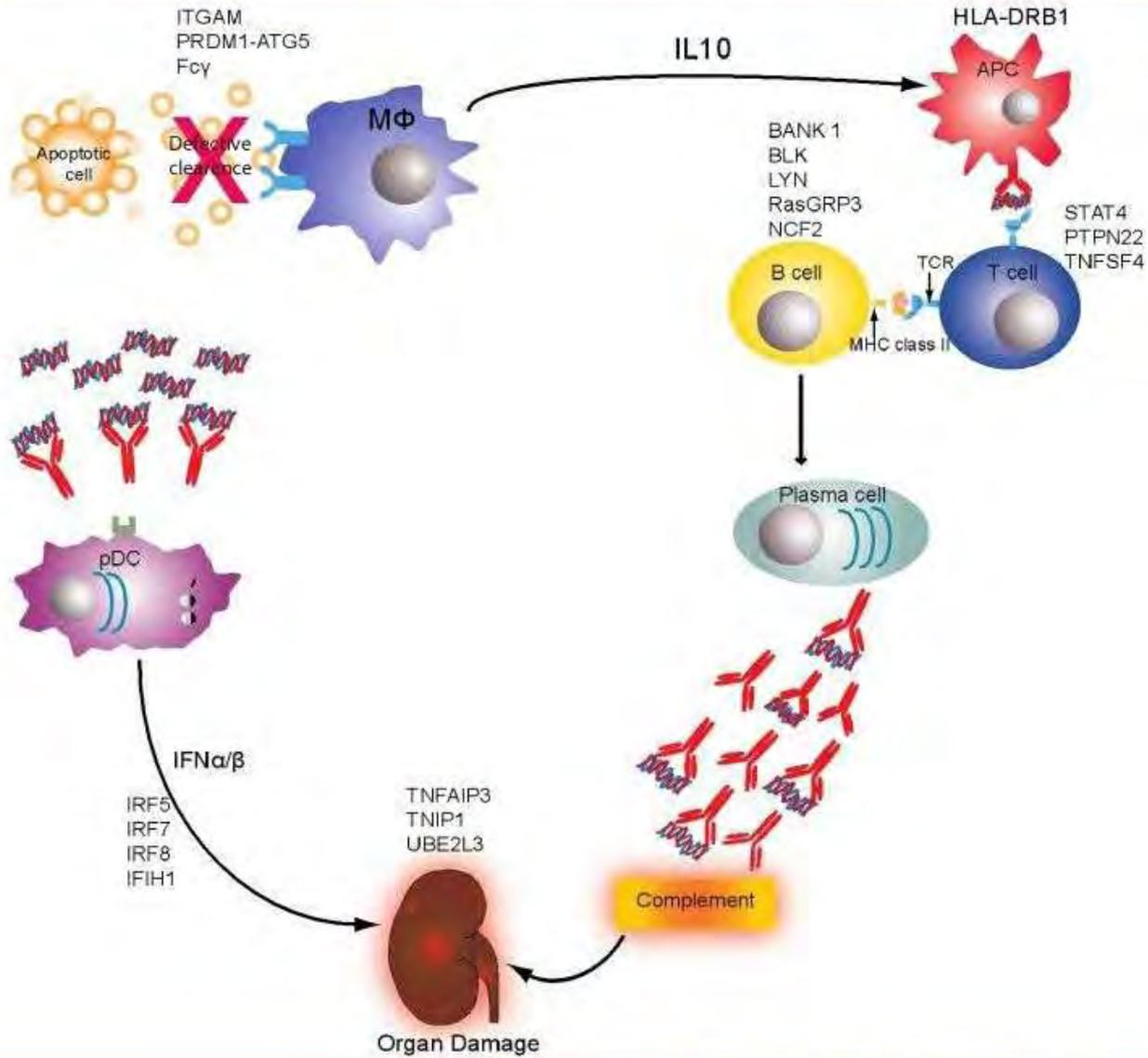


**LUPUS IS ONE OF SEVERAL DISEASES THAT
REPRESENT A DYSREGULATION OF AUTOIMMUNITY**

**THE KIDNEY IS A TARGET ORGAN AND COMMONLY
EFFECTED IN SLE**

SLE





**VIRTUALLY ALL PATIENTS WILL HAVE SOME DEGREE OF
RENAL INVOLVEMENT ON BIOPSY**

**ARA CRITERIA: RENAL INVOLVEMENT IF 500 MG
PROTEINURIA/ 24 HOURS +/- CASTS**

DIVERSE PRESENTATION:

ASSYMPTOMATIC



**RENAL
FAILURE**

PREDISPOSING FACTORS

Clinical manifestations of Lupus Nephritis

Symptoms

Physical findings

Hypertension

Edema

Rash

WORLD HEALTH ORGANIZATION CLASSIFICATION

ISN CLASSIFICATION

Class I. Normal glomeruli

Class II. Pure mesangial disease

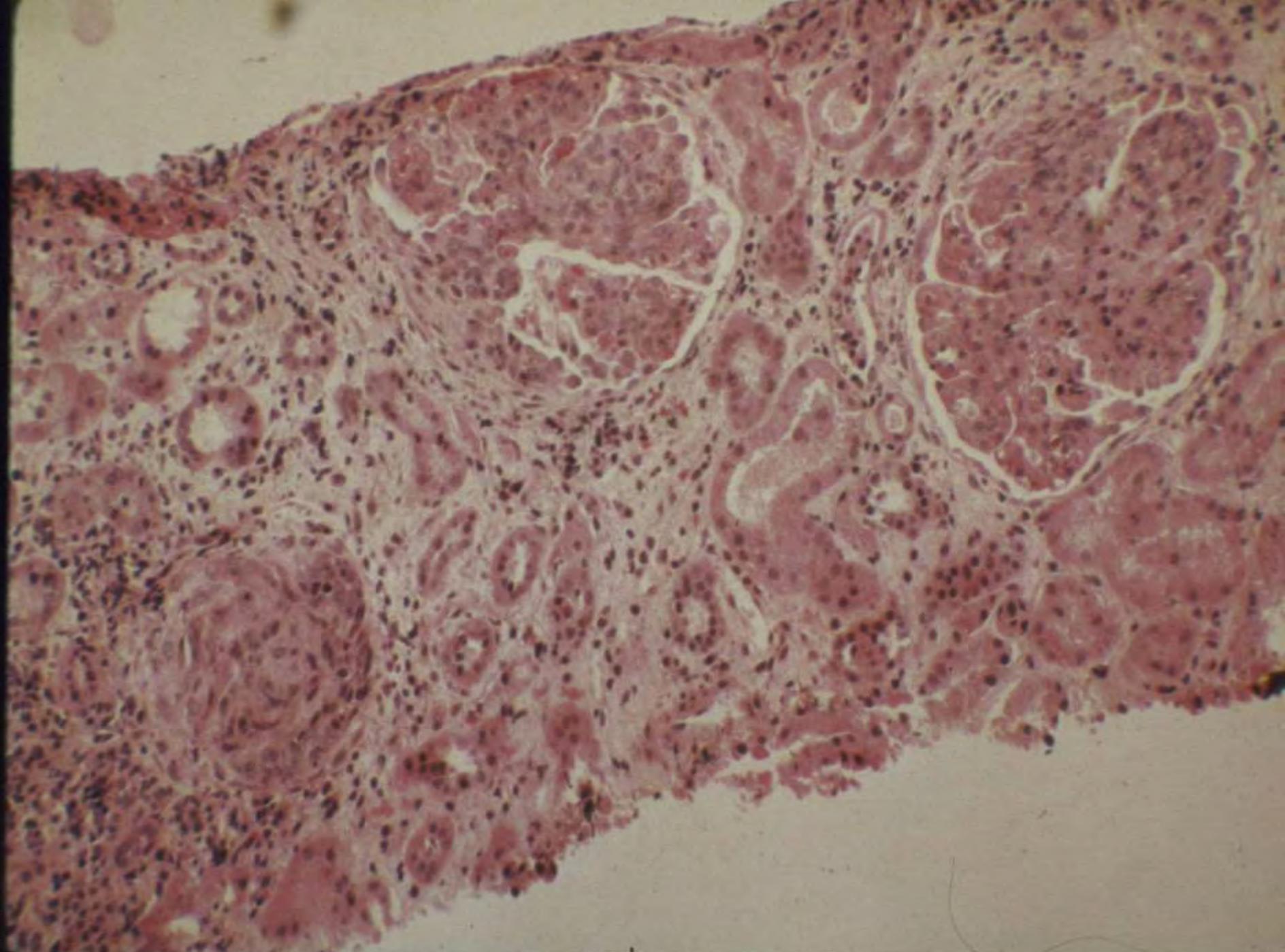
Class III. Focal segmental glomerulonephritis

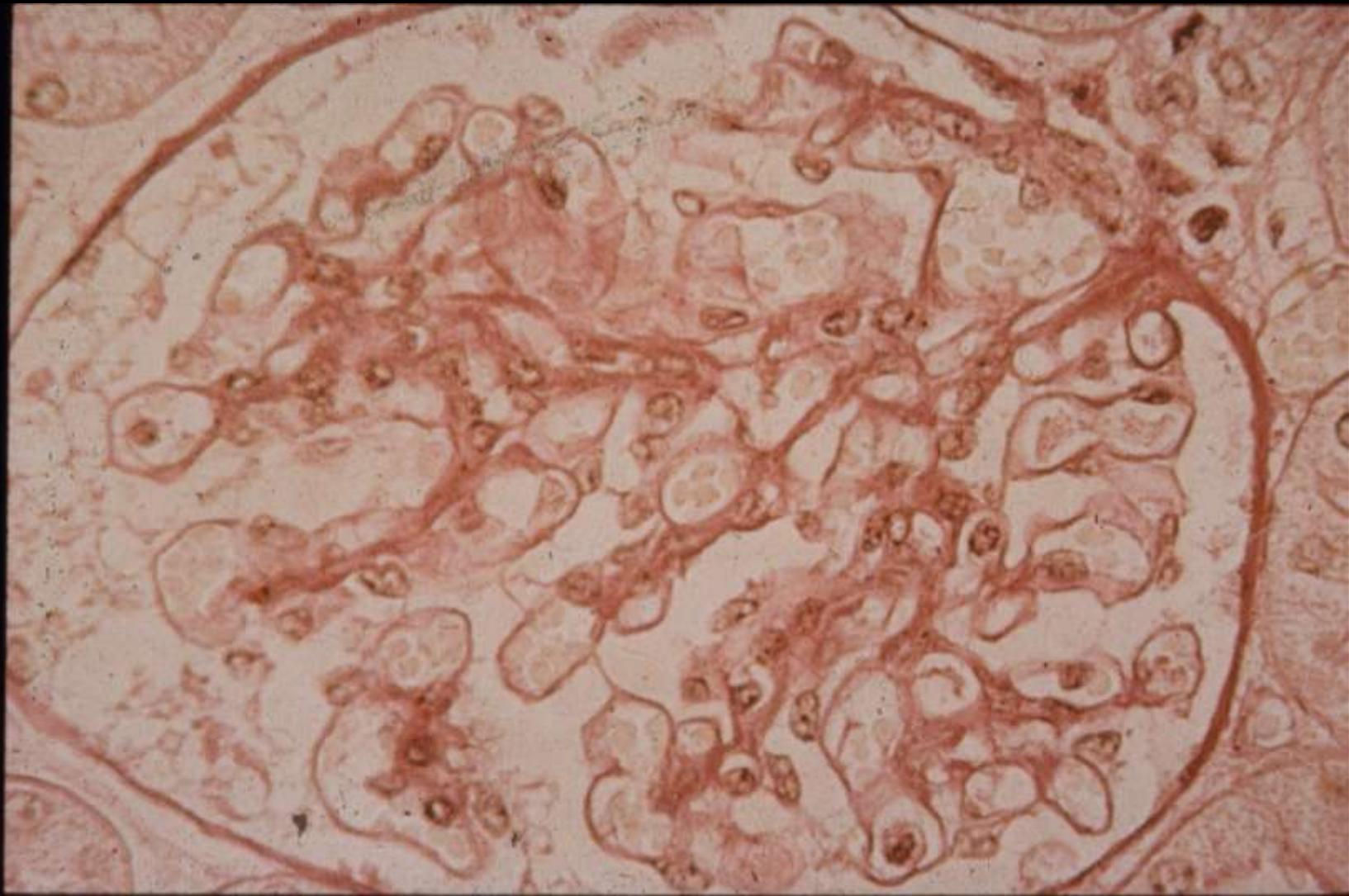
Class IV. Diffuse proliferative GN

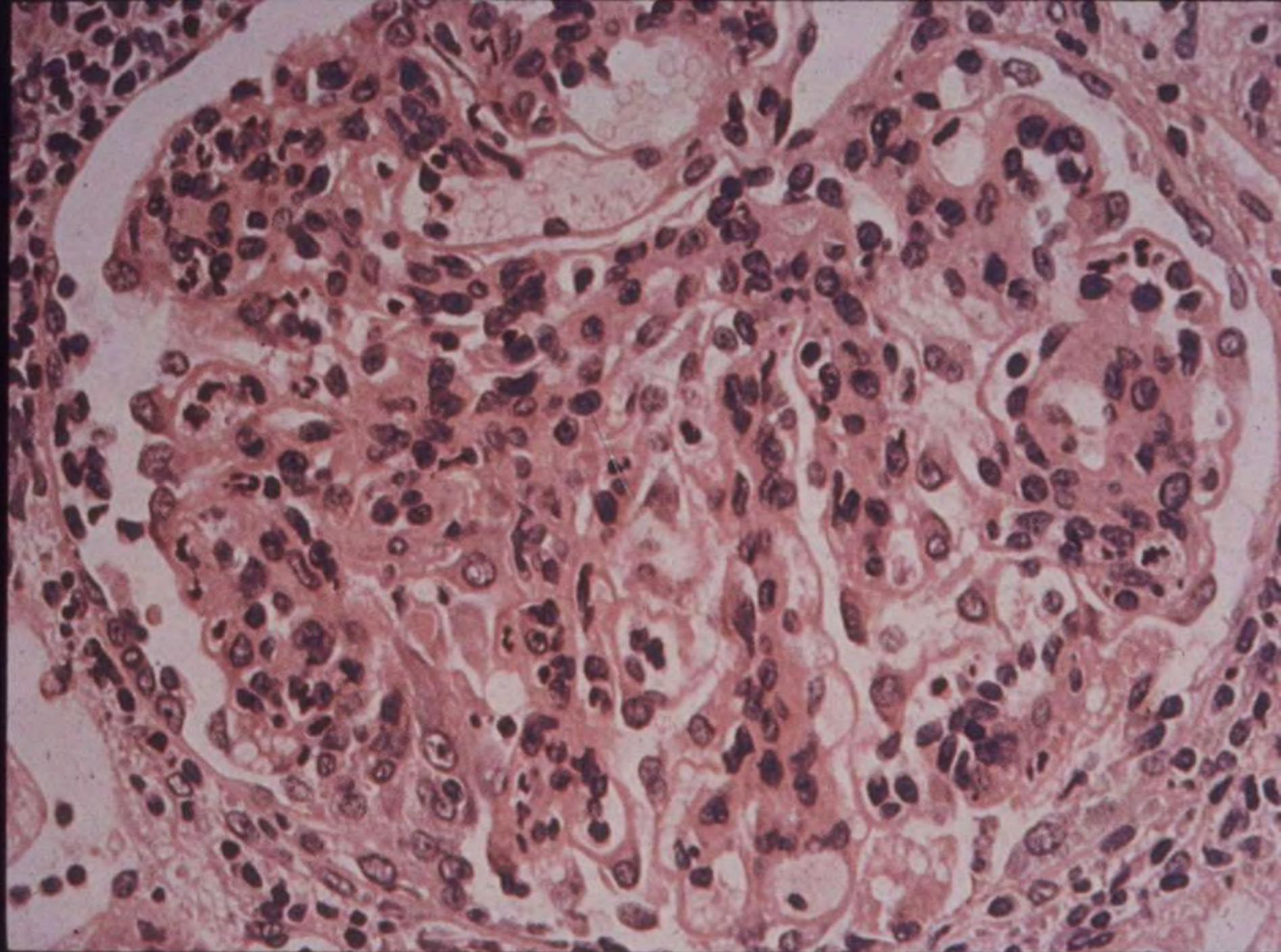
Class V. Membranous GN

Class IV. Advanced sclerosing GN

- Activity/chronicity index**
- transformation**







TREATMENT

STEROIDS

CYCLOPHOSPHAMIDE

AZATHIOPRINE

MYCOPHENOLATE MOFETIL

TACROLIMUS

CYCLOSPORINE

RITUXIMAB

PLASMAPHERESIS

AGGRESSIVE IMMUNOSUPPRESSION



**ACE INHIBITORS
ARB'S**

TREATMENT

CLOSE MONITORING FOR EFFECTIVENESS AND TOXICITY

**BLOOD COUNT, CHEMISTRIES,
URINALYSIS, COMPLEMENT LEVELS,
ESR, ANTI-DNA LEVELS**

**INFECTION
BONE MARROW SUPPRESSION
TOXICITY TO OTHER ORGANS**

- **10 – 30 % OF PTS PROGRESS TO ESRD WHO HAVE PROLIFERATIVE LUPUS NEPHRITIS OVER TIME**
- **DISEASE ACTIVITY TENDS TO DECREASE WHEN ESRD DEVELOPS**
- **SIMILAR SURVIVAL TO OTHER ESRD PATIENTS ON DIALYSIS AND WHO HAVE TRANSPLANTS**
- **TIMING OF TRANSPLANT : USUALLY ON HD FOR ATLEAST 3 – 6 MONTHS AND ON LESS THAN 10 MG OF PREDNISONE DAILY**
- **RECURRENCE IN TRANSPLANT PTS IS NOT TYPICAL (2- 11 %)**

PREGNANCY

Pts with disease activity have increased risk of fetal loss and worsening renal function

If proteinuria is present prior to pregnancy it is likely to worsen during pregnancy with subsequent edema and hypertension.

Risk factors for worsening renal function include hypertension, proteinuria and renal insufficiency

Higher incidence of pre-eclampsia and miscarriage with the presence of antiphospholipid antibodies

Better prognosis if:

- SLE quiescent for 1yr**
- nl BP**
- nl GFR**



Doctor and the Doll by Norman Rockwell