


## Glomerular Diseases

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## True case

- Mom says to Dad at dinner table that their 5 yo daughter had puffy eyes that morning
- Dad says "she's tired" and needs to go to bed earlier
- Next evening, same conversation
- Following morning, mom calls dad at work to say their daughter has edematous ankles



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## What do the kidneys do?

- Excrete impurities
- Prevent loss of blood proteins and cells



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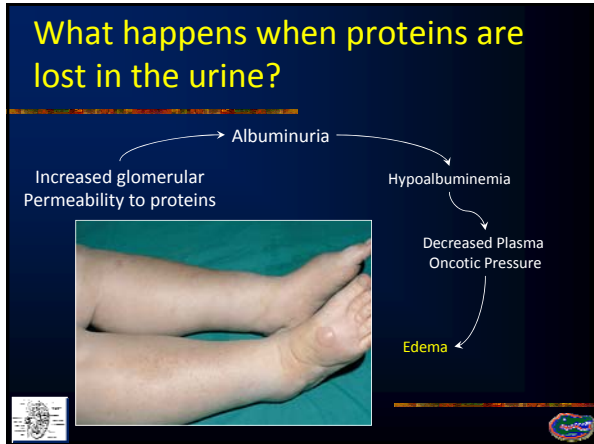
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- ### True story, more
- Sees pediatrician
  - Confirms edema
    - Nephrotic syndrome
    - Heart failure
    - Liver failure
  - Urinalysis, 4+ protein, otherwise negative
  - Urine protein:creatinine ratio, 10.3 gm/gm
    - Normal, < 0.1 gm/gm
  - Cholesterol, 518 mg/dl

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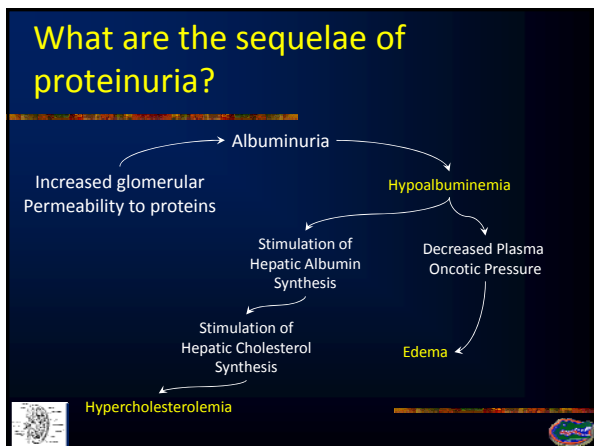
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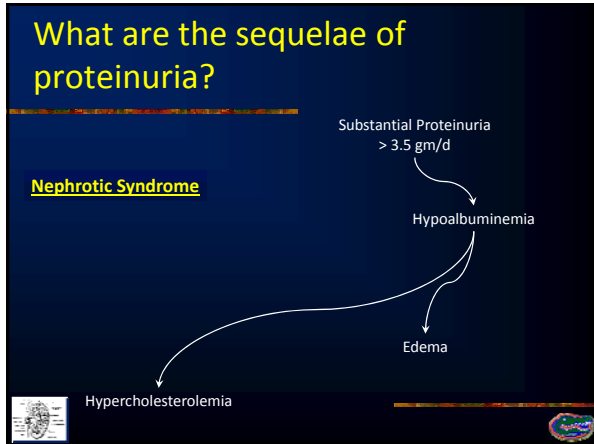
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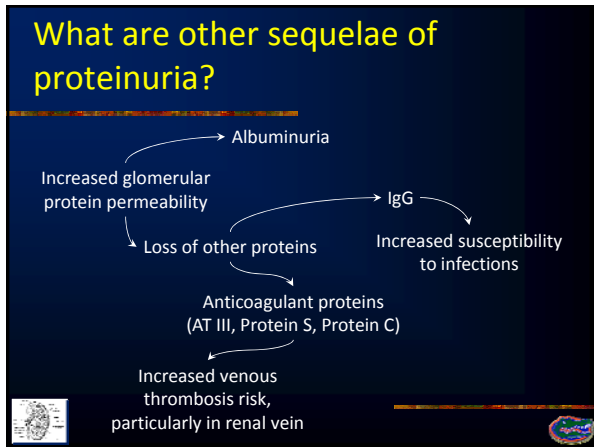
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- ### What are the most common causes of proteinuria?
- Primary – disease limited to kidney
    - Children
      - Minimal change disease
    - Adults
      - Membranous glomerulonephritis – Caucasian adults
      - Focal segmental glomerulosclerosis – AA adults
      - IgA nephropathy – young adults

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### What are the common causes of proteinuria?

- Secondary – component of systemic disease
  - Diabetes mellitus
  - Lupus nephritis – SLE
  - Cancer - Membranous glomerulonephritis
  - Hepatitis C - Membranoproliferative GN

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### What do the kidneys do?

- Excrete impurities
- Prevent loss of blood proteins and cells



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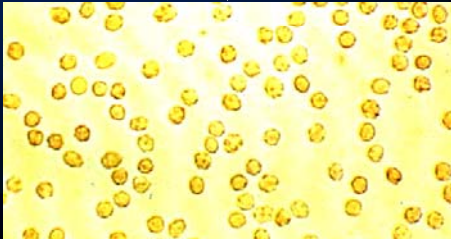
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### Glomerular RBC loss

- “Nephritic syndrome”

Dysmorphic (crenated) RBC



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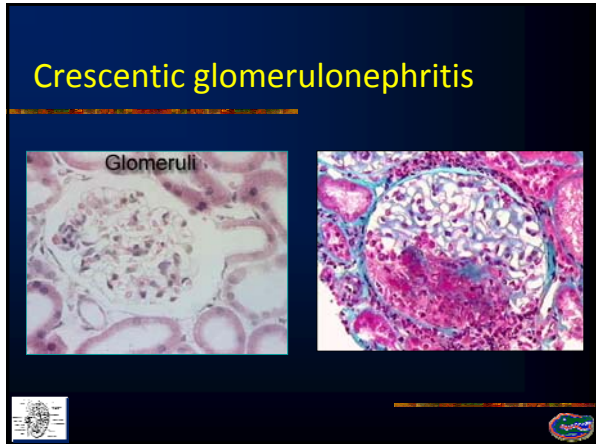
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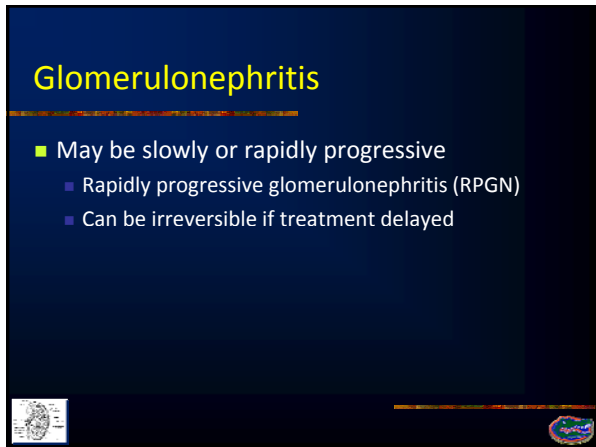
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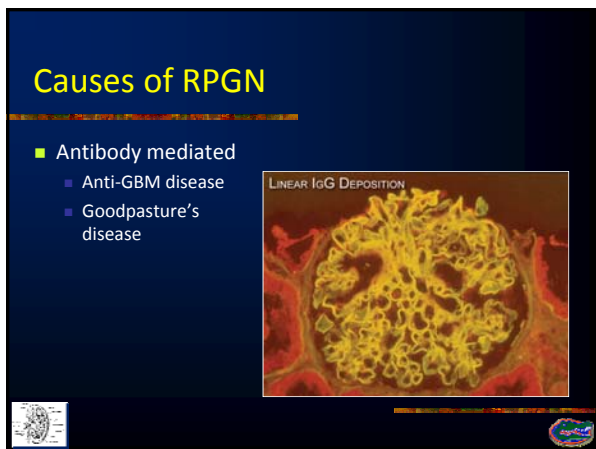
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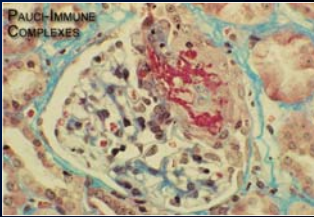
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### Causes of RPGN

- Pauci-immune (cell-mediated)
  - ANCA-related disease
    - PAN
    - Wegener's granulomatosis



PAUCI-IMMUNE COMPLEXES

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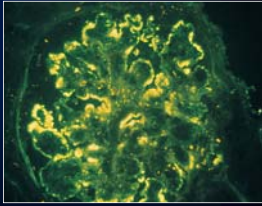
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### Causes of RPGN

- Immune-complex deposition
  - SLE
  - Endocarditis
  - Post-infectious or post-streptococcal GN



"Lumpy-bumpy Immune complexes"

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### "Chronic" glomerulonephritis

- Young adults
  - IgA nephropathy
    - Can be slowly progressive
    - ESRD in 20% in 20 years
- Hepatitis C – membranoproliferative GN
- SLE and lupus nephritis

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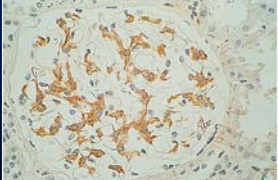
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### World Health Organization (WHO) Lupus nephritis classification

Class	Histology
1	Minimal changes



Normal by light microscopy

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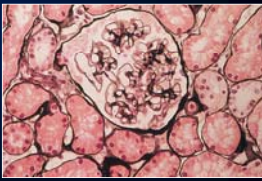
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### World Health Organization (WHO) Lupus nephritis classification

Class	Histology
1	Minimal changes
2	Mesangial disease



Mesangial expansion by light microscopy

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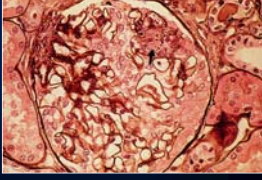
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### World Health Organization (WHO) Lupus nephritis classification

Class	Histology
1	Minimal changes
2	Mesangial disease
3	Focal proliferative



Focal necrosis (arrow) and cellular proliferation on light microscopy

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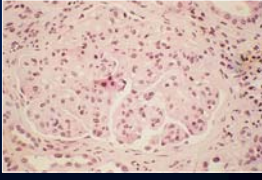
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### World Health Organization (WHO) Lupus nephritis classification

Class	Histology
1	Minimal changes
2	Mesangial disease
3	Focal proliferative
4	Diffuse proliferative



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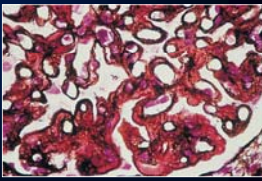
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### World Health Organization (WHO) Lupus nephritis classification

Class	Histology
1	Minimal changes
2	Mesangial disease
3	Focal proliferative
4	Diffuse proliferative
5	Membranous



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### Glomerular disease

- Leads to nephrotic syndrome and/or chronic kidney disease
- Treatment depends on underlying cause



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