Brigham and Women's Hospital
Founding Member, Mass General Brigham

Acute Kidney Injury in Cancer

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DISCLOSURES

- I have no relevant financial relationships to disclose
- I will not discuss any off-label use of medications or treatments

OBJECTIVES

- Provide an overview of anti-cancer agents and their associated nephrotoxicities
- Review mechanisms of renal injury with anti-cancer agents
- Review clinical and basic research literature using an evidence-based approach.
- Discuss the prevention and management of nephrotoxicity from anti-cancer agents

Renal Impairment in Cancer patients

Rates of AKI in cancer patients are higher than non-cancer patients[1]

- 1 yr risk: 17.5%
- 5 yr risk: 27%

Cancer patients with AKI[2]

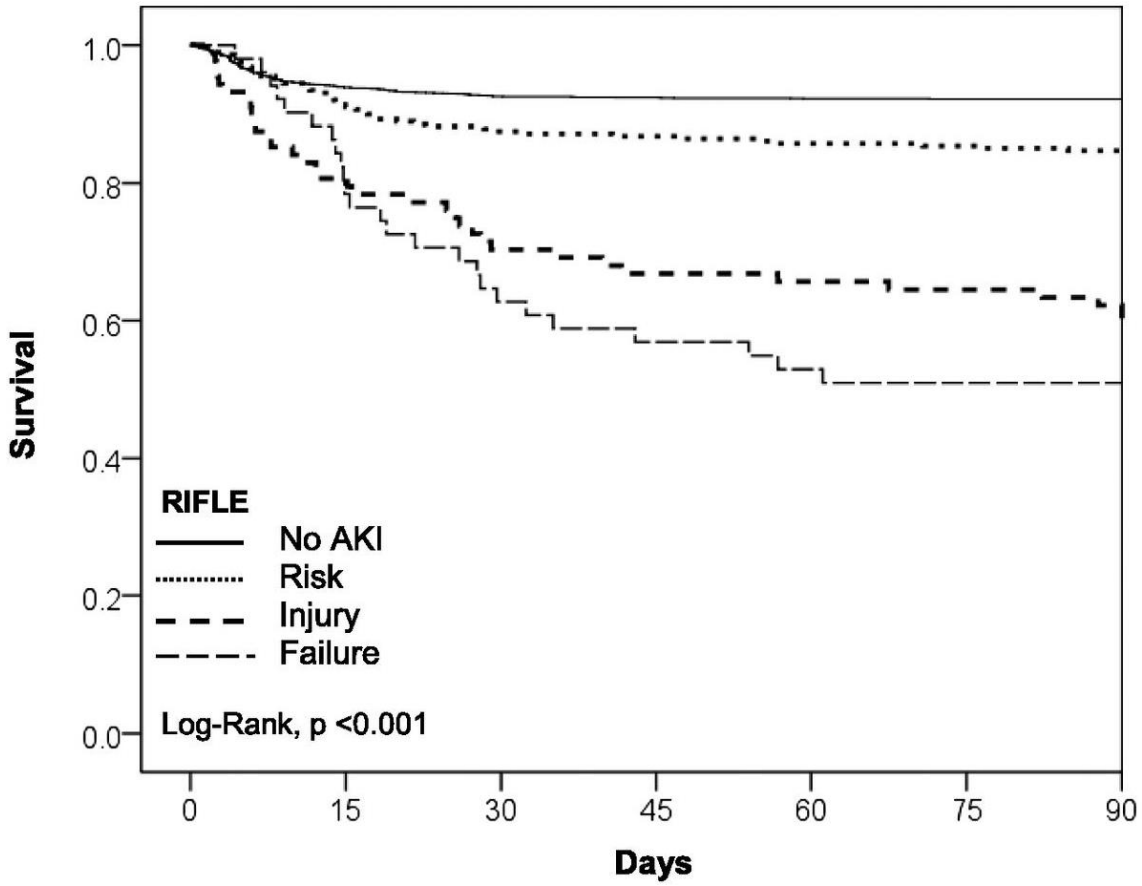
- ↑mortality, inferior outcomes overall
- Stage of AKI confers high relative risk for mortality

AKI associated with worse malignancy outcomes in newly diagnosed hematologic malignancies[3]

- Lower 6 month CRR (39% in AKI group vs 68% in non-AKI group)
- 14.6% patients received suboptimal chemotherapy doses

Renal impairment often excludes patients from large prospective studies, clinical trials

- Limits therapeutic options for our cancer patients



AKI in Cancer Patients

Cancer specific factors

RCC

Post nephrectomy

Hematological mailgnancies

Obstructive nephropathy

Hepatopoetic stem cell transplant (HSCT)

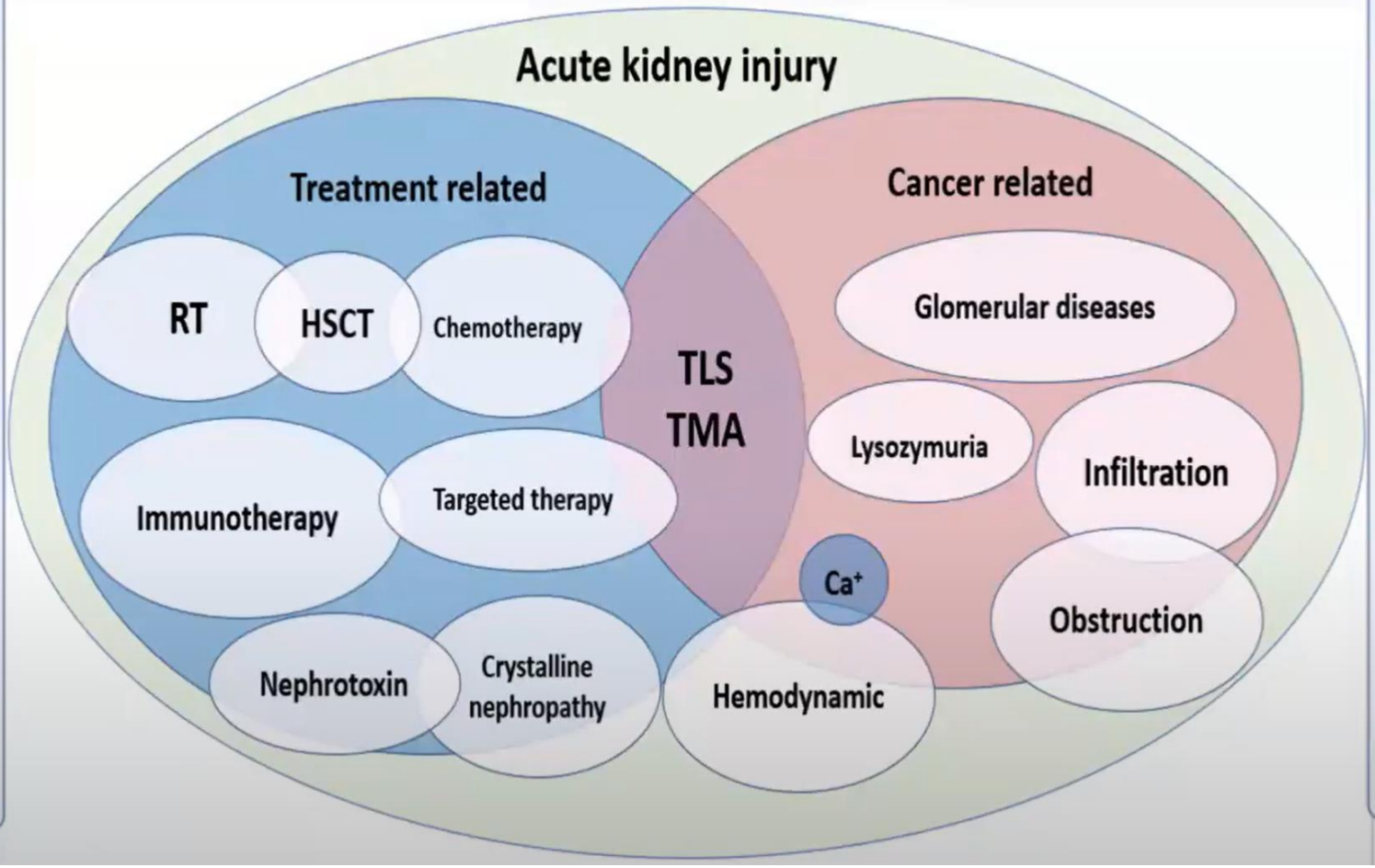
Hypercalcemia of maliganancy (Ca+)

Nephrotoxic chemotherapy

Paraneoplastic glomerular diseases

Tumor lysis syndrome (TLS)

Neutropenic sepsis



Patient Specific Factors

Age > 65 years

Baseline CKD

Diabetes mellitus

Hypertension

Concomitant thretament with renin angiotenin inhibitors, diuretics and NSAIDS

Antibiotics

Electrolyte imbalance (e.g. hyponatremia)

Amission to ICU

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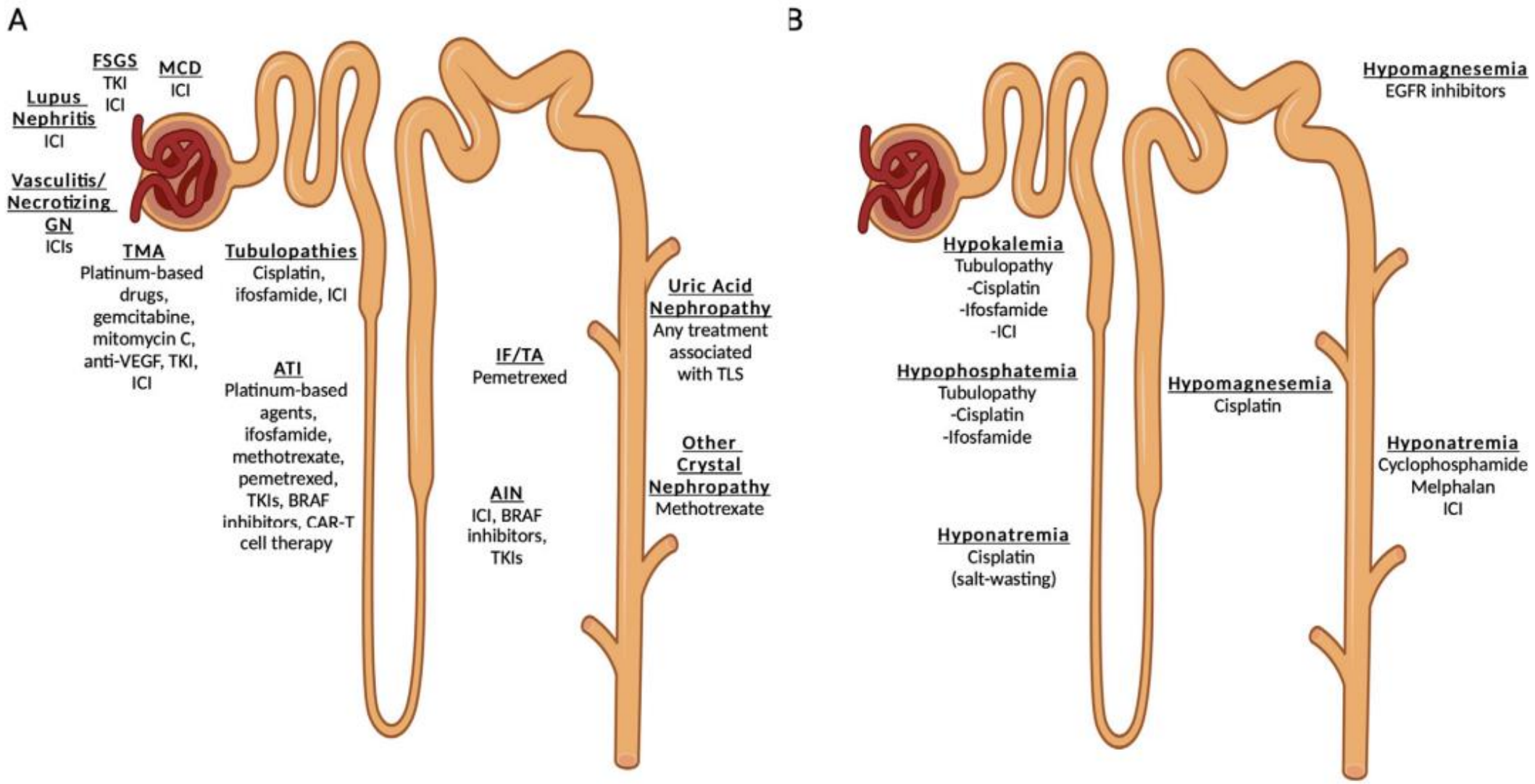

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Case 1

HPI: 65 yr old female with metastatic lung adenocarcinoma presents for cycle 3 of her treatment with carboplatin, pemetrexed and pembrolizumab. She is found to have a new AKI with serum Cr 3.6 mg/dl (baseline Cr 0.8 mg/dl).

PMHx: HTN, Gout

Medications: losartan 50 mg, omeprazole 20 mg

Labs:

Hgb 9, WBC 6, platelets 120k
Na 134, K 4.4, HCO3 22, BUN 52, Cr 3.6 (baseline Cr 0.8 mg/dl),
CRP 30 mg/L
Urinalysis bland, Urine Protein/Cr 0.5 g/g, Urine RBP/Cr 15 151 mcg/g

Imaging: No hydronephrosis on renal ultrasound

Case 1

What is the most likely cause of the patient's kidney injury?

a) Pauci-immune glomerulonephritis from pembrolizumab
b) Acute interstitial nephritis from pembrolizumab
c) Acute tubular injury from pemetrexed
d) Acute tubular injury from carboplatin
e) All of the above are possible

Conventional Chemotherapy

Platinum Agents

AKI Incidence: 30% of pts (receiving cisplatin)

- Cisplatin>> Carboplatin>Oxaliplatin

Renal manifestation

- Early direct tubular toxicity (ATI) – typically week 1
- Tubulopathies/electrolyte derangements
  - Fanconi syndrome (complete vs partial), hypoPO4, hypoK, hypoMg, distal RTA
  - HypoNa (salt-wasting nephropathy) → Cisplatin
  - TMA (rare)

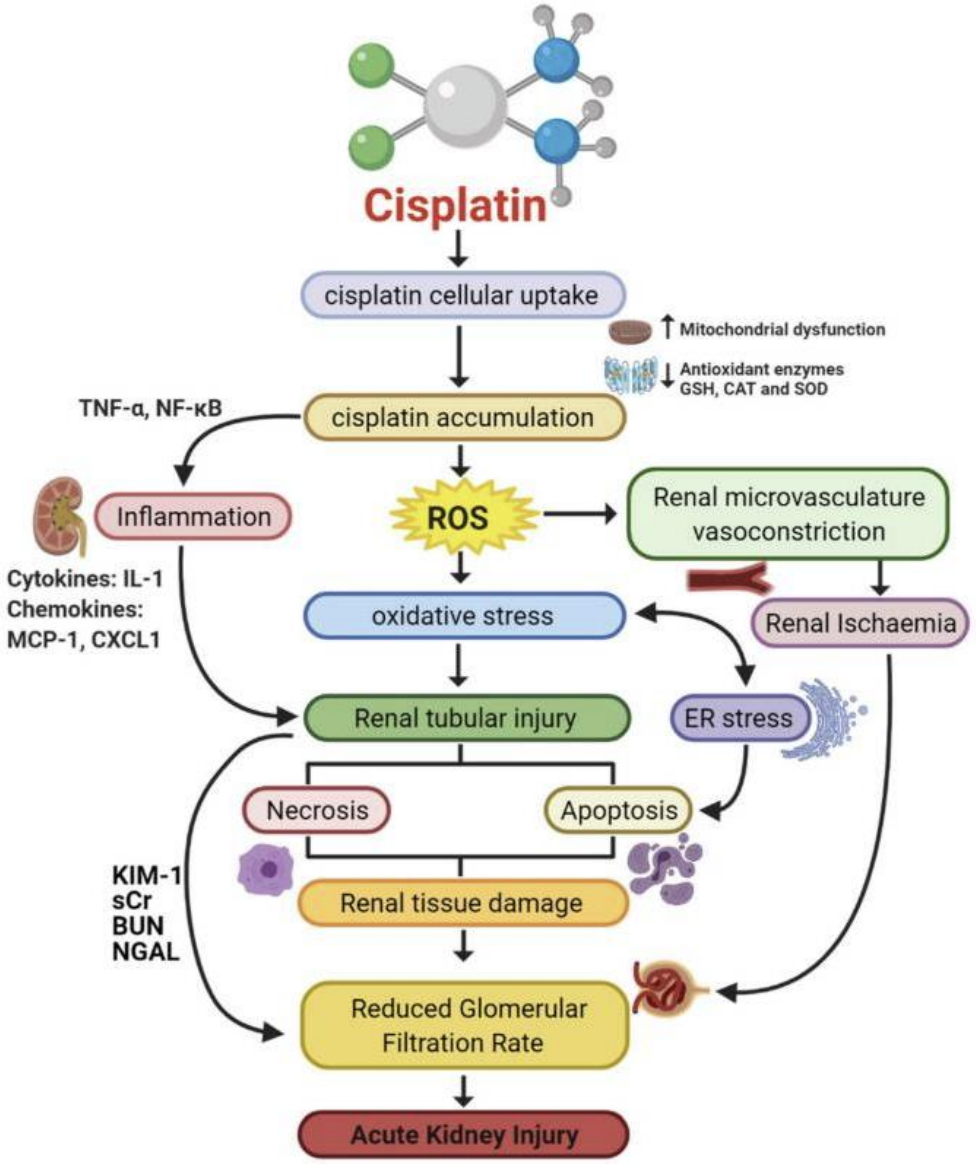
RF:

- Age >60 yr
- Dose-dependent
  - Single cycle dosing of >60 mg/m2
  - Cumulative cycle dosing >300 mg/m2

Platinum Agents

Mechanism of Injury:

- Cisplatin enters proximal tubule cells via transporters (ie. OCT-2)
- Intracellular accumulation → cascade of ER stress + mitochondrial damage
  - Activation of apoptotic pathways
  - Oxidative stress/ROS generation
  - Inflammation



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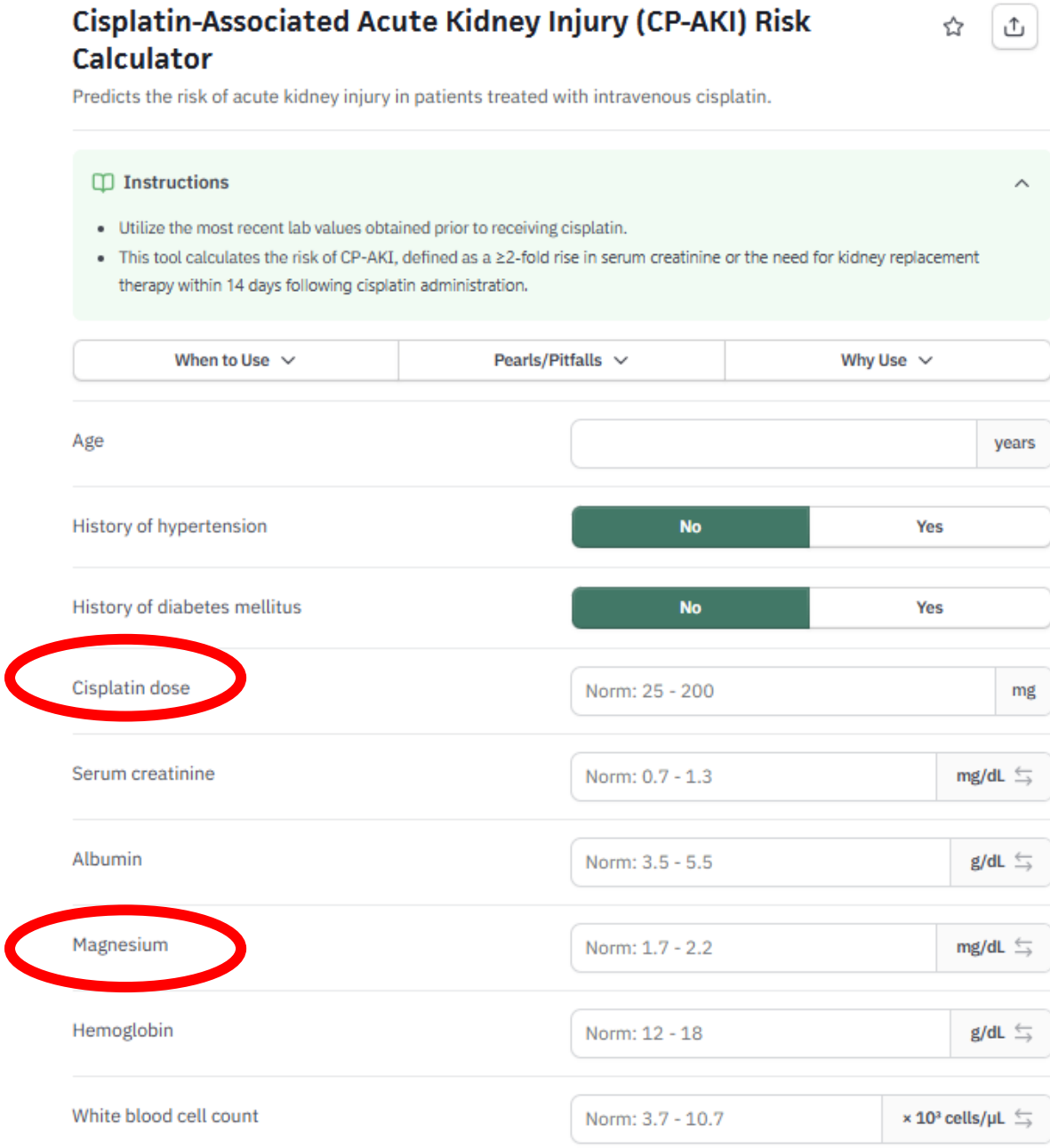
Platinum Agents

Risk Prediction?

- CP-AKI Risk Calculator

Prevention Strategies?

- Volume expansion
- Amifostine
- Cilastatin
- Mannitol
- SGLT2i
- Magnesium



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Original Investigation

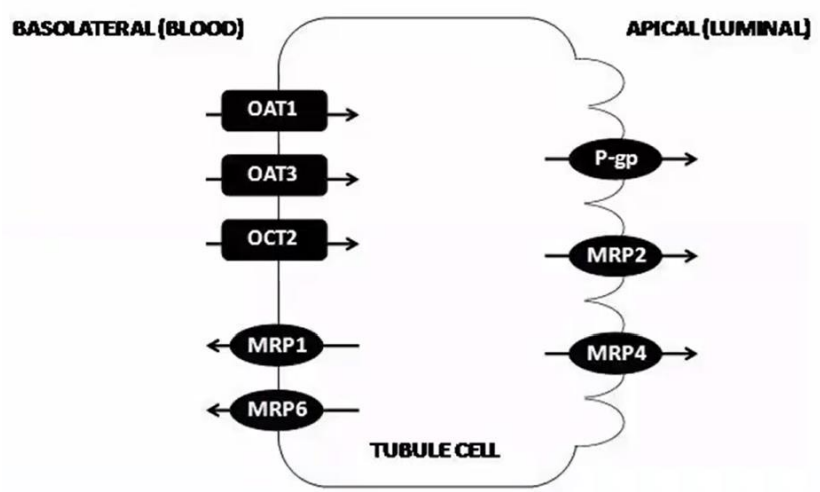
April 24, 2025

Intravenous Magnesium and Cisplatin-Associated Acute Kidney Injury

Shruti Gupta, MD, MPH[1,2,3]; Ilya G. Glezerman, MD[4]; Jamie S. Hirsch, MD, MA, MSB[5,6,7]; et al

» Author Affiliations

JAMA Oncol. Published online April 24, 2025. doi:10.1001/jamaoncol.2025.0756

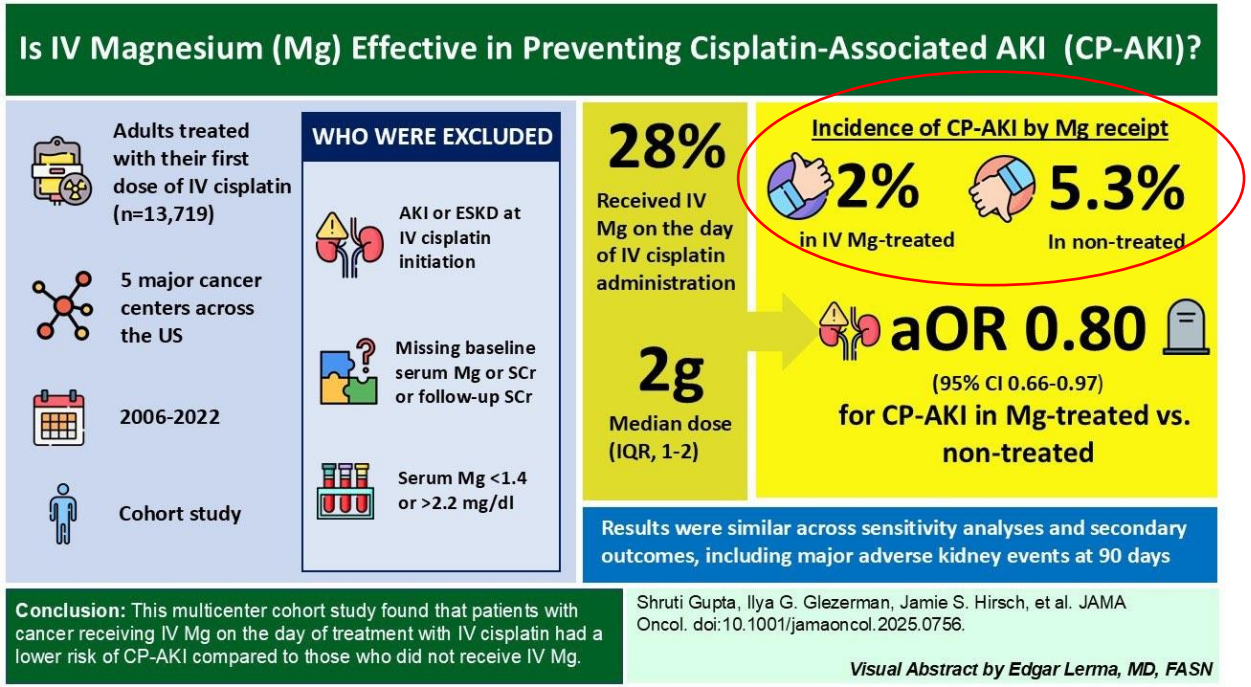


Multicenter cohort study, 13719 cancer patients
- 5 US Cancer Centers
- 2006-2022

Results:
- Prophylactic IV magnesium on the day of cisplatin chemotherapy had a lower risk of developing cisplatin associated acute kidney injury compared to those that did not receive IV magnesium (2.7% versus 5.3%, adjusted odds ratio 0.8)
- Median dose of IV magnesium administered 2 g, stronger protective effect with doses >2g

Proposed mechanism:
- Mg deficiency = downregulates drug efflux transporters in PTEC cells (secretes cisplatin into PCT lumen)
- Mg repletion = restores expression of these transporters

Limitations
- Baseline differences between groups with cisplatin dosing
- Only 28% received IV Mg on day of cisplatin dosing
- Data only collected for 1st cycle of IV cisplatin
- Insufficient data on IV fluid administration before/after cisplatin treatment



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Platinum Agents

Treatment

- Hold platinum agent, usually reversible
- Limited role for cisplatin clearance via dialysis → highly protein-bound after 24 hrs

GFR thresholds

- Cisplatin: eGFR > 45 ml/min/1.73 m2
- Carboplatin: Dose with BSA adjusted eGFR (Calvert formula)
- Oxaliplatin: Dose reduction if eGFR <30 ml/min/1.73 m2

Methotrexate

AKI Incidence ~ 10%

Cancers: CNS Lymphoma and Leukemia, osteosarcoma

MOA: anti-metabolite

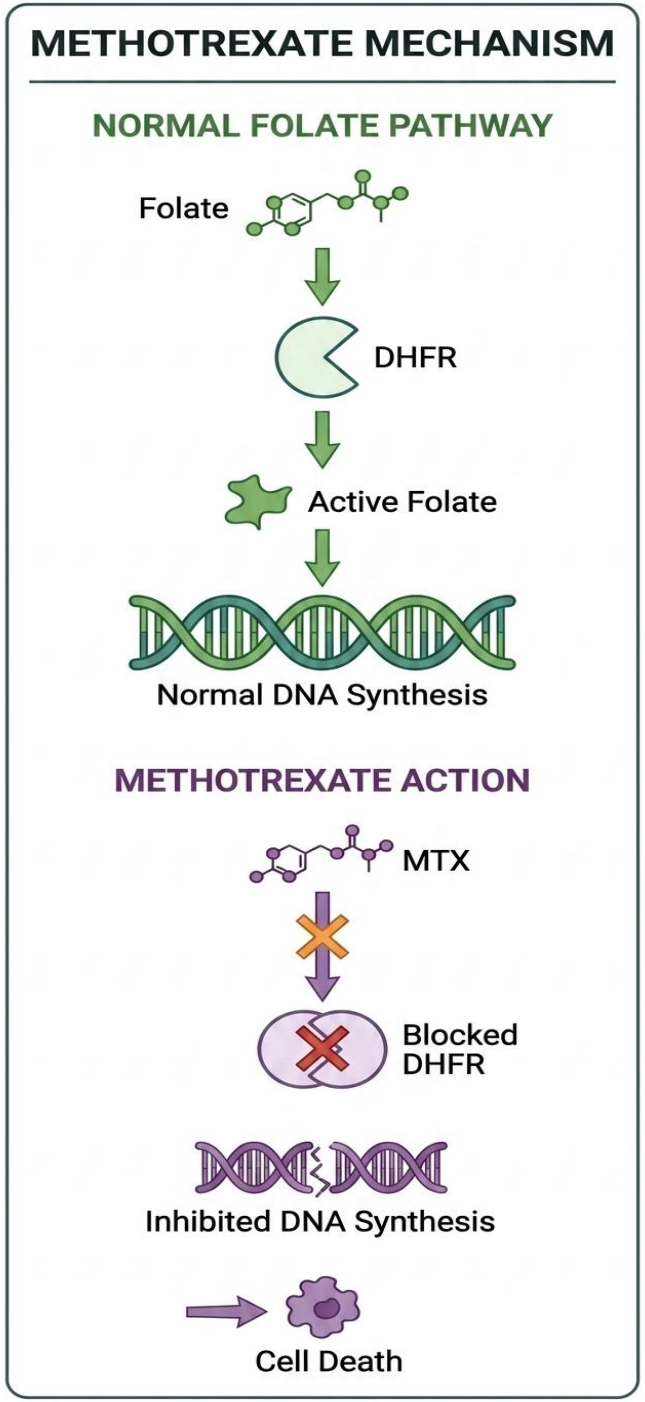
- inhibits dihydrofolate reductase = deficiency of thymidylate/purines needed for nucleic acid synthesis
- Active against rapidly dividing cells

Elimination:

- Renal excretion (80-90% in 24 hrs)

Risk Factors

- Treatment-related
  - High dose, low urine pH, volume depletion
  - Prolonged clearance (3rd spaced fluid collections), CKD, drug-drug interaction (NSAIDs, sulfa drugs, penicillin, Ppi)
- Patient-specific
  - Older age, DM, CKD, genetic (mutations in MRP2)



Methotrexate

Renal Manifestation

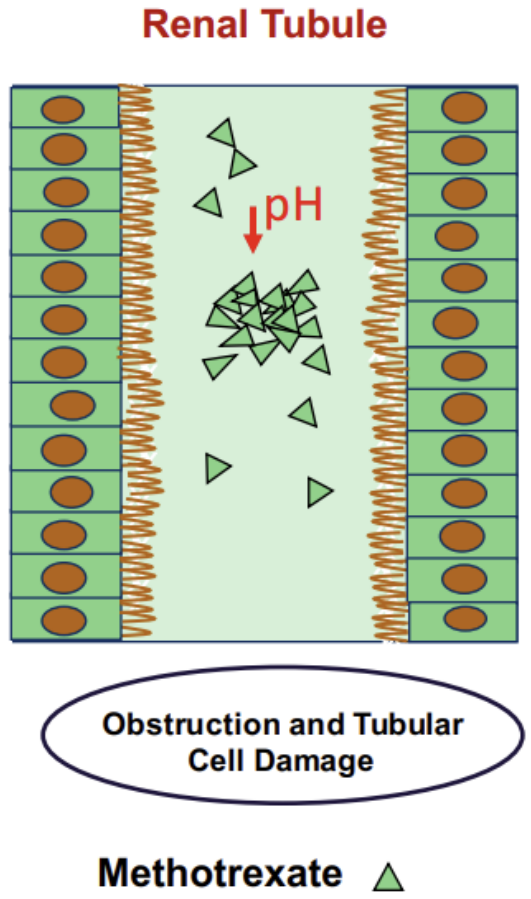
- Acute tubular injury
  - Renal vasoconstriction
  - Intra-tubular crystal formation (low urine flow, pH<7)

Extra-renal Manifestations

- Myelosuppression, Mucositis, Dermatitis, Hepatitis

Management

- Urine alkalinization with serial monitoring of urine pH (pH >7)
- Urine output >2.5L
- Leucovorin Rescue
  - Folic acid derivative (allows purine/pyrimidine synthesis)
  - Decreased efficacy at high MTX levels
- Glucarpidase
- Hemodialysis



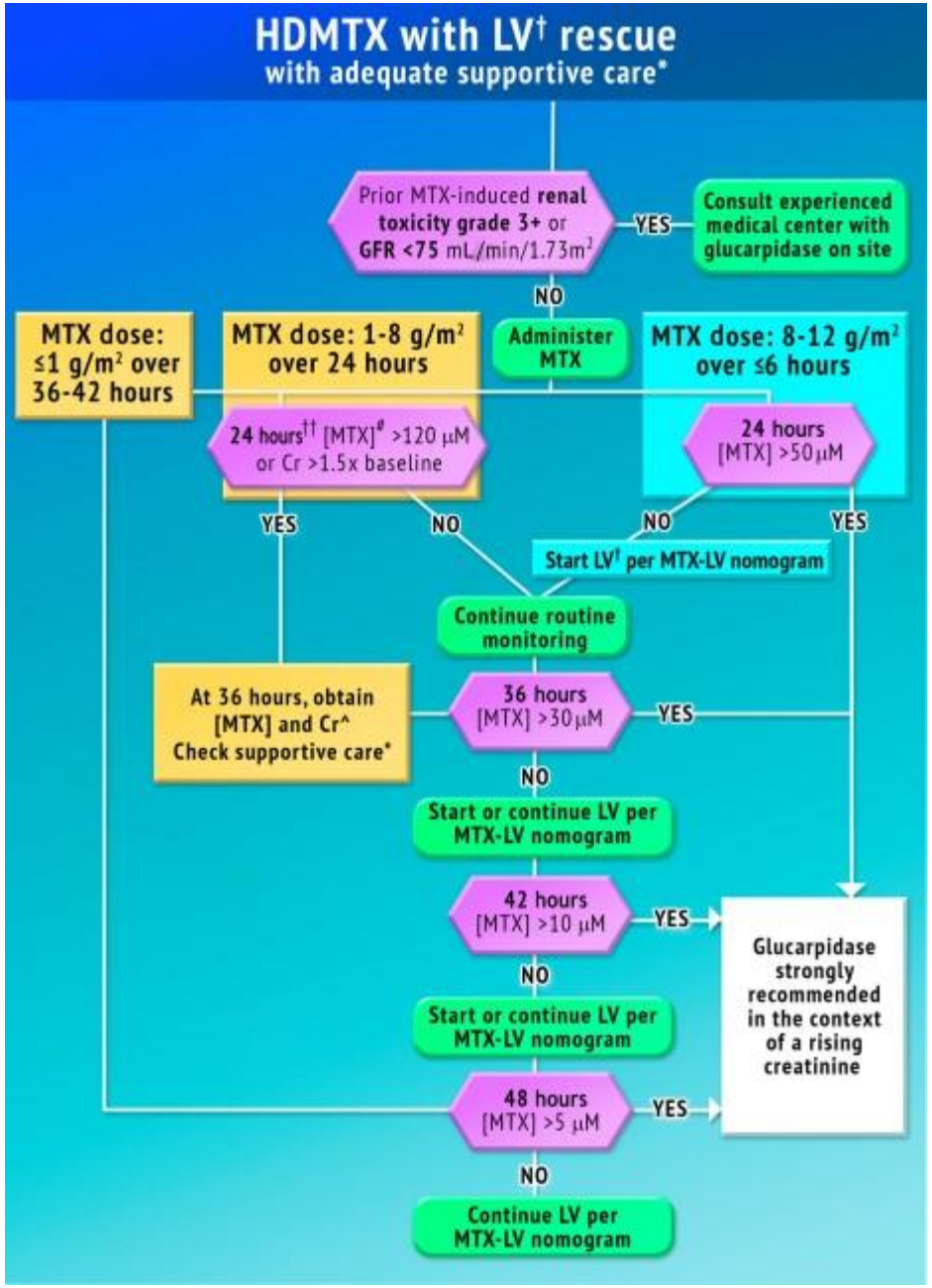
Methotrexate

Glucarpidase

- Recombinant bacterial enzyme = cleaves MTX to inactive metabolites
- Reduces plasma levels by >95% within 15 minutes
  - Does not penetrate cell membrane (cannot reverse intra-tubular toxicity)
- Varying site-specific protocols
- Use HPLC to measure MTX levels post-glucarpidase

Prevention?

- Prophylactic Glucarpidase
  - Faster time to kidney recovery (multiple cycles of HD-MTX)
  - Lower risk of extra-renal manifestations (neutropenia, transaminitis)
  - Cost ($27k per 1000 units)
  - Anti-body formation



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Glucarpidase for Treatment of High-Dose Methotrexate Toxicity

Context of Research

- Glucarpidase is a recombinant bacterial enzyme that cleaves methotrexate (MTX)
- No study examined whether glucarpidase improves clinical outcomes in patients with MTX toxicity, including recovery from MTX-related acute kidney injury (MTX-AKI)

Patients and Methods

- Sequential target trial emulation
- Multivariable adjustment for demographics, comorbidities, MTX infusion characteristics, acute organ injury, medications, and labs

708 Adult patients with MTX-AKI from 28 cancer centers across the US

209 Received glucarpidase

499 Did not receive glucarpidase

Main Findings

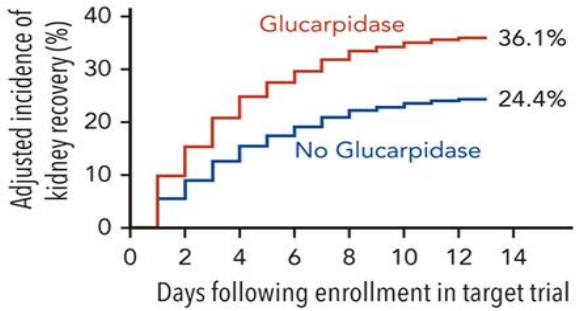
Glucarpidase vs. No Glucarpidase:

Kidney recovery: OR 2.70 (95% CI, 1.69–4.31)

Neutropenia: OR 0.50 (95% CI, 0.28–0.91)

Transaminitis: OR 0.31 (95% CI, 0.13–0.77)

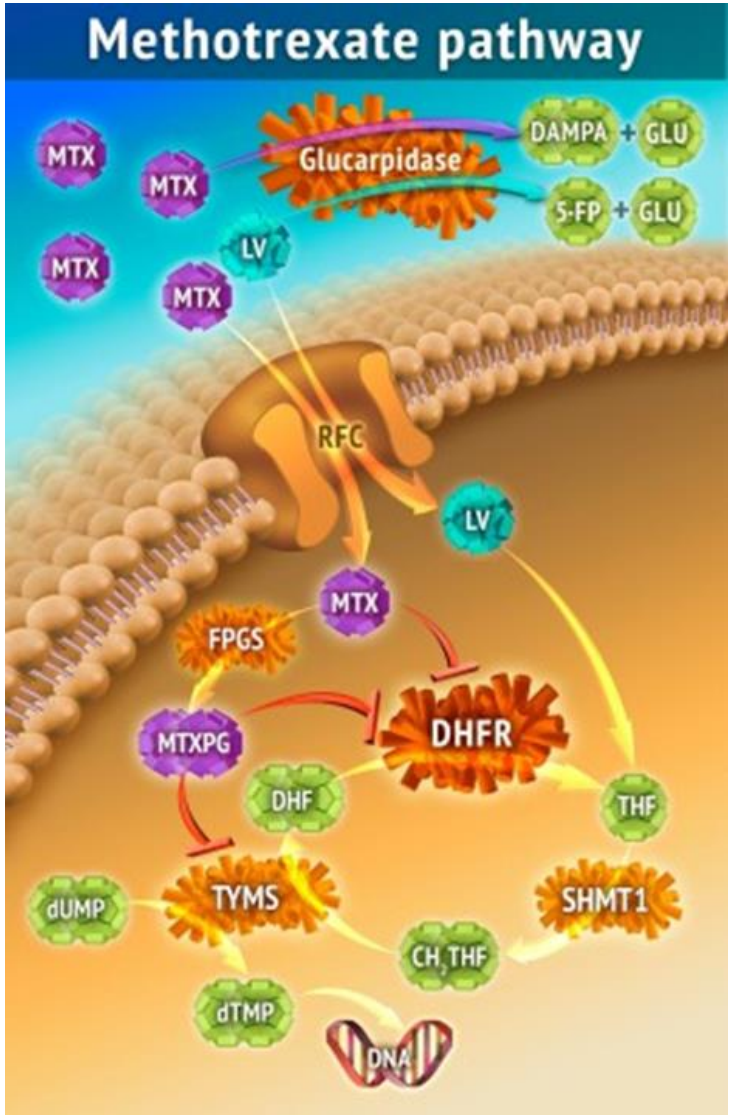
Time-to-kidney recovery: HR 1.88 (95% CI, 1.18–3.33)



Conclusions: In patients with MTX-related acute kidney injury, glucarpidase was associated with a higher adjusted odds ratio of kidney recovery and a faster time-to-kidney recovery. Glucarpidase receipt was also associated with a lower adjusted odds ratio of transaminitis and neutropenia.

*Gupta et al. DOI: 10.1182/**blood**.2024026211*

blood Visual Abstract



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Case 2

HPI: 70 yr old female with metastatic pancreatic cancer initially treated with FOLFIRINOX and later switched to Gemcitabine and Abraxane after disease progress. She presents for cycle 8 of treatment and was found to have a new AKI with serum Cr 2.4 mg/dl (baseline Cr 0.9 mg/dl).

PMHx: Breast Cancer

Medications: Hydralazine 25 mg TID, coreg 37.5 mg BID, Eliquis 5 mg BID

Vitals: Temperature 98.6F, BP 180/110, HR 110

Labs:

Hgb 8.4, WBC 12, platelets 135k
Na 136, K 3.4, HCO3 32, BUN 52, Cr 2.4
C3 115 C4 14,
LDH 365, haptoglobin <5
Peripheral smear = no schistocytes seen
Urinalysis 51-100 RBCs, no WBCs, Urine Protein/Creatinine ratio 1.79

Imaging: Renal ultrasound unremarkable

Case 2

The patient was diagnosed with a thrombotic microangiopathy. Which of the following are risk factors associated with TMA?

a) Uncontrolled hypertension
b) Presence of schistocytes
c) Low C4 levels
d) High LDH, low haptoglobin
e) Use of gemcitabine
f) All of the above

Gemcitabine

Anti-metabolite: Pyrimidine analog disrupting DNA synthesis

Clinical Use:

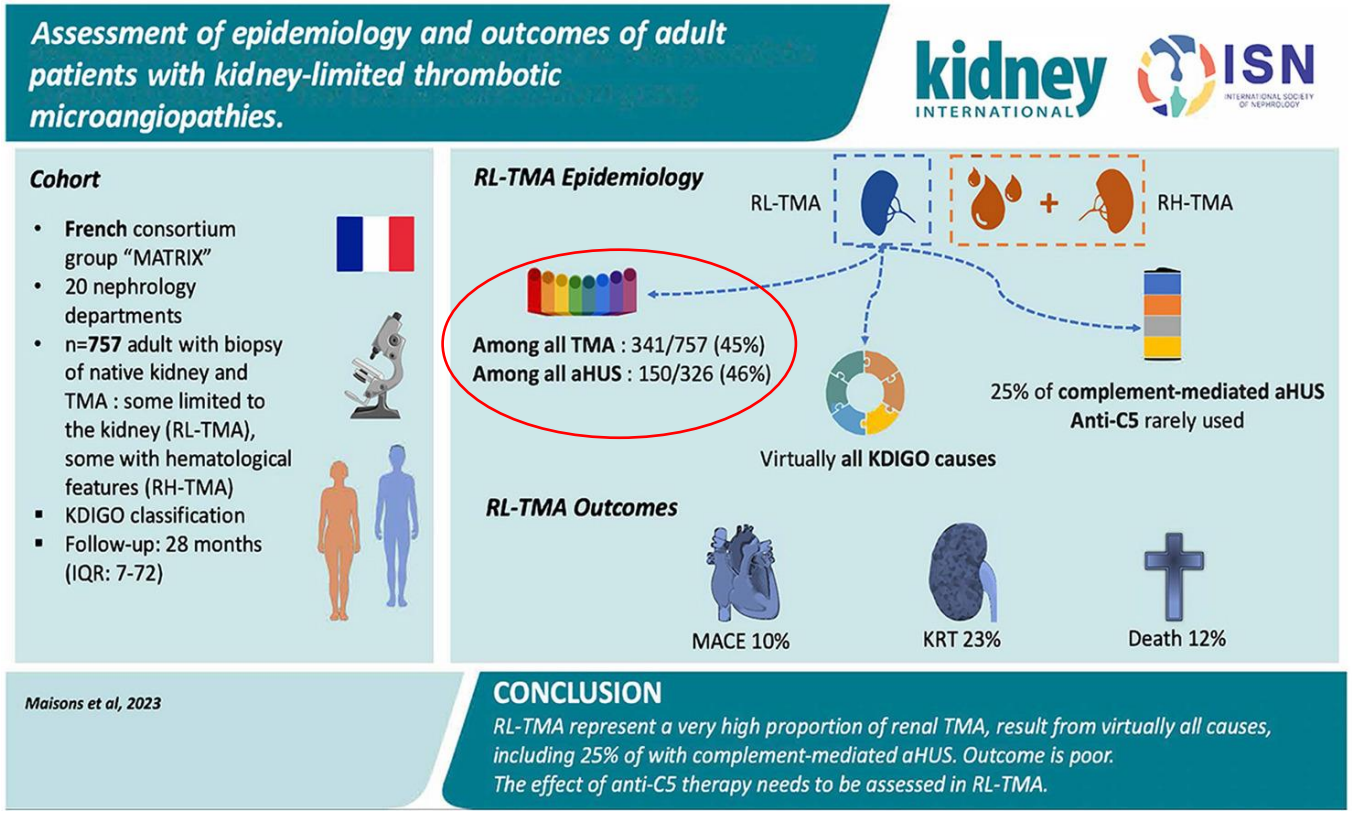
- ovarian cancer, pancreatic cancer, and other solid tumors

Incidence

- 0.3%-2.2%
- Underdiagnosed → renal-limited TMA w/o systemic sx

Risk Factors:

- Duration of exposure
- Cumulative dose



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Gemcitabine

Renal Manifestations

- Insidious/Delayed onset
  - Median time ~ 156 days
- Systemic TMA = TCP, schistocytes + AKI, proteinuria
- New onset or worsening of controlled HTN

Pathophysiology

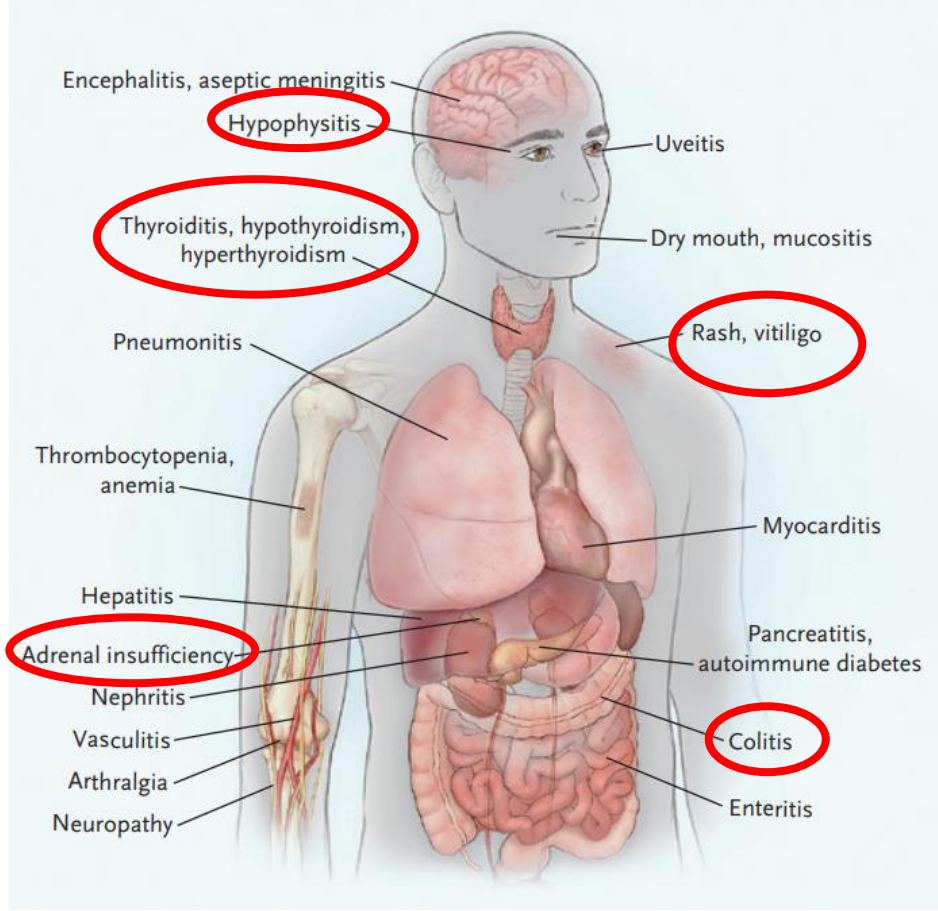
- Unknown mechanism → Proposed direct endothelial damage exposing the subendothelial extracellular matrix, which promotes complement activation (C5b9 deposits in kidney)
- Often irreversible

Treatment

- Stop gemcitabine + supportive care (BP control)
- No role for PLEX
- Eculizumab?

Immunotherapy

Immune-related Adverse Events (irAE)



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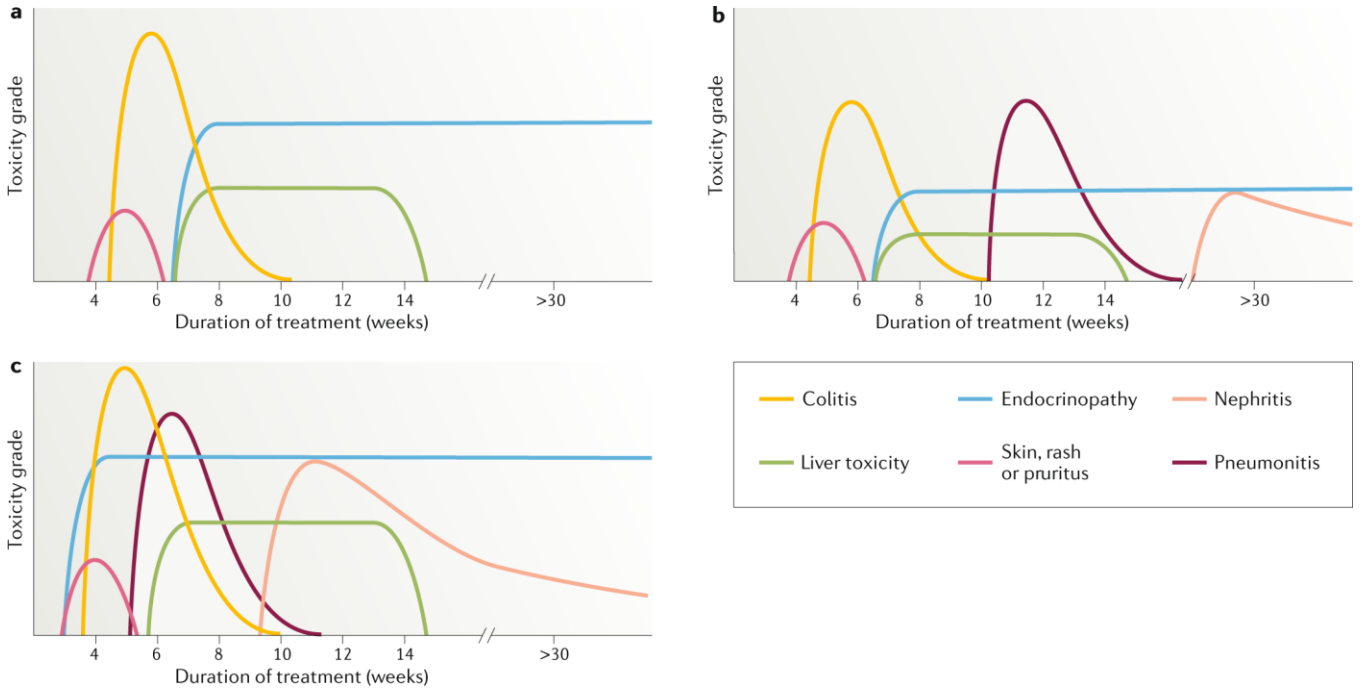
- NON-SPECIFIC T-cell activation
- Incidence = 60-80%

irAEs

Time Course
- Weeks to months, but can occur anytime

Most common
- Derm (Skin, rash, pruritic)
- GI (Colitis)

Positive association between irAE development and clinical response and survival outcomes
- Development of irAEs are representative of a robust immune reaction



Kinetics of ICPIs
a) CTLA-4 antibody
b) PD-1 or PD-L1 antibodies
c) CTLA-4 and PD-1 antibody

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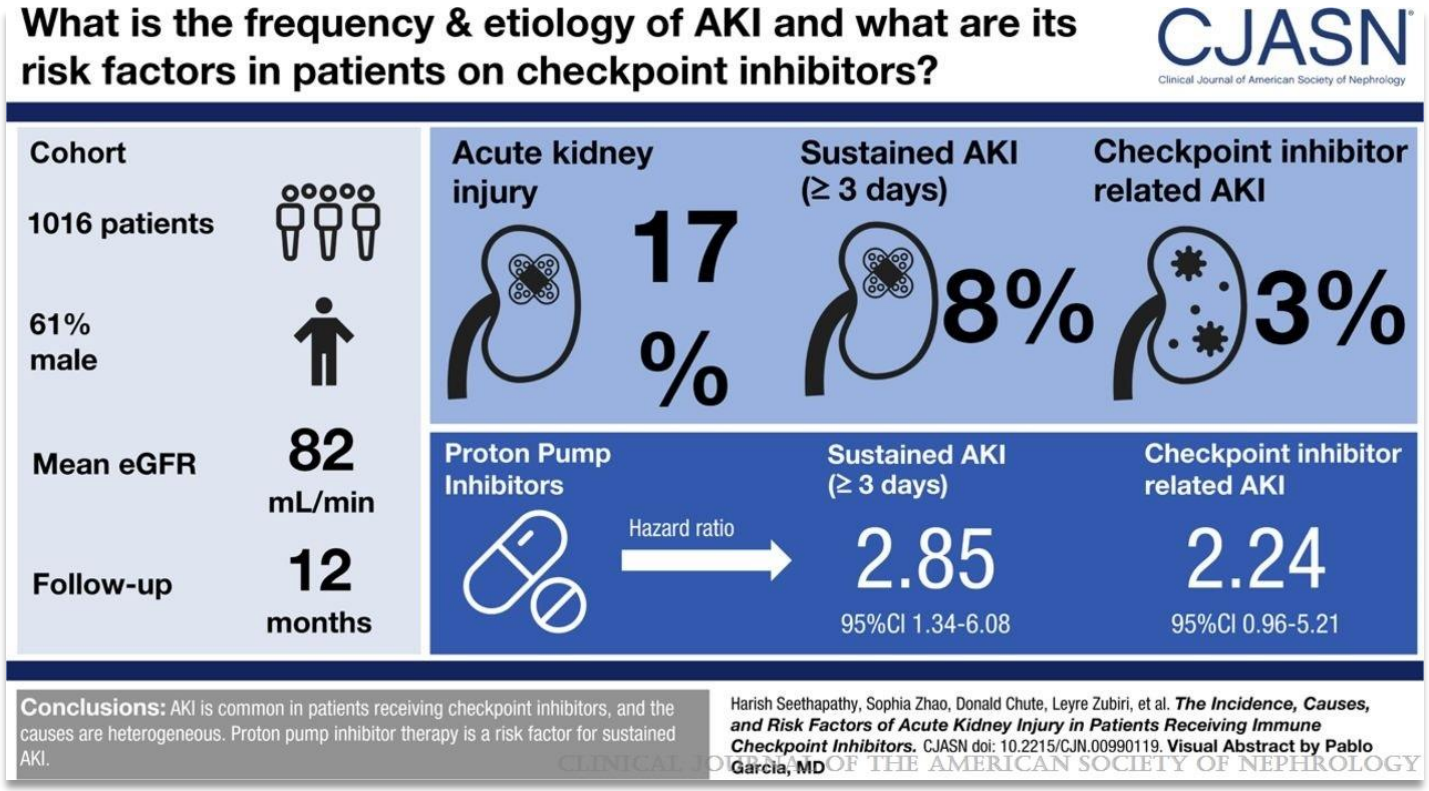
ICPI-AKI

Incidence

- All cause AKI in cancer ≈15-25 %
- IPCI-AKI → 2-5%



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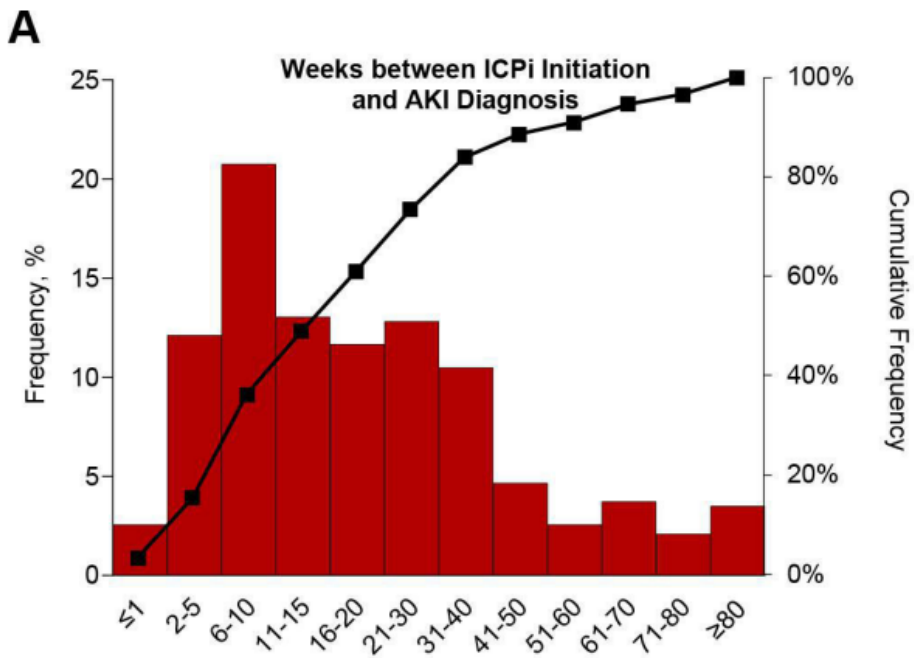
Immunotherapy

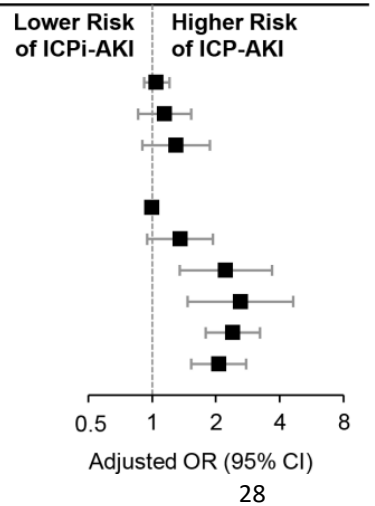
Incidence: 2-5%
- PD-L1 <1%
- PD-1 ~ 2%
- CTLA-4 ~ 2-5%
- Combined ~ 5%

Time to onset = Anytime
- Median ≈ 12-16 weeks
- 10% of cases >1 yr after ICPI

Risk Factors
- Low eGFR
- Nephrotoxic Drugs (PPi, NSAID, Vit K antagonists)
- Combination ICPI therapy
- Prior irAEs



Variable	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Age (per 10 years)	1.17 (1.04-1.31)	1.05 (0.92-1.21)
Male sex	1.16 (0.88-1.52)	1.15 (0.86-1.53)
Combination ICPi therapy	1.42 (1.01-1.98)	1.30 (0.90-1.87)
Baseline eGFR (ml/min/1.73m²)		
≥90 (REF)	1	1
60-89	1.54 (1.13-2.10)	1.36 (0.95-1.94)
45-59	2.48 (1.59-3.87)	2.23 (1.35-3.68)
<45	1.92 (1.74-4.89)	2.62 (1.47-4.65)
PPI use*	2.55 (1.92-3.40)	2.40 (1.79-3.23)
Prior or concomitant extrarenal irAEs**	2.19 (1.65-2.91)	2.07 (1.53-2.78)



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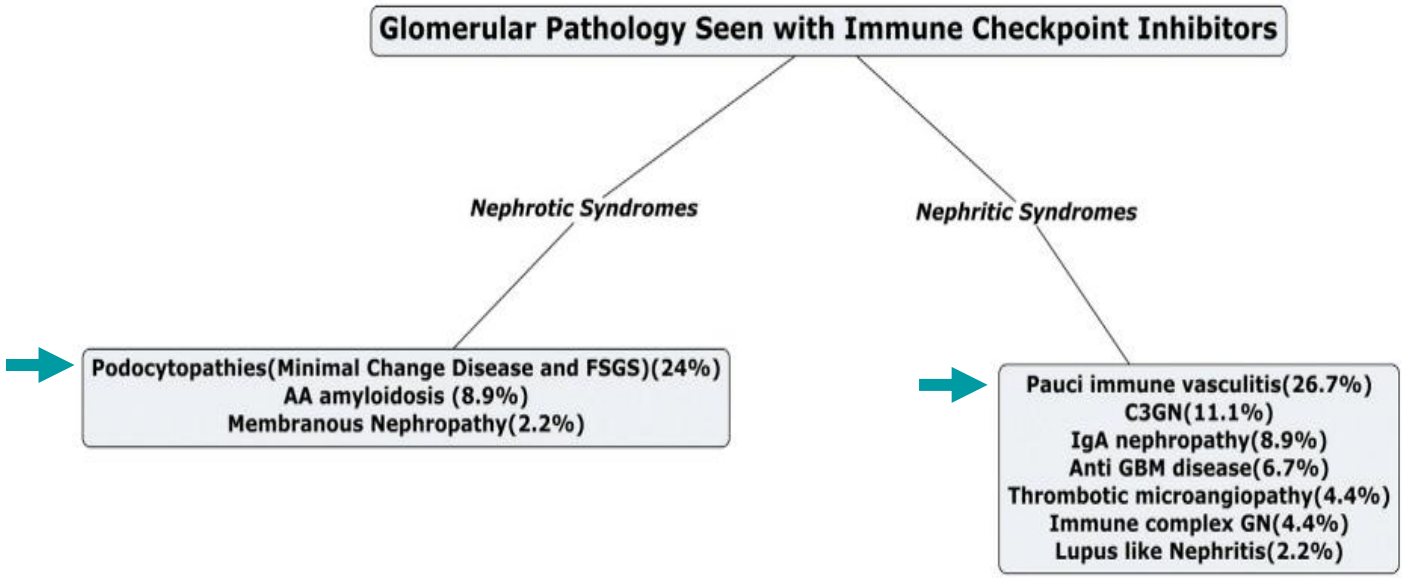
ICPI-AKI

Histopathologic Features

- **ATIN (80-90%)**
  - Can be concurrent with glomerular disease
- ATN
- Glomerulopathies (<10%)
  - Pauci-immune GN (ANCA-negative)
  - Podocytopathies
  - IgAN
  - LN
  - Membranous Nephropathy
  - C3 GN
- Vasculitis



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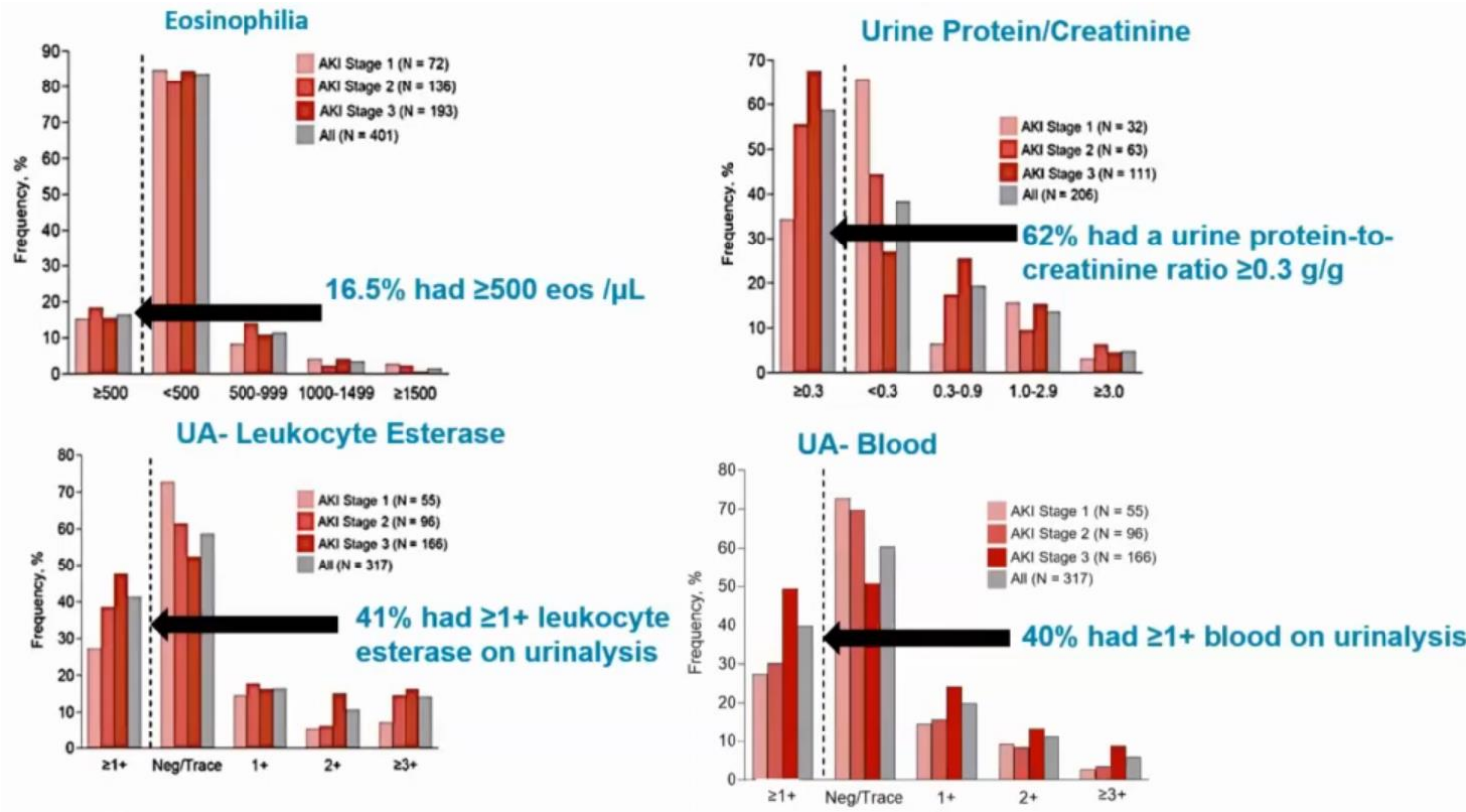
ICPI-AKI

Diagnosis

- Absence of reliable clinical or laboratory features
  - Distal RTA
- Urinary Findings are highly variable
  - 16.5% had eosinophilia
  - 40% had >+1 blood
  - 41% had >+1 LE
  - 62% had UPCR >0.3 g/g
- Urine biomarkers
  - Urinary CXCL9
  - CRP + Urine RBP/Cr ratio
- PET-CT (JCI)
- Renal Biopsy

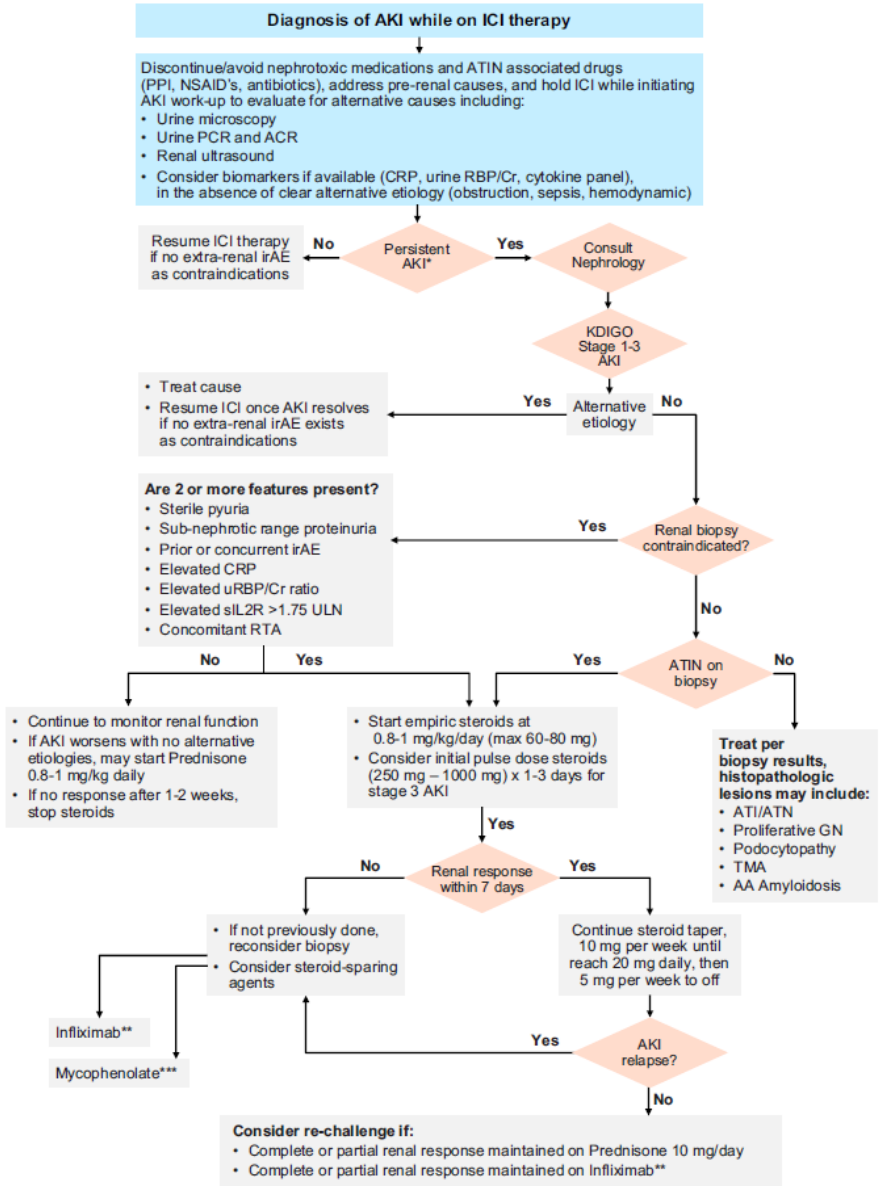


Adapted from ASON-ISN Webinar

Management of ICPI-AKI

1. Hold ICPI
   - Resolution of AKI or stabilization of renal function
   - Permanently discontinue any ATIN-associated medications
   - PPi, allopurinol, NSAIDs, Antibiotics
2. Start Corticosteroids
   - Stage 1 or 2 AKI → Prednisone 0.8-1 mg/kg (max 60-80 mg/day)
   - Stage 3 AKI → IV Methylprednisolone (0.25-1 g/day) for 1-3 days followed by an oral steroid taper

   - Duration: 6-8 week taper vs 3-4 wks
   - Prophylaxis
     - PCP ppx →non-ATIN inducible drugs (pentamidine, atovaquone)
     - GI ppx (ie. famotidine)
3. Refractory ICPI-AKI
   - Infliximab
   - Tocilizumab
   - MMF



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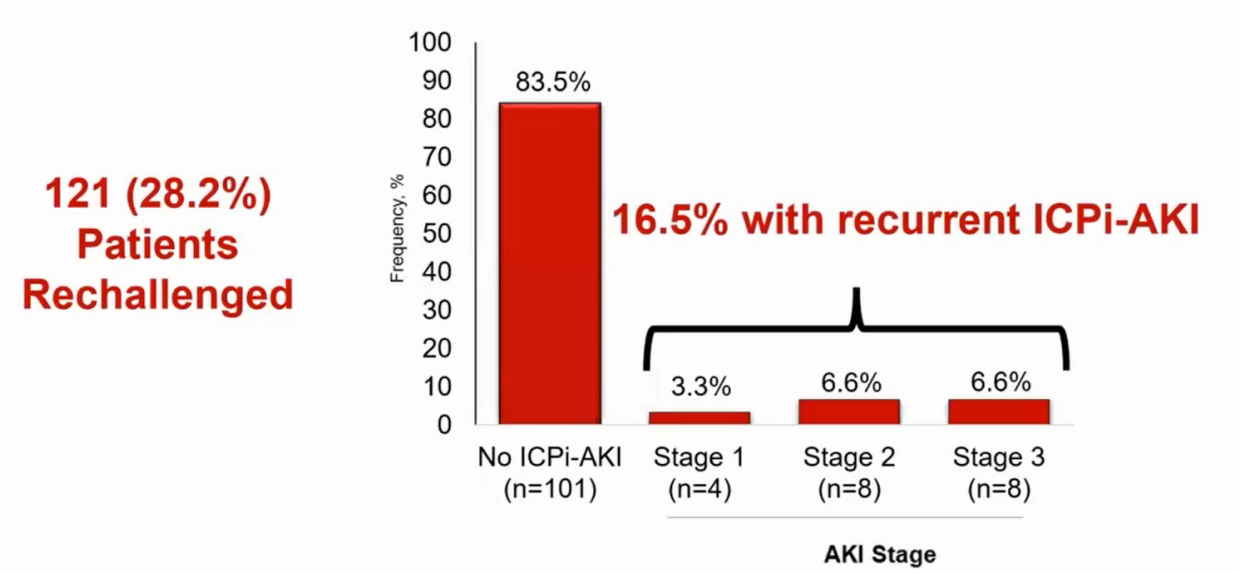
ICPI Re-challenge?

Oncology Guidelines

- ASCO 2021
  - recommend PERMANENT ICPI discontinuation for grade 3 (Scr >3-4x baseline)
- ESMO, SITC → no clear guidelines on re-challenge
- NCCN 2024
  - Consider rechallenge for CTCAE grade 3 if AKI resolves to grade 1

Nephrology Data

- **16-25% risk of recurrent ICPI-AKI with rechallenge**
  - Cortazar et al, J Am Soc Nephrol, 2020
    - 31/138 pts rechallenged
    - Recurrent ICPI-AKI occurred in 23%
  - Gupta et al, J Immunother Cancer, 2021
    - Largest cohort study of ICPI-AKI
    - 121/429 pts rechallenged
    - 42 pts w/ Stage 3 AKI
    - Only 16.5% had recurrent ICPI-AKI



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ICPI Re-challenge?

Recommendations

- Patients who develop ICPI-AKI with concomitant use of ATIN-associated drugs
  - Can consider rechallenge without secondary steroid ppx
- Rechallenge can occur with same class of ICPI
- If combination ICPI, discontinue one class of ICPI

- Our practice
  - use low dose prednisone (10 mg/day) for the first 2 cycles

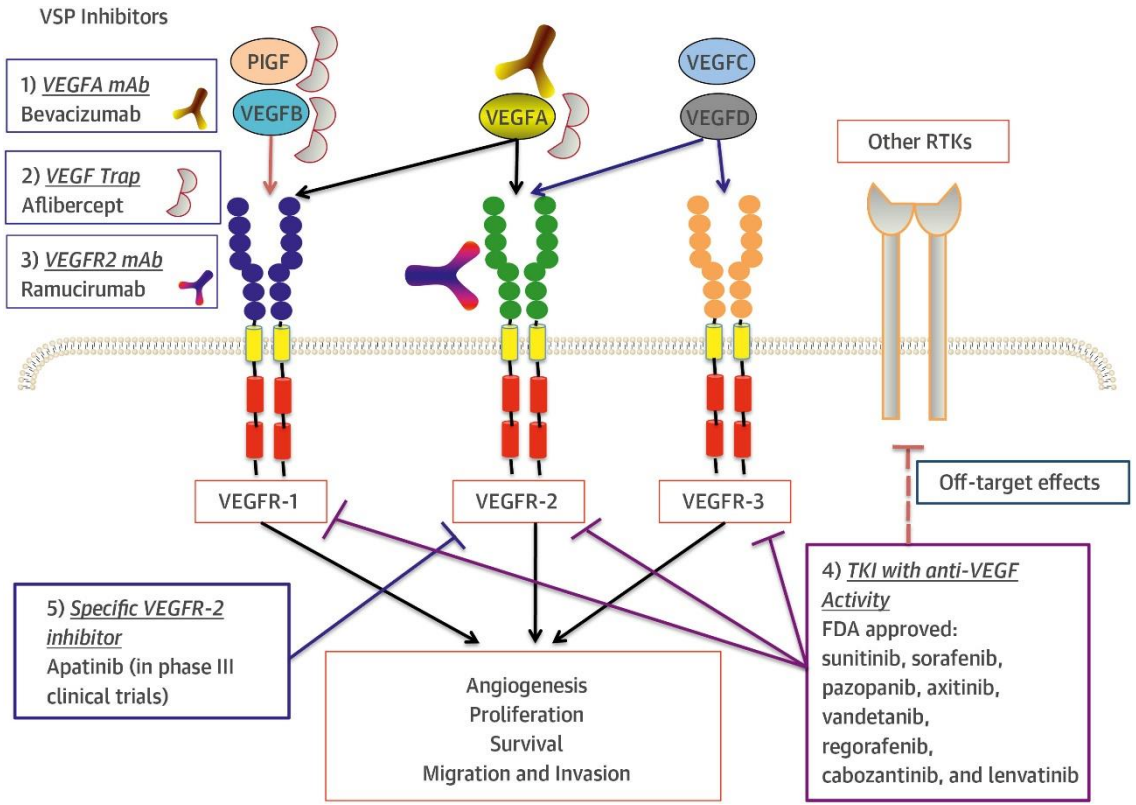
Targeted Therapies

VEGF inhibitors

Direct VEGFi = ie. bevacizumab
- TMA

Indirect VEGFi/TKi = ie. axitinib
- Podocytopathies (MCD, cFSGS)

Renal Manifestations:
- **HTN:** 30-80%
  - New onset or worsening hypertension
  - Lenvatinib (70%) > Axitinib (40%) > Sunitinib (20%)
- **Proteinuria:** 21-63%
  - Bevacizumab (20-60%)> Ramicirumab (10%)
- **TMA**
  - often renal-limited
- **Thromboembolic events**
  - Renal Vein thrombosis



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VEGF inhibitors

Mechanism of injury

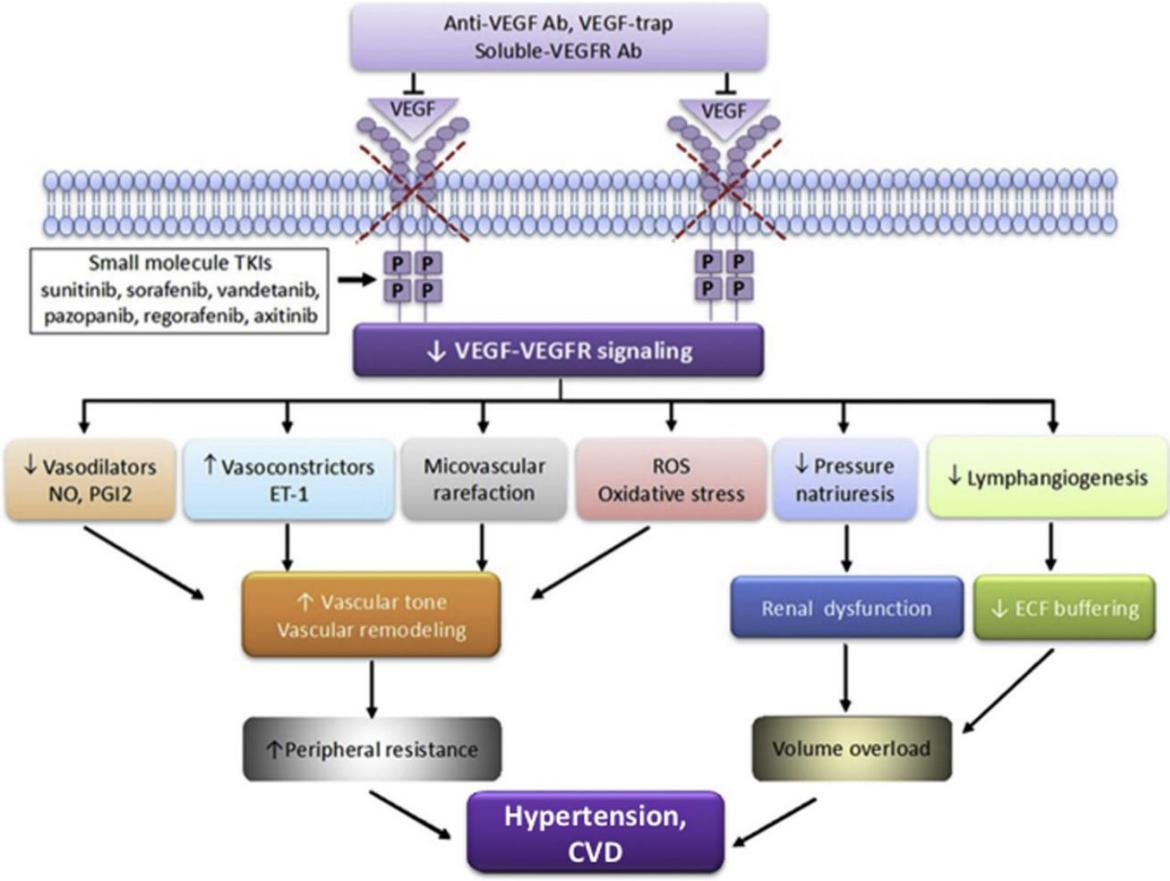
- Vasoconstriction → ↑ endothelin, ↓ NO
- Endothelial rarefication
- Podocyte damage
- Pressure natriuresis
- Decreased lymphangiogenesis

Treatment:

- Hold offending medication
  - Urine protein >2 g/24 hr
- BP control
  - Enhance vasodilation = DHP-CCB vs ACEi/ARB vs Long acting nitrates (NO donors)
  - Avoid NDHP-CCB, diuretics
- Anti-complement therapy

Re-challenge?

- Prophylactic anti-complement therapy



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Case 4

HPI: 84 yr old male with combined NSCLC (adenocarcinoma) and small cell lung cancer with MET exon 14–skipping mutation had disease progression after 4 cycles of carboplatin/etopside. He was started on capmatinib 400 mg BID.

1 week after initiation, his serum creatinine increased from a baseline of 1.3-1.6 mg/dl to 2.44 mg/dl.

ROS: No dizziness, nausea/emesis, pain

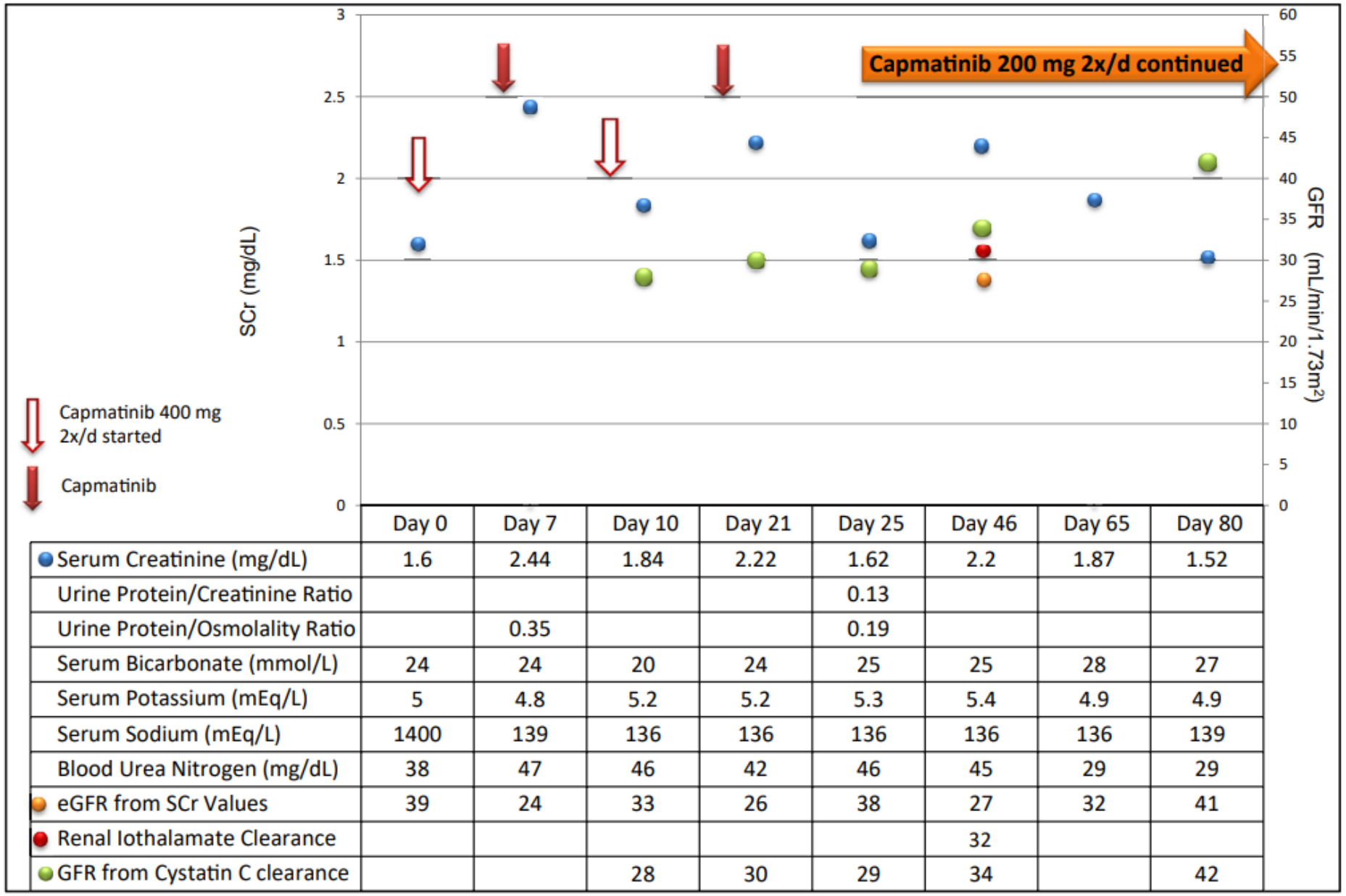
PMHx: CKD3, HTN, Afib, Gout, Tobacco use

Medications: allopurinol, atorvastatin, spironolactone, levetiracetam, losartan, metoprolol

Labs:

Hgb 12, WBC 6, platelets 150k
Na 139, K 4.8, HCO3 24, BUN 47, Cr 2.44 (baseline Cr 1.3-1.6 mg/dl),
Urinalysis bland, Urine Protein/Cr 0.13 mg/mg

Imaging: No hydronephrosis on renal ultrasound



	Day 0	Day 7	Day 10	Day 21	Day 25	Day 46	Day 65	Day 80
Serum Creatinine (mg/dL)	1.6	2.44	1.84	2.22	1.62	2.2	1.87	1.52
Urine Protein/Creatinine Ratio					0.13			
Urine Protein/Osmolality Ratio		0.35			0.19			
Serum Bicarbonate (mmol/L)	24	24	20	24	25	25	28	27
Serum Potassium (mEq/L)	5	4.8	5.2	5.2	5.3	5.4	4.9	4.9
Serum Sodium (mEq/L)	1400	139	136	136	136	136	136	139
Blood Urea Nitrogen (mg/dL)	38	47	46	42	46	45	29	29
eGFR from SCr Values	39	24	33	26	38	27	32	41
Renal Iothalamate Clearance						32		
GFR from Cystatin C clearance			28	30	29	34		42

PMID: 34118303

MET inhibitors

Use: NSCLC

Mechanism of renal injury:

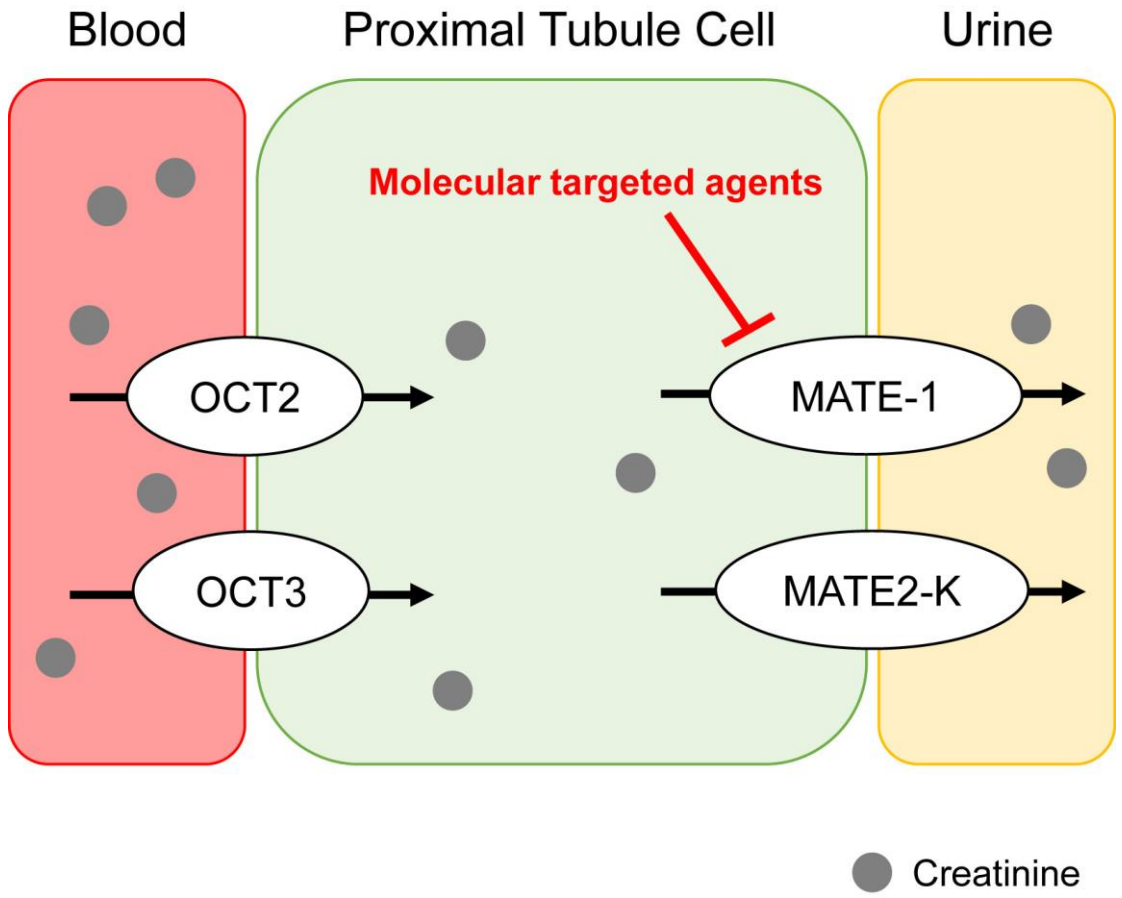
- 10-40% of Scr clearance via SLC transporters in the PCT (MATE 1/2, OCT2/3)
- MET Inhibition of MATE 1 & 2 and/or OCT

Renal Manifestations:

- Pseudo-AKI

Management

- eGFR via Cystatin C
- mGFR



PMID: 38185510

Pseudo-AKI

Drug class	Drug names	Cancer	Mechanism	Kidney effect
Anaplastic Lymphoma Kinase (ALK) inhibitors	**Crizotinib** **Alectinib** **Lorlatinib**	**NSCLC** **(3-7% ALK+)**	Inhibits MATE1 & OCT of creatinine secretion, Renal arteriolar myocyte vacuolization	Pseudo-AKI ATI Peripheral edema Kidney cyst (Criz) Podocytopathies (rare)
Cyclin Dependent Kinase (CDK) 4/6 inhibitors	**Palbociclib** **Ribociclib** **Abemaciclib (10-25%)**	**Breast**	Inhibit MATE1&2 transporters	Pseudo-AKI True AKI AIN Electrolytes (HypoNa, hypoK 2/2 diarrhea)
Poly (ADP-ribose) polymerase (PARP) inhibitors	**Olaparib (~30%)** **Rucaparib** **Niraparib** **Talazoparib**	**Breast** **Ovarian**	Inhibit MATE1&2 and OCT1&2 of creatinine secretion	Pseudo-AKI
Mesenchymal-epithelial transition (MET) tyrosine kinase	**Capmatinib** **Tepotinib**	**NSCLC**	**Capmatinib** Inhibit MATE 1 & 2 transporters of creatinine secretion **Tepotinib** inhibits OAT1	Pseudo-AKI

Adapted from ASN Onco-nephrology Curricula

Case 5

A 62-year-old business executive presents with a three-week history of fatigue and back pain

VS: 125/ 75 HR: 95 Temp 99.0F on Room Air.

BMP: Ca 14 mg/dl , Cr 2.9 mg/dl (bsl 1.7-1.s)

CBC: Hgb 7g/dl, rest WNL

SPEP: M spike 3.9 g/d

FLC: L 3000 mg/l K 30 mg/l R 100

UA: bland, pr/cr 8g, albumin/cr 500

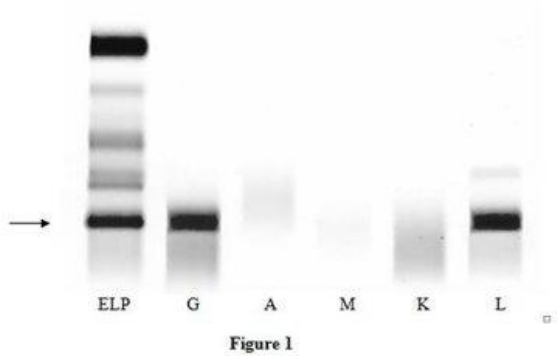


Fig 7. Serum Electrophoresis-Immunofixation, Reproduced from UCSD Laboratory Medicine. http://ucsdlabmed.wikidot.com/chapter-7-laboratory-diagnosis-of-protein-abnormalities

AKI: Intrinsic Renal Disease, Myeloma Diagnosis

Criteria 1: Clonal Proliferation of >10% or Biopsy Proven Extramedullary Plasmacytoma

AND

≥ 1 CRAB

OR

≥ 1 SLIM

OR MDE

Which of the following can precipitate cast formation?

1)ACE/ARB
2)Diuretics
3)NSAID
4)All of the above

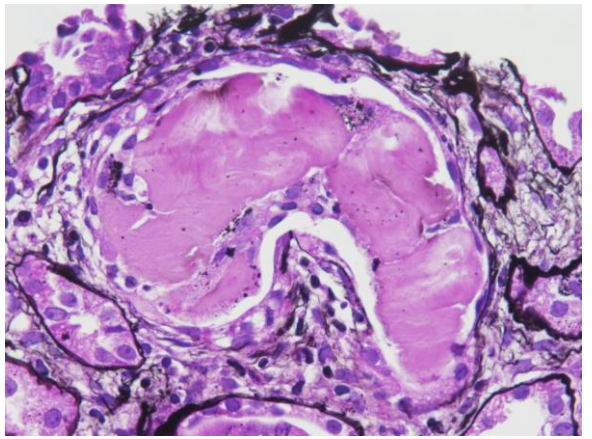


Fig. 7 Cast Nephropathy, LM, Reproduced from AJKD atlas of Renal Pathology.

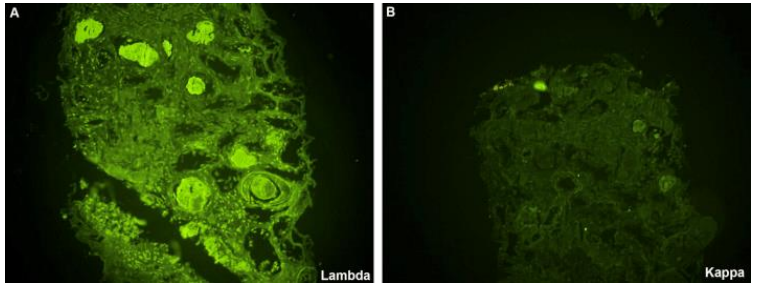


Fig. 8 Cast Nephropathy, IF, Reproduced from AJKD atlas of Renal Pathology.

AKI: Cast Nephropathy

Can occur as a presenting feature or later in the course

Incidence varies from 16-31% in Myeloma Patients[6].

50% of all Myeloma patients will develop some form of kidney disease

Renal impairment has the highest impact on survival in Myeloma Patients

Risk factors

- degree of sFLC elevation. Rare <50 mg/dl (500 mg/l)
- ACE/ARB/Diuretics/NSAIDS can precipitate cast formation

AKI: Cast Nephropathy

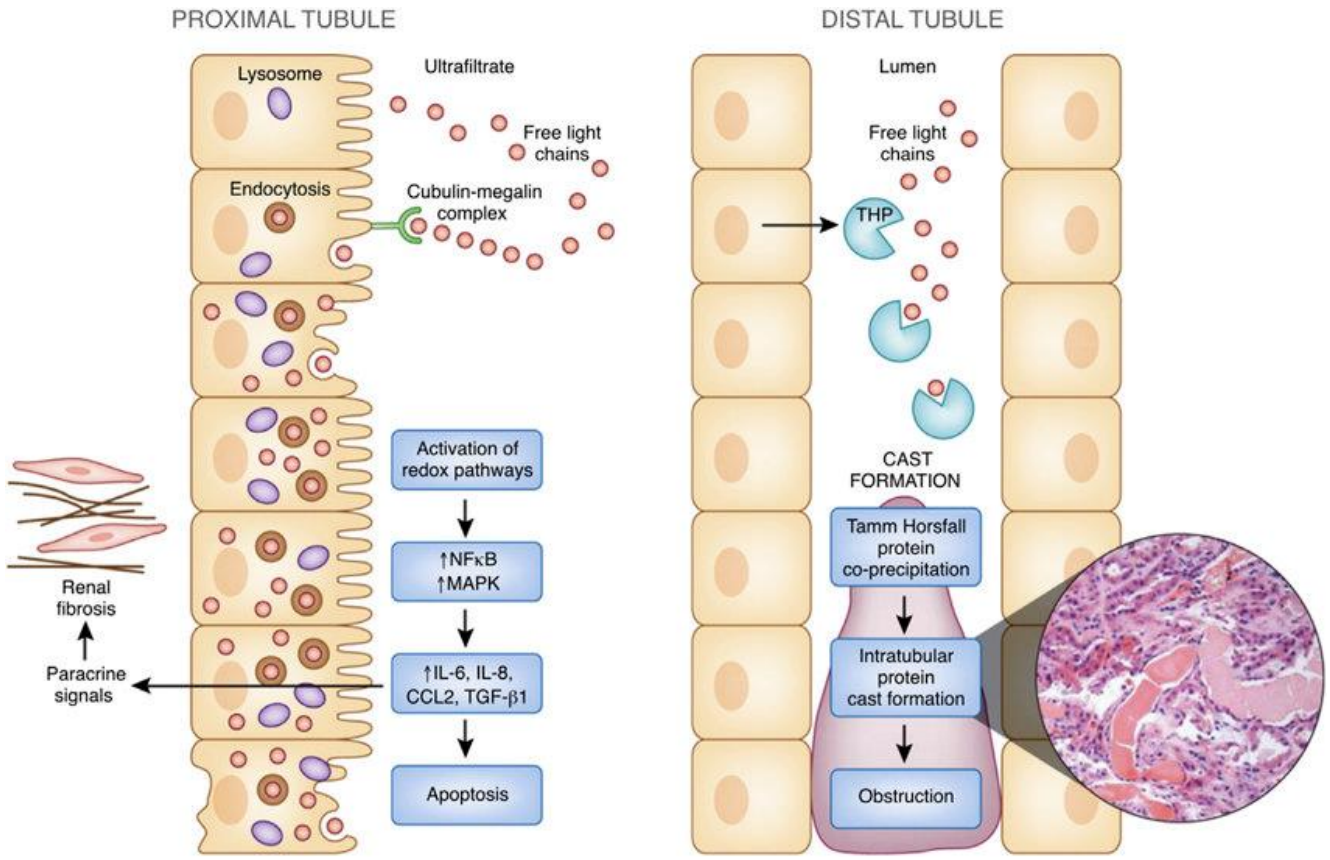


Fig 9. Mechanism of Cast Nephropathy. Reproduced from Lam, A.Q., Humphreys, B.D. (2012). CJASN

Renal Impact:

-Decrease OS, response rates[7]

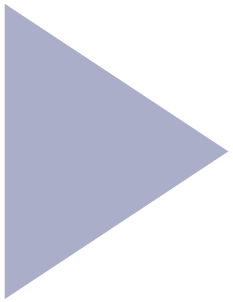
-MM patients requiring RRT have median OS 0.91 vs 4.46 MM non-RRT

AKI: Cast Nephropathy

Goal = reduce light chain burden, suppress further light chain formation, address precipitating causes (volume depletion, hypercalcemia)

Volume Expansion =2-3L UOP

Clone Directed Therapy (PI) + Alkylating Agent (Cytoxan) + Steroids +/- Daratumumab



Bortezomib

- Proteosome inhibitor that induces apoptosis, decreases tumor growth/angiogenesis of myeloma cells in BM[8].
- VISTA Trial: Bortezomib increased ORR, CR, and renal recovery rate[9]
- Phase II Trial by Ludwig et al. Bortezomib arm better ORR, eGFR improvement correlated with depth of heme response
- Is Bortezomib nephrotoxic?[10]
- 5 Landmark trials, >2000 patients, significant renal adverse events extremely sparse

AKI: Cast Nephropathy

Extracorporeal Management

High Cut Off Dialyzers

- 50kd pore size vs ~15Kd
- H+L 150 Kd vs IgM >1000 Kd
- MYRE Trial[11]
  - High cut off Dialyzers vs conventional dialysis
- **trends towards higher hematological response and renal recovery**
- Most experts will favor the use of High Cut off Dialyzers

AKI: Cast Nephropathy, Plasmapheresis

No Benefit

- Clark et Al, 2005[12]
- 104 patients with AKI and MM
- Conventional therapy vs 5-7 sessions of PLEX
- No difference in death, dialysis dependence, or eGFR improvement >30

Benefit

- Leung et al. 2008[13]
- 14 patients with biopsy proven LCCN treated with PLEX
- Renal response 78% in PLEX treated patients.
- FLC reduction >50% had a renal response rate of 71%
- Survival higher in renal response group

Expert Opinion: involved FLC >150 mg/dl with bence jones proteinuria > Dara+Bort+Cytoxan+Dex + daily PLEX.

Goal: target 50% reduction by the end of cycle 1

This may change!

My Approach:

- First episode vs relapsed?

- Diagnosis Correct?
  - Prior LCCN?
    - What is the rate of Light Chain and Cr Rise
  - Biopsy?

- Do they meet Criteria for LCCN?
  - Involved Light Chain >1500 mg/L (150mg/dl)
  - bence jones proteinuria

- Risk of PLEX
  - DIC
  - Infectious
  - Electrolytes

- Next line of therapy?
  - Discussion with Myeloma Team

TAKE HOME MESSAGES

- AKI is a common complication in cancer and can be a result of the cancer specific factors, treatment-related factors or both
- AKI has implications on cancer treatment (dose, therapeutic options), cancer prognosis and mortality
- Consider the type (ie. conventional chemotherapy vs immunotherapy) and mechanism of cancer treatments when formulating renal differentials

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CLINICAL TRIALS

Clinical Trials	Change in Management	
None Specific as this topic was a gross overview		