

Table 2. Electrolyte disorders in onco-nephrology

Etiology	Hyponatremia	Hypernatremia	Hypokalemia	Hyperkalemia	Hypophosphatemia	Hyperphosphatemia	Hypomagnesemia
<b>Tumor-related</b>	- Paraneoplastic SIADH (e.g., squamous cell carcinoma of the lung)	- Central diabetes insipidus - Cushing syndrome	- Lysozymuria with acute leukemia - Mineralocorticoid excess syndrome - Primary hyperaldosteronism (adrenal carcinoma) - Renin-producing tumors (extremely rare) - Ectopic adrenocorticotropin syndrome	- Tumor lysis syndrome - Pseudohyperkalemia - Adrenal insufficiency (metastatic disease) - Acute kidney injury (tumor-induced)	- Hyperparathyroidism (parathyroid carcinoma) - PTHrP-secreting tumors - Tumor-induced osteomalacia (mesenchymal tumors) - Light chain-associated	- or lysis syndrome - Hyperglobulinemia (pseudohyperparathyroidism)	- None

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			in the setting of high white cell counts		Fanconi syndrome		
<b>Chemotherapy-related</b>	- Medication-induced SIADH (cyclophosphamide, vincristine, etc.) - Salt-losing nephropathy (cisplatin) - Drug-induced Fanconi syndrome - Nausea/vomiting - Diarrhea	- Nephrogenic diabetes insipidus - Diarrhea and increased free water losses	- Chemotherapeutic agents (cisplatin and ifosfamide) - Antimicrobial and antifungal agents (aminoglycosides and amphotericin B) - Excessive gastrointestinal losses (vomiting and diarrhea) - Drug-induced Fanconi syndrome	- Tumor lysis syndrome - Acute kidney injury (medication-induced) - Drug-induced (heparin, trimethoprim, calcineurin inhibitors, and ketoconazole)	- Drug-induced Fanconi syndrome - Tyrosine kinase inhibitors (imatinib) - mTOR inhibitors - VEGF inhibitors (sorafenib)	- Acute kidney injury - Bisphosphonates	- Cisplatin - Calcineurin inhibitors - Antibodies to EGF receptor (cetuximab and panitumumab) - Vomiting - Diarrhea
<b>Other causes</b>	- Hypothyroidism			- Hypercalcemia		- Hyperalimentation	- Rhabdomyolysis

Etiology	Hyponatremia	Hypernatremia	Hypokalemia	Hyperkalemia	Hypophosphatemia	Hyperphosphatemia	Hypomagnesemia
	(drug-induced)	Hyperglycemia and osmotic diuresis	-	Hypomagnesemia	Blood transfusions	n (refeeding syndrome)	- Hypoparathyroidism (postsurgical)
	- Cirrhosis		-	Postobstructive diuresis			
	- Heart failure		-	Use of growth factors		- Vitamin D deficiency	
						- Malabsorption	

EGF, endothelial growth factor; mTOR, mammalian target of rapamycin; PTHrP, parathyroid hormone–related protein; SIADH, syndrome of inappropriate antidiuretic hormone secretion; VEGF, vascular endothelial growth factor.

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<b>Tumor-related</b>	<ul style="list-style-type: none"> <li>- Paraneoplastic SIADH (e.g., squamous cell carcinoma of the lung)</li> <li>- Paraneoplastic nephrotic syndrome</li> <li>- Adrenal insufficiency (metastatic disease)</li> </ul>	<ul style="list-style-type: none"> <li>- Central diabetes insipidus</li> <li>- Cushing syndrome</li> </ul>	<ul style="list-style-type: none"> <li>- Lysozymuria with acute leukemia</li> <li>- Mineralocorticoid excess syndrome</li> <li>- Primary hyperaldosteronism (adrenal carcinoma)</li> <li>- Renin-producing tumors (extremely rare)</li> <li>- Ectopic adrenocorticotropic hormone syndrome</li> <li>- Intracellular shifts (pseudohypokalemia) in the setting of high white cell counts</li> </ul>	<ul style="list-style-type: none"> <li>- Tumor lysis syndrome</li> <li>- Pseudo-hyperkalemia</li> <li>- Adrenal insufficiency (metastatic disease)</li> <li>- Acute kidney injury (tumor-induced)</li> </ul>	<ul style="list-style-type: none"> <li>- Hyperparathyroidism (parathyroid carcinoma)</li> <li>- PTHrP-secreting tumors</li> <li>- Tumor-induced osteomalacia (mesenchymal tumors)</li> <li>- Light chain-associated Fanconi syndrome</li> </ul>	<ul style="list-style-type: none"> <li>- Tumor lysis syndrome</li> <li>- Hyperglobulinemia (pseudohyperparathyroidism)</li> </ul>	<ul style="list-style-type: none"> <li>- None</li> </ul>
<b>Chemotherapy-related</b>	<ul style="list-style-type: none"> <li>- Medication-induced SIADH (cyclophosphamide, vinblastine, vincristine, etc.)</li> <li>- Salt-losing nephropathy (cisplatin)</li> <li>- Drug-induced Fanconi syndrome</li> </ul>	<ul style="list-style-type: none"> <li>- Nephrogenic diabetes insipidus</li> <li>- Diarrhea and increased free water losses</li> </ul>	<ul style="list-style-type: none"> <li>- Chemotherapeutic agents (cisplatin and ifosfamide)</li> <li>- Antimicrobial and antifungal agents (aminoglycosides and amphotericin B)</li> <li>- Excessive gastrointestinal losses (vomiting and diarrhea)</li> </ul>	<ul style="list-style-type: none"> <li>- Tumor lysis syndrome</li> <li>- Acute kidney injury (medication-induced)</li> <li>- Drug-induced (heparin, trimethoprim, calcineurin inhibitors, and ketoconazole)</li> </ul>	<ul style="list-style-type: none"> <li>- Drug-induced Fanconi syndrome</li> <li>- Tyrosine kinase inhibitors (imatinib)</li> <li>- mTOR inhibitors</li> <li>- VEGF inhibitors (sorafenib)</li> </ul>	<ul style="list-style-type: none"> <li>- Acute kidney injury</li> <li>- Bisphosphonates</li> </ul>	<ul style="list-style-type: none"> <li>- Cisplatin</li> <li>- Calcineurin inhibitors</li> <li>- Antibodies to EGF receptor (cetuximab and panitumumab)</li> <li>- Vomiting</li> <li>- Diarrhea</li> </ul>

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	- Nausea /vomiting - Diarrhea		- Drug-induced Fanconi syndrome				
<b>Other causes</b>	- Hypothyroidism (drug-induced) - Cirrhosis  - Heart failure	- Hyperglycemia and osmotic diuresis	- Hypercalcemia - Hypo-magnesemia - Postobstructive diuresis - Use of growth factors	- Blood transfusions	- Heralimentation (refeeding syndrome) - Vitamin D deficiency - Malabsorption	- Rhabdomyolysis - Hypoparathyroidism (postsurg)	