



AAVBC

AMERICAN ACADEMY OF VALUE BASED CARE

Addison's Disease

Quick Reference Guide

2026

Table of Contents

1. CLINICAL SNAPSHOT	3
HCC/RAF V28 Mapping	4
2. RECOGNITION AND DIAGNOSIS	5
Medicare Diagnostic Workup (Adult and Geriatric)	5
Subtle Early Signs in Older Adults (>65)	6
Risk Factors	7
Diagnostic Thresholds and Classification.....	8
Clues to Dig Deeper	9
Common Oversights	9
Key Differentials in Elderly	10
Comorbidity Screening	11
3. MEAT DOCUMENTATION ESSENTIALS	12
Clinical Documentation Elements	13
Reframing Common Documentation Shortcuts	14
4. TREATMENT AND REFERRAL QUICK GUIDE	14
Therapy Escalation Criteria	15
Endocrine Society Guideline-Aligned Replacement by Agent and Profile	16
Non-Pharmacologic Care and Crisis Prevention.....	16
Medication Safety and Key Interactions	17
When to Refer	18
Follow-Up Timing	18
Comorbidity Management.....	19
Cost-Smart Options	20
Patient Education and Adherence	21
Quality Metrics Tie-In	22
5. CODING REMINDERS AND CASE EXAMPLES	24
Coding Specificity	24
Annual Clinical Review and Confirmation	25
Good Documentation — EHR Tips	26
Brief Case Examples.....	26
REFERENCES	27

1 CLINICAL SNAPSHOT

Definition: Addison's disease (primary adrenal insufficiency, PAI) is a chronic, life-limiting **endocrine disorder** in which destruction of the adrenal cortex produces deficient cortisol and, in most primary cases, deficient aldosterone.¹ In North America and Europe roughly **90%** of cases are autoimmune (autoimmune adrenalitis); the remainder follow **infection** (historically tuberculosis, now also HIV and fungal disease), **hemorrhage, infiltrative disease, or bilateral adrenalectomy**.² Because the adrenal glands lose most of their reserve **before** overt symptoms appear, the presentation is **insidious** and the **stress-response axis fails silently** — any physiologic stressor can then precipitate a **life-threatening adrenal crisis**.^{3,4} Addison's must be conveyed as **dual-hormone** loss: it is not simply low cortisol, and most patients require both glucocorticoid and mineralocorticoid replacement.⁵



CLINICAL PEARL: PRIMARY VS. SECONDARY ADRENAL INSUFFICIENCY

In **primary** adrenal insufficiency (Addison's disease), the adrenal gland itself is destroyed, so both **cortisol and aldosterone** are deficient, and **ACTH is elevated** due to loss of negative feedback - often producing **hyperpigmentation**.

In **secondary** adrenal insufficiency, the defect lies in the pituitary or hypothalamus (deficient ACTH or CRH), so **aldosterone production is preserved** (regulated independently by the renin-angiotensin system), **ACTH is low**, and hyperpigmentation is absent. This distinction matters clinically: only primary adrenal insufficiency requires mineralocorticoid replacement.

ICD-10 Codes:

Confirmed Addison's disease is reported as **E27.1** (primary adrenocortical insufficiency), the standard code for autoimmune or other primary adrenal-gland failure. Acute decompensation is **E27.2** (Addisonian/adrenal crisis) and, when a crisis is the reason for the encounter, **E27.2** is sequenced as the principal diagnosis. Insufficiency from exogenous steroid withdrawal is **E27.3** (drug-induced), with an added code for the causative drug. **E27.40** (unspecified) and **E27.49** (other) should be reserved for genuinely undetermined cases. Secondary (pituitary) adrenal insufficiency is a distinct disorder coded **E23.0** — pituitary ACTH failure, not adrenal-gland failure — and does not require mineralocorticoid replacement. Autoimmune polyglandular failure is **E31.0**, and **A18.7** (tuberculosis of the adrenal gland) is coded in addition to **E27.1** when relevant. Long-term steroid replacement is documented with **Z79.52**.⁶

Prevalence and Burden: Addison's disease occurs equally in males and females, affecting an estimated 1 in 100,000 people in the United States. Overall prevalence is estimated at **40-60 cases per million** in the general population, though underdiagnosis makes true prevalence difficult to determine. While Addison's disease can occur at any age, it most commonly presents between **30-50 years**.⁷ The Under-Recognition Problem: Diagnostic delay is the central clinical failure. Up to **50% of patients first present in adrenal crisis**, about **20% report nonspecific symptoms for more than 5 years** before diagnosis, and **40% are diagnosed more than 6 months** after symptom onset — with fewer than 30% of women diagnosed within the first 6 months.⁸

HCC/RAF V28 Mapping

ICD-10 CODE	HCC CATEGORY (V28)	RAF (CNA)	DOCUMENTATION REQUIREMENT
E27.1; Primary adrenocortical insufficiency (Addison's disease, autoimmune adrenalitis)	HCC 51 Addisons and Cushings Diseases/ Acromegaly/and Other Specified Endocrine Disorders	0.510	Use for confirmed autoimmune or primary adrenal gland failure — the standard Addison's code
E27.2; Addisonian crisis (adrenal crisis)	HCC 51 Addisons and Cushings Diseases/ Acromegaly/and Other Specified Endocrine Disorders	0.510	Must sequence FIRST during acute crisis; do not bury under E27.1 — sequencing error loses clinical urgency signal
E27.3; Drug-induced adrenocortical insufficiency	No HCC	N/A	Use when prolonged steroid use caused the insufficiency; document the offending drug and withdrawal context
E27.40; Unspecified adrenocortical insufficiency	No HCC	N/A	AVOID — specificity is always achievable; E27.40 signals documentation failure to coders and auditors
E27.49; Other adrenocortical insufficiency (non-autoimmune, non-drug)	No HCC	N/A	Use for TB-related , infectious, or neoplastic causes when E27.1 does not apply; document etiology explicitly

ABBREVIATIONS: CNA = Community Non-Dual Eligible, Aged; HCC = Hierarchical Condition Category; PAI = primary adrenal insufficiency; RAF = Risk Adjustment Factor; RxHCC = Prescription-Drug Hierarchical Condition Category; T1DM = Type 1 diabetes mellitus; V28 = CMS-HCC Model Version 28 *RAF values represent the Community Non-Dual Eligible Aged (CNA) coefficient from the 2026 CMS-HCC model; values vary across patient populations based on eligibility and care setting

Risk-Adjusted Care Resources per Patient/Year^{9,10}

Risk-adjusted care resource allocation — MA base rate (~\$10,402.34) × RAF coefficient

Addison's Disease

\$5,305

HCC 51 · RAF 0.510

2 RECOGNITION AND DIAGNOSIS

Medicare Diagnostic Workup (Adult and Geriatric)

TEST/ SURVEILLANCE*	CPT CODE	WHEN TO USE IT	INTERPRETATION	NOTES FOR OLDER ADULTS
Morning (~8 AM) serum cortisol ^{2,4}	CPT 82533	First-line when nonspecific symptoms persist without a clear cause	<3.0 µg/dL is 99.7% specific for AI ; <5 µg/dL is highly probable; 5-10 µg/dL is indeterminate; >10 µg/dL excludes AI in 98.8% of cases; >16 µg/dL has a negative predictive value of 98.7%	Diurnal rhythm makes morning timing essential ; a random cortisol has limited value
Plasma ACTH (paired with cortisol) ^{4,11}	CPT 82024	Drawn simultaneously to separate primary from secondary AI	ACTH elevated >2x the upper limit of normal points to primary AI; low/low-normal ACTH points to secondary (pituitary) AI	Do not use ACTH to titrate replacement dose — it stays chronically high in PAI
Cosyntropin (250 µg IV) stimulation test ^{2,4}	CPT 80400	When basal cortisol is indeterminate or dynamic confirmation is needed	Peak cortisol <18 µg/dL at 30 or 60 min confirms AI (sensitivity 64%, specificity 93% for secondary AI)	In PAI, low basal cortisol + high ACTH is often sufficient without dynamic testing
21-hydroxylase antibodies ¹²	CPT 83516	Once at diagnosis to confirm autoimmune etiology	Positive in ~90% of autoimmune cases in North America/Europe ³	A newly positive result in a patient with another autoimmune disease warrants expedited endocrine review

TEST/ SURVEILLANCE*	CPT CODE	WHEN TO USE IT	INTERPRETATION	NOTES FOR OLDER ADULTS
Electrolytes, renin, aldosterone, DHEAS ^{3,4}	Electrolytes (CPT 80051), renin (CPT 84244), aldosterone (CPT 82088), DHEA-S (CPT 82627)	At diagnosis and for ongoing monitoring	Low aldosterone with high renin and low DHEAS support PAI; renin in the upper-normal range indicates adequate fludrocortisone	Normal electrolytes do NOT exclude early Addison's — they are late findings

ABBREVIATIONS: ACTH = adrenocorticotrophic hormone; AI = adrenal insufficiency; DHEAS = dehydroepiandrosterone sulfate; IV = intravenous; PAI = primary adrenal insufficiency

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Subtle Early Signs in Older Adults (>65)

SIGN/SYMPTOM	FREQUENCY AND MEANING	WHY IT IS MISSED IN OLDER ADULTS
Hyperpigmentation	Present in ~74% — the single most specific sign of PAI; ACTH-driven darkening of skin creases, knuckles, buccal mucosa, and lips; absent in secondary AI ^{2,4}	Attributed to sun exposure or age ; frequently undocumented, which erases the key primary-vs-secondary discriminator
Orthostatic hypotension ¹³	~68% — reflects mineralocorticoid deficiency and volume depletion ²	Relative hypotension can be masked when baseline blood pressure is elevated
Fatigue, anorexia, weight loss	Fatigue 50-95% ; anorexia/weight loss 43-73% — the symptoms most often miscoded as depression or malaise ^{2,4}	Overlaps with age-related decline, depression, and deconditioning
Nausea, vomiting, abdominal pain	20-62% — nonspecific GI complaints that delay endocrine workup ²	Anchored to a GI diagnosis before AI is considered
Salt craving	12-19% — unique to primary AI (mineralocorticoid deficiency); absent in secondary AI ^{2,4}	Rarely volunteered unless specifically asked

SIGN/SYMPTOM	FREQUENCY AND MEANING	WHY IT IS MISSED IN OLDER ADULTS
Hyponatremia (± hyperkalemia)	Hyponatremia is the most consistent biochemical finding (~84% of untreated patients); ~1/3 have hyperkalemia; the combination strongly suggests PAI ¹⁴	Hyponatremia is often attributed to SIADH in older adults, delaying diagnosis

ABBREVIATIONS: AI = adrenal insufficiency; GI = gastrointestinal; PAI = primary adrenal insufficiency; SIADH = syndrome of inappropriate antidiuretic hormone

Risk Factors

RISK FACTOR	STATISTICAL SIGNAL	RELEVANCE IN OLDER ADULTS
Pre-existing autoimmune disease (T1DM)	Incidence rate ratio for Addison's in childhood-onset T1DM is 26.5 (95% CI 17.3-40.7) — the strongest documented risk factor ¹⁵	Autoimmune burden accumulates with age ; a personal history of T1DM should raise suspicion
Autoimmune thyroid disease³	Most common co-occurring autoimmune condition; the majority of autoimmune-Addison's patients develop another autoimmune disease over their lifetime	Hypothyroid symptoms overlap with both AI and aging, complicating recognition
Female sex	Slight prevalence predominance; women with autoimmune Addison's carry elevated ischemic heart disease risk (adjusted HR 2.15, 95% CI 1.49-3.10) ¹⁶	Longer diagnostic delay in women (<30% diagnosed within 6 months) ¹⁷
Immune checkpoint inhibitor therapy	An increasing iatrogenic cause of AI; onset typically 2-8 months after initiation	Increasingly relevant in older adult patients receiving cancer immunotherapy
Age 80 and older	Adrenal-crisis admission rate 45.8 per million per year — about 3x the general adult rate ²	Older adults are disproportionately harmed by crisis and present atypically

RISK FACTOR	STATISTICAL SIGNAL	RELEVANCE IN OLDER ADULTS
Prior adrenal crisis/ comorbid diabetes, cardiac disease	Prior crisis is an established predictor of recurrence; comorbid diabetes and cardiac disease raise crisis risk ¹³	Comorbidities such as diabetes mellitus, cardiac disease, and chronic kidney disease are concentrated in the multimorbid older adult population, compounding crisis risk during acute illness or physiologic stress

ABBREVIATIONS: AI = adrenal insufficiency; CI = confidence interval; HR = hazard ratio; T1DM = Type 1 diabetes mellitus

Diagnostic Thresholds and Classification

FRAMEWORK	THRESHOLD/DEFINITION	PRACTICAL USE
Morning cortisol thresholds^{2,18}	<3.0 µg/dL: 99.7% specific for A <5 µg/dL: highly probable 5-10 µg/dL: indeterminate >10 µg/dL: excludes AI in 98.8% >16 µg/dL: NPV 98.7%	The single most practical primary-care decision tool; draw at ~8 AM
Primary vs. secondary biochemistry²	Primary: high ACTH, low aldosterone, high renin, salt craving, hyperkalemia. Secondary: low/normal ACTH, preserved aldosterone, no mineralocorticoid deficiency	Determines both treatment (fludrocortisone) and coding (E27.1 vs. E23.0)
Adrenal crisis clinical criteria (ESE/ES 2024)¹⁹	Hypotension or hypovolemic shock PLUS ≥1 of: nausea/vomiting, severe fatigue, fever, or impaired consciousness; electrolyte abnormalities support but are not required	A clinical definition — do not wait for lab confirmation to treat
APS classification²⁰	APS-I: ≥2 of Addison's, hypoparathyroidism, chronic mucocutaneous candidiasis (AIRE gene; ~1:100,000). APS-II: ≥2 of Addison's, autoimmune thyroid disease, T1DM (polygenic; ~1:1,000, most common)	Frames comorbidity screening; in APS-II do not start levothyroxine before glucocorticoid

ABBREVIATIONS: ACTH = adrenocorticotrophic hormone; AI = adrenal insufficiency; APS = autoimmune polyendocrine syndrome; ES = Endocrine Society; ESE = European Society of Endocrinology; NPV = negative predictive value; T1DM = Type 1 diabetes mellitus

Clues to Dig Deeper

CLUE TO DIG DEEPER	WHAT IT SHOULD PROMPT
Unexplained hyperpigmentation with fatigue, weight loss, or salt craving ²	Morning cortisol + ACTH ; expedited endocrine referral if cortisol is low
Unexplained hyponatremia, especially with hyperkalemia ²	Measure cortisol and ACTH before attributing to SIADH
Elevated TSH that does not fully correct on levothyroxine ²	Consider concurrent AI — about half of untreated patients have an elevated TSH
Persistent fatigue + weight loss + nausea without a GI or psychiatric diagnosis ²	Screen for AI rather than continuing watchful waiting
A patient on long-term glucocorticoids undergoing taper who develops fatigue, nausea, or orthostasis ²	Evaluate for drug-induced AI (E27.3) within days
ABBREVIATIONS: ACTH = adrenocorticotrophic hormone; AI = adrenal insufficiency; GI = gastrointestinal; SIADH = syndrome of inappropriate antidiuretic hormone; TSH = thyroid-stimulating hormone	

Common Oversights

COMMON CLINICAL OVERSIGHT	CONSEQUENCE	CORRECTION
Attributing fatigue, weight loss, and nausea to depression, GI illness, or aging	Diagnosis delayed months to years; up to 50% first present in crisis ³	Add a morning cortisol to the workup when the constellation persists without a clear cause
Assuming normal electrolytes exclude Addison's	False reassurance ; hyponatremia/hyperkalemia are late findings that may appear only near crisis ³	Diagnose on the clinical constellation , not on a single normal chemistry panel
Treating a single cortisol result as definitive	Oral estrogens raise cortisol-binding globulin and can falsely elevate total cortisol, masking disease ²	Interpret in clinical context; use free/salivary cortisol or repeat/dynamic testing in estrogen users
Missing atypical crisis in older adults	Relative hypotension masked by baseline hypertension, hyponatremia blamed on SIADH, delirium misattributed ¹³	Keep adrenal crisis on the differential for any older adult with unexplained refractory hypotension

COMMON CLINICAL OVERSIGHT	CONSEQUENCE	CORRECTION
Overlooking associated autoimmune disease	Comorbid thyroid disease, T1DM, celiac disease, and pernicious anemia go undetected ³	Screen systematically — most autoimmune-Addison's patients develop another autoimmune condition

ABBREVIATIONS: AI = adrenal insufficiency; GI = gastrointestinal; SIADH = syndrome of inappropriate antidiuretic hormone; T1DM = Type 1 diabetes mellitus

Key Differentials in Elderly

DIFFERENTIAL	DISTINGUISHING FEATURES FROM ADDISON'S	NOTE
Secondary/Tertiary Adrenal Insufficiency E27.3 (Drug-induced/iatrogenic Most Common) E23.0 (Organic/Pituitary hypopituitarism)^{2,21}	Pituitary ACTH failure: low/normal ACTH, preserved aldosterone, no hyperpigmentation, no salt craving; does NOT require fludrocortisone	The key treatment contrast — not Addison's disease
Depression/deconditioning²	No hyperpigmentation, hyponatremia, or hyperkalemia; cortisol normal	The most common misattribution in early PAI
Primary GI disorder²	Weight loss and nausea without endocrine biochemical signature; cortisol normal	GI workup should not indefinitely defer a cortisol check
SIADH^{13,22}	Hyponatremia without hyperkalemia, orthostasis, or hyperpigmentation; cortisol normal	A frequent mislabel for the hyponatremia of PAI in older adults
Hypothyroidism³	Elevated TSH may coexist with AI; hypothyroid symptoms overlap but cortisol is normal in isolated thyroid disease	In APS-II, do not start levothyroxine before glucocorticoid replacement

ABBREVIATIONS: ACTH = adrenocorticotropic hormone; AI = adrenal insufficiency; APS = autoimmune polyendocrine syndrome; GI = gastrointestinal; PAI = primary adrenal insufficiency; SIADH = syndrome of inappropriate antidiuretic hormone; TSH = thyroid-stimulating hormone

Comorbidity Screening

COMORBIDITY TO SCREEN	WHY IT MATTERS IN PAI	ACTION*
Autoimmune thyroid disease ^{3,20}	Most common co-occurring autoimmune condition; symptom overlap complicates management	Annual TSH ; in APS-II give glucocorticoid before levothyroxine to avoid precipitating crisis
Type 1 diabetes mellitus ¹⁵	Incidence rate ratio 26.5 in childhood-onset T1DM glucocorticoid replacement destabilizes glucose	Coordinate insulin adjustment with any steroid dose change
Cardiovascular disease ²³	Mortality in PAI is increased ~2.5-fold ; CV disease is the leading cause of death (HR 1.54) ^{23,24}	Monitor blood pressure, glucose, and lipids; women carry elevated IHD risk (aHR 2.15) ¹⁶
Infection risk ²⁴	Infection-related mortality is markedly elevated (HR 4.00); infections are common crisis triggers	Keep the threshold for stress dosing low during any febrile illness
Pernicious anemia, celiac disease, vitiligo, osteoporosis ³	Additional autoimmune associations; chronic glucocorticoids add fracture risk	Screen B12/celiac serology when indicated ; DEXA every 2 years on chronic glucocorticoids

ABBREVIATIONS: aHR = adjusted hazard ratio; CV = cardiovascular; DEXA = dual-energy X-ray absorptiometry; HCC = Hierarchical Condition Category; HR = hazard ratio; IHD = ischemic heart disease; PAI = primary adrenal insufficiency; T1DM = Type 1 diabetes mellitus; TSH = thyroid-stimulating hormone

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**



RED FLAG — EMERGENCY/ACTIVATE CRISIS RESPONSE

- Suspected **adrenal crisis** — hypotension or shock (especially refractory to fluids), severe hyponatremia, altered mental status, or severe vomiting/diarrhea preventing oral medication in a known or suspected AI patient
- Give **hydrocortisone 100 mg IM immediately** (from the patient's emergency kit if available) and call EMS — do **not** delay the injection for IV access
- Keep adrenal crisis on the differential for any **unexplained refractory hypotension**, particularly with a history of glucocorticoid use

**RED FLAG — URGENT (24-72 HOURS)**

- New AI with a **morning cortisol <5 µg/dL** and **elevated ACTH** — endocrine consult for confirmation and treatment
- **Recurrent crisis** despite education
- Newly identified severe **hyponatremia (<125 mEq/L)** or **hyperkalemia** with unexplained fatigue and weight loss
- Patient with **persistent vomiting** who has not yet self-administered IM hydrocortisone

**AAVBC PERSPECTIVE**

AAVBC encourages primary care providers to lower the threshold for testing when unexplained **hyperpigmentation, salt cravings, or persistent lethargy** are present without a clear alternative diagnosis, rather than defaulting to watchful waiting or attributing the symptom cluster to depression, gastrointestinal illness, or deconditioning. Addison's disease loses roughly **substantial adrenal function** before overt symptoms emerge, meaning the clinical presentation is insidious and symptoms may appear months to years before diagnosis. The appropriate first step is an **8 AM serum cortisol** - morning timing is critical, as cortisol follows a diurnal rhythm and a random cortisol has limited diagnostic value. When fatigue, weight loss, and hyperpigmentation or salt cravings cluster together, this test should be ordered before the diagnostic window closes.

AAVBC also supports documentation of **hyperpigmentation** (darkening of skin creases, lips, buccal mucosa, and sun-exposed areas) as the clinical signature that distinguishes primary adrenal insufficiency from secondary and tertiary causes, and encourages providers to preserve this distinction in the clinical record. Addison's disease is not reducible to low cortisol alone; **aldosterone deficiency** is a distinct and concurrent therapeutic requirement that must be recognized and addressed. **This helps ensure the right patients are identified and tested at the right time.**

3 MEAT DOCUMENTATION ESSENTIALS

MEAT documentation allows the reflection of the patient's true clinical complexity. For Addison's disease, the highest-yield habit is to carry **E27.1** as an active problem at every encounter, name the underlying etiology, and, during any acute decompensation, sequence **E27.2** first. Because the condition is chronic and lifelong, each visit is an opportunity to reconfirm the diagnosis, the replacement regimen, and the crisis-prevention plan.

Case vignette: A female patient, 74, with a 6-year history of autoimmune thyroid disease reports months of fatigue, a 4 kg weight loss, and new darkening of her palmar creases. A morning cortisol returns at 3.8 µg/dL with an ACTH more than three times the upper limit of normal; aldosterone is low and renin is high. She is diagnosed with primary adrenal insufficiency, started on

*hydrocortisone and fludrocortisone, prescribed an emergency hydrocortisone kit, and coded **E27.1** with the autoimmune etiology documented and her thyroid disease coded separately.*

Monitor: "Blood pressure (standing): **118/72**, no orthostatic drop. Weight: **stable**, no interval change since diagnosis. Sodium: **136 mEq/L**, potassium **4.2 mEq/L** — both within normal limits. TSH: pending (annual screening due, given autoimmune thyroid history). Fasting glucose: **94 mg/dL**. Fludrocortisone-related renin: not yet checked, plan at next visit. DEXA: not yet due (baseline pending, chronic glucocorticoid use)."

Evaluate: "No signs of over-replacement (no weight gain, edema, insomnia, or cushingoid features). No signs of under-replacement today — prior presenting symptoms (**4 kg weight loss**, fatigue, palmar hyperpigmentation) have resolved on current hydrocortisone/fludrocortisone dosing. No nausea, no orthostasis, no recurrent hyperpigmentation. Clinical picture consistent with adequate, stable replacement; no serum marker exists to titrate hydrocortisone, so dosing is guided by symptoms and exam."

Assess: "**Primary adrenal insufficiency (Addison's disease)**, autoimmune etiology, on stable replacement — chronic stable, not crisis. Associated autoimmune thyroid disease, coded separately. **E27.1** carried as active problem this visit."

Treat: "Continue hydrocortisone **15 mg AM/5 mg early afternoon**, fludrocortisone **0.1 mg daily** — no dose change, current regimen effective. Sick-day plan reviewed: double/triple oral dose with illness or fever, use emergency **IM hydrocortisone 100 mg** kit for vomiting/inability to take oral meds or trauma. Emergency kit prescription confirmed current; patient and spouse re-trained on injection technique today. Medical alert bracelet confirmed in use. Follow-up in **3-6 months** or sooner with illness."

Clinical Documentation Elements

- **Specific diagnosis and etiology:** primary adrenal insufficiency/Addison's disease, autoimmune (or infectious/drug-induced) — supporting **E27.1** rather than **E27.40**
- **Status:** chronic stable vs. adrenal crisis; during crisis, sequence **E27.2** as the principal diagnosis and record the trigger, treatment, and response
- **Dual-hormone regimen:** glucocorticoid and mineralocorticoid doses, with fludrocortisone documented for primary AI
- **Crisis-prevention triad reviewed:** emergency hydrocortisone kit prescribed and in date, sick-day rules taught and teach-back confirmed, and medical-alert identification in place
- **Associated autoimmune conditions screened and separately coded** (T1DM, autoimmune thyroid disease, celiac disease, vitiligo, pernicious anemia)
- **Assay caveats noted** where relevant (oral estrogens elevate cortisol-binding globulin; normal electrolytes do not exclude AI)

Reframing Common Documentation Shortcuts

DOCUMENTATION SHORTCUT	WHY IT FALLS SHORT	REFRAME
"Adrenal insufficiency"	Defaults to E27.40 (unspecified), which carries no Part C HCC and hides a confirmed diagnosis	"Primary adrenal insufficiency (Addison's disease), autoimmune" -> E27.1
"Low cortisol"	Reduces a dual-hormone disorder to a single lab value	State the diagnosis and specify the axis affected — primary AI requires dual replacement (cortisol + fludrocortisone); secondary AI typically requires cortisol only, since aldosterone stays intact
Coding only E27.1 during a crisis admission	Misrepresents acuity and violates sequencing guidance	Sequence E27.2 first when crisis is the reason for the encounter; keep E27.1 for the chronic disease
"Steroid-dependent"	Implies dependency rather than medically necessary replacement	Requires lifelong physiologic cortisol replacement (plus mineralocorticoid in primary AI; cortisol only in secondary AI)
AI after a steroid taper left uncoded	Drug-induced AI (E27.3) is missed when the link to prior steroids is not documented	Document the causative drug and withdrawal context; code E27.3 with the drug code, and pair with Z79.52 (long-term systemic steroid use) to establish medical necessity for the diagnostic taper workup

ABBREVIATIONS: AI = adrenal insufficiency; HCC = Hierarchical Condition Category



DOCUMENTATION REMINDER IS AN ACCURATE CLINICAL RECORD

Specific documentation is simply an accurate clinical record. Naming **Addison's disease**, its etiology, both hormone deficiencies, and the crisis-prevention plan at each visit conveys the real complexity of a patient who depends on lifelong replacement. This further supports correct **E27.1** assignment and the separate documentation of associated autoimmune disease.

4 TREATMENT AND REFERRAL QUICK GUIDE

Treatment is lifelong hormone replacement that mimics physiologic cortisol and aldosterone secretion, with dose escalation during physiologic stress to prevent crisis. Management follows the **Endocrine Society (2016)** guideline and the **2024 ESE/Endocrine Society** joint guidance, refined by the **2025 JAMA** and **2026 Lancet Diabetes & Endocrinology** reviews.^{2,3,4,19}

Therapy Escalation Criteria

SITUATION	ACTION	ESCALATION POINT
Stable chronic Addison's disease ³	Lowest effective glucocorticoid dose plus fludrocortisone; reassess replacement adequacy each visit	Persistent under- or over-replacement signs prompt dose adjustment and, if unresolved, endocrine review
Minor stress (fever, infection on antibiotics, significant emotional stress) ¹⁹	Increase to hydrocortisone ~40 mg/day (or prednisone ~10 mg/day) in divided doses for 2-5 days until recovery	No improvement, or oral intake fails -> move to injectable and contact clinician
Moderate stress (fever >38.5 C, vomiting once) ¹³	Triple the daily oral dose; if oral not tolerated, hydrocortisone 100 mg IM ¹⁹	IM injection if oral not tolerated; ED if no improvement in 1-2 hours
Severe stress/crisis (persistent vomiting/diarrhea, sepsis, trauma, surgery) ^{13,19}	Hydrocortisone 100 mg IM/IV immediately , then 50 mg IV every 6 h or 200 mg continuous over 24 h; fluids	Immediate IM injection + EMS; do not delay for IV access ³
Major surgery/general anesthesia ¹⁹	Perioperative stress-dose protocol coordinated with anesthesia (IV hydrocortisone at induction)	Endocrine consult in advance for planning

ABBREVIATIONS: ED = emergency department; EMS = emergency medical services; IM = intramuscular; IV = intravenous ***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Endocrine Society Guideline-Aligned Replacement by Agent and Profile

AGENT	GUIDELINE-ALIGNED DOSE*	ROLE AND OLDER-ADULT CONSIDERATIONS
Hydrocortisone (first-line glucocorticoid)	15-25 mg/day orally in 2-3 divided doses, largest dose on waking to mimic diurnal rhythm ⁴	Start at the lower end (10-15 mg/day) in frail elderly to limit bone loss and glycemic destabilization; avoid late-day dosing (insomnia)
Prednisone (alternative)	3-5 mg each morning ⁴	Longer half-life and simpler dosing , but higher over-replacement risk per mg; monitor blood pressure, glucose, and bone density
Fludrocortisone (mineralocorticoid — required in PAI)	0.05-0.2 mg once daily (typical 0.1 mg) ⁴	Titrate on standing BP, edema, sodium/potassium; reduce to 0.05 mg if transient hypertension develops ; may need seasonal adjustment; NOT used in secondary AI ²
Hydrocortisone 100 mg IM (emergency)	100 mg IM/IV bolus for crisis or when oral cannot be retained ¹³	Every patient must have a current kit ; a trained caregiver is essential when the older adult cannot self-inject

ABBREVIATIONS: AI = adrenal insufficiency; BP = blood pressure; IM = intramuscular; IV = intravenous; PAI = primary adrenal insufficiency *Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions



CLINICAL PEARL

Titrate hydrocortisone to the lowest effective dose that restores well-being. No serum marker guides dosing, and **ACTH** remains chronically elevated in **PAI**. Using it to adjust the dose leads to dangerous over-replacement. In frail older adults, even standard "replacement" doses can drive **bone loss, hyperglycemia, and hypertension**, so favor the lower end of the dosing range and reassess function regularly.

Non-Pharmacologic Care and Crisis Prevention

INTERVENTION	RATIONALE	DOCUMENTATION/ACTION
Emergency hydrocortisone kit + caregiver training ¹³	Self- or caregiver-administered IM hydrocortisone prevents fatal crisis when oral intake fails	Prescribe, confirm expiry, train patient AND a household caregiver ; document who was trained and when

INTERVENTION	RATIONALE	DOCUMENTATION/ACTION
Individualized sick-day rules	~ 30% of patients answer incorrectly about dose adjustment during GI illness — the most common trigger ²⁵	Provide a written tiered plan ; confirm teach-back; review at every encounter
Medical-alert identification ¹³	May be the only emergency communication tool for a patient with dementia or communication barriers	Confirm the patient wears it stating "Adrenal Insufficiency — requires hydrocortisone"
Liberal sodium, calcium, and vitamin D ⁴	Patients salt-waste and need liberal sodium; chronic glucocorticoids threaten bone	Counsel on a liberalized diet exceeding the standard 6 g/day sodium intake (especially in heat/exercise), plus calcium and vitamin D at least annually

ABBREVIATIONS: GI = gastrointestinal; IM = intramuscular

Medication Safety and Key Interactions

DRUG/CLASS*	INTERACTION	MANAGEMENT
Hydrocortisone	Replacement doses still carry dose-dependent harm: even <5 mg/day prednisolone-equivalent raised all-cause CV risk (HR 1.74); systemic steroids raise hyperglycemia (OR 2.13), hypertension (OR 1.68), weight gain (OR 5.20) ^{4,26,27}	Use the lowest effective dose; monitor BP, glucose/HbA1c, lipids, and bone density
Fludrocortisone	Mineralocorticoid effects — hypertension, edema, hypokalemia — worsened in older adults with CV disease ²	Monitor BP, potassium, and edema; reduce dose if transient hypertension develops
Rifampin (and phenytoin, phenobarbital, carbamazepine)	CYP3A4 inducers accelerate hydrocortisone metabolism and can precipitate crisis ^{13,21}	Increase hydrocortisone 2-3x when rifampin starts; monitor for under-replacement with other inducers
Levothyroxine	In APS-II, starting levothyroxine before glucocorticoid can precipitate crisis by accelerating cortisol metabolism ²⁸	Replace glucocorticoid first, then levothyroxine
Oral estrogens	Raise cortisol-binding globulin, falsely elevating total cortisol and masking under-replacement ²	Do not titrate on total cortisol alone; use free/salivary cortisol

DRUG/CLASS*	INTERACTION	MANAGEMENT
Antidiabetic agents (insulin, sulfonylureas)	Glucocorticoid dose changes destabilize glucose in comorbid diabetes ²⁹	Monitor glucose closely and adjust with any steroid dose change

ABBREVIATIONS: APS = autoimmune polyendocrine syndrome; BP = blood pressure; CV = cardiovascular; CYP3A4 = cytochrome P450 3A4; HbA1c = hemoglobin A1c; HR = hazard ratio; OR = odds ratio

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

When to Refer

SITUATION	REFER TO	TIMING
Suspected adrenal crisis²	Emergency department/EMS (after immediate IM hydrocortisone)	Immediate
New AI (cortisol <5 µg/dL, high ACTH)²	Endocrinology for confirmation and treatment initiation	Within 24-48 hours
Recurrent crisis despite education, suspected APS, need for dynamic testing, pregnancy, or perioperative planning²	Endocrinology	Same-day to within days , per acuity
Unexplained hyperpigmentation with chronic fatigue, weight loss, salt craving²	Endocrinology for diagnostic workup	Expedited, within 1-2 weeks
Newly diagnosed/stable PAI²	Endocrinology co-management with primary care	At diagnosis , then at least annual specialist review

ABBREVIATIONS: ACTH = adrenocorticotrophic hormone; AI = adrenal insufficiency; APS = autoimmune polyendocrine syndrome; EMS = emergency medical services; IM = intramuscular; PAI = primary adrenal insufficiency

Follow-Up Timing

INTERVAL	WHAT TO REVIEW	PURPOSE
Every encounter⁴	Standing BP, weight, over-/under-replacement signs, sick-day rules teach-back, emergency-kit status, medical-alert ID	Detect replacement drift and keep the crisis-prevention plan current

INTERVAL	WHAT TO REVIEW	PURPOSE
Every 3-6 months (and with illness/dose change)⁴	Serum sodium and potassium	Confirm adequate mineralocorticoid replacement
Annually⁴	TSH, fasting glucose/HbA1c, lipids; screening for associated autoimmune disease	Catch comorbid autoimmune and metabolic disease early
Every 2 years³⁰	DEXA bone density	Monitor glucocorticoid-related bone loss
At each fludrocortisone change⁴	Plasma renin, standing BP, edema	Target renin in the upper-normal range
ABBREVIATIONS: BP = blood pressure; DEXA = dual-energy X-ray absorptiometry; HbA1c = hemoglobin A1c; ID = identification; TSH = thyroid-stimulating hormone		

Comorbidity Management

COMORBIDITY	PRIMARY-CARE ROLE	COORDINATION
Autoimmune thyroid disease⁴	Annual TSH; treat hypothyroidism after glucocorticoid is established ²⁰	Endocrine input in APS-II
Type 1 diabetes	Adjust insulin with steroid dose changes; watch for bidirectional hypoglycemia ^{15,29}	Diabetes care team co-management
Cardiovascular disease	Monitor BP, glucose, lipids; recognize elevated CV mortality in PAI and IHD risk in women ²⁴	Cardiology when indicated
Bone health	Calcium/vitamin D, DEXA every 2 years, FRAX assessment; bisphosphonate when risk exceeds threshold ³⁰	Follow ACR glucocorticoid-induced osteoporosis guidance
Infection	Low threshold for stress dosing during febrile illness; vaccinate¹⁹	Reinforce sick-day rules

ABBREVIATIONS: ACR = American College of Rheumatology; BP = blood pressure; CV = cardiovascular; DEXA = dual-energy X-ray absorptiometry; FRAX = Fracture Risk Assessment Tool; IHD = ischemic heart disease; PAI = primary adrenal insufficiency

Cost-Smart Options

BRAND (EST. COST)*	GENERIC (EST. COST)	EST. SAVINGS	COST-SMART TIP
Brand Cortef (hydrocortisone 20mg oral) (~\$97/month at standard 20mg/day Addison's dose) ³¹	Generic hydrocortisone 20mg (~\$13-18/month cash; from ~\$13 with discount card) ^{32,33}	~\$79-84/month	Generic hydrocortisone is bioequivalent to Cortef; no clinical indication favors brand; Cortef is typically not covered by Medicare Part D — generic hydrocortisone is ³⁴
Brand Rayos (delayed-release prednisone) (~\$450-600/month) ³⁵	Generic prednisone 5mg (~\$9-15/month) ³⁶	~\$435-585/month	Prednisone 3-5 mg/day is an acceptable alternative when divided hydrocortisone dosing is not feasible; generic prednisone is the appropriate choice — Rayos offers no clinical advantage in Addison's; note that prednisone's longer half-life makes circadian rhythm mimicry less physiologically precise than hydrocortisone
Brand dexamethasone — all brands discontinued ³⁷	Generic dexamethasone (~\$9-15/month) ³⁸	N/A	Dexamethasone carries significant supraphysiologic risk and is not preferred for long-term outpatient management ; if found on a patient's medication list, review with endocrinology before continuing
Brand Solu-Cortef 100mg Act-O-Vial emergency kit (~\$25-33/vial) ^{39,40}	Generic A-Hydrocort 100mg (~\$12.77/vial with discount card) ⁴¹	~\$12-20/vial	Emergency IM hydrocortisone kit is non-negotiable for every diagnosed patient — prescribe, train, and document at every visit; prescribe generic A-Hydrocort to remove cost as a barrier; document who in the household is trained and when

BRAND (EST. COST)*	GENERIC (EST. COST)	EST. SAVINGS	COST-SMART TIP
Brand Florinef (fludrocortisone) — discontinued by manufacturer⁴²	Generic fludrocortisone 0.1mg — only available option (avg retail ~\$76/30 tablets) ⁴³	N/A	Brand Florinef is discontinued; prescribe 0.05–0.2 mg once daily generic only; adjust dose based on standing BP, sodium, potassium, and edema at every visit; dose often requires upward seasonal adjustment in summer due to increased sodium and water loss

ABBREVIATIONS: IM = intramuscular; IV = intravenous; OTC = over-the-counter; BP = blood pressure

***Consult FDA labels for the most up-to-date dosage information, contraindications, and drug-drug interactions**

Patient Education and Adherence

- Patient education is a recurring clinical intervention, not a one-time event: **more than half** of diagnosed patients cannot correctly explain how to adjust their dose during a GI illness. This is the most common crisis trigger
- At each visit, confirm the patient (and a **caregiver**, when the older adult cannot self-inject) can state the **sick-day rules**, has an **in-date emergency hydrocortisone kit**, and wears **medical-alert identification**
- Reinforce that normal electrolytes do **not** mean the patient is safe to skip dose escalation



DOCUMENTATION REMINDER — CRISIS-PREVENTION TRIAD

Document the crisis-prevention triad at every encounter: **emergency hydrocortisone kit** prescribed and in-date, **sick-day rules** taught with teach-back confirmed, and **medical-alert identification** in place, noting who received training.



CLINICAL PEARL: SICK DAY MANAGEMENT

Sick-day dosing for adrenal insufficiency scales with severity.

For **mild stress** (common cold, no fever), the standard replacement dose is usually sufficient.

For **moderate illness** (fever $>37.5^{\circ}\text{C}/100.4^{\circ}\text{F}$, significant infection, or dental procedures), **double or triple** the daily oral hydrocortisone dose for the illness duration.

For **severe illness or vomiting**, repeat the dose if vomited within 30-45 minutes; if oral medication cannot be retained, administer the **emergency hydrocortisone injection** and seek immediate care. **Fludrocortisone dosing should not be increased** during illness, as this risks hypertension and fluid retention.

Quality Metrics Tie-In

No HEDIS, Star, or MIPS measure is specific to Addison's Disease. The highest-yield internal quality targets are crisis-prevention documentation proxies; sick-day rule counseling, emergency injection kit prescription and status, medic-alert documentation, and patient/caregiver education.

MEASURE/ PROGRAM	STANDARD	APPLICABILITY TO ADDISON'S DISEASE
Medication Adherence (Part D Star)	Denominator: Medicare Part D enrollees dispensed a chronic medication class with ≥ 2 fills during the measurement period Numerator: proportion of days covered (PDC) ≥ 0.80 for the medication class during the measurement period Exclusions: hospice, long-term care, end-stage conditions	No individual MIPS equivalent; CMS calculates automatically from Part D pharmacy claims. Non-adherence to hydrocortisone and fludrocortisone is a leading precipitant of adrenal crisis; assess adherence and barriers explicitly at every visit rather than assuming fill data reflects actual ingestion
All-Cause Readmissions (CMS Stars PCR; MIPS #479)	Denominator: enrollees ≥ 18 with acute inpatient discharge Numerator: unplanned readmission within 30 days (lower is better) Exclusions: planned readmissions, hospice, psychiatric	MIPS #479 is group-level only; individual PCPs cannot submit it directly. Adrenal crisis admissions contribute substantially to the 30-day readmission rate in this population; document sick-day education, emergency injection kit status, and individualized trigger counseling at each discharge and follow-up visit

MEASURE/ PROGRAM	STANDARD	APPLICABILITY TO ADDISON'S DISEASE
Controlling High Blood Pressure (HEDIS CBP; MIPS #236)	Denominator: patients 18-85 with hypertension (≥ 2 outpatient visits with HTN diagnosis in measurement period or year prior) Numerator: most recent BP $< 140/90$ mmHg during measurement period Exclusions: ESRD, hospice, palliative care, pregnancy	Fludrocortisone can raise BP through mineralocorticoid-mediated sodium and water retention; BP monitoring at every visit is routine PAI management. Uncontrolled hypertension signals over-replacement — reduce fludrocortisone dose before initiating antihypertensive therapy
Osteoporosis Screening (MIPS #39)	Denominator: women 65-85 with a qualifying visit during the performance period Numerator: documentation of central DXA of hip or spine, ever performed Exclusions: prior diagnosis of osteoporosis; hospice	Chronic physiologic glucocorticoid replacement accelerates bone loss even at standard doses
Post-Fracture Management (MIPS #418)	Denominator: women 50-85 with a fracture during the measurement period or year prior Numerator: BMD test or pharmacotherapy for osteoporosis within 180 days of fracture Exclusions: fractures of finger, toe, face, or skull; hospice; frailty + advanced illness (≥ 66)	DEXA every 2 years is the clinical standard for PAI but falls outside both MIPS #39 (women 65-85 without prior osteoporosis) and MIPS #418 (post-fracture only) — treat as an internal practice benchmark for all PAI patients regardless of age or sex
Glycemic Control (MIPS #1)	Denominator: patients 18-75 with diabetes (≥ 2 diagnoses on different service dates in measurement period or prior year, or diagnosis + dispensed diabetes medication) Numerator (inverse): most recent HbA1c $> 9.0\%$ or missing during measurement period Exclusions: hospice, palliative care, frailty + advanced illness (≥ 66)	For comorbid T1DM (autoimmune polyglandular syndrome), cortisol deficiency reduces insulin counter-regulation and lowers insulin requirements — monitor HbA1c annually and adjust diabetes management at each visit

ABBREVIATIONS: BP = blood pressure; DEXA = dual-energy X-ray absorptiometry; HbA1c = hemoglobin A1c; HEDIS = Healthcare Effectiveness Data and Information Set; MIPS = Merit-based Incentive Payment System; PAI = primary adrenal insufficiency; T1DM = Type 1 diabetes mellitus



AAVBC PERSPECTIVE

AAVBC supports proactive emergency preparedness for all patients with confirmed Addison's disease, recognizing that **adrenal crisis** is a life-threatening emergency that is preventable when patients and providers are adequately prepared. Crisis is triggered by physiologic stressors such as illness, surgery, trauma, or missed doses, and presents with sudden severe pain, vomiting, dehydration, hypotension, and possible loss of consciousness. Every patient with confirmed Addison's disease must have a **rescue steroid supply** and documented understanding of **Sick Day Rules**, including clear guidance on when to administer emergency hydrocortisone and when to call 911.

AAVBC supports a fundamental shift in PCP behavior from reactive management, such as waiting for crisis to prompt action, to proactive screening when a constellation of non-specific symptoms warrant earlier clinical investigation. **This helps ensure the right patients receive the right preparation and the right treatment at the right time.**



QUALITY OUTCOME

The best outcome measure in Addison's disease is a crisis that never happens.
Consistent crisis-prevention documentation, timely and specific coding, and systematic comorbidity documentation work together to keep patients safer and reduce preventable hospital admissions and readmissions.

5 CODING REMINDERS AND CASE EXAMPLES

Coding Specificity

ICD-10	DESCRIPTION	V28 HCC (PART C)	CODING DISCIPLINE
E27.1	Primary adrenocortical insufficiency (Addison's disease; autoimmune adrenalitis)	HCC 51 (CNA RAF 0.510)	Use for confirmed Addison's; document etiology; carry as an active problem every encounter
E27.2	Addisonian/adrenal crisis	No Part C HCC	Sequence FIRST when crisis is the reason for the encounter; document trigger, treatment, response
E27.3	Drug-induced adrenocortical insufficiency	No Part C HCC	Document the causative drug and steroid-withdrawal context; add the drug code

ICD-10	DESCRIPTION	V28 HCC (PART C)	CODING DISCIPLINE
E27.40/E27.49	Unspecified/other adrenocortical insufficiency	No Part C HCC	Avoid E27.40 when etiology is known; move to the specific E27.1
E23.0	Hypopituitarism (secondary adrenal insufficiency)	No Part C HCC	Pituitary ACTH failure — NOT Addison's; no fludrocortisone; distinct from E27.1
E31.0/A18.7/Z79.52	Autoimmune polyglandular failure/adrenal TB/long-term steroid use	E31.0 -> HCC 51; A18.7 and Z79.52 no Part C HCC	Code E31.0 when APS applies; add A18.7 for TB etiology; Z79.52 documents chronic replacement

ABBREVIATIONS: ACTH = adrenocorticotrophic hormone; APS = autoimmune polyendocrine syndrome; CNA = Community Non-Dual Eligible, Aged; HCC = Hierarchical Condition Category; RAF = Risk Adjustment Factor; TB = tuberculosis; V28 = CMS-HCC Model Version 28

Annual Clinical Review and Confirmation

- Addison's is a lifelong condition, so **E27.1** should appear as an **active problem at least annually and at every relevant encounter**, with the diagnosis re-stated specifically rather than carried forward as "adrenal insufficiency"
- **Confirm the etiology** (autoimmune, infectious, drug-induced), the ongoing dual-hormone regimen, and the crisis-prevention plan at each review
- Because only **E27.1** (and **E31.0**) carry a Part C HCC in V28, the annual review is the moment to move any lingering **E27.40** documentation to the specific, confirmed code and to record the supporting biochemistry (low morning cortisol, elevated ACTH, low aldosterone/high renin)
- The annual review is also the highest-yield opportunity to document associated autoimmune disease — T1DM, autoimmune thyroid disease, celiac disease, vitiligo, pernicious anemia — each of which reflects independent clinical complexity and, where applicable, its own HCC
- During any acute presentation, sequence **E27.2** as the principal diagnosis and document the trigger, the treatment given, and the response, while still recording the underlying chronic **E27.1**

Good Documentation — EHR Tips

EHR TIP	HOW IT HELPS
Store the diagnosis as "Primary adrenal insufficiency (Addison's), autoimmune" on the problem list, not "adrenal insufficiency"	Prevents the E27.40 default and keeps the HCC-eligible E27.1 in view each visit
Build an encounter smartphrase for the crisis-prevention triad	Prompts documentation of kit, sick-day teach-back, and medical-alert ID every visit
Add a crisis-coding reminder to trigger on E27.2	Reinforces sequencing E27.2 first with trigger/treatment/response
Link an autoimmune-comorbidity screening checklist to the annual review	Documents T1DM, thyroid, celiac, vitiligo, and pernicious anemia consistently
Flag oral-estrogen use and normal-electrolyte results as interpretation caveats	Reduces false-negative and false-reassurance errors at the point of care
ABBREVIATIONS: EHR = electronic health record; HCC = Hierarchical Condition Category; ID = identification; T1DM = Type 1 diabetes mellitus	

Brief Case Examples

SUCCESS — Specific Diagnosis, Dual-Hormone Care, Comorbidity Documented

Patient: Female patient, 74, with autoimmune thyroid disease; months of fatigue, weight loss, and new palmar-crease hyperpigmentation.

Documentation: "Primary adrenal insufficiency (Addison's disease), autoimmune; morning cortisol 3.8 µg/dL, ACTH >3x ULN, low aldosterone/high renin. On hydrocortisone + fludrocortisone. Emergency kit prescribed, caregiver trained, sick-day rules reviewed (teach-back confirmed), medical-alert ID in place. Autoimmune thyroid disease coded separately."

Outcome: Coded **E27.1** (HCC 51) with etiology and comorbidity documented; crisis-prevention plan documented. Record reflects true complexity and supports coordinated care.

PITFALL — Unspecified Coding and Omitted Complexity

Documentation as written: "Adrenal insufficiency, stable on steroids." No etiology, no mineralocorticoid noted, no crisis plan; comorbid thyroid disease omitted.

Consequence: Defaults to **E27.40** (no Part C HCC), hides a confirmed diagnosis, and misses the dual-hormone dependence and associated autoimmune disease.

RAF/complexity impact: The HCC-eligible **E27.1** and the separate autoimmune-comorbidity complexity are lost; the record understates the patient's true risk.

Fix: Document "primary adrenal insufficiency (Addison's), autoimmune," note both hormone deficiencies and the crisis-prevention triad, and code associated autoimmune conditions.

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