

Supplementary Table 1 Complete Layer 2 cross-system orthogonal extreme-value exclusion criteria.

#	Criterion	System Used For Exclusion	Threshold (<60 yr)	Threshold (≥60 yr)	Rationale for Threshold	N Flagged
1	Urine BLD ≥ 3+	Urinalysis	≥ 3+	≥ 3+	Gross hematuria indicates urinary tract pathology (stone, tumor, glomerulonephritis)	101
2	Urine GLU ≥ 2+	Urinalysis	≥ 2+	≥ 2+	Significant glycosuria indicates poorly controlled diabetes	81
3	NIT+ AND LEU+ (UTI evidence)	Urinalysis	Both positive	Both positive	Combined nitrite + leukocyte esterase is highly specific for urinary tract infection	50
4	Urine PRO ≥ 2+	Urinalysis	≥ 2+	≥ 2+	Proteinuria ≥ 2+ indicates glomerular pathology (exclude orthostatic/transient)	22
5	TG > 10.0 mmol/L	Lipid	> 10.0	> 10.0	Severe hypertriglyceridemia — pancreatitis risk level; indicates genetic or secondary lipid disorder	18
6	UA > 600 umol/L	Renal	> 600	> 600	Severe hyperuricemia — nephropathy/gout risk; far exceeds any physiological range	17
7	GLU < 2.5 or > 15.0 mmol/L	Glycemic	< 2.5 or > 15.0	< 2.5 or > 15.0	Hypoglycemia (<2.5) or severe hyperglycemia (>15.0) — metabolic emergency / poorly controlled diabetes	10
8	GGT > 300 U/L	Hepatic	> 300	> 300	>5x any reasonable ULN; indicates biliary obstruction, alcoholic hepatitis, or hepatic malignancy	8
9	WBC < 2.0 or > 15.0 x10 ⁹ /L	Hematology	< 2.0 or > 15.0	< 2.0 or > 15.0	Leukopenia (<2.0) — bone marrow suppression; leukocytosis (>15.0) — active infection/inflammation	8
10	TBIL > 50 umol/L	Hepatic	> 50	> 50	Overt clinical jaundice — biliary obstruction, hepatitis, or hemolysis	5
11	Urea > 12	Renal	> 12	> 12	Overt renal	4

	mmol/L				insufficiency (corresponds to eGFR ~30 mL/min); far exceeds physiological range	
12	HGB < 90 (M) / < 80 (F) g/L	Hematology	M: < 90 F: < 80	M: < 80 F: < 70	Moderate anemia indicating hematologic pathology or chronic disease; relaxed cutoffs for elderly [*]	4
13	PLT < 50 or > 600 x10 ⁹ /L	Hematology	< 50 or > 600	< 50 or > 600	Severe thrombocytopenia — bleeding risk; thrombocytosis — myeloproliferative or reactive	3
14	CREA > 200 (or > 250 if >= 60 yr)	Renal	> 200	> 250	Overt renal impairment (~eGFR <30); relaxed cutoff for elderly as GFR physiologically declines with age [*]	0
15	AST > 200 U/L	Hepatic	> 200	> 200	>5x any reasonable ULN; indicates severe hepatocellular injury (ischemic, toxic, or viral hepatitis)	1

[*] Age-differentiated threshold: elderly participants (>=60 years) have relaxed cutoffs to prevent misclassification of physiological age-related changes as pathological exclusion criteria. For CREA (criterion #14), elderly threshold is >250 umol/L vs. >200 for younger adults. For HGB (criterion #12), elderly women threshold relaxed to <70 g/L (vs. <80), elderly men to <80 g/L (vs. <90).