Supplementary Table S1. Admission biomarker levels by pathogen type.

Biomarker	Bacterial (n = 35)	Viral (n = 25)	Fungal (n = 2)	Mixed / Unknown (n = 18)	p value*
CRP (mg/L), median (IQR)	75 (55–110)	40 (28–60)	90 (70–110)	60 (40–85)	0.010
PCT (ng/mL), median (IQR)	5.0 (3.0–8.0)	1.5 (0.8–3.0)	7.0 (5.0–9.0)	3.0 (1.5–5.0)	< 0.001
IL-6 (pg/mL), median (IQR)	240 (170–380)	210 (140–300)	260 (200–320)	230 (160–340)	0.15
SAA (mg/L), median (IQR)	170 (120–230)	145 (100–190)	190 (150–240)	155 (110–210)	0.30
ESR (mm/h), median (IQR)	38 (28–50)	32 (22–44)	45 (35–55)	34 (26–45)	0.40
D-dimer (mg/L), median (IQR)	1.8 (1.3–2.6)	1.4 (1.0–2.0)	2.0 (1.5–2.8)	1.6 (1.1–2.3)	0.12

*Kruskal-Wallis test
CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IL-6, interleukin-6; IQR, interquartile range; PCT, procalcitonin; SAA, serum amyloid A.

Supplementary Table S2. Admission biomarker levels by primary infection site.

Biomarker	Respiratory (n = 30)	Abdominal/GI (n = 20)	Urinary-tract (n = 10)	Other/Unknown (n = 20)	p value
CRP (mg/L), median (IQR)	70 (50–100)	80 (60–115)	55 (35–75)	60 (40–85)	0.14
PCT (ng/mL), median (IQR)	4.0 (2.0–6.0)	5.0 (3.0–8.0)	3.0 (1.8–4.5)	2.8 (1.4–5.0)	0.18
IL-6 (pg/mL), median (IQR)	260 (180–400)	210 (150–310)	140 (100–200)	230 (150–330)	0.030
SAA (mg/L), median (IQR)	165 (120–230)	170 (125–240)	150 (110–210)	155 (110–210)	0.33
ESR (mm/h), median (IQR)	38 (28–50)	36 (26–47)	33 (23–42)	34 (24–45)	0.40
D-dimer (mg/L), median (IQR)	1.7 (1.2–2.5)	1.8 (1.3–2.6)	1.5 (1.0–2.1)	1.6 (1.1–2.3)	0.22

*Kruskal-Wallis test
CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IL-6, interleukin-6; IQR, interquartile range; PCT, procalcitonin; SAA: serum amyloid-A

Supplementary Table S3. Seven-day biomarker change $\Delta(T_2–T_0)$ by pathogen type.

Biomarker	Bacterial	Viral	Fungal	Mixed / Unknown	p
ΔCRP (mg/L), median (IQR)	–55 (–70 to –40)	–35 (–50 to –25)	–60 (–80 to –40)	–45 (–60 to –30)	0.09
ΔPCT (ng/mL), median (IQR)	–4.0 (–6.0 to –2.0)	–1.0 (–2.0 to –0.5)	–5.0 (–7.0 to –3.0)	–2.0 (–3.5 to –1.0)	0.07
ΔIL-6 (pg/mL), median (IQR)	–160 (–230 to –90)	–120 (–190 to –70)	–180 (–220 to –140)	–140 (–200 to –80)	0.18
ΔSAA (mg/L), median (IQR)	–120 (–170 to –70)	–110 (–150 to –60)	–130 (–190 to –90)	–115 (–160 to –65)	0.31
ΔESR (mm/h), median (IQR)	–10 (–18 to –5)	–8 (–15 to –4)	–12 (–18 to –6)	–9 (–16 to –4)	0.42
ΔD-dimer (mg/L), median (IQR)	–0.6 (–1.0 to –0.3)	–0.5 (–0.9 to –0.2)	–0.7 (–1.2 to –0.4)	–0.6 (–1.0 to –0.3)	0.25

Δ, Change in; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IL-6, interleukin-6; IQR, interquartile range; PCT, procalcitonin; SAA: serum amyloid-A

Supplementary Table S4. Interaction tests (effect-modification p values).

Biomarker	Pathogen × ΔBiomarker p value	Infection-site × ΔBiomarker p value
CRP	0.21	0.25
PCT	0.18	0.22
IL-6	0.27	0.28
SAA	0.45	0.47
ESR	0.60	0.63
D-dimer	0.32	0.30

CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IL-6, interleukin-6; PCT, procalcitonin; SAA: serum amyloid-A

Supplementary Table S5. pSOFA trajectory over the first week

Time-point	Mean ± SD	Median (IQR)
T0 (Admission)	3.8 ± 1.5	4 (3–5)
T1 (72 h)	2.9 ± 1.4	3 (2–4)
T2 (Day 7)	1.9 ± 1.2	2 (1–3)

IQR, interquartile range; pSOFA, pediatric Sequential Organ Failure Assessment; SD, standard deviation.

Supplementary Table S6. Log-scale sensitivity analysis (Δln biomarker vs. ΔpSOFA).

Biomarker	Δln (T2–T0) Median (IQR)	Spearman r with ΔpSOFA	*p-value*	Adjusted β (95% CI)*	*p-value*	AUC for pSOFA ≤ 2
CRP	–1.18 (–1.61 to –0.92)	–0.46	0.001	–0.06 (–0.11 to –0.01)	0.016	0.81
PCT	–1.25 (–1.75 to –0.78)	–0.51	<0.001	–0.08 (–0.13 to –0.03)	0.004	0.84
IL-6	–1.80 (–2.31 to –1.21)	–0.56	<0.001	–0.34 (–0.50 to –0.18)	<0.001	0.90
SAA	–1.14 (–1.55 to –0.70)	–0.34	0.005	–0.05 (–0.10 to 0.00)	0.065	0.77
ESR	–0.29 (–0.46 to –0.11)	–0.20	0.080	–0.02 (–0.05 to 0.01)	0.21	0.69
D-dimer	–0.81 (–1.20 to –0.49)	–0.44	0.002	–0.07 (–0.12 to –0.02)	0.011	0.79

Δ, Change in; AUC, area under the curve; CI, confidence interval; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; IL-6, interleukin-6; IQR, interquartile range; PCT, procalcitonin; pSOFA, pediatric Sequential Organ Failure Assessment; SAA: serum amyloid-A.
*β indicates change in ΔpSOFA per 1-unit decrease in ln(biomarker); models adjusted for age.

Supplementary Table S7. Optimal admission cut-offs (Youden index) for adverse outcome.

Biomarker	Optimal cut-off	AUC (95% CI)	Sensitivity	Specificity
CRP	≥ 60 mg/L	0.78 (0.68–0.88)	72%	76%
PCT	≥ 3.0 ng/mL	0.82 (0.72–0.91)	76%	78%
IL-6	≥ 200 pg/mL	0.86 (0.77–0.94)	80%	82%
D-dimer	≥ 1.5 mg/L	0.75 (0.64–0.85)	70%	71%

AUC, area under the curve; CI, confidence interval; CRP, C-reactive protein; IL-6, interleukin-6; PCT, procalcitonin.