

Figure S1 Effects of antibiotic usage on the microbiota composition. (A) The microbiota composition of each individual patient at the phylum level (above panel). The table below shows the history of antibiotics each patient received. The blue bars represent the duration of antibiotic usage. (B) The cluster in fecal microbiota composition at the order level in septic patients. The top panel shows the classes of antibiotics each patient received during their stay in the ICU prior to fecal sampling. The heatmap based on the abundance of the microbiota was analyzed using the R package “pheatmap”.

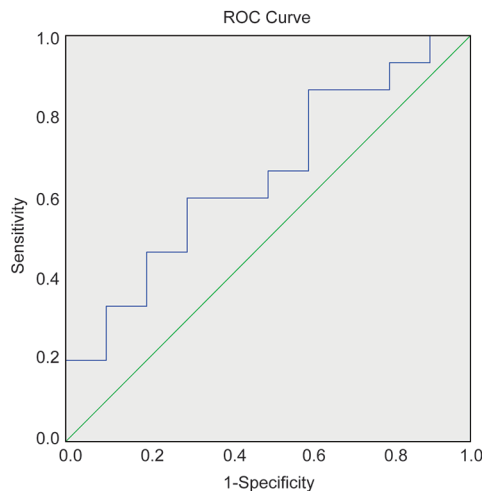


Figure S2 Variables tested by the receiver operating characteristics (ROC) curve with the Youden index used to select the optimal F/B-ratio cut-off value.

Table S1 The Youden index for different F/B-ratio

| F/B-ratio | Sensitivity | Specificity | Youden inde ^x a |
|------------|-------------|-------------|----------------------------|
| -0.962447 | 0 | 1 | 0 |
| 0.045269 | 0.067 | 1 | 0.067 |
| 0.130323 | 0.133 | 1 | 0.133 |
| 0.23455 | 0.2 | 1 | 0.2 |
| 0.279403 | 0.2 | 0.9 | 0.1 |
| 0.42287 | 0.267 | 0.9 | 0.167 |
| 0.564136 | 0.333 | 0.9 | 0.233 |
| 0.598574 | 0.333 | 0.8 | 0.133 |
| 0.700053 | 0.4 | 0.8 | 0.2 |
| 0.839495 | 0.467 | 0.8 | 0.267 |
| 3.019338 | 0.467 | 0.7 | 0.167 |
| 7.071272 | 0.533 | 0.7 | 0.233 |
| 24.569 | 0.6 | 0.7 | 0.3 |
| 48.547837 | 0.6 | 0.6 | 0.2 |
| 68.478255 | 0.6 | 0.5 | 0.1 |
| 82.19674 | 0.667 | 0.5 | 0.167 |
| 92.197132 | 0.667 | 0.4 | 0.067 |
| 105.052824 | 0.733 | 0.4 | 0.133 |
| 152.662431 | 0.8 | 0.4 | 0.2 |
| 222.644559 | 0.867 | 0.4 | 0.267 |
| 310.834903 | 0.867 | 0.3 | 0.167 |
| 995.296751 | 0.867 | 0.2 | 0.067 |
| 1911.24238 | 0.933 | 0.2 | 0.133 |
| 3101.2057 | 0.933 | 0.1 | 0.033 |
| 5496.09214 | 1 | 0.1 | 0.1 |
| 6994.26366 | 1 | 0 | 0 |

^a, Youden index = |Sensitivity – (1 – Specificity)|.

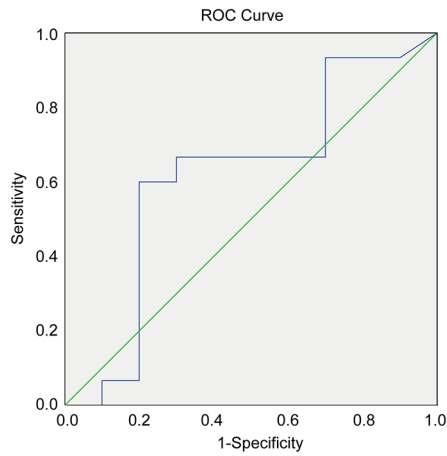


Figure S3 Variables tested by the receiver operating characteristics (ROC) curve with the Youden index used to select the optimal Bacteroidetes cut-off value.

Table S2 The Youden index for different abundance of Bacteroidetes.

| Abundance of Bacteroidetes | Sensitivity | Specificity | Youden index ^a |
|----------------------------|-------------|-------------|---------------------------|
| -0.99800 | 1 | 0 | 0 |
| 0.00300 | 0.933 | 0.1 | 0.033 |
| 0.006500 | 0.933 | 0.2 | 0.133 |
| 0.010000 | 0.933 | 0.3 | 0.233 |
| 0.013000 | 0.867 | 0.3 | 0.167 |
| 0.026000 | 0.8 | 0.3 | 0.1 |
| 0.039000 | 0.733 | 0.3 | 0.033 |
| 0.045500 | 0.667 | 0.3 | 0.033 |
| 0.058500 | 0.667 | 0.4 | 0.067 |
| 0.073000 | 0.667 | 0.5 | 0.167 |
| 0.102000 | 0.667 | 0.6 | 0.267 |
| 0.168000 | 0.667 | 0.7 | 0.367 |
| 0.293000 | 0.6 | 0.7 | 0.3 |
| 4.319000 | 0.6 | 0.8 | 0.4 |
| 18.572500 | 0.533 | 0.8 | 0.333 |
| 35.754500 | 0.467 | 0.8 | 0.267 |
| 45.751000 | 0.4 | 0.8 | 0.2 |
| 51.166500 | 0.333 | 0.8 | 0.133 |
| 55.195500 | 0.267 | 0.8 | 0.067 |
| 58.540000 | 0.2 | 0.8 | 0 |
| 60.832000 | 0.133 | 0.8 | 0.067 |
| 62.204500 | 0.067 | 0.8 | 0.133 |
| 68.878500 | 0.067 | 0.9 | 0.033 |
| 75.320000 | 0.067 | 0.9 | 0.033 |
| 5496.09214 | 0 | 0.9 | 0.1 |
| 76.775000 | 0 | 1 | 0 |

^a, Youden index = |Sensitivity - (1 - Specificity)|.

Table S3 Correlation between the abundance of Bacteroidetes and clinical features of sepsis.

| Characteristics | B ≤ 5 (N=14) | B > 5 (N=11) | P |
|---|--------------------|-------------------|-------|
| Age (years) ^a | 2.40 ± 2.23 | 4.43 ± 3.70 | 0.103 |
| Female | 10 (71.4%) | 6 (54.5%) | 0.383 |
| BMI ^a | 15.76 ± 3.13 | 17.77 ± 3.65 | 0.152 |
| WBC ^b , ×10 ¹² /L | 10.75 [0.66–16.40] | 2.08 [0.56–10.59] | 0.352 |
| CRP ^b , mg/L | 76 [23.5–113.5] | 69 [23–160] | 0.583 |
| PCT ^b , ng/mL | 4.85 [0.68–10.56] | 3.03 [0.32–50.27] | 0.596 |
| Lactic acid ^b , mmol/L | 1.70 [0.93–2.88] | 1.40 [0.88–2.60] | 0.423 |
| Shock (n, %) | 10 (71.4%) | 8 (72.7%) | 0.943 |
| MODS (n, %) | 4 (28.6%) | 3 (27.3%) | 0.943 |
| Mechanical ventilation | 11 (78.6%) | 4 (36.4%) | 0.032 |
| Days of antibiotics before sample collection ^b | 18 [4.75–36.25] | 4 [2–13] | 0.048 |
| Kinds of antibiotics before sample collection ^a | 4.36 ± 2.37 | 4.45 ± 1.97 | 0.914 |
| Hospital stays before sample collection ^b (days) | 2 [0–30.75] | 2 [0–5] | 0.759 |
| Hospital stays after sample collection ^b (days) | 25 [6.5–34.25] | 19 [6–62] | 0.826 |
| Prognosis | | | 0.048 |
| Cure | 6 (42.9%) | 9 (81.8%) | |
| Death | 8 (57.1%) | 2 (18.2%) | |

Data are shown as the mean (SD)^a or median [IQR]^b.