# Sequential Organ Failure Assessment (SOFA) Score

## INPUTS

|  |  |
| --- | --- |
| PaO₂ | **Options:** |
| FiO₂  *See* [*Evidence*](#evidence) *for estimating FiO₂ from oxygen flow/delivery rates* | **Options:** |
| On mechanical ventilation  *Including CPAP* | **Options:**   * No * Yes |
| Platelets, ×10³/µL | **Options:**   * ≥150 (0) * 100-149 (1) * 50-99 (2) * 20-49 (3) * <20 (4) |
| Glasgow Coma Scale  *If on sedatives, estimate assumed GCS off sedatives* | **Options:**   * 15 (0) * 13-14 (1) * 10-12 (2) * 6-9 (3) * <6 (4) |
| Bilirubin, mg/dL (μmol/L) | **Options:**   * <1.2 (<20) (0) * 1.2–1.9 (20-32) (1) * 2.0–5.9 (33-101) (2) * 6.0–11.9 (102-204) (3) * ≥12.0 (>204) (4) |
| Mean arterial pressure OR administration of vasoactive agents required  *Listed doses are in units of mcg/kg/min* | **Options:**   * No hypotension (0) * MAP <70 mmHg (1) * DOPamine ≤5 or DOBUTamine (any dose) (2) * DOPamine >5, EPINEPHrine ≤0.1, or norEPINEPHrine ≤0.1 (3) * DOPamine >15, EPINEPHrine >0.1, or norEPINEPHrine >0.1 (4) |
| Creatinine, mg/dL (μmol/L) (or urine output) | **Options:**   * <1.2 (<110) (0) * 1.2–1.9 (110-170) (1) * 2.0–3.4 (171-299) (2) * 3.5–4.9 (300-440) or UOP <500 mL/day (3) * ≥5.0 (>440) or UOP <200 mL/day (4) |

## FORMULA

Addition of the selected points:

|  |  |
| --- | --- |
| **Variable** | **Points** |
| **PaO2/FiO2\*, mmHg** | |
| ≥400 | 0 |
| 300-399 | +1 |
| 200-299 | +2 |
| ≤199 and NOT mechanically ventilated | +2 |
| 100-199 and mechanically ventilated | +3 |
| <100 and mechanically ventilated | +4 |
| **Platelets, ×103/µL** | |
| ≥150 | 0 |
| 100-149 | +1 |
| 50-99 | +2 |
| 20-49 | +3 |
| <20 | +4 |
| **Glasgow Coma Scale** | |
| 15 | 0 |
| 13–14 | +1 |
| 10–12 | +2 |
| 6–9 | +3 |
| <6 | +4 |
| **Bilirubin, mg/dL (μmol/L)** | |
| <1.2 (<20) | 0 |
| 1.2–1.9 (20-32) | +1 |
| 2.0–5.9 (33-101) | +2 |
| 6.0–11.9 (102-204) | +3 |
| ≥12.0 (>204) | +4 |
| **Mean arterial pressure OR administration of vasoactive agents required (listed doses are in units of mcg/kg/min)** | |
| No hypotension | 0 |
| MAP <70 mmHg | +1 |
| DOPamine ≤5 or DOBUTamine (any dose) | +2 |
| DOPamine >5, EPINEPHrine ≤0.1, or norEPINEPHrine ≤0.1 | +3 |
| DOPamine >15, EPINEPHrine >0.1, or norEPINEPHrine >0.1 | +4 |
| **Creatinine, mg/dL (μmol/L) (or urine output)** | |
| <1.2 (<110) | 0 |
| 1.2–1.9 (110-170) | +1 |
| 2.0–3.4 (171-299) | +2 |
| 3.5–4.9 (300-440) or UOP <500 mL/day) | +3 |
| ≥5.0 (>440) or UOP <200 mL/day | +4 |

\*Estimating FiO₂ from oxygen flow/delivery rates:

|  |  |  |
| --- | --- | --- |
| **Type of O₂ delivery** | **Flow rates, L/min** | **FiO₂** |
| Nasal cannula | 1-6 | ~4% FiO₂ added above room air\* per 1 L/min   * Room air = 21% * 1 L/min = 25% * 2 L/min = 29% * 3 L/min = 33% * 4 L/min = 37% * 5 L/min = 41% * 6 L/min = 45% |
| Simple face mask | ~6-12 | 35-60%\* |
| Non-rebreather mask | 10-15 | ~70-90% |
| High-flow nasal cannula | Up to 60 | 30-100% |

\*Varies based on respiratory rate and minute ventilation.

## FACTS & FIGURES

Interpretation:

|  |  |  |
| --- | --- | --- |
| **SOFA Score** | **Mortality if initial score** | **Mortality if highest score** |
| 0-1 | 0.0% | 0.0% |
| 2-3 | 6.4% | 1.5% |
| 4-5 | 20.2% | 6.7% |
| 6-7 | 21.5% | 18.2% |
| 8-9 | 33.3% | 26.3% |
| 10-11 | 50.0% | 45.8% |
| 12-14 | 95.2% | 80.0% |
| >14 | 95.2% | 89.7% |

|  |  |
| --- | --- |
| **Mean SOFA Score** | **Mortality** |
| 0-1.0 | 1.2% |
| 1.1-2.0 | 5.4% |
| 2.1-3.0 | 20.0% |
| 3.1-4.0 | 36.1% |
| 4.1-5.0 | 73.1% |
| >5.1 | 84.4% |

From [Ferreira 2001](https://www.ncbi.nlm.nih.gov/pubmed/11594901).

## EVIDENCE APPRAISAL

* [This paper](https://www.ncbi.nlm.nih.gov/pubmed/8844239) describes how the European Society of Intensive Care Medicine selected the SOFA score variables.
* In [this validation study](https://www.ncbi.nlm.nih.gov/pubmed/9824069), 1,449 patients were enrolled over a period of one month in forty intensive care units (ICUs) in 16 countries. The SOFA score was found to have a good correlation of organ dysfunction/failure in critically ill patients.
* [This prospective, observational cohort study](https://www.ncbi.nlm.nih.gov/pubmed/11594901) was performed at a university hospital in Belgium and recruited 352 patients. The SOFA score was again found to be a good indicator of prognosis.