THE FIRST **COVID-19 SEVERITY SCORE**
FACILITATING PATIENT TRIAGE

**abioSCOPE®**
GET THE cSOFA SCORE IN 5 MINUTES
ASSESS COMPLICATIONS IN COVID-19 PATIENTS
IDENTIFY COVID-19 PATIENTS AT RISK OF DETERIORATION

The clinical need to assess the SOFA score in Covid-19 patients: get the cSOFA score in 5 minutes

Today’s Covid-19 pandemic has made it extremely challenging for healthcare professionals to perform efficient clinical assessments, especially given the critical time constraints and lack of resources experienced by most hospitals.

The sequential organ failure assessment score (SOFA score) is used to track a patient’s status in intensive care units (ICU) to determine the extent of organ function or rate of failure. The score is however long and complex to establish and is based on six different sub-scores from the respiratory, cardiovascular, hepatic, coagulation, renal and neurological systems that only ICU have resources to obtain.

Abionic has developed an exclusive cSOFA score (Covid-19 Sequential Organ Failure Assessment), offering physicians the solution they need to accurately identify patients at risk of subsequent deterioration and mortality. This will optimise clinical management from prehospital care, all the way through to emergency departments, hospital wards and ICU.

The cSOFA score is a 5-minute Covid-19 severity score to immediately assess your patient’s clinical deterioration and to support your medical decision. The combination of a simple respiratory score (RESP) along with the blood biomarker Pancreatic Stone Protein (PSP), defines the cSOFA score, allowing for the severity assessment of an ongoing SARS-CoV-2 infection.

PSP is easily quantified in 5 minutes from a single drop of blood using the CE marked IVD test on the abioSCOPE®.

THE FASTEST COVID-19 SEVERITY SCORE FACILITATING PATIENT TRIAGE

cSOFA as Covid-19 Sequential Organ Failure Assessment

First Covid-19 Severity Score
Facilitating Patient Triage

Covid-19 patient at admission or during hospital stay

5-minute cSOFA score 1x/day

Consider discharging patient

Consider keeping patient at ward

Consider transferring patient to the ICU

cSOFA≥3

1≤cSOFA<3

cSOFA=0
**CLINICAL EVIDENCES**

The cSOFA score is composed of two easy-to-measure parameters and correlates well with SOFA

**A simplified respiratory component (RESP)**

The RESP component is derived from the more complex SOFA score, which is used to track the status of a patient in the ICU and to determine the extent of organ function or rate of failure. However, this score is based on six different sub-scores making it complex to obtain and inaccessible outside of the ICU.

**PSP blood biomarker on the abioSCOPE device**

PSP is characterised by its diagnostic accuracy in predicting sepsis and/or multiple organ dysfunction in various types of critically ill patients. As of today more than 20 publications demonstrate that PSP correlates well with several sub-scores of SOFA. Preliminary data from the first European wave of SARS-CoV-2 infections shows a strong link between PSP concentration and the severity of these patients.

<table>
<thead>
<tr>
<th>Respiratory System</th>
<th>RESP score</th>
<th>PSP ng/ml</th>
<th>PSP score</th>
<th>cSOFA score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanically ventilated</td>
<td>3</td>
<td>&gt;600</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Need O₂ support</td>
<td>2</td>
<td>≤600</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Difficulties to breathe</td>
<td>1</td>
<td>≤500</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>No breathing problem</td>
<td>0</td>
<td>≤400</td>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 1. Score table combining RESP score with PSP score to obtain cSOFA. An increasing score correlates with increasing severity, up to a maximum of 10.

The combination of PSP and the RESP component, gives the cSOFA score which enables a rapid and accurate assessment of the severity of the patient.

![Diagram of cSOFA score](image)

Figure 1. Distribution of control (healthy non-Covid-19 patients), mild, moderate, and severe Covid-19 patient groups against cSOFA scores, computed from the PSP values and the RESP score.

Table 2. Diagnostic performances of cSOFA at a cut-off of 0 to determine patient non-hospitalisation. SP stands for specificity, SN for sensitivity.

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>SN (95 %CI)</th>
<th>SP (95 %CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-hospitalised patient cSOFA=0</td>
<td>100 (96.4 to 100)</td>
<td>94.8 (88.5 to 97.8)</td>
</tr>
</tbody>
</table>

The combination of PSP and the RESP component, gives the cSOFA score which enables a rapid and accurate assessment of the severity of the patient.

![Diagram of cSOFA and SOFA scores](image)

Figure 2. The cSOFA and SOFA score demonstrate a good correlation on 96 Covid-19 patients admitted to the ICU between March and April 2020. Each point is the average of the cSOFA and SOFA score over the entire length of stay.

Table 3. Diagnostic performances of cSOFA at a cut-off of 3 to determine Covid-19 patients’ severity. SP stands for specificity, SN for sensitivity.

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>SN (95 %CI)</th>
<th>SP (95 %CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer patient to the ICU cSOFA=3</td>
<td>95.3 (84.3 to 98.8)</td>
<td>84.9 (78.1 to 90.3)</td>
</tr>
</tbody>
</table>

The PSP test and the RESP score combined into the cSOFA score, enables the discrimination between non-severe and severe SARS-CoV-2 infection among adults, with a p-value <0.0001.
Overall, the fast and highly accurate severity cSOFA score enables healthcare professionals to efficiently assess Covid-19 patients within 5 minutes to measure the likelihood of clinical deterioration. This facilitates patient triaging and assignment to the appropriate level of care right from admission, whilst also liberating vital clinical resources, key to optimising patient management.

DISRUPTIVE NANOTECHNOLOGY BASED PLATFORM
5-minute PSP test on the abioSCOPE®

- Rapid turnaround time
  5 minutes from blood sampling to actionable results
- Easy to use
  Simple 4 steps with a blood volume of 50 µl from a fingerstick
- No maintenance
  Contamination-free device, no washing step required
- Laboratory quality results
  Laboratory equivalent performances
- Connectivity options
  HL7, Ethernet to HIS/LIS, barcode scanner and QR code
- Complementary menu in development
  Available tests: allergy, ferritin
  Coming soon: D-Dimer, CRP among others

References: