PrEvalence of Acute and Chronic Kidney Disease treated by Renal Replacement Therapy in the ICU Environment (PEACE)

A prospective international, multi-centre, prevalence study on the epidemiology of the use of renal replacement therapy for ICU patients who have acute kidney injury and chronic end stage kidney disease.

Manual to the study Case Record Form (CRF)
Executive summary of the PEACE study

- Investigators may choose from one of 2 study dates for this study (March 25th, or April 22nd).
- All adult patients present in the ICU on the index day can be included in the study.
- For each patient a limited data set is recorded.
- When a patient meets AKI stage 3 criteria (as per KDIGO criteria) or is started on RRT, additional data are to be entered on both time points. When AKI stage 3 and need for RRT fall on the same day, the data on SOFA score and kidney function will be the same.
- Outcomes: All patients will have 3 outcomes recorded (creatinine, RRT, alive) at time of ICU discharge, hospital discharge, study day + 30, and study day +60.
  - Study day +60 is the last day of data recording, even if the patient is still in hospital.
    - If the patient is still in the ICU at time of study day +60, ICU and hospital outcome data will not be recorded.
    - If the patient is still in hospital at time of study day +60, hospital outcome data will not be recorded.

Contact details

Study coordination:
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Abbreviations

ACT = activated clotting time
AKI = acute kidney injury
antiXa = anti clotting factor Xa concentration
APTT = activated partial tromboplastin time
BUN = blood urea nitrogen
Cai = ionised calcium concentration
CAVH = continuous arterio-venous hemofiltration
CAVHD = continuous arterio-venous hemodialysis / hemodiafiltration
CVVH = continuous veno-venous hemofiltration
CVVHD = continuous veno-venous hemodialysis
CVVHDF = continuous veno-venous hemodiafiltration
D = day
GCS = Glasgow Coma Scale
H = hour
ICU = intensive care unit
FE = fractional excretion
Kt/V = Clearance over time per volume of distribution
OR = operating room
PD = peritoneal dialysis
P/F = PaO2/FiO2
RRT = renal replacement therapy
SLEDD = slow low efficiency daily dialysis, other terminology used in literature Hybrid.

**Defined** as intermittent dialysis for at least 5 h duration

UF = ultrafiltration
Data recording
We advise to record all patient study data on the paper CRF, and subsequently on the electronic CRF (www.akipeace.org).

The individual paper CRF’s are coded with a patient ID (generated by the website; a 3 digit number 001, 002, etc). A code list (linking the patient IDs to patient identification) needs to be kept in the participating hospital in a locked room. Data will be recorded anonymously on an electronic CRF through a secured website (www.akipeace.org).

ICU_Registration
The first thing you have to do is to record some data related to your ICU. This will inform us about the type of ICU and also tell us what units are used when measuring laboratory values, ie. serum creatinine etc.

This page has to be completed only once.

Updating of investigator and ICU data
On the PEACE home page you have the possibility to

Update ICU profile
Update YOUR profile
Add an Investigator to the ICU

Start a New Patient
Please check the inclusion criteria on page 1 of the CRF. All boxes should be checked.

Patient ID:

Each patient is assigned a patient ID after recording the patient on the electronic CRF. The patient ID is a 3-digit number, starting with 001.

Baseline creatinine:

This value should be the creatinine which is most representative of the patient’s stable pre-hospital renal function. In general it will often be an average value seen over past 6-12 months. However, clinical judgement should be used as individual patients may have increasing or fluctuating creatinine values and in some cases it may be more appropriate to take the most recent pre-hospital value.

Reference creatinine
When a baseline creatinine is available, it will always be used as the reference creatinine. In case, there is no baseline serum creatinine, and no history of chronic kidney disease, reference serum creatinine concentration can be estimated by back calculation using the MDRD equation and a presumed eGFR of 75 mL/kg/min (see Table 1 below) (Bellomo et al., 2004, Crit Care, 8, R204 – 212). The back calculated MDRD based value can be used as the reference creatinine when it is lower than the hospital admission creatinine and there is clinical suspicion of community acquired AKI.

In the unusual circumstance where there is a history of chronic kidney disease and no baseline creatinine, the hospital admission creatinine should be used as the reference creatinine.

Table 1: Back calculation of estimated baseline serum creatinine (Bellomo et al., 2004, Crit Care, 8, R204 – 212)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Black males (mg/dl [μmol/l])</th>
<th>Other males (mg/dl [μmol/l])</th>
<th>Black females (mg/dl [μmol/l])</th>
<th>Other females (mg/dl [μmol/l])</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–24</td>
<td>1.5 (133)</td>
<td>1.3 (115)</td>
<td>1.2 (106)</td>
<td>1.0 (88)</td>
</tr>
<tr>
<td>25–29</td>
<td>1.5 (133)</td>
<td>1.2 (106)</td>
<td>1.1 (97)</td>
<td>1.0 (88)</td>
</tr>
<tr>
<td>30–39</td>
<td>1.4 (124)</td>
<td>1.2 (106)</td>
<td>1.1 (97)</td>
<td>0.9 (80)</td>
</tr>
<tr>
<td>40–54</td>
<td>1.3 (115)</td>
<td>1.1 (97)</td>
<td>1.0 (88)</td>
<td>0.9 (80)</td>
</tr>
<tr>
<td>55–65</td>
<td>1.3 (115)</td>
<td>1.1 (97)</td>
<td>1.0 (88)</td>
<td>0.8 (71)</td>
</tr>
<tr>
<td>&gt;65</td>
<td>1.2 (106)</td>
<td>1.0 (88)</td>
<td>0.9 (80)</td>
<td>0.8 (71)</td>
</tr>
</tbody>
</table>

Estimated glomerular filtration rate = 75 (mL/min per 1.73 m²) = 186 x (serum creatinine [SCr]) - 1.154 x (age) - 0.203 x (0.742 if female) x (1.210 if black) = exp(0.226 - 1.154 x ln(SCr)) - 0.203 x ln(age) - (0.299 if female) + (0.192 if black).

**AKI stage 3 criteria for this patient**

When you fill in this part you will get the cut-offs for meeting AKI stage 3 criteria for your patient. This will help you to diagnose AKI stage 3.

**Admission hospital (date):** date of hospital admission. If the patient was admitted to more than one hospital before ICU admission, please enter the date of the first hospital admission.

**Intra-hospital location before ICU admission:**

- **Ward:** the patient was admitted to the ICU from a regular medical or surgical ward
- **Emergency room (ER):** the patient was admitted to the ICU from the emergency room
- **Operating Room (OR):** the patient was admitted to the ICU from the operating room.
- **Other ICU:** the patient was admitted to the ICU from another ICU, located in the same hospital or in another hospital.
**Main admission diagnosis**

**Medical:** patients did not undergo surgery before ICU admission.

**Scheduled surgery:** patients underwent a surgical procedure before ICU admission which was planned more than 24 hours in advance (including laparoscopic surgery).

**Emergency surgery:** patients underwent a surgical procedure before ICU admission which was planned less than 24 hours in advance (including laparoscopic surgery).

Comorbidities on day of AKI 3:

**Sepsis:** **patient received** antimicrobial treatment for proven or suspected infection with systemic inflammatory response syndrome (SIRS)

1. Antimicrobial therapy for proven or suspected infection
2. 2 or more of the following SIRS criteria within the preceding 48 h:
   a. Temperature $>38^\circ C$ or $<36^\circ C$
   b. Heart rate $>90$ beats per minute
   c. Respiratory rate $>20$ breaths per minute, PaCO2 $< 32$ mmHg or the use of mechanical ventilation for an acute process.
   d. White blood cell count $>12000$/mm3 or $<4000$/mm3 or differential count showing $>10\%$ immature neutrophils

**Cancer:** Any cancer, with or without metastases

**Diabetes Mellitus:**

- insulin dependent: patients needing daily injection(s) of insulin before ICU admission.
- OR
- Non-insulin dependent: patients with prior diagnosis of diabetes mellitus, controlled with diet and/or drugs. The patient did not need daily injection(s) of insulin before ICU admission.

**Acute or chronic liver disease:** impaired liver function, with or without cirrhosis, and associated metabolic disturbances and/or encephalopathy.
Renal Replacement Therapy:
All questions related to RRT refer to the 1st day of RRT.

SOFA score and kidney function parameters at time of AKI stage 3 and RRT

Please indicate the worst value recorded on the day of AKI stage 3 or day of initiation of RRT, respectively.

Table 2: FiO2 for non-ventilated patients.

<table>
<thead>
<tr>
<th>100% O₂ Flow rate (L/min)</th>
<th>FiO₂</th>
<th>100% O₂ Flow rate (L/min)</th>
<th>FiO₂</th>
<th>100% O₂ Flow rate (L/min)</th>
<th>FiO₂</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasal cannula</td>
<td></td>
<td>Oxygen mask</td>
<td></td>
<td>Non-rebreathing mask</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.24</td>
<td>5-6</td>
<td>0.40</td>
<td>6</td>
<td>0.60</td>
</tr>
<tr>
<td>2</td>
<td>0.28</td>
<td>6-7</td>
<td>0.50</td>
<td>7</td>
<td>0.70</td>
</tr>
<tr>
<td>3</td>
<td>0.32</td>
<td>7-8</td>
<td>0.60</td>
<td>8</td>
<td>0.80</td>
</tr>
<tr>
<td>4</td>
<td>0.36</td>
<td></td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.40</td>
<td></td>
<td>0.80</td>
<td></td>
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<tr>
<td>6</td>
<td>0.44</td>
<td></td>
<td>0.90</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>0.99</td>
<td></td>
<td></td>
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