**IMPRESS project - Survey of participating IQM member clinics on structural quality and care processes in ventilated patients**

The items were surveyed by means of an electronic questionnaire (implementation via RedCap)

### 1. Structural and process data in the field of intensive care medicine

<table>
<thead>
<tr>
<th>Items</th>
<th>Possible answers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1 Number of beds in the intensive care unit, annual average 2017</strong></td>
<td></td>
</tr>
<tr>
<td>1.1.1 Internal medicine beds</td>
<td>[Number]</td>
</tr>
<tr>
<td>1.1.2 Surgical beds</td>
<td>[Number]</td>
</tr>
<tr>
<td>1.1.3 Total</td>
<td>[Number] → Automatically calculated</td>
</tr>
<tr>
<td><strong>1.2 How many full time staff are employed in intensive care units (actually filled positions in full time equivalents on an annual average in 2017)?</strong></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Physicians</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td>1.2.2 thereof specialists</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td>1.2.3 of which specialists with additional qualification in intensive care medicine</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td>1.2.4 registered nursing staff</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td>1.2.5 of which registered nurses with additional qualification in anaesthesia and intensive care</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td>1.2.6 Physiotherapists</td>
<td>[Number] Full-time employees</td>
</tr>
<tr>
<td><strong>1.3 Is there an Intermediate Care Station or other transitional care between non-intensive and intensive care?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.4 Are stroke patients treated in a stroke unit?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.5 Are patients with acute coronary syndrome treated in a chest pain unit?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.6 Are patients seen daily by a specialist with an additional qualification in intensive care?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.7 Is there a concept to adapt the physician staffing to the current demand (e.g. on-call duty)?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.8 Medical management of the intensive care unit:</strong></td>
<td></td>
</tr>
<tr>
<td>1.8.1 Is the intensive care unit managed by a specialist with an additional qualification in intensive care medicine?</td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td>1.8.2 Does the medical management of the intensive care unit have other clinical tasks?</td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.9 Is the presence of medical and nursing staff experienced in intensive care medicine guaranteed for 24 hours?</strong></td>
<td>[Yes] [No]</td>
</tr>
<tr>
<td><strong>1.10 Is there a concept to adapt the nursing staffing to current demands (e.g. on-call duty)?</strong></td>
<td>[Yes] [No]</td>
</tr>
</tbody>
</table>
1.11 Is there a written training protocol for new staff?

- Yes for physicians and nurses
- Yes for physicians
- Yes for nurses
- No

1.12 Is there a mentor system in the training phase?

- Yes
- No

1.13 Are there fixed break regulations?

- Yes for physicians and nurses
- Yes for physicians
- Yes for nurses
- No

1.14 Are temporary or self-employed staff used in case of personnel shortages?

- Yes for physicians and nurses
- Yes for physicians
- Yes for nurses
- No

1.15 Which of the measures and standards listed below are available in your intensive care unit?

| 1.15.1 Medical Standard Operating Procedures |   |
| 1.15.2 Nursing standards |   |
| 1.15.3 Defined standard equipment per intensive care bed |   |
| 1.15.4 Daily medical and nursing rounds for each intensive care patient |   |
| 1.15.5 Daily visits by an experienced medical specialist and specialist nursing staff with the joint definition of daily goals |   |
| 1.15.6 Daily multi-professional and interdisciplinary visits with documentation of daily goals for patient safety, interdisciplinary planning and documentation of therapy concepts and goals |   |
| 1.15.7 Structured emergency training |   |

- Fully available
- Partly available
- Not available

1.16 Which of the fully or partially existing measures and standards from 1.14 are implemented in your intensive care unit?

| 1.16.1 Medical Standard Operating Procedures |   |
| 1.16.2 Nursing standards |   |

- Fully implemented
- Partly implemented
- Not implemented
<table>
<thead>
<tr>
<th>1.16.3 Defined standard equipment per intensive care bed</th>
<th>□ Fully implemented □ Partly implemented □ Not implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.16.4 Daily medical and nursing rounds for each intensive care patient</td>
<td>□ Fully implemented □ Partly implemented □ Not implemented</td>
</tr>
<tr>
<td>1.16.5 Daily visits by an experienced medical specialist and specialist nursing staff with the joint definition of daily goals</td>
<td>□ Fully implemented □ Partly implemented □ Not implemented</td>
</tr>
<tr>
<td>1.16.6 Daily multi-professional and interdisciplinary visits with documentation of daily goals for patient safety, interdisciplinary planning and documentation of therapy concepts and goals</td>
<td>□ Fully implemented □ Partly implemented □ Not implemented</td>
</tr>
<tr>
<td>1.16.7 Structured emergency training</td>
<td>□ Fully implemented □ Partly implemented □ Not implemented</td>
</tr>
</tbody>
</table>
2. Use of quality instruments to improve care for ventilated patients in intensive care

<table>
<thead>
<tr>
<th>Items</th>
<th>Possible answers</th>
</tr>
</thead>
</table>
| 2.1 IQM – Peer Review of the tracer “Ventilation > 24h” in intensive care medicine | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| 2.2 IQM – Peer Review on another tracer (e.g. heart attack, stroke) in the field of intensive care medicine (maximum of three most recent tracers) | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Tracer 1]                                                           | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Tracer 2 (fade in only when 1 is filled)]                          | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Tracer 3 (fade in only when 2 is filled)]                          | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| 2.3 Other peer reviews (e.g. DIVI, internal PR etc.) in the field of intensive care medicine (maximum of three topical areas) | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Theme 1]                                                           | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Theme 2]                                                           | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
| [Theme 3]                                                           | □ Not applied so far and not planned  
□ No applied so far, but planned  
□ applied before 2016  
□ applied 2016  
□ applied 2017  
□ applied 2018 |
### 2.4 Morbidity and Mortality Conferences in Intensive Care Defined According to the Guidelines for Interdisciplinary M&M Conferences (Including Recorded and Justified Case Selection, Presentation, Discussion and Analysis with Derivation of Measures and Implementation Control)

*Reference: Rohn, C. & Martin, J. Leitfaden für interdisziplinäre M&M-Konferenzen, In: Martin J, Rink O, Zacher J (Hrsg.) Handbuch IQM*

### 2.5 Other Interventions in the Field of Intensive Care Medicine, E.g. Error Reporting Systems and Qualification Measures (Maximum of Three Most Recent Interventions)

<table>
<thead>
<tr>
<th>Intervention 1</th>
<th>□ Not applied so far and not planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention 2 (fade in only when 1 is filled)</td>
<td>□ No applied so far, but planned</td>
</tr>
<tr>
<td>Intervention 3 (fade in only when 2 is filled)</td>
<td></td>
</tr>
</tbody>
</table>

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s).
3. Implementation of the selected quality instruments

<table>
<thead>
<tr>
<th>Items</th>
<th>Possible answers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3.1 IQM - Peer Review of the tracer &quot;Ventilation &gt; 24h&quot; [year of application according to 2.1]</td>
<td></td>
</tr>
<tr>
<td>Variant A: These questions are only asked if a peer review protocol including a summary in the intervention group is available</td>
<td></td>
</tr>
<tr>
<td>A3.1.1. Peer review protocol [annual data according to 2.1]: quality objectives, proposed solutions and action plan</td>
<td></td>
</tr>
<tr>
<td>A3.1.1.1. Have the quality objectives and proposed solutions of the peer review protocol [year as per 2.1] been communicated internally?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>A3.1.1.2. If yes, to whom were the quality objectives and proposed solutions of the peer review protocol [year as per 2.1] communicated?</td>
<td>□ To the medical management □ To nursing management □ To administrative Management □ To quality Management □ To other functional areas: [Text Field]</td>
</tr>
<tr>
<td>A2.1.1.3. Was an action plan derived for the achievement of the quality objectives or implementation of the proposed solutions of the peer review protocol?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>A3.1.1.3.1. The following potential for improvement, proposed solutions, responsibilities and deadlines for implementation were identified in the summary of the Peer Review Protocol [annual details according to 2.1]: [Line by line improvement potential, proposed solutions, responsibilities and implementation deadlines]</td>
<td>Potential for improvement: [automated listing from the protocol of the intervention group]</td>
</tr>
<tr>
<td></td>
<td>Proposed solutions: [automated listing from the protocol of the intervention group]</td>
</tr>
<tr>
<td></td>
<td>Responsibilities: [automated listing from intervention group protocol]</td>
</tr>
<tr>
<td></td>
<td>Deadlines for transposition: [automated listing from the intervention group protocol]</td>
</tr>
<tr>
<td>A3.1.1.3.2. Has solution [XX] been included in a plan of action?</td>
<td>□ Yes, unchanged, the following measure has been derived [text field] □ Yes, but modified and the following measure was derived [text field] □ No, because [text field] □ Not known/ Not specified</td>
</tr>
<tr>
<td>XX [each named solution proposal from the list in A3.1.1.3.1 is queried]</td>
<td></td>
</tr>
<tr>
<td>A3.1.1.3.3. If yes, was the action plan implemented within the deadline?</td>
<td>□ Yes, complete in accordance with the above-mentioned deadline □ Yes, complete, but different from the above-mentioned deadline for transposition since [date field] □ Yes, implementation has started but is not yet complete □ No, implementation has not yet started because [text field] □ Not known/ Not specified</td>
</tr>
<tr>
<td>A3.1.1.4. Were the peer review summary, analysis criteria or self-assessment [year specified in 2.1] used to propose solutions, followed by an action plan?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>A3.1.1.4.1. If yes, which</td>
<td>[manual entry]</td>
</tr>
<tr>
<td>A3.1.1.4.2. If yes, have all measures already been implemented?</td>
<td>□ Yes, complete since [date field]. □ Yes, implementation has started but is not yet complete □ No, implementation has not yet started because [text field] □ Not known/ Not specified</td>
</tr>
<tr>
<td>A3.1.1.5. Was the analysis of the peer review [year] used to identify follow-up actions that were not included in the peer review summary?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
</tbody>
</table>
### B3.1.1.5.1 If yes, which

**[manual entry]**

### A3.1.1.5.2 If yes, have all measures already been implemented?

- □ Yes, complete since [date field]
- □ Yes, implementation has started but is not yet complete
- □ No, implementation has not yet started because [text field]
- □ Not known/ Not specified

---

[Option B: These questions are only asked if no peer review protocol including summary is available (for example, for ventilation peer reviews from previous years or for intervention clinics for which no summary table is available)]

### B3.1.1.1.15 IQM - Peer Review of the tracer "Ventilation > 24 h" [year of application according to 2.1]

Note: This survey block is provided individually for each tracer specified

### B3.1.1 Peer review protocol [annual data according to 2.1]: quality objectives, proposed solutions and plan of action

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3.1.1.1</td>
<td>Which quality objectives have been derived from the peer review [annual data according to 2.1]?</td>
</tr>
</tbody>
</table>
| B3.1.1.2 | Were the quality objectives communicated internally? | □ Yes
- □ No
- □ Not known/ Not reported |
| B3.1.1.3 | If yes, to whom were the quality objectives communicated internally? | □ To the medical management
□ To nursing management
□ To administrative Management
□ To quality Management
□ To other functional areas: [Text Field] |
| B3.1.1.4 | Were the summary, analysis criteria or self-assessment of the peer review [year specified in 2.1] used to derive proposed solutions followed by an action plan? | □ Yes
□ No
□ Not known/ Not reported |
| B3.1.1.4.1 | If yes, has the action plan been implemented? | □ Yes, complete since [date field]
□ Yes, implementation has started but is not yet complete
□ No, implementation has not yet started because [text box]
□ Not known/ Not specified |
### 3.2 IQM - Peer Review of another tracer in intensive care [Tracer XX from 2.2]

#### 3.2.1 Peer review protocol for the tracer [Tracer XX from 2.2]: Quality objectives + proposed solutions and action plans

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2.1.1 Which quality objectives were derived from the Peer Review on the tracer [Tracer XX from 2.2]?</td>
<td>[manual entry]</td>
</tr>
<tr>
<td>3.2.1.2 Were the quality objectives communicated internally?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>3.2.1.3 If yes, to whom were the quality objectives communicated internally?</td>
<td>□ To the medical management □ To nursing management □ To administrative Management □ To quality Management □ To other functional areas: [manual entry]</td>
</tr>
<tr>
<td>3.2.1.4 Were the summary, the analysis criteria or the self-assessment of the Peer Review on the tracer [Tracer XX from 2.2] used to derive proposals for solutions and subsequently an action plan?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>3.2.1.4.1 If yes, has the action plan been implemented?</td>
<td>□ Yes, complete since [date field]. □ Yes, implementation has started but is not yet complete □ No, implementation has not yet started because [manual entry] □ Not known/ Not specified</td>
</tr>
</tbody>
</table>

### 3.3 Other peer reviews in intensive care medicine [query of 2.3]

#### 3.3.1 Peer review protocol on the topic [query of 2.3]: Quality objectives + proposed solutions and action plans

<table>
<thead>
<tr>
<th>Question</th>
<th>Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3.1.1 Which quality objectives were derived from the Peer Review in the thematic area [Topic XX of 2.3]?</td>
<td>[manual entry]</td>
</tr>
<tr>
<td>3.3.1.2 Were the quality objectives communicated internally?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>3.3.1.3 If yes, to whom were the quality objectives communicated internally?</td>
<td>□ To the medical management □ To nursing management □ To administrative Management □ To quality Management □ To other functional areas: [manual entry]</td>
</tr>
<tr>
<td>3.3.1.4 Were the summary, analysis criteria or self-assessment of the peer review on topic [Topic XX of 2.3] used to derive proposed solutions and a subsequent action plan?</td>
<td>□ Yes □ No □ Not known/ Not reported</td>
</tr>
<tr>
<td>3.3.1.4.1 If yes, has the action plan been implemented?</td>
<td>□ Yes, complete since [date field]. □ Yes, implementation has started but is not yet complete □ No, implementation has not yet started because [manual entry] □ Not known/ Not specified</td>
</tr>
</tbody>
</table>
### 3.4 Morbidity and mortality conferences

#### 3.4.1 Which groups of people are involved in the organisation of the morbidity and mortality conferences?
- To the medical management
- To nursing management
- To administrative Management
- To quality Management
- To other functional areas: [manual entry]

#### 3.4.2 Did the morbidity and mortality conferences result in proposals for solutions and a subsequent action plan?
- Yes
- No
- Not known/Not reported

#### 3.4.2.1 If yes, has the action plan been implemented?
- Yes, complete, since [date field].
- Yes, implementation has started but is not yet complete
- No, implementation has not yet started because [text box]
- Not known/Not reported

### 3.5 Other interventions in intensive care [Intervention XX from 2.5]

Note: This survey block is provided separately for each specified intervention

#### 3.5.1 Which groups of people are involved in the implementation?
- To the medical management
- To nursing management
- To administrative Management
- To quality Management
- To other functional areas: [Text field]

#### 3.5.2 Were proposals for solutions and subsequently an action plan derived from this intervention?
- Yes
- No
- Not known/Not reported

#### 3.5.2.1 If yes, has the action plan been implemented?
- Yes, complete, since [date field].
- Yes, implementation has started but is not yet complete
- No, implementation has not yet started because [manual entry]: Not known/Not reported
4. Assessment of changes on the basis of the quality instruments used (e.g. peer review, M&M conferences)

<table>
<thead>
<tr>
<th>Items</th>
<th>Possible answers</th>
</tr>
</thead>
</table>
| 4.1 How do you judge the changes on the structural level of your intensive care unit caused by the use of the quality instruments (e.g. staff, technical equipment)? | □ Mainly improvements were noticed  
□ Mainly deteriorations were noticed  
□ Both improvements and deteriorations were noticed  
□ No changes were noticed  
□ Not known/ Not reported |

4.1.1 Which improvements have you noticed?  
[Manual entry]

4.1.2 In your opinion, which of the instruments used were relevant to this improvement?  
□ IQM - Peer Review of the Tracer Ventilation > 24h [year(s) according to 2.1]  
□ IQM - Peer Review of another tracer in intensive care medicine: [Tracer 1,2,3 according to 2.2]  
□ Other peer reviews in intensive care medicine: [Tracers 1,2,3 according to 2.3]  
□ Morbidity and mortality conferences in intensive care  
□ Other interventions in intensive care: [Intervention 1,2,3 according to 2.5]  
□ No assignment possible  
□ Not known/ Not reported |

4.1.3 Which deteriorations have you noticed?  
[Manual entry]

4.1.4 In your opinion, which instruments used were relevant to this deterioration?  
□ IQM - Peer Review of the Tracer Ventilation > 24h [year(s) according to 2.1]  
□ IQM - Peer Review of another tracer in intensive care medicine: [Tracer 1,2,3 according to 2.2]  
□ Other peer reviews in intensive care medicine: [Tracers 1,2,3 according to 2.3]  
□ Morbidity and mortality conferences in intensive care  
□ Other interventions in intensive care: [Intervention 1,2,3 according to 2.5]  
□ No assignment possible  
□ Not known/ Not reported |

4.2 How do you judge the changes on the process level of your intensive care medicine caused by the use of the quality instruments (e.g. course of treatment)?  
□ Mainly improvements were noticed  
□ Mainly deteriorations were noticed  
□ Both improvements and deteriorations were noticed  
□ No changes were noticed  
□ Not known/ Not reported |

4.2.1 Which improvements have you noticed?  
[Manual entry]

4.2.2 In your opinion, which of the instruments used were relevant to this improvement?  
□ IQM - Peer Review of the Tracer Ventilation > 24h [year(s) according to 2.1]  
□ IQM - Peer Review of another tracer in intensive care medicine: [Tracer 1,2,3 according to 2.2]  
□ Other peer reviews in intensive care medicine: [Tracers 1,2,3 according to 2.3]  
□ Morbidity and mortality conferences in intensive care  
□ Other interventions in intensive care: [Intervention 1,2,3 according to 2.5]  
□ No assignment possible  
□ Not known/ Not reported |

4.2.3 Which deteriorations have you noticed?  
[Manual entry]

4.2.4 In your opinion, which instruments used were relevant to this deterioration?  
□ IQM - Peer Review of the Tracer Ventilation > 24h [year(s) according to 2.1]  
□ IQM - Peer Review of another tracer in intensive care medicine: [Tracer 1,2,3 according to 2.2]  
□ Other peer reviews in intensive care medicine: [Tracers 1,2,3 according to 2.3]  
□ Morbidity and mortality conferences in intensive care  
□ Other interventions in intensive care: [Intervention 1,2,3 according to 2.5]  
□ No assignment possible  
□ Not known/ Not reported |
4.3 How do you judge the changes caused by the use of the quality instruments (e.g. patient satisfaction, mortality, (co)morbidity,...) at the outcome level of your intensive care unit?

| □ Mainly improvements were noticed  
| □ Mainly deteriorations were noticed  
| □ Both improvements and deteriorations were noticed  
| □ No changes were noticed  
| □ Not known/ Not reported |

4.3.1 Which improvements have you noticed?
[Manual entry]

4.3.2 In your opinion, which of the instruments used were relevant to this improvement?

| □ IQM - Peer Review of the Tracer Ventilation > 24h [year(s) according to 2.1]  
| □ IQM - Peer Review of another tracer in intensive care medicine: [Tracer 1,2,3 according to 2.2]  
| □ Other peer reviews in intensive care medicine: [Tracers 1,2,3 according to 2.3]  
| □ Morbidity and mortality conferences in intensive care  
| □ Other interventions in intensive care: [Intervention 1,2,3 according to 2.5]  
| □ No assignment possible  
| □ Not known/ Not reported |

4.3.3 Which deteriorations have you noticed?
[Manual entry]

4.3.4 In your opinion, which instruments were responsible for this deterioration?

| □ Mainly improvements were noticed  
| □ Mainly deteriorations were noticed  
| □ Both improvements and deteriorations were noticed  
| □ No changes were noticed  
| □ Not known/ Not reported |