Definition of SGI/SSMI-categories using NEMS and SAS
A simple scoring system:
General requirements

- For general use in all Swiss ICU's
- Simple
- Objective and reproducible
- Validated (i.e. measures what it is intended to)
A simple scoring system: General requirements

- Scoring the patient (i.e. assigning a patient to a SGI/SSMI-category) should be simple, uniform and objective

- Scoring
  - Is required to document the patient process (as required by KAI, KWFB and paritätische Kommission)
  - Serves as basis for the reimbursement system (Tarmed)
  - May be used to calculate indicators for quality management
  - Might serve as basis for an ICU-specific module in Swiss-DRG
  - May have some limited use as a tool in human resource management
A simple scoring system: General requirements

- Scoring the patient (i.e. assigning a patient to a SGI/SSMI-category) should be simple, uniform and objective

- Scoring
  - Is required to document the patient process (as required by KAI, KWFB and paritätische Kommission)
  - Serves as basis for the reimbursement system (Tarmed)
  - May be used to calculate indicators for quality management
  - Might serve as basis for an ICU-specific module in Swiss-DRG
  - May have some limited use as a tool in human resource management

<table>
<thead>
<tr>
<th>Kategorie</th>
<th>Pflegepersonal pro Schicht</th>
<th>Zeitbedarf (Min/h)</th>
<th>Zeitbedarf (h/Tag)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>4/3</td>
<td>&gt; 40</td>
<td>&gt; 16</td>
</tr>
<tr>
<td>1B</td>
<td>3/3</td>
<td>30 – 39</td>
<td>12 – 16</td>
</tr>
<tr>
<td>2</td>
<td>2/3</td>
<td>20 – 29</td>
<td>8 – 12</td>
</tr>
<tr>
<td>3</td>
<td>1/3</td>
<td>&lt; 20</td>
<td>&lt; 8</td>
</tr>
</tbody>
</table>

Der Pflegepersonalbedarf auf Intensivstationen, Schriftenreihe SKI Bd. 41 1989, p.72ff (see also: Critical Care Medicine, JAMA 1983, 250:798-804)
## Tarmed 1.2 (ab 01.01.05)
### Intensivpflegestationen (IPS)

<table>
<thead>
<tr>
<th>Kat.</th>
<th>Ärztliche Leistung</th>
<th>Nichtärztliche Leistung IPS</th>
<th>Nichtärztliche Leistung Verbr.-IPS</th>
<th>Nichtärztliche Leistung Neo-IPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>172 239</td>
<td>621 1150</td>
<td>657 1295</td>
<td>619 1141</td>
</tr>
<tr>
<td>1B</td>
<td>172 63</td>
<td>621 882</td>
<td>657 1027</td>
<td>619 874</td>
</tr>
<tr>
<td>2</td>
<td>172 28</td>
<td>621 615</td>
<td>657 760</td>
<td>619 608</td>
</tr>
<tr>
<td>3</td>
<td>172 16</td>
<td>621 348</td>
<td>657 493</td>
<td>619 340</td>
</tr>
</tbody>
</table>

**N.B.:** nichtärztliche Leistung Kardio-/angiolgische Überwachungsstation: erste 2 Std. 82TP, dann 32TP pro Std., maximal 14 mal

Kategoriewechsel jeweils bei Schichtwechsel
Swiss ICU’s with SGI/SSMI-acknowledgement
New calibration of SGI/SSMI-categories: participating units

- 24: 15.6%
- 26: 25.2%
- 27: 12.5%
- 23: 15.4%
- 22: 5.9%
- 21: 7.8%
- 16: 10.6%
- 14: 7.6%
- 13: 9.6%
- 12: 4.5%
- 11: 5.3%
- 10: 2.3%
Distribution of SGI/SSMI-categories in participating units

- 1A: 18.8%
- 1B: 41.9%
- 2: 31.2%
- 3: 8.1%
Distribution of SGI/SSMI-categories in participating units
Distribution of NEMS in participating units

NEMS (points)

Proportion

P

0.0 0.1 0.2 0.3 0.4

0 10 20 30 40 50 60

C

Distribution of NEMS in participating units

NEM$^S$ (points)
Distribution of SAS/RASS in participating units

Distribution of SAS
n = 9'154

Distribution of RASS
n = 2'515
Definition of SGI/SSMI-categories using NEMS and SAS

<table>
<thead>
<tr>
<th>Model</th>
<th>SGI/SSMI-category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1A</td>
</tr>
<tr>
<td>1 (NEMS)</td>
<td>&gt;32 Pt.</td>
</tr>
<tr>
<td>2 (NEMS)</td>
<td>&gt;32 Pt.</td>
</tr>
<tr>
<td>3 (NEMS)</td>
<td>&gt;33 Pt.</td>
</tr>
<tr>
<td>4 (NEMS)</td>
<td>&gt;33 Pt.</td>
</tr>
<tr>
<td>4_S (NEMS)</td>
<td>&gt;33 Pt.</td>
</tr>
<tr>
<td>5 (NEMS)</td>
<td>&gt;30 Pt.</td>
</tr>
<tr>
<td>5_S (NEMS)</td>
<td>&gt;30 Pt.</td>
</tr>
<tr>
<td>6 (LEP)</td>
<td>&gt;320 Min.</td>
</tr>
<tr>
<td>Euricus-1</td>
<td>&gt;30</td>
</tr>
</tbody>
</table>

models 4_S and 5_S: category increased by 1 level if SAS > 5
Definition of SGI/SSMI-categories using NEMS and SAS

Assigned („old“)  Model 1  Model 2

Assigned („old“)  Model 3  Model 4  Model 5

Model LEP  
\( n = 4'675 \)
SGI/SSMI-categories using model 5
Change in SGI/SSMI-category „old“ vs. model 5 including SAS

Note: negative number = modelled ("new") category is lower
Distribution of SGI/SSMI-categories 
„old“
Distribution of SGI/SSMI-categories model 5 including SAS
Patient Scoring: An uniform system for Switzerland?

- Common standard for Switzerland
- Common documentation of patient process and performance (KAI, KWFB, paritätische Kommission für WB in IP)
- Common language in MDSi (Quality management, Benchmarking, etc.)
- Common base for reimbursement (SLK/TarMed/SwissDRG?)

- The actual used scoring system (SGI/SSMI-categories) is not very plausible, there is thus a risk of low credibility in the future
- Units using LEP or PRN would prefer not to add a further, new scoring system
Patient scoring (categorization) using NEMS and SAS/RASS

- NEMS and SAS can easily be collected with minimal amount of expenses
- NEMS and SAS form a common base for all users
- NEMS is well established in the general medical literature
- NEMS is validated as a tool to analyse the patient process in critical care
- NEMS may be used to calculate indicators for quality management
- NEMS allows for a direct, easy documentation of a few core competencies in critical care
- NEMS (and SAS) might serve as basis for an ICU-specific module in Swiss-DRG
- NEMS (and SAS) may have some limited use as tool in human resource management
Patient scoring (categorization) using NEMS and SAS/RASS

- Due to the small number of items included, there is limited resolution
- NEMS is not a tool for detailed assessment of nursing care
- If used without any further context, neither NEMS nor SAS will allow to estimate quality of care
- NEMS and SAS are not included in TarMed
- NEMS is in general used only once per 24 hours
- SAS/RASS have only recently been introduced
- The point of view of the patient is virtually missing
Patient scoring (categorization) using model 5_S

- Aims at an overall similar distribution of SGI-categories as actually used ("conventional" categorization)

- SAS is included based on a proposal by nurses
- Units using RASS may easily transform their data to SAS-equivalents

- Model 5_S shows plausible distribution of categories, both in non-university and in university ICUs
Patient scoring (categorization) using model 5_S

- Possibly might result in a small increase in the relative number of shifts with SGI-category 1A, and on the other hand a small decrease in SGI-category 3
- The share of category 1A/1B is high in comparison to EURICUS-1 (but is low in comparison to the LEP-model)
- The model needs further evaluation
  - Use in paediatric/neonatology ICU
  - Large-scale application

- Explore the future use of this model in intermediate care units
- Explore the use of this model (or NEMS) for Swiss-DRG
Patient scoring (categorization) using NEMS and SAS/RASS

- **The KPK proposes** to calculate SGI/SSMI-categories based on NEMS and SAS:
  - NEMS (nine equivalents of nursing manpower use score) contains nine elements, representing core competencies of critical care
  - SAS (sedation agitation scale) or RASS (Richmond agitation-sedation scale) is used to assess the patient’s mental state

- Categories are defined as follows
  
<table>
<thead>
<tr>
<th>Category</th>
<th>NEMS (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>&gt; 30</td>
</tr>
<tr>
<td>1B</td>
<td>21 – 30</td>
</tr>
<tr>
<td>2</td>
<td>13 – 20</td>
</tr>
<tr>
<td>3</td>
<td>0 – 12</td>
</tr>
</tbody>
</table>
  
- If SAS > level 5, a given category is increased by 1 step.
  Note that category 1A cannot be increased further.

- The MDSi-tool calculates the SGI/SSMI-categories based on this new algorithm since 01.01.06
Patient scoring (categorization) using NEMS and SAS

**NEMS: Nine equivalents of nursing manpower use score**

**SAS: Sedation agitation scale**