JIPADって何？
＋慈恵におけるGATEWAY

2016/10/4
慈恵ICU火曜勉強会
内野 滋彦
Systemic Inflammatory Response Syndrome Criteria in Defining Severe Sepsis

Kiri-Maija Kaukonen, M.D., Ph.D., Michael Bailey, Ph.D., David Pilcher, F.C.I.C.M., D. Jamie Cooper, M.D., Ph.D., and Rinaldo Bellomo, M.D., Ph.D.

Systemic Inflammatory Response Syndrome Criteria in Defining Severe Sepsis

- 72 intensive care units in Australia and New Zealand from 2000 through 2013.
- Patients with infection and organ failure
- SIRS-positive or SIRS-negative severe sepsis
- 109,663 had infection
- 87.9% had SIRS-positive severe sepsis
WHAT IS JIPAD?
The transition to sepsis, severe sepsis, and septic shock require the presence of such signs to help define SIRS. All patients with SIRS have been assumed to indicate a clinical response, and mortality increased linearly with each additional SIRS criterion from 0 to 4 without any transitional response, and mortality decreased over time almost identically to the rates among patients with SIRS-negative severe sepsis. Such patients with SIRS-negative sepsis excluded a sizable group of patients that the SIRS-criteria rule missed one patient in eight with severe sepsis. Such patients with SIRS-positive severe sepsis have an increased risk of death and mortality associated with the presence of severe sepsis and organ failure and guidelines for the management of severe sepsis and organ failure recommended earlier definitions. We found that the SIRS criteria were described more than two years of the ICU stay were missed. Our findings challenge the sensitivity, face validity, and construct validity of the rule of using two or more SIRS criteria as a continuous variable (0 to 4 criteria).}

**Figure A** Adjusted Annual Odds of Death

**Figure B** Adjusted Annual Odds of Death

**Table** Patients stratified into quartiles of risk (Table S4 in the Supplementary Appendix).

**Odds of Death**

- **Adjusted Annual Odds of Death**
  - No. of SIRS Criteria Met: 0, 1, 2, 3, 4
  - Odds of Death: 0.0, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6
  - 95% confidence intervals (bars)

**Panel A** Unadjusted and adjusted annual mortality among patients from 2000 to 2013, and Panel B shows the adjusted annual odds of death. The adjusted annual mortality among patients in the two groups from 2000 to 2013 are compared in a forest plot. The number of SIRS criteria was described more than two years of the ICU stay were missed. Our findings challenge the sensitivity, face validity, and construct validity of the rule of using two or more SIRS criteria as a continuous variable (0 to 4 criteria).
METHODS

STUDY DESIGN
We conducted a retrospective study from January 1, 2000, to December 31, 2013, using data from the Australia and New Zealand Intensive Care Society (ANZICS) Adult Patient Database (APD), a high-quality database run by the ANZICS Centre for Outcome and Resource Evaluation. The ANZICS APD includes information on more than 90% of all ICU admissions in Australia and New Zealand. The Alfred Hospital Human Research Ethics Committee, Melbourne, Australia, approved the study with a waiver of informed consent. Follow-up was available only for the duration of the ICU admission. The data were gathered as a part of routine clinical registry surveillance by clinical staff, quality-assurance benchmarking processes by the ANZICS Centre for Outcome and Resource Evaluation, and indirect empirically tested by defining the number, characteristics, and outcome of patients with infection and organ failure or one of the following in the ANZICS APD diagnostic codes for infection and organ failure or one of the following: sepsis due to infection other than from the urinary tract, sepsis due to infection other than from the urinary tract with organ failure, sepsis with shock due to infection other than from the urinary tract, sepsis with shock due to infection other than from the urinary tract with organ failure, sepsis due to urinary tract infection with organ failure, sepsis due to urinary tract infection. We applied the consensus statement of the American College of Chest Physicians–Society of Critical Care Medicine in 1992 as a clinical expression of the host response to inflammation. We diagnosed severe sepsis if a patient had two or more SIRS criteria to all the data analyses (see the Supplementary Appendix). The face validity and sensitivity can, however, be assumed to have severe sepsis on the basis of their presentation. Moreover, the construct validity and sensitivity of the SIRS criteria can be empirically assessed by testing whether the cutoff value of two criteria represents a significant transitional increase in the risk of death. This approach was codified by increasing severity. This approach was codified by decreasing severity. This approach was codified by decreasing severity.
データベースでNEJMかいっ！！！

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Mortality Related to Severe Sepsis and Septic Shock Among Critically Ill Patients in Australia and New Zealand, 2000-2012


JAMAもかいっ！
WHAT IS JIPAD?

ANZICS CORE is made up of 4 data registries

- Adult Patient Database (APD)
- ANZICS Paediatric Intensive Care (ANZPICR) Registry
- Critical Care Resources (CCR) Registry
- Central Line Associated Bloodstream Infection (CLABSI) Registry
WHAT IS JIPAD?

Development and implementation of a high-quality clinical database: the Australian and New Zealand Intensive Care Society Adult Patient Database

Journal of Critical Care (2006) 21, 133–141

Fig. 1 Number of ICUs contributing to the APD by year.
Development and implementation of a high-quality clinical database: the Australian and New Zealand Intensive Care Society Adult Patient Database

Journal of Critical Care (2006) 21, 133–141

Fig. 1  Number of contributing ICUs

Fig. 2  Number of patient episodes contributed to the APD by year.
Development and implementation of a high-quality clinical database: the Australian and New Zealand Intensive Care Society Adult Patient Database

Figure 1: Contributions to the APD

- Number of contributing sites
- Number of admissions

Financial Year:
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013

Sites:
- Contributions increase over time

Admissions:
- Contributions increase over time

WHAT IS JIPAD?
- 80% of all ICUs
WHAT IS JIPAD?
<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Australia</th>
<th>New Zealand</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Admissions</strong></td>
<td>123,566 (n=139)</td>
<td>27,781 (n=28)</td>
<td>151,347 (n=167)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td>64.6 (49.9-75.6)</td>
<td>60 (40.9-72.0)</td>
<td>64.2 (49.2-75.3)</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>58.0%</td>
<td>59.2%</td>
<td>58.1%</td>
</tr>
<tr>
<td><strong>Planned Admissions to ICU after Elective Surgery</strong></td>
<td>38.0%</td>
<td>26.7%</td>
<td>37.2%</td>
</tr>
<tr>
<td><strong>Ventilated in First 24 Hours of ICU Admission</strong></td>
<td>38.7%</td>
<td>48.8%</td>
<td>39.5%</td>
</tr>
<tr>
<td><strong>Ventilated Overall</strong> (see legend)</td>
<td>40.0% (n=111)</td>
<td>38.0% (n=21)</td>
<td>39.7% (n=132)</td>
</tr>
<tr>
<td><strong>Length of Stay in ICU (days)</strong></td>
<td>1.8 (0.9-3.7)</td>
<td>1.3 (0.8-2.9)</td>
<td>1.8 (0.9-3.6)</td>
</tr>
<tr>
<td><strong>After-Hours Discharges to Ward (18:00 – 06:00)</strong></td>
<td>14.8%</td>
<td>11.5%</td>
<td>14.6%</td>
</tr>
<tr>
<td><strong>Readmissions</strong></td>
<td>4.9%</td>
<td>4.5%</td>
<td>4.9%</td>
</tr>
<tr>
<td><strong>Source of Admission</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td>15.9%</td>
<td>19.9%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Operating Theatre</td>
<td>50.7%</td>
<td>38.8%</td>
<td>49.8%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>25.6%</td>
<td>34.7%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Other Hospital</td>
<td>6.4%</td>
<td>4.8%</td>
<td>6.3%</td>
</tr>
</tbody>
</table>
### WHAT IS JIPAD?

<table>
<thead>
<tr>
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<td>151,347 (n=167)</td>
</tr>
<tr>
<td>Age (years) (^*)</td>
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<td>60 (40.9-72.0)</td>
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<tr>
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<td>58.1%</td>
</tr>
<tr>
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<td>38.0%</td>
<td>26.7%</td>
<td>37.2%</td>
</tr>
</tbody>
</table>

### Severity of Illness – Scores \(^*\)

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>New Zealand</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE III-J</td>
<td>46 (32-64)</td>
<td>49 (35-68)</td>
<td>46 (32-64)</td>
</tr>
<tr>
<td>APACHE II</td>
<td>14 (10-19)</td>
<td>15 (11-20)</td>
<td>14 (10-19)</td>
</tr>
<tr>
<td>SAPS II</td>
<td>27 (19-37)</td>
<td>29 (21-40)</td>
<td>27 (19-38)</td>
</tr>
</tbody>
</table>

### Severity of Illness – APACHE III-J Predicted Risk of Death \(^*\)

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>New Zealand</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Predicted Risk of Death</td>
<td>14.0%</td>
<td>16.0%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Median Predicted Risk of Death</td>
<td>4.6% (1.4-16.1%)</td>
<td>5.7% (1.5-19.7%)</td>
<td>4.7% (1.4-16.4%)</td>
</tr>
</tbody>
</table>

### Outcomes \(^*\)

<table>
<thead>
<tr>
<th></th>
<th>Australia</th>
<th>New Zealand</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICU Mortality</td>
<td>5.9%</td>
<td>7.5%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Hospital Mortality</td>
<td>10.4%</td>
<td>11.9%</td>
<td>10.5%</td>
</tr>
<tr>
<td>APACHE III-J SMR (95% CI)</td>
<td>0.73 (0.72 – 0.75)</td>
<td>0.77 (0.73 – 0.82)</td>
<td>0.74 (0.72 – 0.75)</td>
</tr>
<tr>
<td>ICU survivors discharged home from hospital</td>
<td>69.7%</td>
<td>67.2%</td>
<td>69.6%</td>
</tr>
<tr>
<td>ICU survivors discharged to a chronic care facility from hospital</td>
<td>8.6%</td>
<td>5.6%</td>
<td>8.3%</td>
</tr>
</tbody>
</table>
Figure 13: Changes in population, admissions and resources for Australian ICUs

WHAT IS JIPAD?
ANZICS CORE Information Request Form

Name of Individual(s) Requesting Data: ________________________________

Organisation: _______________________________________________________

Position/Title: ______________________________________________________

Postal Address: _____________________________________________________

____________________________________________________________________

City/Town: ______________________ State: ______________ Post Code: ____

Telephone: _____________________ Mobile: ____________________ Fax: ______

Email: __________________________ _____________________________________

Financial ANZICS Member: Yes / No

Non-ANZICS Member associated with a current contributing ICL: Yes / No

Name of Unit: __________________________ ________________________________

Why do you want this information?

☐ Research Purposes (Enclose an outline of proposed research if insufficient space below)

☐ Mailing List

☐ Seminar / Meeting Promotion (Please specify)

☐ Advertising / Product Promotion (Enclose a sample kit)

☐ Other: ____________________________________________________________

____________________________________________________________________

How will this information be used?

____________________________________________________________________

Will the data be used in a publication (including manuscripts, abstracts)? Yes / No

Will the data be used in a presentation (including conference or education)? Yes / No

____________________________________________________________________

WHAT IS JIPAD?
AIMS of ANZICS-CORE

• Provide a peer review mechanism for contributing adult and paediatric ICUs by providing data processing and reporting facilities

• Provide reliable information to clinicians, policy makers, health care providers and state and federal governments

• Develop research focus and activities of the ANZICS CORE through local, national and international collaboration

• Promote research activities directed at greater understanding of critical illness, its management and outcome

WHAT IS JIPAD?
WHAT IS JIPAD?
Critical care research crisis in Japan!

Fig. 1 Number of articles published in three major critical care journals from East Asian countries
WHAT IS JIPAD?

**JIPAD**

*Japanese Intensive care PATient Database*

日本 ICU 患者データベース
### JIPADの歩み

<table>
<thead>
<tr>
<th>年月</th>
<th>事業内容</th>
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<tbody>
<tr>
<td>2011年7月</td>
<td>ICU学会DB作成準備 WG発足</td>
</tr>
<tr>
<td>2011年11月</td>
<td>ICU機能評価委員会で事業計画</td>
</tr>
<tr>
<td>2012年7月</td>
<td>ANZICS-COREと合意、情報提供、収集項目決定</td>
</tr>
<tr>
<td>2013年1月</td>
<td>パイロットスタディ（5施設）</td>
</tr>
<tr>
<td>2013年3月</td>
<td>学術総会にて結果報告、参加呼びかけ</td>
</tr>
<tr>
<td>2014年1月</td>
<td>本格稼働</td>
</tr>
<tr>
<td>2015年2月</td>
<td>8施設、968例</td>
</tr>
<tr>
<td>2015年3月</td>
<td>サイトビジットなど積極的な活動開始</td>
</tr>
</tbody>
</table>
WHAT IS JIPAD?
### WHAT IS JIPAD?

JIPAD is a database management system designed to store and manage patient data. It is used in various healthcare settings to facilitate the storage, retrieval, and analysis of patient information. The system allows for the entry of detailed patient records, including demographic data, medical history, treatment information, and clinical outcomes. JIPAD is equipped with features for data encryption, user authentication, and secure data transmission, ensuring patient data privacy and security. It supports various data formats and integrates well with other healthcare information systems, enhancing the overall efficiency of patient care management.
WHAT IS JIPAD?

16歳以上
APACHE III
APACHE II
SAPS II

15歳以下
PIM 2
WHAT IS JIPAD?
Case mix, outcome and length of stay for admissions to adult, general critical care units in England, Wales and Northern Ireland: the Intensive Care National Audit & Research Centre Case Mix Programme Database

David A Harrison¹, Anthony R Brady² and Kathy Rowan³

Research

Abstract

Keywords

Conclusions

Results

Methods

Acknowledgements

References

WHAT IS JIPAD?
Case mix, outcome and length of stay for admissions to adult, general critical care units in England, Wales and Northern Ireland: the Intensive Care National Audit & Research Centre Case Mix Programme Database

David A Harrison

Senior Statistician, Intensive Care National Audit & Research Centre, London, UK

Keywords: Case mix, critical care, high-quality clinical database, intensive care units, length of stay, mortality

Figure 2

Type: Surgical (condition requiring surgery)
Non-surgical

System: Respiratory
Cardiovascular
Gastrointestinal
Neurological (including eyes)
Trauma
Poisoning
Genito-urinary
Endocrine, Metabolic, Thermoregulation and Poisoning
Haematological / Immunological
Musculoskeletal
Dermatological
Psychiatric

Site: Upper airway and trachea
Bronchi and airways
Pulmonary vasculature
Lungs
Pleura or mediastinum
Brain lesions causing respiratory failure
Spinal cord lesions causing respiratory failure
Peripheral nervous system disorders causing respiratory failure
Neuro-muscular junction disorders causing respiratory failure
Chest wall and diaphragm disorders causing respiratory failure

Process: Collapse
Congenital or acquired deformity or abnormality
Haemorrhage
Infection
Oedema, inflammation, fibrosis or inhalation
Transplant or related
Trauma, perforation or rupture
Tumour or malignancy

Condition: Bacterial pneumonia
Fungal or yeast pneumonia
Viral pneumonia
Parasitic pneumonia
Pneumonia, no organism isolated
Tuberculosis
Lung abscess

An example of the Intensive Care National Audit & Research Centre Coding Method – bacterial pneumonia.
Research

Case mix, outcome and length of stay for admissions to adult, general critical care units in England, Wales and Northern Ireland: the Intensive Care National Audit & Research Centre Case Mix Programme Database

David A Harrison¹, Anthony R Brady² and Kathy Rowan³

Introduction

High-quality clinical databases are of value in comparative audit, clinical practice, in managing services and in evaluating health technologies [1,2]. The use of inappropriate, unrepresentative or poor-quality data can, however, lead to inaccurate conclusions. The Directory of Clinical Databases [R99] APACHE = Acute Physiology and Chronic Health Evaluation; CMP = Case Mix Programme; CMPD = Case Mix Programme Database; DoCDat = Directory of Clinical Databases; HDU = high dependency unit; ICM = ICNARC Coding Method; ICNARC = Intensive Care National Audit & Research Centre; ICU = intensive care unit; MPM = Mortality Probability Model; SAPS = Simplified Acute Physiology Score.

Abstract

Introduction

The present paper describes the methods of data collection and validation employed in the Intensive Care National Audit & Research Centre Case Mix Programme (CMP), a national comparative audit of outcome for adult, critical care admissions. The paper also describes the case mix, outcome and activity of the admissions in the Case Mix Programme Database (CMPD).

Methods

The CMP collects data on consecutive admissions to adult, general critical care units in England, Wales and Northern Ireland. Explicit steps are taken to ensure the accuracy of the data, including use of a dataset specification, of initial and refresher training courses, and of local and central validation of submitted data for incomplete, illogical and inconsistent values. Criteria for evaluating clinical databases developed by the Directory of Clinical Databases were applied to the CMPD. The case mix, outcome and activity for all admissions were briefly summarised.

Results

The mean quality level achieved by the CMPD for the 10 Directory of Clinical Databases criteria was 3.4 (on a scale of 1 = worst to 4 = best). The CMPD contained validated data on 129,647 admissions to 128 units. The median age was 63 years, and 59% were male. The mean Acute Physiology and Chronic Health Evaluation II score was 16.5. Mortality was 20.3% in the CMP unit and was 30.8% at ultimate discharge from hospital. Nonsurvivors stayed longer in intensive care than did survivors (median 2.0 days versus 1.7 days in the CMP unit) but had a shorter total hospital length of stay (9 days versus 16 days). Results for the CMPD were comparable with results from other published reports of UK critical care admissions.

Conclusions

The CMP uses rigorous methods to ensure data are complete, valid and reliable. The CMP scores well against published criteria for high-quality clinical databases.

Keywords

case mix, critical care, high-quality clinical database, intensive care units, length of stay, mortality

Received: 6 November 2003
Revisions requested: 6 January 2004
Revisions received: 28 January 2004
Accepted: 13 February 2004
Published: 26 February 2004

This article is online at http://ccforum.com/content/8/2/R99
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Professor Kathy Rowan

Kathy is founder and Director of ICNARC and works within a team of audit, research, IT and administrative staff. ICNARC's aim is to facilitate improvements in the organisation and practise of critical care through a broad programme of audit and research.

In 2004, Kathy was awarded the Humphry Davy Medal by the Royal College of Anaesthetists as a mark of distinction for her significant contribution to critical care. More recently, Kathy completed a Harkness Fellowship in Health Care Policy in the USA (Nov 2004 to Oct 2005).

Kathy is an Honorary Professor in the Department of Public Health and Policy at the London School of Hygiene and Tropical Medicine.
If “ICU Admission Source” is entered as “OT/Recovery” then the APACHE diagnosis entry must be from the post-operative group.

### ICU Diagnosis – Reason for ICU Admission

Tick one admission diagnosis from either a non-op. or post-operative group (see list below).

If “ICU Admission Source” is entered as “OT/Recovery” then the APACHE diagnosis entry must be from the post-operative group.

#### Non-operative

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Gastrointestinal</th>
<th>Neurological</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiogenic Shock</td>
<td>GI Perforation/Rupture</td>
<td>Intracerebral Haemorrhage</td>
</tr>
<tr>
<td>Cardiac Arrest</td>
<td>GI Bleeding</td>
<td>Subarachnoid Haemorrhage</td>
</tr>
<tr>
<td>Aortic Aneurysm</td>
<td>GI Obstruction</td>
<td>Stroke</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>GI Neoplasm</td>
<td></td>
</tr>
<tr>
<td>Peripheral Vasc. Disease</td>
<td>Cholecystitis/cholangitis</td>
<td></td>
</tr>
<tr>
<td>Rhythm Disturbance</td>
<td>Liver Transplant</td>
<td></td>
</tr>
<tr>
<td>Acute Myocardial Infarct.</td>
<td>Fistula/Absscess surgery</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>GI Vascular ischemia resection surgery</td>
<td></td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>Peritonitis</td>
<td></td>
</tr>
<tr>
<td>Unstable Angina</td>
<td>Pancreatitis</td>
<td></td>
</tr>
<tr>
<td>Other Cardiovas. Disease</td>
<td>Other GI Inflammatory Disease</td>
<td></td>
</tr>
</tbody>
</table>

#### Respiratory

- Aspiration Pneumonia
- Resp Neoplasm incl. larynx/trachea
- Respiratory Arrest
- Pulm.Oedema (non-cardiac)
- COPD
- Pulmonary Embolism
- Mechanical Airway Obstruct.
- Asthma

#### Post-operative

<table>
<thead>
<tr>
<th>Cardiovascular</th>
<th>Gastrointestinal</th>
<th>Neurologic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Periph. Vascular Dis. – no Graft</td>
<td>GI Perforation/Rupture</td>
<td>Intracerebral Haemorrhage</td>
</tr>
<tr>
<td>Periph. Artery Bypass Graft eg Fempop</td>
<td>GI Bleeding</td>
<td>Subarachnoid Haemorrhage</td>
</tr>
<tr>
<td>Elective AA Surgery</td>
<td>GI Obstruction</td>
<td></td>
</tr>
<tr>
<td>Carotid Endarterectomy</td>
<td>GI Neoplasm</td>
<td></td>
</tr>
<tr>
<td>Valvular Heart Surgery</td>
<td>Cholecystitis/cholangitis</td>
<td></td>
</tr>
<tr>
<td>(CABG) Coronary Artery Bypass Graft</td>
<td>Liver Transplant</td>
<td></td>
</tr>
<tr>
<td>Dissecting Aortic Aneurysm</td>
<td>Fistula/Absscess surgery</td>
<td></td>
</tr>
<tr>
<td>Ruptured Aortic Aneurysm</td>
<td>GI Vascular ischemia resection surgery</td>
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</tr>
<tr>
<td>Aorto-femoral bypass Graft</td>
<td>Peritonitis</td>
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<tr>
<td>CABG with Valve repair replacement</td>
<td>Pancreatitis</td>
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<tr>
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<td>Other GI Inflammatory Disease</td>
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<tr>
<td>Other Cardiovascular Diseases</td>
<td>Other GI Disease</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Respiratory</th>
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<th>Neurologic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Infection</td>
<td>GI Perforation/Rupture</td>
<td>Intracerebral Haemorrhage</td>
</tr>
<tr>
<td>Respiratory Neoplasm - Lung</td>
<td>GI Bleeding</td>
<td>Subarachnoid Haemorrhage</td>
</tr>
<tr>
<td></td>
<td>GI Obstruction</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GI Neoplasm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cholecystitis/cholangitis</td>
<td></td>
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<tr>
<td></td>
<td>Liver Transplant</td>
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**If CABG – CABG redo?**
- Yes
- No

No of coronary arteries grafted? ____________

### Diagnostic sub code (optional, see Appendix B)
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*Japanese Intensive care PAatient Database*
Clinical review: Scoring systems in the critically ill

Jean-Louis Vincent* and Rui Moreno

* Correspondence: Jean-Louis.Vincent@erasme.ulb.ac.be

Critical Care 2010, 14:207

Table 1. Comparison of general outcome prediction models

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Organ failure scores are primarily designed to describe the presence and severity of organ dysfunction (for example, the Glasgow Coma Scale (GCS)) or disease (for example, the APACHE or APACHE IV score). They can broadly be divided into general illness severity scores and disease severity scores.

### General Illness Severity Scores

- **APACHE**
- **SAPS**
- **SAPS II**
- **MPM II**
- **APACHE III**
- **SAPS III**
- **MPM IIb**
- **SAPS 3**
- **APACHE IV**
- **MPM III**

These scores are used for individual prognostication and characterize disease severity and resource use. They incorporate key person characteristics, including age, type of admission, and 3 admission variables, and a 24-hour model using seven 24-hour variables. They have been recently updated to ensure their continued accuracy and efficiency and have been widely used in the USA in 2002/2003, and remodeling over 100,000 patients admitted to 104 ICUs in 45 countries. Although some of these equations was relatively small, which may influence by statistical methods. APACHE IV again provides ICU efficiency and resource use.

### Disease Severity Scores

#### Organ Dysfunction

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I. History of the APACHE Set of Equations

The need to collect quality information on patients in the ICU and to use that information to improve outcomes led to the development of the Acute Physiology, Age, and Chronic Health Evaluation system, known by its acronym APACHE [1]. Originated at George Washington University by William Knaus this severity score measure was first published in 1981 [2]. This initial version of APACHE utilized values from 33 physiologic measurements. Further work by Dr. Knaus and colleagues Dr. Jack Zimmerman, Elizabeth Draper, and Dr. Douglas Wagner led to the introduction of APACHE II in 1985 [3]. APACHE II hospital mortality predictions were based on the prognostic impact of the deviation from normality for 12 physiologic values (Acute Physiology Score or APS), age, chronic health status, and one of 56 disease groups. These variables were used to obtain risk adjusted predictions of mortality that could be utilized for outcome comparisons among ICUs that were adjusted for differing patient case-mix.

In 1991 APACHE III was introduced [4]. Data elements were selected based upon a scientific evaluation of their impact on severity rather than upon a panel of experts’ selection. The number and weightings of APS variables were changed, the measurement of chronic health status revised with co-morbidities reduced from 16 to 7, the number of disease groups expanded from 56 to 78, terms for admission source were added, and a variable for operative status was included in the model. This version of APACHE became known as III and consisted of a set of equations for predicting hospital mortality, ICU mortality, hospital length of stay, ICU length of stay, risk of active treatment, duration of mechanical ventilation, and Therapeutic Intervention Scoring System (TISS). Further for mortality, risk of active treatment, and TISS score, daily equations were developed that predicted the pertinent outcome on the next day. Additional equations were constructed for use with patients undergoing coronary artery bypass grafting (CABG) surgery. Between 1991 and 1998 these outcome predictions were re-evaluated and updated [5].

APACHE III-i was released in 1998 and updated all of the mortality equations [6]. The APS was modeled as a splined variable and the number of disease groups increased to 94. In 2001 APACHE III-j was introduced [7]. This version updated the length of stay equations and the predicted days on mechanical ventilation. In addition a new equation was added that predicts the remaining number of ICU days for patients still in the ICU on day 5. A variable that rescaled the PaO2:FiO2 ratio was included, and this variable along with age had spline terms added. Length of stay measurements and predictions were changed from days (an integer variable) to time measured in fractions of days (e.g. 0.56 days, 1.28 days, 6.33 days, etc.).

Changes in protocols and practices within ICUs prompted a full review and updating of all of the APACHE III equations. The result is a new version of the set of equations which is called APACHE IV.
何故APACHE III-jなのか？

• APACHE IIやSAPS IIと異なり、キャリブレーションの時期が21世紀
• おまけでAPACHE IIとSAPS IIが付いてくる
• APACHE IVへの移行が比較的容易
Data Collection Methods and Operational Definitions

Eligible Patients
When using APACHE Foundations to assess an ICU's overall performance, data should be collected on all consecutive ICU admissions. The exceptions are categories of patients the system does not yet fully accommodate or patients whose brief stay did not provide enough physiology data for adequate risk assessment.

The following patient types will be classified as non-predictive:
- Burn patients
- Patients less than sixteen years of age

APACHE® III Score

Basic Severity Indicator

Compare to Actual Performance

APACHE® IV Predictive Equations

- Hospital & ICU Mortality
- Hospital & ICU LOS
- Risk of active treatment/LRM
- Ventilator Usage
- TISS (not in Critical Outcomes Day 1 tool)

Lead-time Bias

Disease
何故APACHE III-jなのか？

• APACHE IIやSAPS IIと異なり、キャリブレーションの時期が21世紀
• おまけでAPACHE IIとSAPS IIが付いてくる
• APACHE IVへの移行が比較的容易
• JIPAD的に、
  ➢ ANZICSと同じ
  ➢ 主病名のコード化
WHAT IS JIPAD?

JIPAD
Japanese Intensive care PAtient Database
日本 ICU 患者データベース

データ辞書

Version 1.2.13
変更日：2016 年 9 月 14 日

日本集中治療医学会 ICU 機能評価委員会
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JIPAD is a Japanese Intensive care Patient Database.

The homepage greeting reads:

JIPADのホームページによくこそ

JIPAD is a database designed to provide accurate information on the status of intensive care units in Japan. The history of intensive care is still in its infancy, and it is important to promote the development of intensive care units to meet the needs of the community. Increased understanding of intensive care units is essential.

Japan Critical Care Society  President  Tsuchiya Masahiko
ICU機能評価委員会

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委員長 橋本 悟 京都府立医科大学附属病院集中治療部
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理事長 西村 匡司 徳島大学病院救急集中治療部

WHAT IS JIPAD?
収集データの質の担保

1. サイトビジット

- 目的：各施設の状況を理解することにより、データの質を維持し、負担をできるかぎり減らせるような情報提供を行うこと
- ”顔見知り”になる
- 朝の回診やカンファレンスに参加
- 使用している入力システムや、実際に入力されているところを拝見
- 提案、あれば質問に回答
- 2015年3月から開始、現在まで21ヶ所を訪問
WHAT IS JIPAD?

2016年10月時点で合計23+2施設
収集データの質の担保

2. 免許皆伝制度

• 参加施設より10例ずつデータをアップ
• こちらでデータの内容を確認、入力ミスなどについてのコメントを返信
• 参加施設はコメントの内容を確認し、必要であればデータを修正して再アップ
• 指摘内容を参考に、次の10例のデータ入力を行う
• 10例全てで入力ミスがなくなるまでこのプロセスを継続
• ミスがなくなったなら”免許皆伝”、それ以降は自由にデータをアップしてOK
ANZICS-APD in Auckland, NZ, 2015
登録症例数の推移

WHAT IS JIPAD?
JIPAD参加のメリット

• 本邦のICUデータベースへの貢献
• ファイルメーカーがそのまま自施設のデータベースになる
• 他施設（国外含む）との比較が可能
• 全データを研究目的に利用可能

➤ DPCなど他のデータベースと結合？
JIPADの話は一旦終了。

次はGATEWAYについて。

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入院後24時間以内に退院した場合はこのページの記入は不要。
GCSは麻酔/鎮静時は薬剤がなかったとして推測。その場合は鎮静前の状態を参考。

ICUデータシート
Ver. 1.5 (2009.1.9)

入院日：年月日
入室日時：年月日時分

身長：cm
体重：kg

病名：
術式：

入室経路：手術室、救急室、C/P/N

入室時：

入室時様式：(APACHE) 内因性、緊急手術、予定手術
非手術、緊急手術、定時手術（非手術：入室1週間以内に手術無し、定時手術：少なくとも入室24時間前に予定された手術、緊急手術：24時間以内に決定）

再入室：Y、N

主因：脳外、脳内、耳鼻、心外、呼吸、消化、肝外、肝内、泌尿、整形、循環、その他（

人工呼吸：開始終了

年月日時分

年月日時分

年月日時分

抜管後48時間以内の再抜管：あり、なし

基本治療（ICU在室中の状態）：気道確保、CV、S/G、A-line、Epidural

特殊治療、モニター（ICU在室中に実施）
ICP SJ02 PCPS ECMO IABP PICCO NOHFO BiPAP CRRT IRRTEPMX

気管切開（外科的、経皮的、施行日：月日）低体温その他（

退室日時：年月日時分

退室時転帰：一般病棟、C/P/N、転院、死亡（脳死：Y、N）、その他（

耐性菌：Y、N MRSA、MDRP、CD、VRE、その他（

慢性疾患：あり、なし（あれば下に○）

癌転移：領域リンパ節は無く

血液悪性腫瘍：Leukemia, Lymphoma or Myeloma

AIDS：HIV(+)で臨床症状あり

その他の免疫不全：免疫抑制剤、ステロイド、化学療法、放射線療法中

肝不全：バイオプシーで確認された肝硬変+門脈圧亢進症、門脈圧亢進による消化管出血、肝性脳症

腎不全：維持透析

心不全：NYHA-IV（安静時に症状あり）

呼吸不全：重度の運動制限のある呼吸器疾患、高CO2血症もしくは多重酸、証明された低酸素性、低酸素血症（>40mmHg）、人工呼吸器依存

WBC
Ht
Plt千
PT-IRI
APTT
Na
K
Glu
BUN
Cr
T-bil
MV Y N
S/G Y N
ARF Y N

PO2/ FiO2が最低値の時点

<table>
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<th>FiO2</th>
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E4：自発開眼
E3：硬めの光反応
E2：痛み刺激
E1：開眼しない

V5：見当識良好
V4：混乱した会話
V3：不適切な言葉
V2：理解不能の声
V1：反応無し

M6：命名に従う
M5：疼痛に適切に反応
M4：屈曲逃避
M3：屈曲反射
M2：進展反射
M1：反応無し
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慈恵ICUデータベースの歴史

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[Image of a computer screen showing a medical record system]
GATEWAY業務：担当の分担

- 入室時：患者基本情報（赤ボタン）
- 24時間経過：重症度スコア（青ボタン）
- 日々の診療：治療内容、人工呼吸器
- 退室時：退室時情報、全体チェック（緑ボタン）
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- 日々の診療：治療内容、人工呼吸器
- 退室時：退室時情報、全体チェック（緑ボタン）

内野担当

- 毎週火曜日：退室一週間以上経過した症例の最終チェック、データロック、PIMS上の保存
- 毎月上旬：先月退院症例の退院時転帰の取り込み
患者情報システム各社の対応状況

- PHILIPS: PIMS, ACSYS
- 日本光電: CAP, Gaia
- 富士フィルム: Prescient
- フクダ電子: Mirrel
- 富士通: EG-MAIN
- ソフトウェアサービス
患者情報システムを使用したデータ取り込みの問題点

PHILIPS以外では、患者情報システムが出力したCSVファイルをJIPADに取り込む：データ移動の手間

記録データの不備
- バイタルサインの異常値：動脈圧、呼吸数
- 開始終了時間の実際との不一致：入退室時間、人工呼吸器
実際にGATEWAYを使ってみよう

リスト画面
- ソートが出来る
- フィルター設定

患者詳細画面
- ツールバーをONすると分かり易い
- 検索方法：検索実行キャンセル
  - 新規検索条件
  - 一致するレコード
  - 演算子
- レコードのエクスポートと保存
データベースの利用方法

データベースの解析
- 自施設の評価、運営のための情報
- 他施設との比較（多施設データベース）
- 研究（多施設データベースを用いて）

研究のための情報提供
- 疾患・治療の検索
- 患者背景などの情報提供
- 他のデータとの結合：Excelを使いこなす
Objective: To assess the effect of body mass index on ICU outcome and on the development of ICU-acquired infection.


Setting: Seven hundred thirty ICUs in 84 countries.

Intervention: Patients with complete data on height and weight (measured or estimated) on ICU admission in order to calculate the body mass index were included (n = 8,829). (Crit Care Med 2015; 43:2623–2632)
Being Overweight Is Associated With Greater 60-day In-Hospital Death

Objective: To assess the impact of obesity on hospital outcomes and the development of type 2 diabetes.

Design: A retrospective analysis of patients diagnosed with type 2 diabetes.

Setting: Seven hundred patients from a tertiary care hospital were included in the study.

Results: Overweight patients had a significantly higher 60-day in-hospital death rate compared to normal BMI patients (adjusted hazard ratio 1.5, 95% CI 1.1-2.0).

Conclusion: Obesity is a significant risk factor for increased hospital mortality in patients with type 2 diabetes.
The Dose-Response Relationship Between Body Mass Index and Mortality in Subjects Admitted to the ICU With and Without Mechanical Ventilation

Yusuke Sasabuchi MD, Hideo Yasunaga MD PhD, Hiroki Matsui MPH, Alan T Lefor MD MPH, Hiromasa Horiguchi PhD, Kiyohide Fushimi MD PhD, and Masamitsu Sanui MD PhD

[Respir Care 2015;60(7):983–991.]
• サイトビジット終了、免許皆伝を取得した11施設
• 16歳以上、再入室は初回のみ
• 予定術後で24時間以内の生存退室例を除外
• 身長もしくは体重の情報のない症例も除外

5839症例
• Underweight (<18.5): 826例
• Lower normal (18.5-23): 2506例
• Higher normal (23-25): 1084例
• Overweight (25-30): 1167例
• Obese (>30): 246例
Multivariable logistic regression analysis for hospital mortality
JIPADの今後

- 年次レポートの作成：2015年度より
- 収集項目の追加：乳酸、HFNC、SOFA
- Internationalなデータベースへの参加
- データ収集システム、ホームページの充実
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- 金！かね！カネ！
感謝