Summarising the effects of therapy: a new table and some more terms

The team members who assemble and edit Evidence-Based Medicine and ACP Journal Club are constantly on the prowl for quicker, easier-to-follow, and clinically more useful ways of presenting the results of the studies that appear in these journals. This EBM Note will describe 2 more efforts to accomplish these goals: summary tables and some additions to our battery of more informative descriptions of the good and bad effects of therapy.

Until this issue, the “Main results” sections of abstracts about therapy had to accomplish 3 distinct objectives: summarise the results of therapy, state the likelihood that they were due to chance, and describe their clinical importance in quantitative terms. In pursuing these objectives, we suspect that our tightly packed words and numbers risked deterring all but our most quantitatively minded readers and made it difficult to scan the abstract for the quantitative elements of its “clinical bottom line.” Beginning with this issue, we will extract the key numbers from the abstract and present them in tabular form as shown in the table below.

The title of the table reminds us of the treatments being compared (the experimental therapy always appears first in text and tables), and column 1 states the clinical outcomes. Column 2 specifies the experimental event rate (EER), column 3 specifies the control event rate (CER), and some pretty straightforward calculations based on the EER and CER determine the entries in the last 3 columns (these calculations are described below and in the Glossary). Column 4 presents the relative risk reduction (RRR) in the occurrence of the specified outcome that the authors have attributed to the experimental treatment (and the numbers in parentheses give the 95% confidence interval [CI] on this RRR). Column 5 specifies the absolute risk reduction (ARR) for that outcome, and the notation |EER – CER| reminds us to ignore any minus sign that might arise from this subtraction. Finally, column 6 quantifies the number of patients we need to treat (NNT) with the experimental therapy in order to achieve 1 additional favorable outcome (with its 95% CI in parentheses). We’d appreciate feedback from our readers on the usefulness of these tables and on how we can improve them.

We also have achieved consensus on some additional terms that we will use to describe both the good and the bad effects of therapy. They will join the terms already in current use (RRR, ARR, NNT), and both sets are described here and summarised in the Glossary. We will bring them to life with a synthesis of 3 randomised trials in diabetes that individually showed that several years of intensive insulin therapy reduced the proportion of patients with worsening retinopathy to 13% from 38% (1), raised the proportion of patients with satisfactory haemoglobin Alc levels to 60% from about 30% (2), and increased the proportion of patients with ≥ 1 episode of symptomatic hypoglycaemia to 57% from 23% (3). Note that in each case the first number constitutes the experimental event rate, or EER, and the second number the control event rate, or CER. We will use the following terms and calculations to describe these effects of treatment:

**When the experimental treatment increases the probability of a good outcome (satisfactory haemoglobin Alc levels)**

### RBI (relative benefit increase): the proportional increase in rates of good outcomes between experimental and control patients in a trial, calculated as |EER – CER|/CER, and accompanied by a 95% CI.

### NNT (number needed to treat): the number of patients who need to be treated to achieve 1 additional favourable outcome, calculated as 1/ARR and accompanied by a 95% CI.

### ABI (absolute benefit increase): the absolute arithmetic difference in rates of good outcomes between experimental and control patients in a trial, calculated as EER – CER.

### Aprotinin (large dose) (ALD) vs placebo

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<thead>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 h</td>
<td>ALD</td>
<td>EER</td>
<td>Placebo</td>
<td>CER</td>
<td>RRR (95% CI)</td>
<td>ARR</td>
</tr>
<tr>
<td>Need for red blood cells</td>
<td>53%</td>
<td>95%</td>
<td>45%</td>
<td>42%</td>
<td>2</td>
<td>(2 to 6)</td>
</tr>
</tbody>
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*Abbreviations defined in Glossary; RRR, ARR, NNT, and CI calculated from data in article.
accompanied by a 95% CI. In this case, 1/ABI = 1/30% = 3.

When the experimental treatment increases the probability of a bad outcome (episodes of symptomatic hypoglycaemia) **RRI (relative risk increase):** the proportional increase in rates of bad outcomes between experimental and control patients in a trial, calculated as \( \frac{\text{IEER} - \text{CER}}{\text{CER}} = 157\% - 23\% = 134\% \). (RRI is also used in assessing the impact of “risk factors” for disease.)

**ARI (absolute risk increase):** the absolute arithmetic difference in rates of bad outcomes between experimental and control patients in a trial, calculated as \( \text{IEER} - \text{CER} \). In the case of symptomatic hypoglycaemic episodes, \( \text{IEER} - \text{CER} = 157\% - 23\% = 134\% \). (ARI is also used in assessing the impact of “risk factors” for disease.)

**NNH (number needed to harm):** the number of patients who, if they received the experimental treatment, would lead to 1 additional patient being harmed compared with patients who received the control treatment, calculated as 1/ARI and accompanied by a 95% CI. In this case, 1/ARI = 1/34% = 3.

These terms are summarised in this and subsequent glossaries. We are still hammering out the most informative ways to present other sorts of treatment effects (e.g., continuous scores rather than events); other ways of quantifying these effects (e.g., hazard ratios rather than RRRs); and non-significant results (e.g., when the CIs for ARIs cross zero and the CIs for NNHs go to infinity). We continue to invite suggestions for other ways to improve our presentation of the evidence.

David L. Sackett in Oxford
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References


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Journals Reviewed for This Issue

**Core Journals**

- Am J Med
- Am J Obstet Gynecol
- Am J Psychiatry
- Am J Surg
- Ann Intern Med
- Ann Surg
- Arch Dis Child
- Arch Gen Psychiatry
- Arch Intern Med
- Arch Pediatr Adolesc Med
- Arch Surg
- Arthritis Rheum
- BMJ
- Br J Gen Pract
- Br J Obstet Gynaecol
- Br J Surg
- Circulation
- Clin Pediatr
- Cochrane Library
- Diabetes Care
- Hypertension
- JAMA
- J Am Board Fam Pract
- J Am Coll Surg
- J Gen Intern Med
- J Intern Med
- J Pediatr
- J Vase Surg
- Lancet
- Med Care
- Med J Aust
- Neurology
- Obstet Gynecol
- Pediatrics
- Surgery

**Journals for Continuing Review**

- Arch Neurol
- Br J Psychiatry
- Br J Rheumatol
- Can Med Assoc J
- Chest
- Clin Invest Med
- Crit Care Med
- Fertil Steril
- Gastroenterology
- Gut
- Heart (formerly Br Heart J)
- J Am Coll Cardiol
- J Am Geriatr Soc
- J Clin Epidemiol
- J Fam Pract
- J Inf Allergy
- J Neurosurg
- NEJM
- Obstet Gynecol
- Pediatrics
- Surgery