

Acute Dialysis Quality Initiative

ADQI Methodology

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Background

The intent of ADQI is to provide an objective, dispassionate distillation of the literature and description of the current state of practice of dialysis and related therapies. The purpose is to develop a consensus of opinion, with evidence where possible, on best practice and to articulate a research agenda¹ to focus on important unanswered questions. This approach is a blend of “expert panel” and “evidence appraisal” and was chosen in order to achieve the best of both methods. We recognize that the expert panel in absence of the literature can lead to statements at odds with high quality research and that evidence appraisal without expert input to question the framework can lead to erroneous interpretation.² Furthermore, this combined approach has led to important practice guidelines with wide acceptance and adoption into clinical practice.³

Objectives

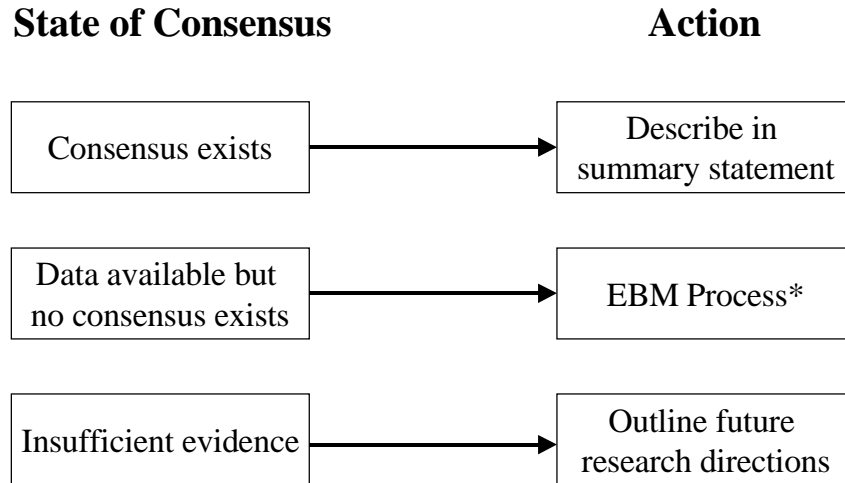
The objectives for ADQI are the following:

1. Standardize process of dialysis for the critically ill patient
2. Develop consensus recommendations for best practice
3. Establish evidence based guidelines where applicable
4. Identify questions for future research and consider study design options

Furthermore, the focus of the first ADQI conference was on CRRT. The objectives were:

1. To describe the current clinical applications of CRRT (therapeutic options, current practice, and evidence).
2. To identify and prioritize issues within each CRRT topic requiring standardization and to define current state of consensus.
3. To propose a strategy to address unresolved issues (consensus development, further research). See Fig 1.

Figure 1.



*When conflicting studies were found, a full evaluation and appraisal was recommended. Individual workgroups did not attempt to synthesize and combine data from individual studies (meta-analysis) nor were attempts made to adjudicate between individual studies on the basis of quality.

Methods

Given the multidisciplinary aspects of CRRT, a multidisciplinary group (nephrologists and intensivists) was assembled. This group was organized into smaller workgroups. Each workgroup was assigned a particular topic area. Topics are shown in table one and were selected on the basis of the following criteria:

- Prevalence of the clinical problem
- Variation in clinical practice
- Potential influence on outcome
- Potential for development of EBM guidelines
- Availability of scientific evidence

Studies were identified via MEDLINE search, bibliographies of review articles and participants' files. Searches were limited to English language articles. However, articles written in other languages were used when identified and presented by members of the group. Evidence was classified by levels per EBM methodology (Table 1). Qualitative commentary was provided when deemed necessary by the group. However, there was no critical appraisal of individual studies during this stage. Outcomes were grouped into the following major categories: physiologic (eg. blood pressure, BUN, etc.), clinical (short-term morbidity/ mortality, long-term morbidity/mortality, renal recovery, functional class/quality of life) and economic. Different types of outcomes were considered separately for each area. Animal research was not considered evidence except that it contributed to commentary.

Table 1: Evidence Based Medicine Levels and Grades

Levels of Evidence	
<i>Level I</i>	Randomized trials with low false positive (α) and low false negative (β) error (i.e. high power)
<i>Level II</i>	Randomized trials with high α error or low power
<i>Level III</i>	Non-randomized concurrent cohort studies
<i>Level IV</i>	Non-randomized historic cohort studies
<i>Level V</i>	Case series, case reports, expert opinion
Grades of Recommendations	
<i>Grade A</i>	Supported by at least 2 level I studies
<i>Grade B</i>	Supported by only 1 level I study
<i>Grade C</i>	Supported level II studies
<i>Grade D</i>	Supported by at least 1 level III study
<i>Grade E</i>	Supported by only level IV or V studies

Each work group was composed of three members, one who served as the group facilitator. Summary statements were developed through a series of breakout sessions where individual work group members were required to identify key issues for which guidelines are needed and to classify current state of consensus and identify supporting evidence for each issue. Workgroup members were then required to present their findings to the entire group, revising each statement as needed until a final version was agreed upon. The responsibilities for presenting the findings of the work group to the rest of the participants was shared by each member on a rotating basis. Group facilitators revised work group findings as needed after each plenary session. Directives for future research were achieved by asking the participants to: a. identify deficiencies in the literature, b. determine if more evidence is necessary, and c. if more evidence is necessary, articulate general research questions. When possible, pertinent study design issues were also considered.

Conference Structure

Conference activities were divided into three steps: pre-conference, conference and post-conference. In the pre-conference step the methodology was developed, work groups were assembled and assigned to specific topics (Table 2). Each group identified a list of key questions, conducted a systematic literature search and generated a bibliography of key studies. During this stage, the scope of the conference was also defined and some topics were excluded from this phase (Table 3). During the next step, the conference itself, the

methodology was approved by the group and the conference was divided into *breakout sessions* where work groups addressed the issues in their assigned topic area, and *plenary sessions* where their findings were presented, debated and refined. During the first plenary session, the key questions were discussed and debated. Revised versions (some added, some deleted and others rewritten) of each question were then presented at the second plenary. At this point evidence was assembled for each question and summary statements were drafted. These statements were further refined in subsequent plenary sessions until final versions were agreed upon. A writing committee assembled the individual reports from the work groups. Each report was edited to conform to a uniform style and for length. The final reports were posted on the internet and mailed to each participant for comment and revision. Finally, international consultants were identified and reports were sent to them for comment. Once final reports were completed, the writing committee summarized the individual reports into a final conference document.

Table 2: Topics

Definitions/nomenclature

Patient Selection for CRRT

Solute Control in CRRT

Membranes

Operational Characteristics

Access and Anticoagulation

Fluid composition and Management

Table 3. Topics Not Covered in This Session

Indications for renal replacement therapy

Costs

Drug dosing

Blood purification in non-renal failure conditions

Withholding and withdrawing dialysis

References

1. Vella K, Goldfrad C, Rowan K, Bion J, Black N. Use of consensus development to establish national research priorities in critical care. *BMJ* 2000; 320:976-980.

2. Kellum JA, Ramakrishnan N, Angus D. Appraising and Using Evidence in Critical Care. In, Grenvik A, Shoemaker PK, Ayers S, Holbrook (eds). Textbook of Critical Care, W.B. Saunders Co, Philadelphia, PA , 1999; Chapter 193; pp 2059-2069.
3. Chestnut RM. Implications of the guidelines for the management of severe head injury for the practicing neurosurgeon. *Surg Neurol* 1998; 50:187-93.

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