Anesthesiology in the Evidence-Based Medicine Era

Evidence-based Medicine proposes the integration of best research evidences, physicians' clinical experience and patients' individual values.

Best research evidences should be understood as relevant clinical research results, often based on basic, however patient-centered medical sciences.

Their objective is to provide accuracy and precision to diagnostic tests (including physical evaluation and complementary preoperative tests) and improve both the diagnostic power of clinical indicators and the efficacy and safety of therapeutic, rehabilitation and preventive procedures.

New clinical research evidences may, in certain situations, invalidate previously accepted and practiced medical attitudes (diagnostic/treatment), replacing them by others with higher efficacy and safety power.

Clinical experience should be interpreted as physicians' ability to use previous clinical knowledge and experience to promptly identify patients' health status, their diagnostic needs (preoperative) and their individual risk-benefit ratio in face of potential medical interventions (drugs and techniques).

Patients' values should be considered individual preferences, complaints and expectations they present along clinical physician-patient relationship and which should be integrated as major factors for clinical decisions to be applied to the individual.

When these three elements are really integrated, physicians and patients form a kind of diagnostic and therapeutic alliance resulting in optimization of epidemiologic morbidity-mortality results and quality of life.

By proposing that clinical decisions should be explicit and conscious processes based on sound scientific grounds, this medical practice prevents, with **evidence,** doubtful and misleading opinions**.** This way, **Evidence-Based Medicine** helps refining physicians' clinical knowledge, improving the quality of their clinical practice, teaching and research activities.

Some issues should be observed during clinical practice based on **Evidence-Based Medicine:**

1. Translation of information needed for diagnostic tests (preoperative tests, etc.) into medical procedures (techniques and drugs) and of risk-benefit ratio into an objective issue;
2. Research of the best literature evidence answering to previous questioning (**MEDLINE, SCIELO** etc);
3. Critical review of quality of evidence through its validity, epidemiological importance and potential impact of its application to the specific situation (**SYSTEMATIC LITERATURE REVIEW**);
4. Integration of clinical applicability of literature evidences to previous physician's experience and individual patient's biological and circumstantial values;
5. Evaluation of the effectiveness and efficiency of applying described topics and means for further improvement.

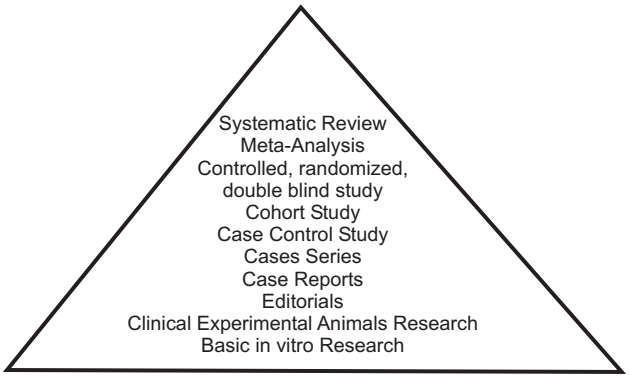
Question formulation should contemplate four fundamental components: patient's specific problem, proposed intervention, applicability of the intervention proposed by literature evidence and validity of the intervention in terms of effectiveness and morbidity-mortality.

- Therapy-related questions are best answered by controlled double-blind studies;
- Prognosis-related questions find more accurate answers through case control or cohort studies;
- Epidemiology and outcome-related questions are best clarified by meta-analyses and systematized reviews;
- Scientific studies followed by editorials mostly inform about their scientific-assistance quality.

MEDLINE, SCIELO and other biomedical literature online databases try to present references in the easiest possible way; indexed material, however, very often has minimum applicability to the clinical practice.

Aiming at making **MEDLINE** and congener sources research more objective, the relationship between indexed studies method and their clinical relevance may be described as a pyramid diagram with major clinical relevance on the top and decreasing toward the base.

The upper six case report levels presented in the pyramid, evidence scientific methods potentially able to demonstrate solutions with significant clinical importance, which should be the basis for evidence-based clinical approach.



The detailed characterization of study design options with potential to be used in scientific studies and their correlation with clinical relevance should be discussed during anesthesiologists' professional qualification and clinical practice. This way, an anesthetic community would be formed with sound clinical-scientific basis and deeply understanding methodological research bases, being able to decide about the applicability of their premises to medical practice.

MEDLINE (National Library of Medicine) is the largest database with approximately 3500 indexed biomedical journals and more than 11 million references. This literature, however, is not submitted to any qualification or critical review process.

The American College of Physicians Journal Club and the **Cochrane Database of Systematic Review** are examples of databases offering biomedical literature previously qualified and reviewed.

The American College of Physicians Journal Club selects studies based on their methods and prepares summaries associated to a structured critic by specialists in the area. The **Cochrane Database of Systematic Review** identifies major clinical research topics, guides literature research, locates and evaluates studies considered relevant, reviews and analyzes results and reports the implications of such results in the clinical practice and for further research.

As from literature review aiming at answering a specific clinical question, physicians applying **Evidence-Based Medi-**

cine shall critically review such material. Aiming at systematizing the evaluation of published biomedical studies, physicians may use the **EBM worksheet**, which shall be found in the following portal (http://cebm.jr2.ox.ac.uk).

The new and current world trend that Anesthesiology should be defined as **Perioperative Medicine**, participating not only in the anesthetic act, but also being involved throughout the perioperative period through postoperative analgesia, nausea and vomiting treatment and prevention, monitoring, mechanical ventilation, malignant hyperthermia treatment and prevention, and clinical preoperative evaluation, orients their practice toward **Evidence-Based Medicine.**

Although **Evidence-Based Medicine** has been originally projected to be applied to clinical specialties, especially Internal Medicine, Psychiatry, Intensive Medicine and Epidemiology, non "therapeutic" specialties, such as Anesthesiology, may adapt to its concepts, guidelines and premises, thus benefiting from their results.

With this in mind, the **Brazilian Society of Anesthesiology**, making use of its scientific structure and medical qualification, has been working toward including in Anesthesiology qualification programs activities allowing the generation and development of a critical sense, both in evaluating investigation methods projects of scientific studies (epidemiology and statistics) and in systematically interpreting existing literature data.

Through this educational and cultural behavior, future Brazilian anesthesiologists shall enhance their competence in evaluating both projects for scientific studies and new clinical practice concepts preconized by current literature.

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