Critiquing the Epidemiologic Literature

I. Objectives or Hypotheses

A. What are the objectives of the study...what measures are to be estimated or associations to be assessed?

B. What is the population to which the investigators intend to generalize their findings?

II. Design of the Study

A. What type of study is this? (Listed below in general order of their potential for confirming causal relationships.)

1. Uncontrolled study of cases
2. Ecologic study
3. Cross-sectional study
4. Case-control study
5. Cohort study
6. Experimental study

B. Is the design appropriate to the study question?
C. Describe the study sample:

1. How was/were the study group(s) selected?

2. Are inclusion and exclusion criteria specified?

3. Are non-participants (refusers, lost-to-follow-up subjects, etc.) described?

4. What size samples were used?

D. Are the study groups comparable?

1. What are possible selection biases?

2. What are possible information/measurement biases?

3. What are possible confounders?

E. If biases might be present, what effect might they have on results?

F. If biases might be present, what attempts were made to deal with them (in either the study design stage or in the analyses)?
G. What percentage of potential subjects are finally studied? Diagram the flow of the study in terms of numbers and percentages of subjects eligible, losses and who finally participated (diagram losses for whatever causes).

H. Are there ethical problems with this study?

III. Observations

A. Are there clear definitions of terms used, including diagnostic criteria, exposure measurements and criteria for outcome? (Note differences between the data obtained and collapsing of categories in analyses)?

B. Do the observations measure what they purport to measure?

C. Are the observations reliable (reproducible)?

IV. Presentation of Findings

A. Do the authors provide basic descriptive tables of subjects and major variables?

B. Are the findings presented in enough detail so the reader can judge them?

C. Are the findings internally consistent, that is, do the numbers add up?
V. Data Analyses

A. Are the data worthy of statistical analysis?

B. Are the statistical methods appropriate to the source and type of data?

C. What measure(s) of effect were calculated? (Odds ratios, risk ratios, etc.)

D. Did the authors calculate confidence intervals for the point estimates?

E. Do the analyses address and control for confounding?

F. If there are observed differences but these are not statistically significant, do the authors discuss the power of the various tests?

G. Are the analyses correctly performed and interpreted?

VI. Conclusions

A. What do the authors conclude?
B. Are all their conclusions justified by their findings? Which are not?

C. Are the conclusions relevant to the original hypotheses posed by the authors?

D. Are the results biologically plausible?

E. Do the authors discuss the limitations of their data?

F. Do the results have external validity? To what other populations might these results be extrapolated?

VII. Constructive Suggestions

Assume that you are planning an investigation to answer the questions about which this study was concerned.

A. If such questions have not been clearly state, frame them in an appropriate manner.

B. How might the study design, criteria for observations, types of analyses be changed to provide more reliable and valid information relevant to the questions under study?