CRITICAL APPRAISAL CHECKLIST FOR AN ARTICLE ON HARM OR CAUSATION.

Study Design: Cohort or case-control study

Adapted from:

Levine M, Walter S, Lee H, Haines T, Holbrook A, Moyer V. Users' guides to the medical literature. IV. How to use an article on harm. JAMA 1994; 271: 1615-1619.

DOES THE STUDY ADDRESS A CLEAR QUESTION?

1. Is there a clearly focussed question? Consider • Patients • Exposure • Outcome	**Yes**	**Can't tell**	**No**

IS THE STUDY DESIGN VALID?

2. Were there clearly defined groups of patients, similar in all important ways other than exposure to the treatment or other causes?	**Yes**	**Can't tell**	**No**
3. Were treatments/exposures and clinical outcomes measured in the same way for both groups?			
4. Was the assessment of outcomes either objective or blinded to exposure?			
5. Was the follow-up of study patients sufficiently long for the outcome to occur?			
6. Do the results of the harm study fulfil some of the diagnostic tests for causation? Consider: • Is it clear that the exposure preceded the onset of the outcome? • Is there a dose-response gradient? • Is there any positive evidence from a "dechallenge – rechallenge" study? • Is the association consistent from study to study? • Does the association make biological sense?			

ARE THE RESULTS IMPORTANT?

		Adverse outcome		Totals
		Present (Case)	Absent (Control)	
Exposed to the treatment/harmful agent	Yes (Cohort)	a	b	a + b
	No (Cohort)	c	d	c + d

Estimating the risk.

If the study is a cohort study:

Risk (chance) in group exposed = a / (a + b).

Risk (chance) in group not exposed = c / (c + d).

$$\text{Relative risk} = \frac{[a / (a + b)]}{[c / (c + d)]}$$

If the study is a case-control study:

Odds (chance) in cases = a / c.

Odds (chance) in cases = b / d.

$$\text{Odds ratio (OR)} = \frac{[a / c]}{[b / d]} = \frac{ad}{bc}$$

7. How strong is the association between exposure and outcome, i.e. the estimate of risk?	
8. How precise is the estimate of risk? Were the results presented with confidence intervals?	

ARE THE RESULTS IMPORTANT FOR MY PATIENT?

	Yes	Can't tell	No
9. Is my patient so different from those included in the study that its results don't apply?			
10. What is my patient's risk of the adverse event/potential benefit from therapy?			
11. What are my patient's preferences, concerns and expectations from this treatment?			
12. What alternative treatments are available?			

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Case-control study	Study design in which individuals with a particular disease or characteristic of interest (**cases**) are related to individuals without that disease or characteristic (**controls**) to determine if they differ in their past exposure to a postulated causal factor. Thus, it tries to relate an effect or outcome to a probable cause. The study design is **retrospective** and **longitudinal**.
Cohort study	Study design in which a group of individuals are followed up **prospectively** over time to see if they develop a disease or outcome of interest. Thus, it tries to relate the exposure to factor(s) of interest to later incidence of disease. The cohort may be: A population cohort followed up over years for the incidence of particular diseases, e.g. a birth cohort, an area-based cohort. A cohort of individuals exposed to a factor of interest compared to a cohort not exposed to that factor.
Risk	Describes the chance of an event occurring. Risk is a **proportion**, i.e. the numerator is in the denominator e.g. a / a + b.
Odds	Also describes the chance of an event occurring. Odds are a **ratio**, i.e. the numerator is **not** in the denominator e.g. a / c.
Relative risk (RR)	A measure of the chance of the event occurring in the exposed group relative to it occurring in the unexposed group. Relative risk is a ratio of proportions. RR > 1.0 means an increase in risk; RR < 1.0 a decrease in risk.
Odds ratio (OR)	A ratio of ratios. Measures the odds (chance) of a case patient being exposed divided by the odds of a control patient being exposed. OR > 1.0 means an increased odds (chance) of being cases being exposed; an OR < 1.0 means a decrease in the odds (chance) of being exposed.
Confidence interval	For whatever effect being measures (e.g. RR, OR) the confidence interval is the range of values within which the “true” value in the population is found. Generally expressed as a 95% confidence interval, i.e. you can be 95% confident that the population value lies within those limits.