

## The Research Question

Write out your research question as you have it formulated in your mind right now:

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Now, write how your research question meets the criteria of the FINER mnemonic:

Feasible:

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Interesting:

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Novel:

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Ethical:

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Relevant:

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Now, write out each component of your research question using the PICO mnemonic:

Population or problem:

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Intervention or exposure:

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Comparator intervention or control:

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Outcome:

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Now that you have worked through the FINER and PICO mnemonics, write out your newly formulated and refined research question:

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Write down any secondary, tertiary, or ancillary research questions that you want to ask.

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## The Research Design

Will you use a retrospective or prospective design? \_\_\_\_\_

Will you use an observational or experimental design? \_\_\_\_\_

What specific design will help you answer your research question?

<input type="checkbox"/> Case Series	<input type="checkbox"/> Case-control	<input type="checkbox"/> Cross-sectional	<input type="checkbox"/> Retrospective Cohort	<input type="checkbox"/> Prospective Cohort	<input type="checkbox"/> RCT	<input type="checkbox"/> Systematic Review
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What is your population of interest?

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Describe your inclusion criteria:

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Describe your exclusion criteria:

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What type of sampling methodology will you use in the study? \_\_\_\_\_

How large of a sampling pool do you have access to currently? \_\_\_\_\_

How will you recruit study participants?

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## Variables

What is your primary outcome variable? \_\_\_\_\_

What is the scale of measurement for your primary outcome variable?

<input type="checkbox"/> Categorical	<input type="checkbox"/> Ordinal	<input type="checkbox"/> Continuous
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What is your primary predictor variable? \_\_\_\_\_

What is the scale of measurement for your primary predictor variable?

<input type="checkbox"/> Categorical	<input type="checkbox"/> Ordinal	<input type="checkbox"/> Continuous
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What other predictor, confounding, demographic, and clinical variables will you collect?

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

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Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

Variable: \_\_\_\_\_ Scale of measurement: \_\_\_\_\_

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## Power Analysis

Based on your research question, your research design, the scale of measurement of your outcome variable, and what you know from your clinical experience, the literature, and your peers and colleagues, what is the effect size?

If you are using a categorical outcome:

What is the proportion of Group 1 that will have the outcome? \_\_\_\_\_

What is the proportion of Group 2 that will have the outcome? \_\_\_\_\_

Proportion of Group 1 – proportion of Group 2 = The effect size

If you are using an ordinal outcome:

What is the mean and standard deviation for the first group or observation of the outcome?

Mean: \_\_\_\_\_

Standard Deviation: \_\_\_\_\_

What is the mean and standard deviation for the second group or observation of the outcome?

Mean: \_\_\_\_\_

Standard Deviation: \_\_\_\_\_

Mean of Group or Observation 1 – Mean of Group or Observation 2 = The effect size

If you are using a continuous outcome:

What is the mean and standard deviation for the first group or observation of the outcome?

Mean: \_\_\_\_\_

Standard Deviation: \_\_\_\_\_

What is the mean and standard deviation for the second group or observation of the outcome?

Mean: \_\_\_\_\_

Standard Deviation: \_\_\_\_\_

Mean of Group or Observation 1 – Mean of Group or Observation 2 = The effect size

What steps are you taking to increase your statistical power?

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## Database Management

What type of database design will help you answer your research question?

<input type="checkbox"/> Stacked	<input type="checkbox"/> Side-by-side	<input type="checkbox"/> Mixed
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Enter the names of your variables into the spreadsheet below:


Write out your codebook for your database:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

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## Inferential Statistics

What is the scale of measurement for your outcome? \_\_\_\_\_

What type of research design are you using? \_\_\_\_\_

How many groups? \_\_\_\_\_

How many observations? \_\_\_\_\_

Which inferential statistic will you use to answer your research question?

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Which inferential statistics will you use to answer your secondary, tertiary, and ancillary research questions?

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If you violated a statistical assumption, which non-parametric statistical tests will you use?

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## 2x2 Tables

Are you going to assess the odds or risk of an outcome given exposure or non-exposure?

	Outcome	No outcome
Exposure	A	B
No exposure	C	D

Odds ratio formula =  $(A \cdot D) / (B \cdot C)$

Relative Risk =  $(A / (A+B)) / (C / (C+D))$

Are you going to assess the diagnostic efficacy of a new agent or test?

	“Gold Standard” +	“Gold Standard” -
Test +	TP	FP
Test -	FN	TN

Sensitivity =  $(TP / (TP+FN))$

Specificity =  $(TN / (TN+FP))$

Positive predictive value =  $(TP / (TP+FP))$

Negative predictive value =  $(TN / (TN+FN))$

Do you need to know the efficacy of a treatment based on clinical evidence?

	Outcome	No outcome
Treatment	A	B
Control	C	D

Control event rate (CER) =  $(A / (A+B))$

Experimental event rate (EER) =  $(C / (C+D))$

Absolute risk reduction (ARR) =  $|CER - EER|$

Absolute risk increase (ARI) =  $|CER - EER|$

Number needed to treat (NNT) =  $(1/ARR)$

Number needed to harm (NNH) =  $(1/ARI)$

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## Evidence-Based Medicine

### Asking

Are you asking any clinical questions at all? \_\_\_\_\_

Are you asking focused questions? \_\_\_\_\_

Are you locating and acknowledging knowledge gaps? \_\_\_\_\_

### Acquiring

Are you searching at all? \_\_\_\_\_

Do you know the best sources of current evidence in your discipline? \_\_\_\_\_

Do you have access to the evidence in your discipline? \_\_\_\_\_

Are you an efficient searcher of the literature? \_\_\_\_\_

### Appraising

Are you critically appraising external evidence at all? \_\_\_\_\_

Are you accurate and efficient at appraisal? \_\_\_\_\_

Are you creating any summaries of your questions, searches, and appraisals?  
\_\_\_\_\_

### Applying

Are you integrating critically appraised evidence into your clinical practice at all? \_\_\_\_\_

Can you explain clinical decisions in the context of the evidence? \_\_\_\_\_

Are you becoming more accurate and efficient at applying clinical evidence? \_\_\_\_\_

### Practice

Have you identified barriers and facilitators to integrating EBM into your practice? \_\_\_\_\_

How will EBM integration improve upon your outcomes? \_\_\_\_\_

Is the integration of EBM interventions sustainable in your current clinical setting? \_\_\_\_\_

Do you have a strategy for implementation and assessment of EBM interventions? \_\_\_\_\_

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Thank you for your time and interest!!!

Contact me at [rheidel@utmck.edu](mailto:rheidel@utmck.edu) for any statistical or empirical consultation needs!

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