

Developing a Research Question & Hypothesis

- **Research Question**
- Hypothesis

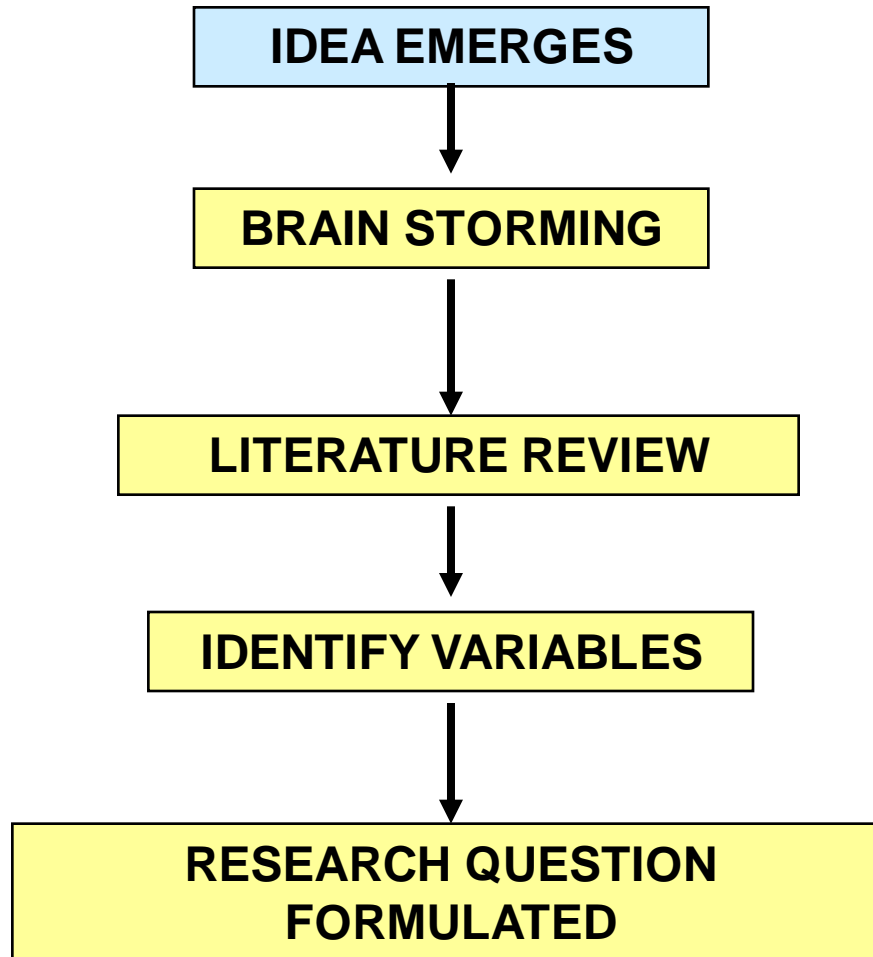
BMJ

Is it possible to exclude a diagnosis of myocardial damage within six hours of admission to an emergency department? Diagnostic cohort study

K R Herren, K Mackway-Jones, C R Richards, C J Seneviratne, M W France and L Cotter

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In the United States, chest pain assessment units are increasingly being established in emergency departments.¹⁴⁻¹⁶ These combine serial measurements of creatine kinase MB with continuous ST segment monitoring to rule out myocardial infarction. Although this approach is safe,⁷ no study has assessed its clinical efficacy with a gold standard for both admitted and discharged patients. We aimed to assess the clinical efficacy and accuracy of an emergency department based six hour rule-out protocol for myocardial infarction.



Research Question:

Essential elements

- Is the rationale clear?
- Has the population been identified?
- Has it identified the variables to be studied?
- Is it possible to empirically test it?

research Qs.....

- Would the topical skin application of sunflower oil as a skin barrier enhancing emollient reduce nosocomial infections in preterm infants ?

research Qs.....

- Would the topical skin application of sunflower oil as a **skin barrier enhancing emollient** reduce nosocomial infections in preterm infants ?
- **Rational**

research Qs.....

- Would the topical skin application of sunflower oil as a skin barrier enhancing emollient reduce nosocomial infections in **preterm infants** ?
- **Population**

research Qs.....

- Would the **topical skin application of sunflower oil** as a skin barrier enhancing emollient reduce nosocomial infections in preterm infants ?
- **Intervention**

research Qs.....

- Would the topical skin application of sunflower oil as a skin barrier enhancing emollient reduce **nosocomial infections** in preterm infants ?
- **Outcome of interest**

A good research question should be.....

- **F**easible
- **I**nteresting
- **N**ovel
- **E**thical
- **R**elevant

.....**FINER**

Research Q: problems & solutions

| Potential problem | Solution |
|---|-----------------|
| Too broad | |
| Not enough subjects | |
| Methods beyond skill of investigator | |
| Too expensive | |
| Not interesting/relevant | |
| Uncertain ethical suitability | |

***Research question determines
study design***

- Research Question
- **Hypothesis**

Hypothesis.....

Transformation of a research question into a statement, and

- *identifies the predicted relationship between variables*
- *is testable (variables must be measurable)*

Hypothesis.....

Statement of a research question should summarize following key elements:

- **P** *opulation to be studied*
- **I** *ntervention (or predictor)*
- **C** *omparison group*
- **O** *utcome: relationship and its magnitude*

Does 3-Day Course of Oral Amoxicillin Benefit Children of Non-Severe Pneumonia with Wheeze: A Multicentric Randomised Controlled Trial

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Research Q..

Can children with non-severe pneumonia with wheeze be effectively be treated with antibiotics ?

P *population*

Children 2-59 months with WHO defined non-severe pneumonia

I *Intervention*

Oral amoxicillin 31- 54 mg/kg/d in three divided doses

C *comparator*

Oral placebo in three divided doses

O *Outcome*

Clinical failure on day 4 being less than 17% between the two groups

Hypothesis

In children with non-severe pneumonia with wheeze oral amoxicillin in a dose of 31-54 mg/kg/d in three divided doses will have a failure rate not more than 17% on day 4 of treatment compared to placebo

Research question

- Does delayed cord clamping at birth improve hemoglobin at 6 months in term neonates born to anemic mothers?

P *population*

Term neonates born to anemic mothers

I *Intervention*

Delayed cord clamping

C *comparator*

Early cord clamping

O *Outcome*

Hemoglobin at 6 months higher by 2 g/dl in delayed clamping compared to early clamping

Hypothesis

In term non-LBW neonates born to mothers with Hb < 10 G/dL, cord clamping after cessation of pulsations increases Hb by 2 g/dl at 6 months when compared to clamping of cord immediately after delivery.