

# What is research?

**Clinical problem**  
**Research question**

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## Objectives:

- Identifying what research is and why it is important
- Identifying a Clinical problem
- Understanding how to formulate a Research Question
- Transforming a Research question into a Hypothesis
- Formulating Aims and Objectives

## What research is?

- Research – the generation of new knowledge, theory or methods using systematic, robust and replicable techniques
- Research starts with a problem: an unanswered question.
- Problems may be unsolved questions based on clinical knowledge
- Scientific research aims to generate new knowledge
- New ideas

## Why is research important

- 1.It is a tool for building knowledge and facilitating learning.
- 2.It is a means to understand issues and increase public awareness.
- 3.It helps us succeed in business.
- 4.It is a means to find, gauge, and seize opportunities.
- 5.It promotes interest and confidence in reading, writing, analyzing, and sharing valuable information.
- 6.It provides intellectual stimulation.

## Key principles of research...

- P1 Rigour in the development, undertaking and reporting of research
- P2 Transparency in declaring interests and reporting research methodology, data collection methods and findings
- P3 Fairness in the treatment of others

## ...Key principles of research

- P4 Respect for research participants, the wider community and the environment
- P5 Accountability for the development, undertaking and reporting of research
- P6 Promotion of responsible research practices

## Identifying a Clinical problem

- From ideas to research
- What strikes our minds: regularities or anomalies?
  - The observation of regularities (“induction”) is a common origin of new ideas
- An anomaly forces us to think about other explanations, and these lead to new hypotheses that we then try to test
  - *Anomalies* - events that run counter to our reasonable expectations, not to say our scientific “presumptions.”
  - *Phenomenon* -term used in science to mark occurrences-especially general types of occurrences-that challenge existing ideas and so call for scientific investigation and explanation.

## Where do research ideas come from? Identify the problem

- read the medical literature
- teach—*questions asked by students* can often give ideas for research;
- be a team player—ideas can come *from colleagues or mentors*
- develop *specific areas of scientific interest*
- get new *ideas* out of your own *previous research*;
- be a *good observer*;
- be *imaginative*;
- have a *skeptical attitude when reading scientific findings*
- *be alert to new ideas*

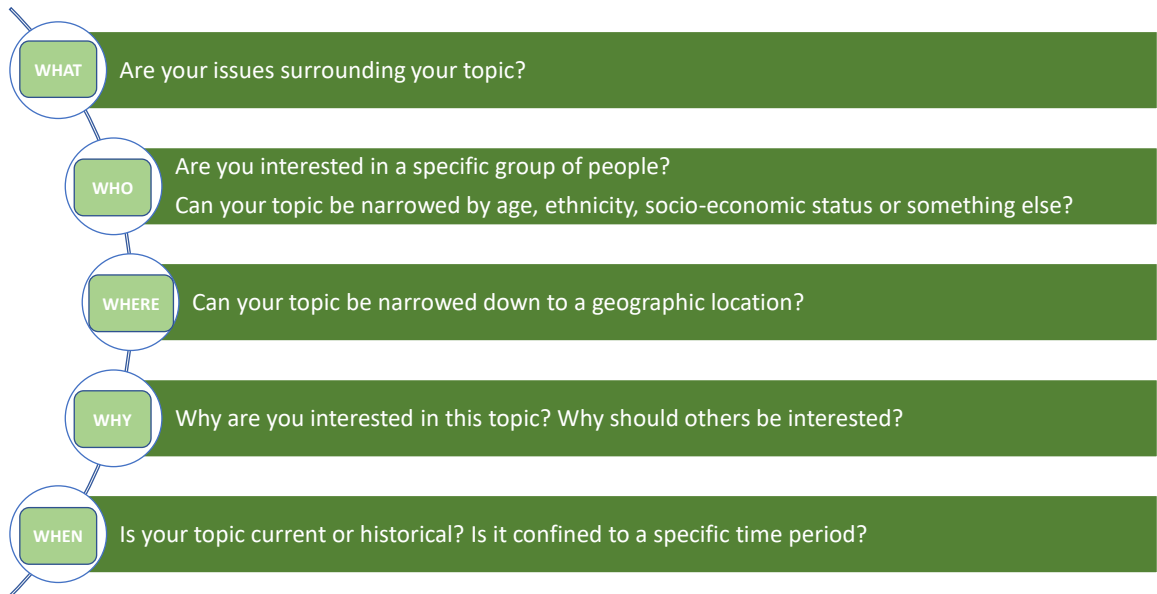
## Sources of new ideas

- Review existing practice
- Challenge accepted ideas
- Look for conflicting views
- Investigate geographical variation
- Identify Cinderella topics
- Let loose the imagination

## Formulating research question Selection of a topic for research

- What?
- Who?
- Where?
- Why?
- When?





## How to develop a research question? A good research topic is:

- *feasible* - can be done and completed
- *interesting* - to the investigators and to the scientific community
- *novel* - contribute with new information
- *ethical*
- *relevant* - have the potential to advance scientific knowledge, influence clinical management, influence health policy, or guide further research

### **Example:**

*What barriers/disparities (concerning clinical, education, legal, organizational dimensions) are hindering access to palliative care for cancer patients in community, in the last year of life?*

## PICOT or PICo process

### Quantitative format

- **P - Population (patients)** - describes the population of interest for your study
- **I - Intervention** defines what is being administered
- **C - Comparison group** to see if the intervention has an effect on the outcome above and beyond the comparator
- **O - Outcome of interest** what researchers measure or observe in a population
- **T - Time** you will observe the outcomes in your study-optional

[Create a Research Question Using PICOT Question Generator](#)

### Qualitative format

- **P - Population (patients)** – describes characteristics of the Population or the patient or the Problem, condition or disease you are interested in?
- **I - Interest** relates to a defined event, activity, experience or process
- **Co - Context** - is the setting or distinct characteristics

## Examples PICOT/PICo process

- How do the barriers/disparities (**I**) concerning clinical, education, legal, organizational dimensions hindering access to palliative care (**O**) for cancer patients (**P**) compared to those with access to palliative care (**C**), in the last year of life (**T**)?
- In cancer patients (**P**), how does morphine (**I**) compared to methadone (**C**) control pain(**O**)? (Time is optional).
- What is the psychological experience (**I**) of patients diagnosed with cancer (**P**) in in rural area (**Co**)?

## Hypothesis

- Transformation of a research question into an operational analog
  - independent variable some sort of association with the dependent/outcome variable

### Characteristics:

- Gives insight into a research question
- Is testable and measurable by the research design
- Has logical basis
- Follows the most likely outcome, not the exceptional outcome

## Research question versus hypothesis

	Research question	Hypothesis
Definition	the question a research study sets to answer	tentative prediction about the relationship between two or more variables
Nature	inquisitive in nature	predictive in nature
Existing Research	can be used if there is little previous research on the subject	can be used if there is significant knowledge or previous research on this subject
Quantitative vs Qualitative	can be used in both quantitative and qualitative studies	mainly used in experimental quantitative studies
Outcomes	allows a wide range of outcomes	doesn't allow a wide range of outcomes

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## Examples

### Research question

*In cancer patients (P), how does morphine (I) compared to methadone (C) control pain(O)?*

### Hypothesis:

*Null hypothesis:* There is no difference between morphine and methadone use in regard to pain control for cancer patients.

*Alternative hypothesis:* There is a difference between morphine and methadone use in regard to pain control for cancer patients.

## Aims and objectives

- **AIMS** "...**WHAT** you want to know..."
  - what you hope to accomplish through your research
- **Objectives** "...**HOW**...the specific steps you will take to achieve your aim..."
  - steps that address HOW your research aim will be achieved

## Aims

**1. Why** is this research required? (this is your context)

**2. What** is this research about? (this is the real aim of your research)

**3. How** are you going to do it? (this is an overview and introduction to your objectives)

- Usually written using an infinitive verb "**to + action**" (*to map, to design, to explore etc*)

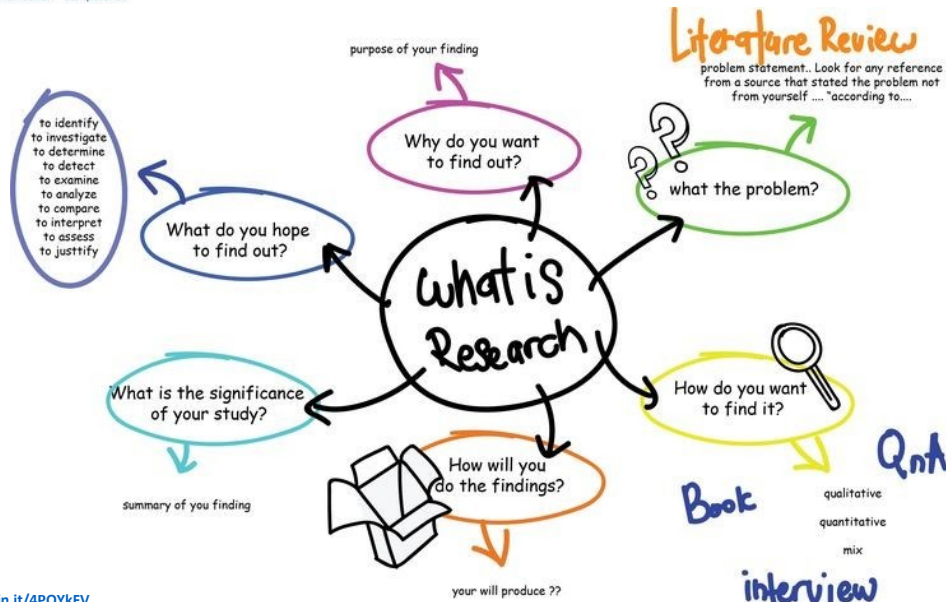
Example

*The aim of our research is to design a new model of care for reducing gaps in access to palliative community care for cancer patients.*

## Objectives

- **S= Specific:** Write them clearly and keep them narrowed and focused.
- **M= Measurable:** You must be able to measure them in order to know how you progress towards achieving them.
- **A= Achievable:** You must create objectives that you can realistically achieve with the financial and human resources that you have available.
- **R= Relevant:** The objectives must be relevant to achieving your overall research aim.
- **T= Time-bound:** Build milestones/timelines for each objective.

## To summarize



<https://pin.it/4POYkFV>  
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For more, please check: <http://www.studiipalliative.ro/projects/research-respacc/>

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