# Case Study

You have been provided with clinical data from a cardiac imaging study (2011-2014) containing:

* patients.csv - Baseline patient characteristics
* echo\_data.csv - Echocardiogram results (multiple per patient)
* cta\_data.csv - CT angiography results with CAC scores (multiple per patient)
* endpoints.csv - Clinical outcomes (MI and death)

**Your goal**: Create a single analytic dataset with one row per patient suitable for statistical analysis.

**Extension** goal: Create a table summarizing descriptive statistics, where the columns are randomization arm.

## Getting started

1. Set up your environment: Create an R project that contains the 4 .csv files as well as any code you write.
2. Understand what you are starting with: Consider your data objects’ dimensions and structure. What does each row represent? What are the relationships between the datasets? Draw or describe what structure you are starting with and what structure you want to end with.
3. Identify your target dataset. What will the rows be? What will the columns be?
4. Plan your approach. What dataset will you start with? What do you need to do to other datasets to join them together? How will you validate/check the results? Write pseudocode or an ordered list before writing any code.

## Let’s get coding!

1. Write code yourself or ask AI to assist you. Here are some tips on using AI to code:

* Start with your computational thinking, starting point, and end goal
* Instruct your AI tool to ask you questions as needed to clarify what you want
* Request multiple approaches with pros/cons
* Validate any AI-written code with checks
* Don’t copy/past code without understanding it
* Get help with errors

1. What if you run into errors that AI can’t seem to fix? Go back to computational thinking. What do you have? Where do you want to go? What problem is the code having that is preventing that? Is there a workaround?
2. You may not have the clinical background to know what all the variables are. Use any helpful resource to assist you.