

Effective design principles for case report forms

Case report form (CRF) definition

“A printed, optical or electronic document designed to record all the protocol required information to be reported to the sponsor on each trial subject”

– International Committee on Harmonisation (ICH) Good Clinical Practice (GCP) guidelines

Purpose

1. To collect all required data needed to answer the study question and to ensure data are of good quality.
2. To collect supportive data for both the administration of the study and for documentation of compliance to regulations and GCP

Why use a CRF?

- consistency: ensure each treatment group’s data are collected equally well
- accuracy: specify all alternative answers

1. Question style

Avoid double negatives:

Poor	(Y/N)	Better	(Y/N)
Is the patient currently not taking asthma medication?	<input type="checkbox"/>	Is the patient currently taking asthma medication?	<input type="checkbox"/>

Avoid compound questions

Poor	(Y/N)	Better	(Y/N)
The answers to items 28 to 32 were reviewed by a nutritionist and the patient is eligible	<input type="checkbox"/>	Were items 28 to 32 reviewed by a nutritionist?	<input type="checkbox"/>
		If yes, is the patient eligible?	<input type="checkbox"/>

Use positive statements, particularly for instructions and comparisons

Poor	(Y/N)	Better	(Y/N)
Would you say you are in worse health than you were a year ago?	<input type="checkbox"/>	Would you say you are in better health than you were a year ago?	<input type="checkbox"/>
Do not skip any of the following questions .		Answer all of the following questions .	

Ask specific questions (especially of patients)

Poor	(Y/N)	Better
Have you recently had a headache?	<input type="checkbox"/>	How many times in the last week have you had a headache? <input type="text"/> times

- completeness: ensure all data are collected
- clarity: provide definitions and details

The ideal CRF is clear, well-organised, provides direction and facilitates good data collection and easy data entry

CRF design

Best practice: design and development

- Involve principal investigators, statisticians, data managers and trial co-ordinators.
- Questions, prompts and instructions should be clear and concise.
- Design the CRF to follow the flow of how data will be collected.
- The main goal is to capture data on primary and secondary objectives.

Three main areas of CRF design that should be considered are 1. question style, 2. question coding, and 3. presentation and layout.

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Specify time points clearly

Poor: How would you rate your pain?

bad _____ good

Better: How would you rate your pain since your last clinic visit?

bad _____ good

The above question may still have such problems as:

- the time period is too long
- the answer may not be an “average”
- the answer may be influenced by 1 bad day in last 3 weeks or patient’s current state

Consider asking:

How would you rate the worst episode of pain since your last clinic visit?

bad _____ good

2. Question coding

Most data must be coded before analysis. Open-ended questions may capture unusual data and are often useful in more exploratory studies and may also facilitate the data cleaning process. However, the coding will be necessary if data are to be used in analysis. Coded data will minimise errors and data processing time. Data codes should be consistent throughout for questions of the same type to simplify the form completion process and assist in data entry.

3. Presentation and layout

The type of response box can be informative. For example, the positioning of decimal points to indicate precision required or checkboxes for different units of measurement.

Weight	<input type="text"/>	kg	Weight	<input type="text"/>	.	<input type="text"/>	kg
Creatinine	<input type="text"/>	mmol/L	Creatinine	<input type="text"/>	mmol/L	<input type="checkbox"/>	<input type="checkbox"/>
					μmol/L	<input type="checkbox"/>	<input type="checkbox"/>

Handling missing data

1. Include general instructions thus:

“Complete all information wherever possible using the following codes where required: (blanks will be queried)

- UNK - unknown [if information unobtainable]
- ND - not done [if measure has not been taken or test not performed]
- N/A - not applicable [if measure was not required]”

2. Include specific instructions at each question as necessary

Tumour detected by x-ray?	1 = Yes 2 = No 9 = Unknown	<input type="checkbox"/>
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3. Allow for unusual circumstances

What treatment was given?	1 = Aspirin 2 = Paracetamol 3 = Other (please specify _____)	<input type="checkbox"/>
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Layout and presentation

Each page of the CRF should contain a header and footer detailing the trial name, number, logo and protocol version number along with the patient ID and visit number

Instructions for completion and storage should be detailed on the front page of the CRF

- when and by whom the form is to be completed
- where the form (and any copies) are to be sent or stored .

All pages and questions to be clearly numbered.

Contact the Outreach team (trials@ctc.usyd.edu.au) or through the website (www.outreachclinicaltrials.org.au) for further advice on this topic.