

GD017

Randomisation Procedure Testing

Randomisation procedure testing is the process whereby a randomisation list is shown to have been generated at random and meets the randomisation specification (see SOP018 Appendix 1), and therefore have the required properties for it to be a suitable randomisation procedure.

Randomisation may be provided:

1. By an external sub-contractor, with online access or through a password protected list.
2. In-house, developed by the TS and/or the statistical team.

The testing procedure is different for each of the above.

External sub-contractor randomisation

External sub-contractors such as SealedEnvelope.com have their own testing system. However, the system must be tested to ensure reliability and to ensure it meets the randomisation specification. Testing should include whether:

- a) A final sequence is random.
- b) A final sequence meets the randomisation specification (e.g. whether blocks, strata, allocation ratios, etc, match what was specified).
- c) A backup system works.
- d) The system is robust to wrong data input.
- e) The code can be broken in those circumstances identified as necessary by the protocol.

If SealedEnvelope.com is to be used, the following testing must be completed on the test system. The test system is an identical copy of the live randomisation system, except it will use a dummy randomisation list or code list (where appropriate). If an alternative external sub-contractor is used, testing should be performed in a similar way where possible. To test the system, take the following steps (see also <https://help.sealedenvelope.com/article/167-how-do-i-test-a-randomisation-system>)

- a) Add at least one site.
- b) Check the specification page and make sure it matches your requirements.
- c) Check the randomisation form. If detailed inclusion and exclusion criteria are listed make sure these are consistent with the approved protocol. If there are validation checks on fields (e.g. an age range on the date of birth field) make sure these operate correctly.

GD017 Randomisation Procedure

- d) Perform some randomisations. Check that these are conforming to the randomisation protocol (blocks, minimisation etc). Ask Sealed Envelope for the dummy list or code list if necessary to help you check this. You may find the statistician for your trial can help, particularly if you have strata or are using minimisation.
- e) Create an investigator account using another email account you have. Log in as an investigator and try randomising. This will show you the simplified interface investigators see.
- f) Check you have received the email notifications for the randomisations. Make sure they contain the correct information.
- g) Try marking a randomisation as in error. Check the reports now exclude this record.
- h) If relevant, try unblinding a randomisation. Check the treatment group matches the dummy code list.
- i) Try downloading the randomisations as a CSV file. Check the data is consistent with the randomisations you have performed.

In-house randomisation sequence

For in-house randomisation we need to test whether a sequence is random and whether it meets the randomisation specification. This includes:

- a) Ensuring a final sequence meets the randomisation specification (e.g. whether blocks, strata, allocation ratios, etc, match what was specified).
- b) Ensuring there is no auto-correlation (significant patterns/similarities between randomisation outcomes over time which could considerably reduce the unpredictability of the sequence).
- c) Testing if the number of switches between treatments and the longest run without switches are as expected for a random sequence (Lunn et al. 2013).
- d) If relevant, try marking a randomisation as in error. Check the reports now exclude this record.
- e) If relevant, try unblinding a randomisation. Check the treatment group matches the dummy code list.

The R package RandomiseR (<https://cran.r-project.org/web/packages/randomizeR/randomizeR.pdf>) may be used as a tool to assess the randomisation procedure.

Details of the randomisation code used to generate a randomisation sequence should be documented so that these testing procedures can be re-done if necessary. Details of the seed used to generate the randomisation sequence should be stored.

1. References

- a. Lunn D, Jackson C, Best N, Thomas A, Spiegelhalter D (2013) The BUGS book: a practical introduction to Bayesian analysis. CRC Press. Example 8.4.2. p150