Table 3: Summary of group discussion on when it was appropriate to use Randomised Controlled Trials (RCTS), their relative merits and limitations

	When to use	Merits	Limitations
Randomised Controlled Trials	For determining the efficacy/ effectiveness of an intervention	• Most valid method for determining the efficacy/ effectiveness of an intervention. • Many of the biases associated with pre and quasi-experimental designs can be avoided. • Reduces the potential for: confounding bias, sample selection bias, information bias, and other forms of systematic bias. • Allows both individual interventions (e.g. a specific technique for chest clearance) and packages of care (e.g. an exercise and education based rehabilitation programme) to be tested. • Allows estimates of both the absolute	• Dropout/non-adherence can compromise the validity of the trial. This may potentially lead to bias, owing to loss of randomisation; however, intention-to-treat analysis can offset this. • May be unethical, particularly if it is intended to use a no-treatment control group for patients who may suffer irreversible loss of function through withheld treatment (may be more of a problem in acute phases of a disease). • Often expensive to run, owing to the high degree of control that needs to be exerted over the clinical environment. This may mean that it is hard to evaluate a treatment in the absence of funding that will allow an RCT of sufficient size to be run. • Potential lack of generalisability; the identification of a very specific population in terms

		effect (against no treatment or placebo) and the relative effect (against alternative treatments) of an intervention to be assessed. • Allows comparison of, and correction for, baseline characteristics between groups. • Allows for synthesis of findings of other RCTs in a systematic review/meta analysis.	of inclusion/exclusion criteria assists in the internal validity of the trial but may restrict the external validity of the findings (e.g. a trial of two treatments for male patients with CF between 12 and 15 years counteracts possible confounding effect of sex and age, but findings cannot be confidently extrapolated beyond this study population). • Difficulty of performing RCTs of surgical and diagnostic technologies, as blinding of clinician and/or patient may be hard to achieve. • The rapidity with which technology changes may mean that by the time the trial has been conducted, analysed and disseminated, clinical practice has changed. • Prone to design flaws e.g. may be performed on too few patients for too short a follow-up period, or important confounders may not have been measured (and cannot therefore be adjusted for). • It may be difficult to apply the aggregate conclusion of treatment effectiveness from an RCT

			to an individual patient.