

# N-OF-1 TRIALS IN FAMILY MEDICINE EDUCATION

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## Single-Case Trial Types

N-of-1, or single-case trials, are individualized, crossover studies that compare intervention effects within a person or group. They provide a framework for personalized clinical or educational decisions by alternating interventions while collecting outcomes.

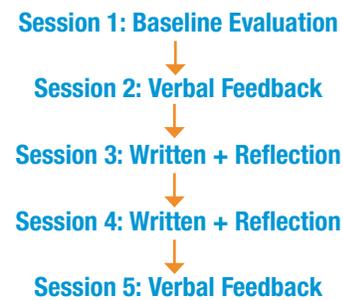
Type	Description	Purpose	Key Considerations	Examples
<b>Single-or double-blind, crossover (ABAB crossover)</b>	Learner or faculty alternates between interventions. Outcomes compared within individual or group learners.	Compares two teaching approaches on learning outcomes.	Controlling confounders; best in repeatable, similar contexts.	Comparing teaching with/without decision aids.
<b>Multiple-baseline design</b>	Intervention has several components targeting skills/behaviors, measured at baseline. Interventions implemented one at a time.	Evaluates specific program elements.	Identifying targeted intervention for specific skills/behaviors.	Evaluating program to improve patient-resident communication and prescribing.
<b>Sequential or adaptive design</b>	Intervention adjusted based on feedback or performance.	Allows iterative improvement while collecting data.	Documenting changes and rationale.	Adapt workshop structure based on feedback.
<b>Aggregated N-of-1 trials</b>	Multiple educators or learners undergo personalized interventions. Data pooled for group-level trends.	Blends individual-level responsiveness with group-level conclusions.	Standardizing outcome metrics.	Evaluate personalized learning plans for underperforming residents across programs.

**Example:** Dr Lopez, a family medicine educator, compares immediate verbal feedback with written feedback and reflection prompts to improve a resident's teaching using an N-of-1 multiple crossover design over several precepting sessions.

## Example Design

Element	Details
<b>Trial type</b>	ABAB crossover
<b>Participant</b>	Single resident or group precepting with faculty
<b>Intervention A</b>	Immediate verbal feedback post-session
<b>Intervention B</b>	Written feedback + structured reflection
<b>Assignment</b>	Residents randomized into intervention A or B
<b>Blinding</b>	Unblind (resident and faculty are aware of intervention)
<b>Outcomes</b>	Self-assessment, faculty evaluation, resident feedback and satisfaction
<b>Duration</b>	5–6 sessions; crossover every 1–2 sessions

## Flow



## Strengths & Weaknesses

Strengths	Weaknesses
<b>Personalized evaluation:</b> Tailored to individual learners or educators.	<b>Limited generalizability:</b> Results may not apply to larger groups.
<b>Rigorous design:</b> Structured randomized approach reduces bias.	<b>Resource intensive:</b> Requires significant time and effort.
<b>Flexibility:</b> Allows real-time adaptation and improvement.	<b>Overstatement Risk:</b> May focus too narrowly on one experience.
<b>Cost-effective:</b> Cheaper than large-scale studies.	<b>Potential for bias:</b> Due to lack of blinding.
<b>Facilitates evidence-based teaching:</b> Uses data for informed decisions.	<b>Limited control of confounders:</b> Difficult to control external factors.
<b>Encourages reflection:</b> Helps identify effective learning or teaching methods.	<b>Complex data interpretation:</b> Requires careful analysis and statistical knowledge.

N-of-1 trials are valuable in family medicine education for assessing personalized teaching strategies and learner progress. They effectively support individualized learning when used thoughtfully.

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