CLINICAL EXCELLENCE CONSULTING

Phases of Clinical Trials

A complete overview of drug development: Pre-Clinical through Phase IV

Phase	Focus	Duration	Sample Size	Key Factors	Outcome
PRE-CLINICAL	Lab & Animal Testing	3–6 months	N/A (animals)	MOA, efficacy, safety	IND application to FDA
PHASE I	Pharmacology & Tolerability	Several months	20–80 subjects	PK/PD, max tolerated dose	Safety profile + recommended dose
PHASE II	Safety & Efficacy	Months–2 years	200–400 patients	Drug interactions, efficacy at doses	Proof of concept + optimal regimen
PHASE III	Effectiveness & Risk–Benefit	1–4 years	1,500–3,000 vol.	Long-term effects, risk–benefit	NDA submission data
PHASE IV	Post-Market Surveillance	Ongoing	1,500+ real-world	Epidemiological, pharmacoeconomics	Label changes or withdrawal

Phase III A vs III B

Phase IIIa (before NDA submission)

- Provides key confirmatory evidence for initial regulatory approval.
- Generates critical data for the submission dossier (FDA/EMA).
- Results form the backbone of the NDA package.

Phase IIIb (after submission/approval)

- Gathers additional safety, efficacy, or quality-of-life data.
- Explores new indications, dosing regimens, or subpopulations.
- Supports labeling refinements and post-approval commitments.

IND & NDA Regulatory Pathway

IND — Investigational New Drug

- FDA permission required before Phase I begins (21 CFR 312).
- FDA has 30 days to object; otherwise IND auto-approves.
- Types: Commercial · Research · Emergency · Treatment · Screening.
- Must include Investigator's Brochure for trial investigators.

NDA — New Drug Application

- Formal FDA submission for market approval
- Includes safety/efficacy data, trial reports, labeling, patent info.
- Only ~30% of initial candidates reach an approved NDA.

Trial Failures & Recruitment

Why Trials Fail:

- Failure to demonstrate efficacy or safety
- Poor recruitment, high dropouts, underpowered.
- Overly narrow eligibility criteria slow enrollment.
- Drug–drug or drug–disease interactions
- ~50% of INDs fail in preclinical or clinical phases.

Recruitment Strategies:

- Remuneration covers patient time & expenses.
- Monetary incentives boost questionnaire retention.
- AI/NLP can streamline eligibility screening.

30%	of candidates reach approved NDA
50%	of INDs fail in clinical phases
20–80	subjects in Phase I
300–3,000	volunteers in Phase III
40%	of trials amended before 1st enrollment

Sources: FDA.gov (21 CFR 312) · NLM.nih.gov · Innovation.org · McInnes (2011) New Drug Applications I Clinical Trial Phases — Syed Shah I clinicalexcellenceconsulting.com