Clinical Research Education

Lunch and Learn Deck

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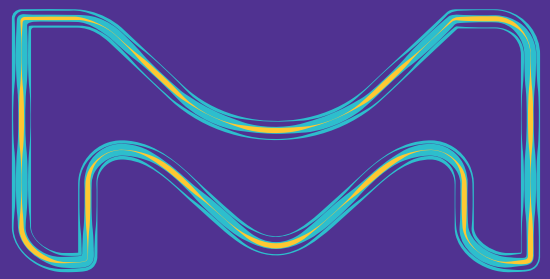
January 2025



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Clinical Research Education

Presentation Content

Clinical Trials 101

Designing a Clinical Trial

Getting Started

Clinical Trials 101

Clinical Trials 101
What is clinical research?

"Clinical research" refers to studies, or trials, conducted in people (patients or healthy volunteers)[1]

Clinical studies are designed to expand medical knowledge related to the treatment, diagnosis, and prevention of diseases or conditions[2]

Numerous study designs can help achieve these goals, but clinical trials (specifically, randomized controlled trials [RCTs]) are the benchmark for comparing disease interventions[3]

RCT, randomized controlled trial.

1. Clinical Research | US FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research
2. Learn About Clinical Studies | ClinicalTrials.gov. https://clinicaltrials.gov/ct2/about-studies/learn
3. Umscheid CA, et al *Postgrad Med*. 2011;123(5):194–204.

Clinical Trials 101
Why is clinical research important?

Clinical trials are fundamental to the development of new medicines or new uses for existing medicines[1]

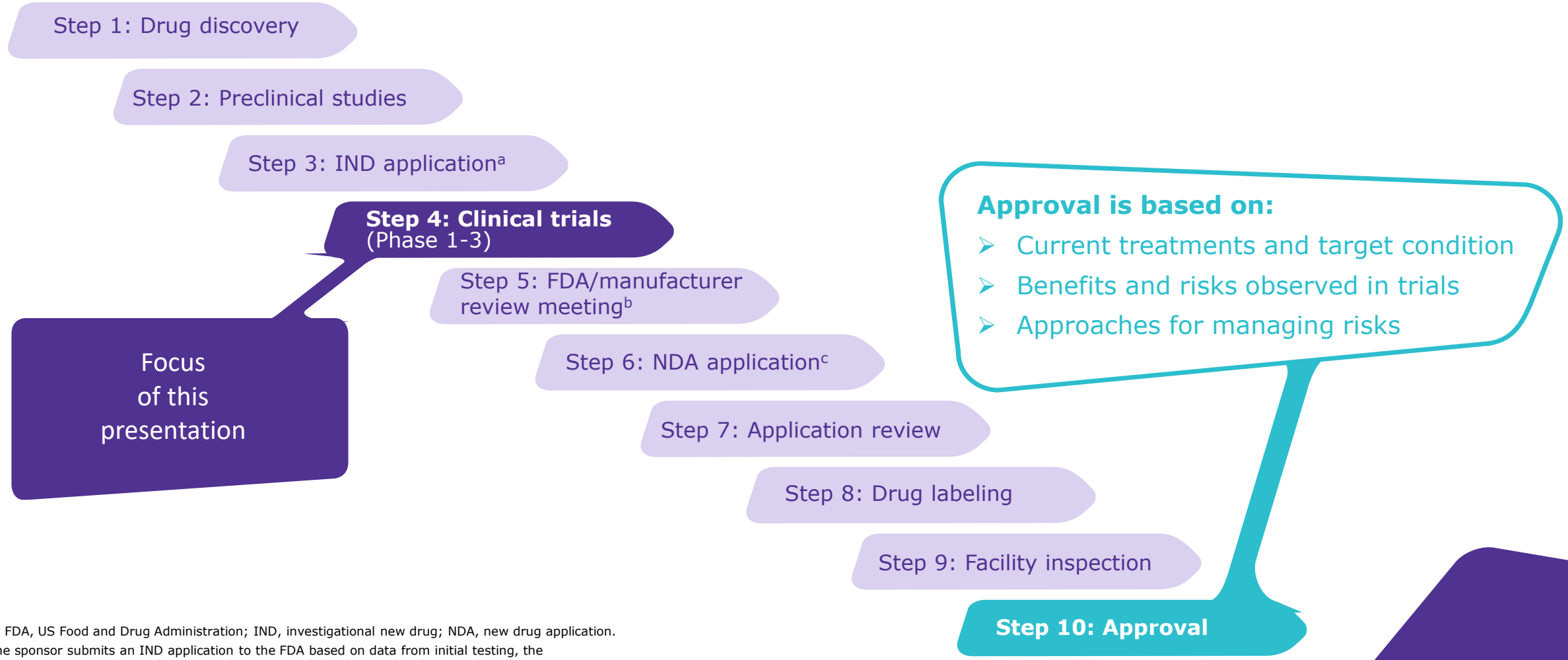
Clinical trials offer patients access to the newest treatments and a chance to help researchers develop better treatments for others in the future[2]

Researchers design clinical trials to **answer specific questions** related to a medical product[3]

Access to new treatments is a leading incentive for investigators to participate in industry-sponsored clinical trials, as well as increases scientific knowledge[4]

1. ICH-E6 Good Clinical Practice (GCP) 19 April 2021;
2. The Basics | NIH. https://www.nih.gov/health-information/nih-clinical-research-trials-you/basics
3. Clinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research
4. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010)

Clinical Trials 101
FDA drug approval process



US FDA, US Food and Drug Administration; IND, investigational new drug; NDA, new drug application.

[a]The sponsor submits an IND application to the FDA based on data from initial testing, the drug composition and manufacturing information and develops a plan for clinical studies; [b]FDA meets with the drug sponsor prior to the submission of the NDA;[c] the drug sponsor asks the FDA to approve the drug for marketing in the US.

Drug Approval Process | FDA. https://www.fda.gov/media/82381/download

Clinical Trials 101
Types of clinical trials

Interventional[1,2]

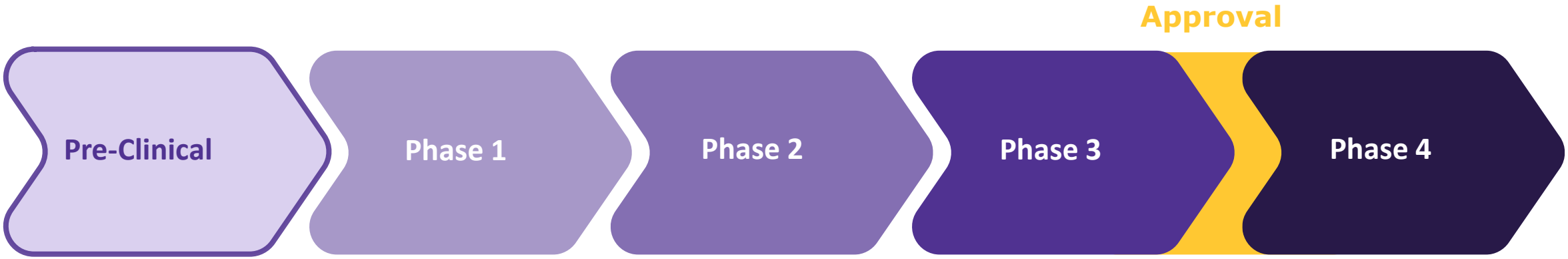
- **Participants are assigned to groups that receive one or more treatments (or no treatment)**. Researchers evaluate the effects of the treatment on biomedical and/or health-related outcomes[1]
- **Participants receive specific interventions according to the research plan or protocol**. Created by the investigators[2]
- Interventions may be medical products (eg, drugs or devices); procedures; or changes to participants' behavior (eg, diet)[2]

Observational[1]

- Participants are identified and study groups are observed for biomedical and/or health-related outcomes
- Participants may receive diagnostic, therapeutic, or other types of interventions, but **investigators do not assign a specific treatment**
- **A patient registry is a type of observational study**

1. Glossary of Common Site Terms | ClinicalTrials.gov;
2. Learn About Clinical Studies | ClinicalTrials.gov. https://clinicaltrials.gov/ct2/about-studies/learn

Clinical Trials 101
Phases of clinical development



Feasibility and Toxicity[1,2]

- 1-6 years

Safety and Dosage[3]

- 20-100 healthy volunteers or patients with the condition
- Several months

Efficacy and Safety Profile[3]

- Several hundred patients with the condition
- Several months to 2 years

Efficacy and Monitoring of Adverse Reactions[3]

- 300-3,000 patients with the condition
- 1-4 years

Safety and Effectiveness[3]

- 1,000+ patients with the condition
- Carried out once the drug or device has been approved by the FDA

Development of new medicinal products takes
10+ years
~6 years pre-clinical research
~6 years of clinical trials[4]

25 to **35**
trials are conducted for a single treatment, with more early than late phase trials[4]

FDA, Food and Drug Administration.

1. Preclinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-2-preclinical-research;
2. Clinical Trial Phases | Antidote.me. https://www.antidote.me/clinical-trial-phases;
3. Clinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research;
4. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010)

Clinical Trials 101
Phases of clinical development

Safety and Dosage

- 20-100 healthy volunteers or patients with the condition
- Several months

Goal is to limit risks and maximize possible benefits

- Used to determine the optimal dose
- Identifies how a drug interacts with the human body
- Early information on efficacy and potential side effects

~70% **of drugs move to the next phase**

Clinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research

Clinical Trials 101
Phases of clinical development

Efficacy and Safety Profile

- Several hundred patients with the condition
- Several months to 2 years

Helps refine research methods and questions for Phase 3 research protocols

- Provides researchers with additional safety data
- Studies are not usually large enough nor designed to show drug efficacy

~33% of drugs move to the next phase

Clinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research

Clinical Trials 101
Phases of clinical development

Pivotal studies

- Determines if the drug offers a benefit to the target population compared to standard of care
- Provides most safety data
- Typically, less common side effects come to light during this phase due to larger sample size

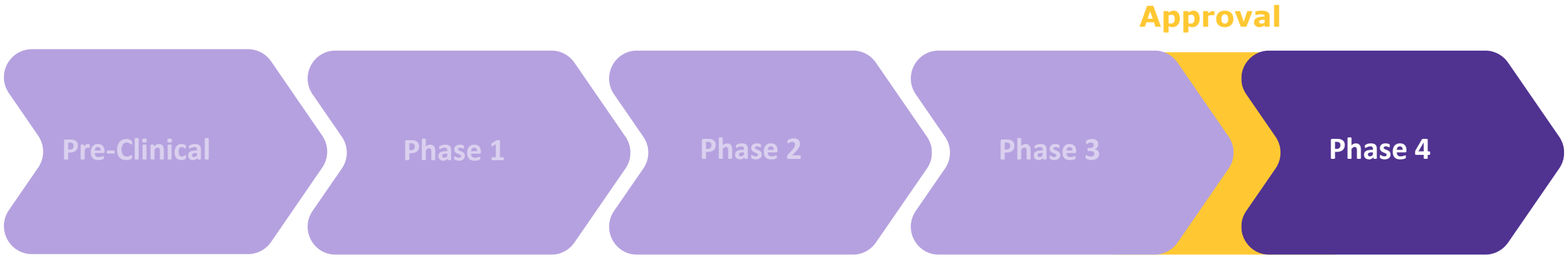
Efficacy and Monitoring of Adverse Reactions

- 300-3,000 patients with the condition
- 1-4 years

25% to 30% **of drugs move to regulatory review**

Clinical Research | FDA. https://www.fda.gov/patients/drug-development-process/step-3-clinical-research

Clinical Trials 101
Phases of clinical development[1]



Real-world setting

- Monitoring in the post-marketing setting to further evaluate drug efficacy and safety[2]
- Conducted in diverse populations to provide more information and to help clinicians ensure/refine the safety profile of approved drugs[2]

Safety and Effectiveness[3]

- 1,000+ patients with the condition
- Carried out once the drug or device has been approved by the FDA

FDA, Food and Drug Administration.

1. Clinical Research | FDA. . https://www.fda.gov/patients/drug-development-process/step-3-clinical-research;
2. Zhang X, et al. *BMJ Open*. 2016;6:e010643.

Clinical Trials 101
Cost of drug development

The cost of drug development varies by therapeutic area and ranges from **$770 million** to **$2.8 billion**[1]

Average cost per study[2]

- **Phase I:** $4 million
- **Phase II:** $13 million
- **Phase III:** $20 million
- **Phase IV:** $20 million

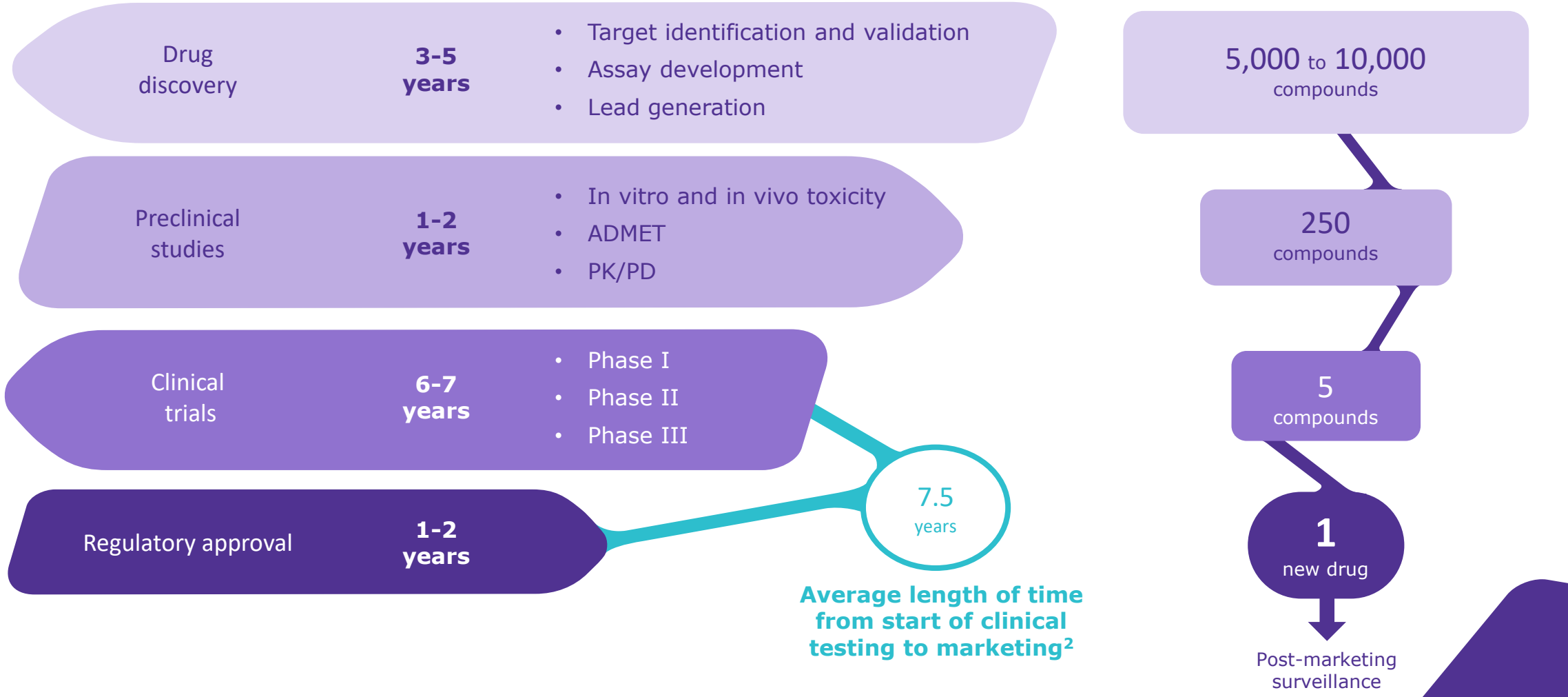
Costs are dependent on a variety of factors[2]

- Number of patients needed for the desired statistical precision
- Patient accrual rates
- Number of investigator sites and their locations
- Administrative, physician, RN, and CRA support
- Cost of clinical data collection, management, and analyses

CRA, clinical research associate;
RN, registered nurse.

1. Wouters OJ, et al. *JAMA*. 2020;323(9):844–853.
2. Examination of Clinical Trial Costs and Barriers for Drug Development | Eastern Research Group (ERG). (25 July 2014).

Clinical Trials 101
Timeline for drug development[1]



ADMET, absorption, distribution, metabolism, excretion, toxicity; PD, pharmacodynamics; PK, pharmacokinetics.

1. Matthews H, et al. *Proteomes*. 2016;4(3):28.
2. Examination of Clinical Trial Costs and Barriers for Drug Development | Eastern Research Group (ERG) (25 July 2014)

Clinical Trials 101
There are multiple players in the clinical trial arena

Drug regulatory authority | **Trial sponsor (pharmaceutical company)** | **Clinical Researcher (investigator)** | **Contract Research Organization (CRO)** | **Institutional Review Board (IRB)[a]** | **Data and Safety Monitoring Board (DSMB)**

These players work in harmony within a strict pattern of interaction, defining their responsibilities and enabling the collection of high-quality trial data in a safe and ethical manner

Sponsor interacts continuously with both the **regulatory authority** and the **investigator** before, during, and after the trial

Investigator interacts with the **IRB**, generally without involvement from other parties

DSMB is established by the **sponsor** to assess trial progress

CROs provide research services for the **sponsor**

CRO, Clinical Research Organization; DSMB, Data and Safety Monitoring Board; IRB, Institutional Review Board.
[a]Also known as an ethics committee (EC).

Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010)

Clinical Trials 101
Investigators and trial monitors

Investigators[1,2]

- Every clinical study is led by a principal investigator, often a **medical physician**
- Clinical studies also have a research team that may include doctors, nurses, social workers, clinical trial coordinators/project managers, and other healthcare professionals

Trial monitor / Clinical Research Associate[2]

- Person employed by sponsor or CRO that monitors the progress of sites participating in a clinical trial
- Interacts regularly with the investigator and his/her team members, while monitoring the **participant informed consent process, participant recruitment rate, test drug presence, protocol compliance, and payment schedules**
- Monitor visits the trial site approximately every month and reports findings to the project manager coordinating the trial

CRO, Clinical Research Organization.

1. Learn About Clinical Studies | ClinicalTrials.gov. https://clinicaltrials.gov/ct2/about-studies/learn;
2. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010)

Clinical Trials 101
Institutional Review Board (IRB) and informed consent

- Each study of a drug, biological product, or medical device regulated by FDA must be reviewed, approved, and monitored by an IRB[1]
- Doctors, researchers, and members of the community **ensure that the study is ethical and that the rights and welfare of participants are protected**[1]

Priorities for IRBs[2]

- Risks to subjects are minimized and reasonable in relation to benefits
- Selection of subjects is equitable
- **Informed consent is sought**
- Sufficient provisions for data monitoring exist to maintain subjects' safety
- Adequate mechanisms are in place to ensure subjects' confidentiality
- Rights and welfare of vulnerable populations are protected

- **Informed consent** is the process of providing participants with information about a research study before agreeing to take part[3]
- The informed consent process is intended to protect participants and should provide enough information for a person to understand the risks of, potential benefits of, and alternatives to the study[1]

FDA, Food and Drug Administration; IRB, Institutional Review Board.

1. Learn About Clinical Studies | ClinicalTrials.gov. https://clinicaltrials.gov/ct2/about-studies/learn;
2. Umscheid CA, et al. *Postgrad Med*. 2011;123(5):194–204.
3. The Basics | NIH. https://www.nih.gov/health-information/nih-clinical-research-trials-you/basics

Clinical Trials 101
Contract Research Organizations (CROs)

The complexity and expense of monitoring human research has prompted the establishment of CROs to oversee clinical trials[1]

CROs are commercial or academic organizations hired by the study sponsor to perform trial-related duties and functions[1,2]

Identifying potential sites[2]

Organizing and managing a Data and Safety Monitoring Board (DSMB)[1,a]

Managing and auditing trial data to maintain data quality[1]

CRO, Clinical Research Organization; DSMB, Data and Safety Monitoring Board.

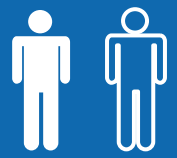
[a]A DSMB is made up of outside experts who monitor participant safety and the efficacy of the study product while a clinical study is taking place.[3]

1. Umscheid CA, et al *Postgrad Med*. 2011;123(5):194–204.
2. Silva A. Selecting Study-Appropriate Clinical Sites in 3 Steps | Applied Clinical Trials (12 April 2018);
3. Fact Sheet: Data Safety Monitoring Boards | AVAC. https://www.avac.org/data-safety-monitoring-boards (April 2011)

Clinical Trials 101
Design approaches

Prospective[1,2]

- **Follows a group of patients over time** to determine how many develop the outcome being studied, and measure relevant exposures and variables
- **Usually involves 2 groups of individuals** one exposed to an intervention and a second group that is not exposed, used as a control
- **Can be interventional or observational**



Retrospective[1,2]

- **Uses clinical data that have already been collected for other purposes** Previous clinical research, existing medical records
- Study period may be many years, but the time to complete the study is only as long as it takes to collate and analyze the data
- **Can only be observational**

Prospective and retrospective components can be combined in a single study design[3]

1. Mann CJ, et al. *Emerg Med J*. 2003;20:54–60.
2. Chidambaram AG, Josephson M. *Pediatr Invest*. 2019;3(4):245–252.
3. Bompas E, et al. *Cancer Med*. 2018;7(8):4023–4035.

Clinical Trials 101
Blinding and randomization

Blinding[1]

- Keeping study participants, investigators, or assessors unaware of the assigned intervention
- Ensures that this knowledge does not affect their behavior, which can be subtle and/or unnoticeable
- "Single-blind" is the blinding of study participants and "double-blind" indicates the blinding of study participants and investigators

Blinded participants are[1]:

- ✓ Less likely to have biased psychological or physical responses to intervention
- ✓ Less likely to use adjunct intervention
- ✓ Less likely to drop out of the study
- ✓ More likely to adhere to the intervention

1943: First double-blind controlled clinical trial (common cold)[2]

1948: First randomized, double-blind controlled clinical trial (tuberculosis)[2]

Randomization[1]

- Powerful tool to help control bias in clinical trials
- Eliminates bias associated with treatment selection
- Aims to ensure balance across factors, even if the factors are unknown or unmeasured

1. Evans SR. *J Exp Stroke Transl Med*. 2010;3(1):19–27.
2. Hart PD, et al. *BMJ*. 1999;319(7209):572–573.

Clinical Trials 101
Comparator and open-label trials

Placebo or Active Comparator[1-3]

Controlled trial in which efficacy is most convincingly established, demonstrating effects relative to placebo or an active control treatment[1]

Placebo[2]

- Inert pill, injection, or other mock intervention
- Masks as an active intervention to maintain the blinding of treatment assignment
- Although the placebo pill or injection has no activity for the disease being treated, it can provide substantial treatment effects. This is especially true when the endpoint is subjective (eg, pain, depression, anxiety, or PRO)

Active Comparator[2]

Study that compares study drug of interest (Drug A) to another active drug used in clinical practice (Drug B)

1863:
First documented use of a placebo in a US clinical trial (articular rheumatism)

Open-label[2]

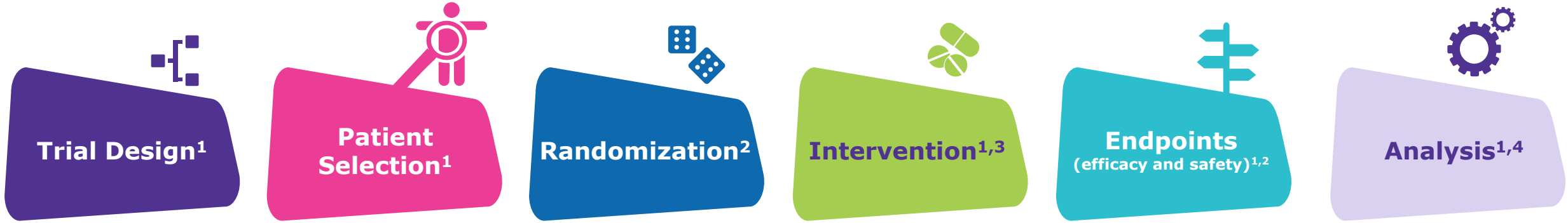
Clinical studies without blinding. Participants and investigators know how the treatment has been allocated

PRO, patient-reported outcome.

1. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010);
2. Evans SR. *J Exp Stroke Transl Med*. 2010;3(1):19–27.
3. Yoshida K, et al. *Nat Rev Rheumatol*. 2015;11(7):437–441.
4. De Craen AJ, et al. *J R Soc Med*. 1999;92(10):511–515.

Designing a Clinical Trial

Designing a Clinical Trial
Clinical trial overview



Prior to patient enrollment, a trial is carefully designed and the number of patients, statistical analysis, intervention, and endpoints are carefully decided

Patient population is determined via inclusion and exclusion criteria

For trials involving multiple arms, enrolled patients are randomly placed into treatment arms to avoid bias

Interventions include drugs, medical devices, procedures, vaccines, and other products[1]
The treatment may be first-line (previously untreated patients), second-line (after initial treatment), or later line[3]

A pre-planned measurement used to determine the effect of the intervention

Primary endpoint
Key outcome that the trial is designed to test specifically

There are also **secondary** and **exploratory** endpoints

Statistical analysis plan describes the principles and techniques used to assess study objectives

Analysis may occur at several points during the trial (interim analysis) and at completion (primary or final analysis)

1. Protocol Registration Data Element Definitions for Interventional and Observational Studies | ClinicalTrials.gov. https://prsinfo.clinicaltrials.gov/definitions.html;
2. Clinical Research Glossary | Clinical Data Interchange Standards Consortium. https://www.appliedclinicaltrialsonline.com/view/cdisc-clinical-research-glossary;
3. Saini, KS, Twelves, C. *Br J Cancer*. 2021;125:155–163.
4. Kumar A, Chakraborty BS. *J Adv Pharm Technol Res*. 2016;7(4):118–122.

Designing a Clinical Trial
Clinical trials follow a plan known as a protocol

The protocol is carefully designed to balance the potential benefits and risks to participants and answer specific research questions[1]

clinical trial protocol[2]

- **Background and Scientific Rationale**
- **Objectives**
- **Patient Selection Criteria**
- **Therapeutic Intervention**
- **Safety**
- **Efficacy**
- **Clinical Work-up/Follow-up**
- **Statistical Analysis Plan (SAP)**

SAP, Statistical Analysis Plan.

1. The Basics | NIH. https://www.nih.gov/health-information/nih-clinical-research-trials-you/basics;
2. Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Background Information and Scientific rationale

Background Information

- Name and description of the study agent
- Findings from nonclinical studies
- Summary of relevant clinical research
- Discussion of literature/data relevant to the trial
- Clinical, epidemiological, or public health information
- Importance of the study

Scientific Rationale

- Problem under study and the trial hypothesis
- Justification for route of administration/dosing, intervention periods, and study population
- Rationale for type and selection of control (eg, placebo, active drug, no treatment)
- Known potential risks and benefits based on other clinical or nonclinical studies

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Objectives

The primary objective is the main question

Drives statistical planning for the trial.

Calculation of the sample size to provide the appropriate power for statistical testing

Reason for performing the study

Scientific question to be answered

Secondary objectives

Goals that will provide further information on use of the intervention

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Patient selection criteria

Clinical studies have standards outlining who can participate **(inclusion and exclusion criteria),** which are listed in the protocol[1]

Patient selection depends on the study and can include[1]:

- Participants who have the illness or condition being studied
- Predetermined group of patients who are asked by researchers to enroll (eg, disease subtype, biomarker, comorbidity)
- Healthy participants

The participant selection process should be **representative of the anticipated population** who are likely to use the medicinal product in future clinical practice[2]

1. Learn About Clinical Studies | ClinicalTrials.gov. https://clinicaltrials.gov/ct2/about-studies/learn;
2. ICH-E6 Good Clinical Practice (GCP) (19 April 2021)

Designing a Clinical Trial
Protocol: Therapeutic intervention

Trial protocol should have details regarding the specific medical intervention

- ✓ Dosing and administration
- ✓ Route of administration
- ✓ Starting dose and dose escalation schedule
- ✓ Dose adjustments/ modifications/delays
- ✓ Duration of therapy
- ✓ Product distribution[a]
- ✓ Formulation, appearance, packaging, and labeling
- ✓ Product storage and stability
- ✓ Tracking of dose
- ✓ Preparation
- ✓ Device specific considerations
- ✓ Assays or procedures required to assess effects[b]

[a]How the study agent and control product will be acquired and shipped to the investigator;
[b]Immunology assays, pharmacokinetic studies, imaging, flow cytometry assays, microarray, DNA sequencing, etc..

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Clinical work-up/follow-up

Description of study procedures

- Assessments to be performed at each visit to evaluate study endpoints
- Schedule of visits
- Sequence of events that should occur during the visit
- Duration of therapy and follow-up

Include as needed:

- Counseling information
- Concomitant medications
- Assessment of AEs

AE, adverse event.

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Efficacy

Primary endpoint is used to determine efficacy and should be clearly specified

- This section should include an explanation of why the primary endpoint(s) was chosen and its importance and role in the analysis and interpretation of study results

Secondary endpoints should be clearly specified and may be related to efficacy, safety, or both

- The protocol should clearly articulate how the selected secondary endpoints are linked to either adding more information about the primary objective or addressing secondary objectives

Exploratory endpoints should be specified

- Exploratory analyses support primary findings and serve as a basis for future research
- Exploratory analyses cannot be used for confirmatory proof of registrational trials

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Safety

Assessment of safety

Risks of the study agent and/or study procedures

Risk factors for the study population (eg, vulnerable populations)

Method for defining and grading the severity of adverse events

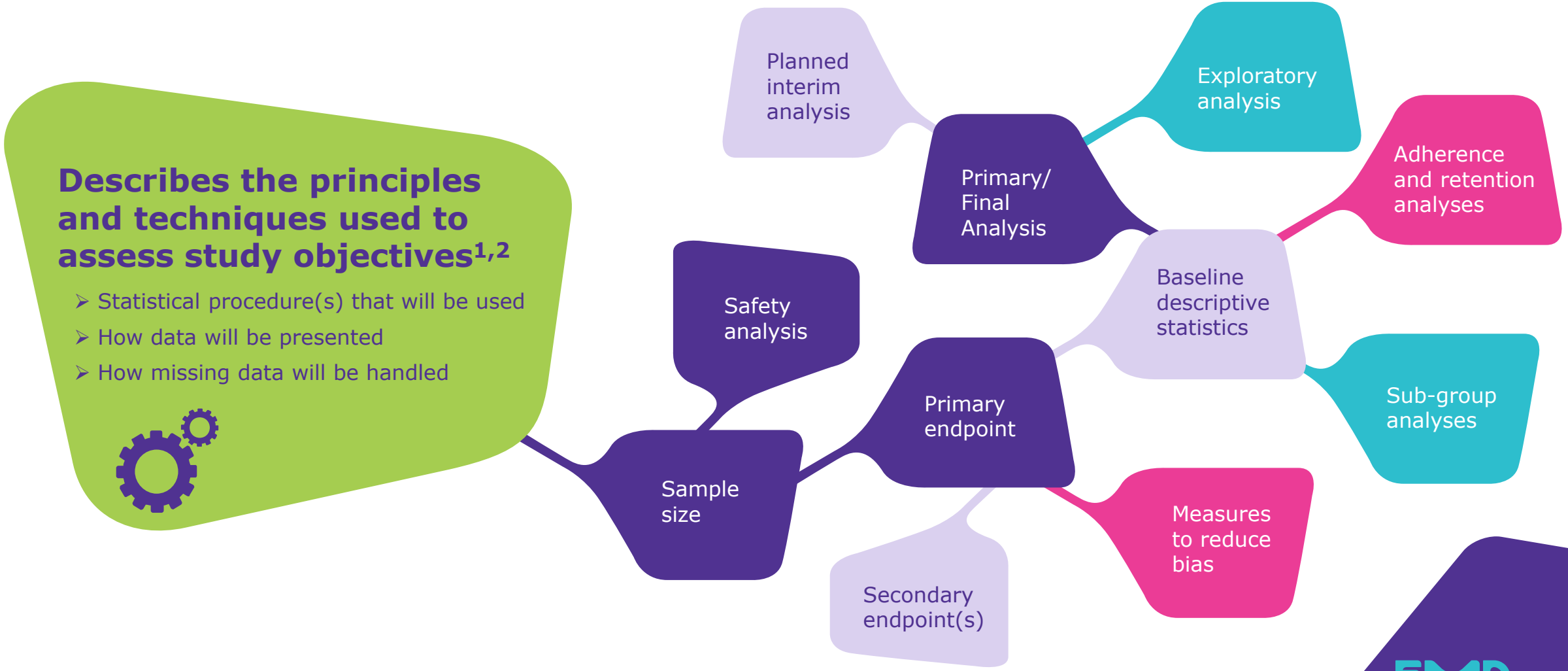
- Should be tailored for specific study characteristics
- Should be done in consultation with the trial monitor

Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Protocol: Statistical Analysis Plan (SAP)

Describes the principles and techniques used to assess study objectives[1,2]

- Statistical procedure(s) that will be used
- How data will be presented
- How missing data will be handled



1. Protocol Registration Data Element Definitions for Interventional and Observational Studies | ClinicalTrials.gov. https://prsinfo.clinicaltrials.gov/definitions.html;
2. Clinical Trial Protocol Template | NIH. https://osp.od.nih.gov/wp-content/uploads/2014/01/Protocol_Template_05Feb2016_508.pdf

Designing a Clinical Trial
Interpretation

Clinical trial results
are captured in a
Clinical Study Report (CSR)

A CSR is a document that describes the methods and results of a clinical study, along with a discussion of key findings

CSR Outline

- *Study compound and methodology*
- *Study results (tables, figures, etc…)*
  - *Efficacy*
  - *Safety*
  - *PK/PD*
  - *Exploratory outcomes*
- *Conclusions*

CSR, Clinical Study Report; PD, pharmacodynamics; PK, pharmacokinetics.

Young K. A Guide to the Clinical Study Reports (8 December 2020)

Getting Started

Getting Started
Balancing benefits and risks

- Well-designed and conducted clinical trials help answer key questions in healthcare and drug development[1]
- **Their results are essential for evidence-based healthcare decisions[1]**

- **Patient research is not without flaws[2]**
- Investigators have limited information regarding the risks and benefits of an investigational intervention because that is the objective of the study[2]

Achieving a balance
between the benefits of a medical intervention and the need to protect participants from research-related risks **is critically important**[3]

1. ICH-E6 Good Clinical Practice (GCP) (19 April 2021);
2. Umscheid CA, et al. *Postgrad Med*. 2011;123(5):194–204.
3. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010)

Getting Started
Potential challenges

Recruitment[1-3]

Recruitment-related factors are critical for both early phase and phase III clinical trials[1]

- 45% of clinical trials are completed late[2]
- 70% of trials experience study start-up delays[2]
- 80% of trials fail to meet their initial target enrollment on time[2]

Strict entry criteria may make it difficult to recruit[3]

Timeline[1]

Common site-related issues that cause delays[1]:

- Insufficient site personnel resources/ backup at the site
- Overestimation of the available study population

Budget[4]

Sites unable to recruit enough patients increase the length of the enrollment period and become an economic burden

Time and cost of training/opening/maintaining a site can be considerable, and underperforming sites cannot justify this expense

Experience[4]

Sites with insufficient experience are more likely to incur protocol violations or have low-quality data that will require further training, on-site visits, and more queries for clarification, which have an impact on costs and study duration

DE&I[5]

Narrow inclusion and exclusion criteria may limit generalizability to a broader population of patients that may not be included in the sample cohort

DE&I, diversity, equity and inclusion.

1. Dombernowsky T, et al. *Trials*. 2019;20:708.
2. Silva A. Selecting Study-Appropriate Clinical Sites in 3 Steps | Applied Clinical Trials (12 April 2018);
3. Evans SR. *J Exp Stroke Transl Med*. 2010;3(1):19–27; 4. Hurtado-Chong A, et al. *BMJ Open*. 2017;7(7):e014796.
5. Umscheid CA, et al. *Postgrad Med*. 2011;123(5):194–204.

Getting Started
Site selection

Choosing sites that are able to recruit an adequate number of patients while maintaining high-quality data is **crucial for timely and successful completion of studies**[1]

- Access to the relevant patient population, startup time, and timely recruitment are among the most important factors when pharmaceutical companies evaluate potential trial sites[2]
- Selecting sites that match specifics of the protocol and the sponsor's regulatory goals/strategies, has a direct impact on data quality, study timelines, and overall project finances[3]
- CROs play a pivotal role during site selection and have external databases of potential sites[2,3]

Considerations for site selection[2,4]

- Availability of participants and proximity to site
- Resources for conducting research
- Recruitment capabilities
- Site personnel (eg, interest/commitment, communication skills, experience)
- Any similar ongoing trials

CRO, contract research organization.

1. Hurtado-Chong A, et al. *BMJ Open*. 2017;7(7):e014796.
2. Dombernowsky T, et al. *Trials*. 2019;20:708.
3. Silva A. Selecting Study-Appropriate Clinical Sites in 3 Steps | Applied Clinical Trials (12 April 2018);
4. What Makes a Good Clinical Trial Site | Novotech CRO. https://novotech-cro.com/faq/what-makes-good-clinical-trial-site

Getting Started
Important considerations

Medical research should conform to generally accepted scientific principles, be conducted in an adequate laboratory, and be based on thorough knowledge of the scientific literature[1]

Clinical trials should be designed and conducted in ways that ensure the rights, safety, and well-being of participants[2]

- The clinical trial protocol should be clear, concise, and operationally feasible
- Roles, tasks, and responsibilities should be clear and documented

Important points to define before initiating a trial[3]

- ✓ Participant population profile
- ✓ Staffing and facilities requirements
- ✓ Enrollment targets and time period
- ✓ Study duration
- ✓ Desired geographical area (if applicable)
- ✓ Target startup timelines

Clinical trials are typically registered in a publicly accessible database (**http://www.clinicaltrials.gov**)[1]

1. Karlberg JPE, et al. Reviewing Clinical Trials: A Guide for the Ethics Committee (March 2010);
2. ICH-E6 Good Clinical Practice (GCP) (19 April 2021);
3. Silva A. Selecting Study-Appropriate Clinical Sites in 3 Steps | Applied Clinical Trials (12 April 2018)

Summary
Clinical research is a collaboration

Clinical trials represent a transition from a vague concept (eg, "to see if the drug works") to a particular hypothesis that can be tested using data collection and a particular duration of therapy[1]

Well-designed and properly executed clinical trials can contribute to improving the effectiveness and efficiency of healthcare[2]

Sponsors are available to guide research sites through the clinical trial process and are responsible for ensuring that sites are well-informed[3]

1. Evans SR. *J Exp Stroke Transl Med*. 2010;3(1):19–27.
2. Umscheid CA, et al. *Postgrad Med*. 2011;123(5):194–204.
3. What Makes a Good Clinical Trial Site | Novotech CRO. https://novotech-cro.com/faq/what-makes-good-clinical-trial-site