Global Drug Development

Data Analysis - Gateway to Unlocking the Potential of Drug Development

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Agenda

- Evolution of clinical studies
- Overview of drug development process
- Types of clinical trials
- What is an endpoint?
- Endpoint variants
- Analysis of endpoints

Evolution of clinical research

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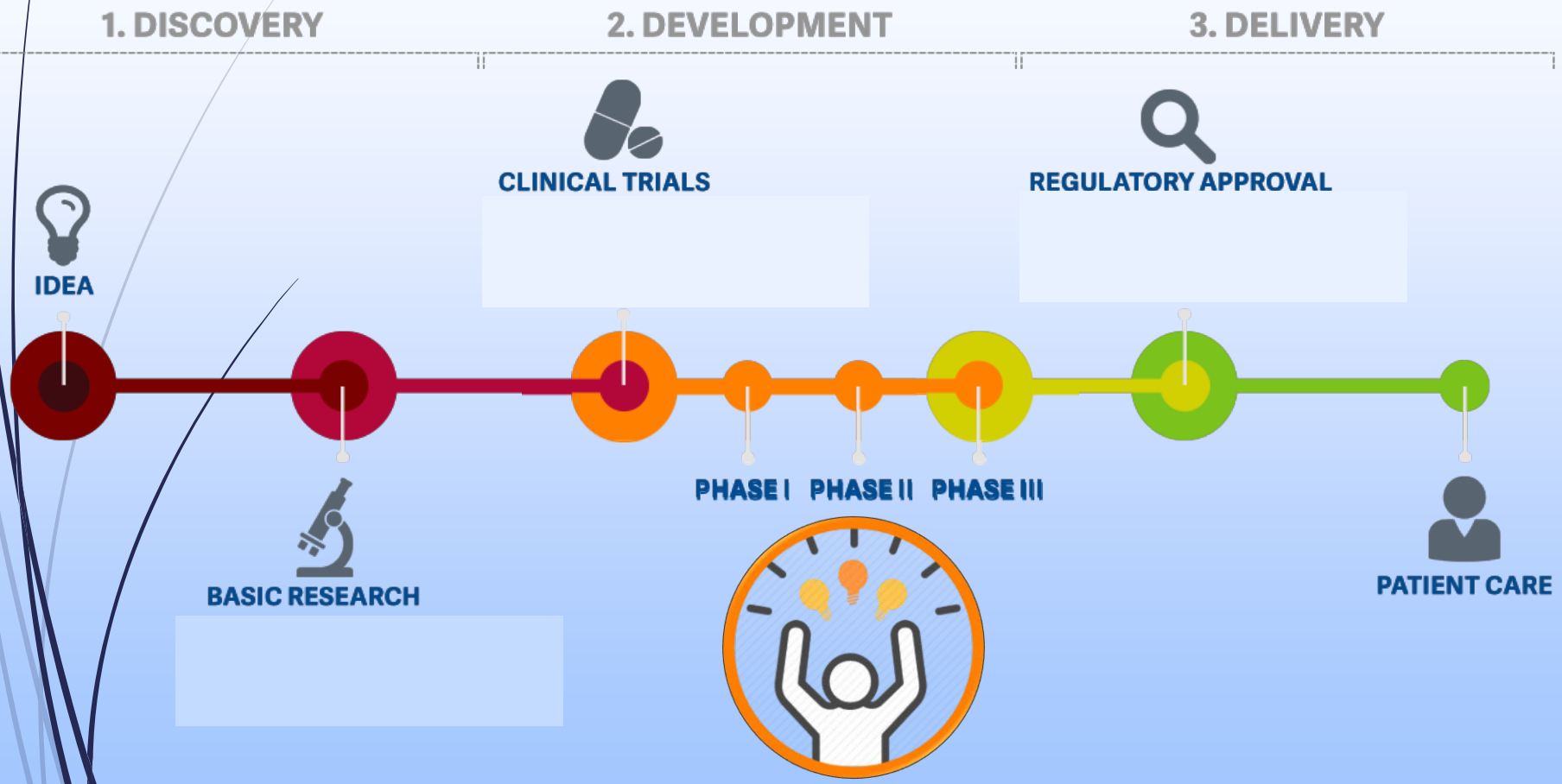
Drug development process



Source: https://www.researchamerica.org

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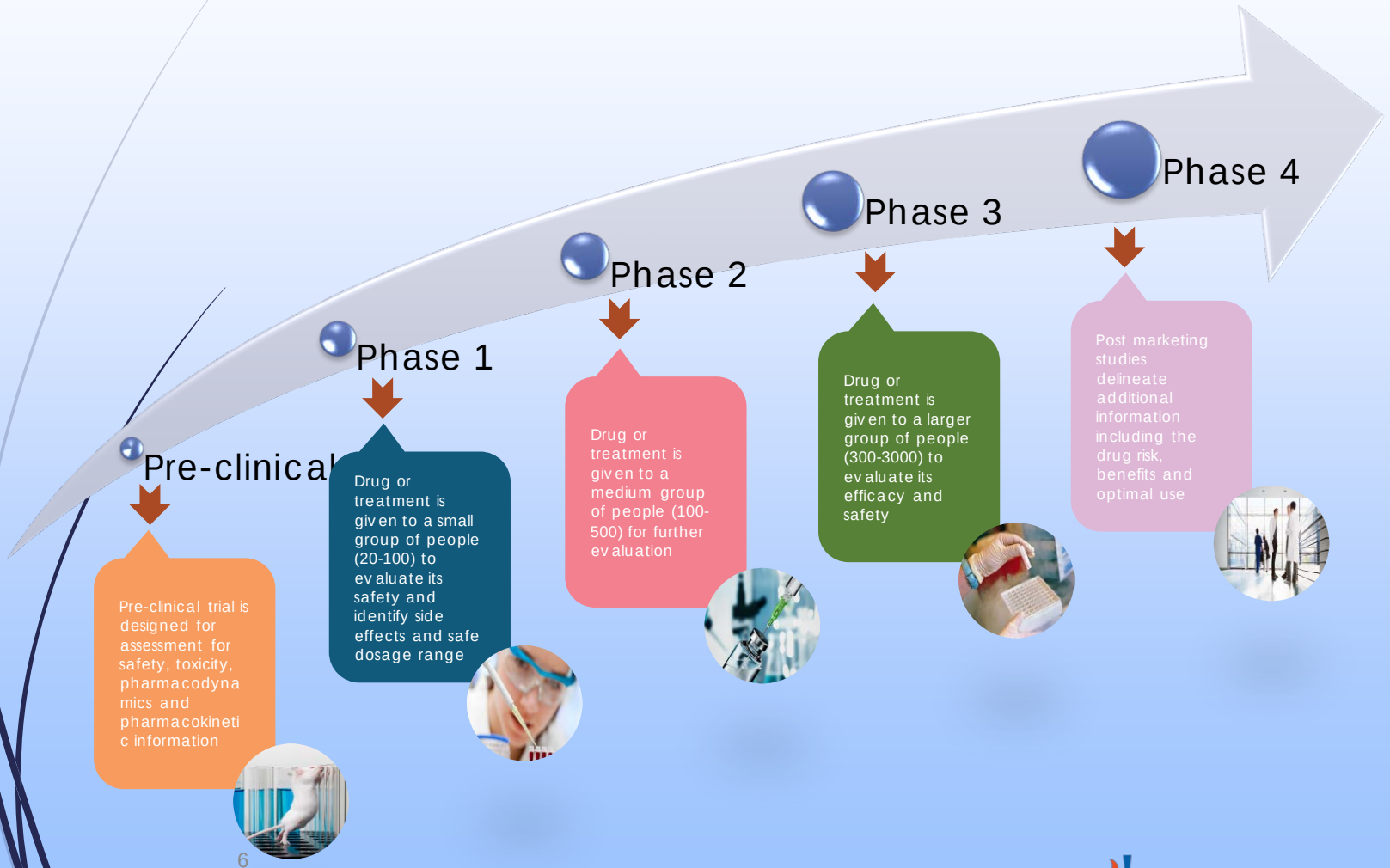
Phases of clinical trial



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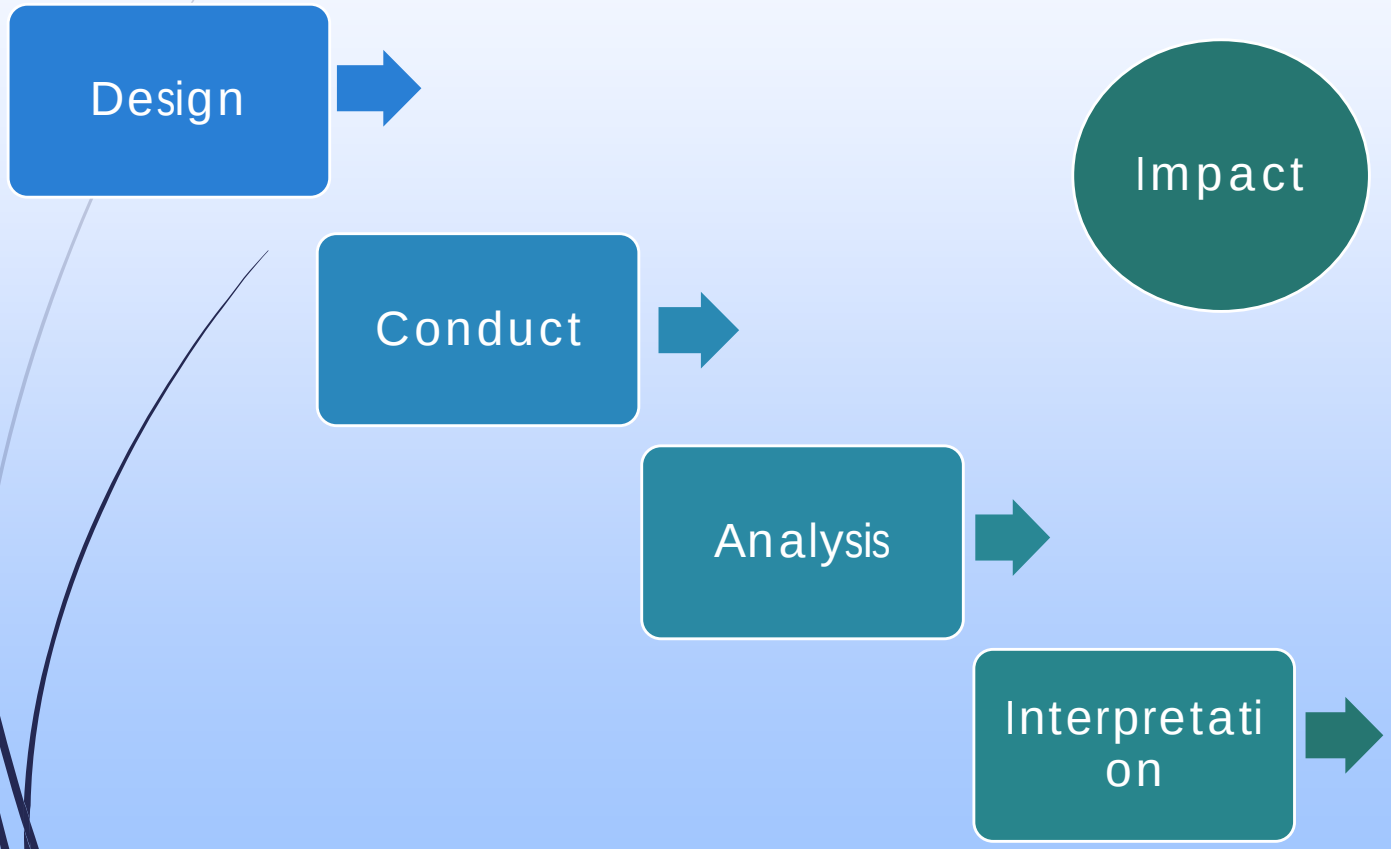
Endpoint

The measurement that will be statistically compared among treatment groups to assess the effect of treatment and corresponds with the clinical trial's objectives, design, and data analysis plan.

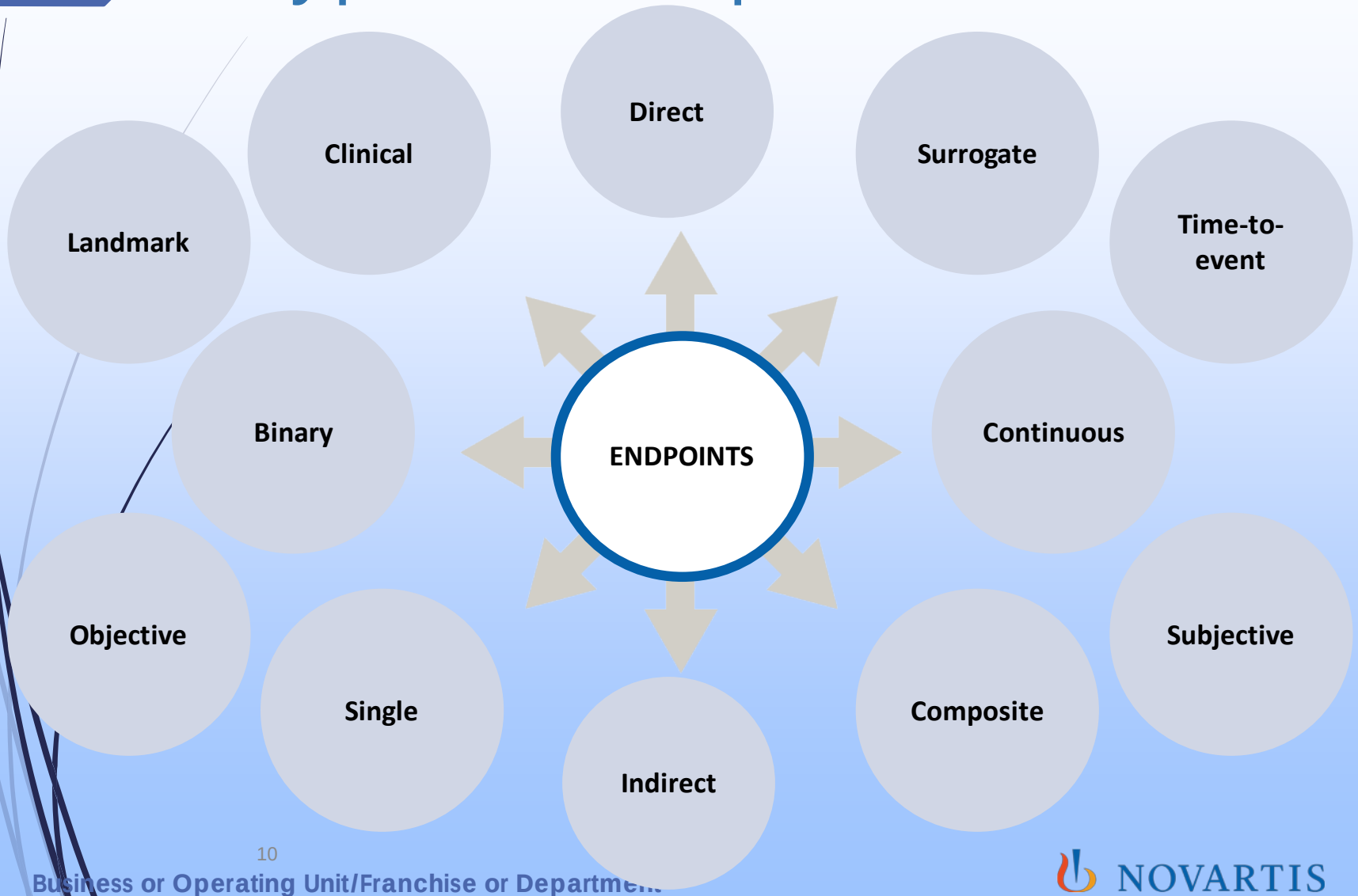
Characteristics of a good Endpoint

- Objective
- Clinically relevant
- Well-defined & reliable
- Interpretable
- Sensitive and able to detect change
- Reproducible
- Easy to use
- Unbiased

Endpoint effects



Types of endpoints



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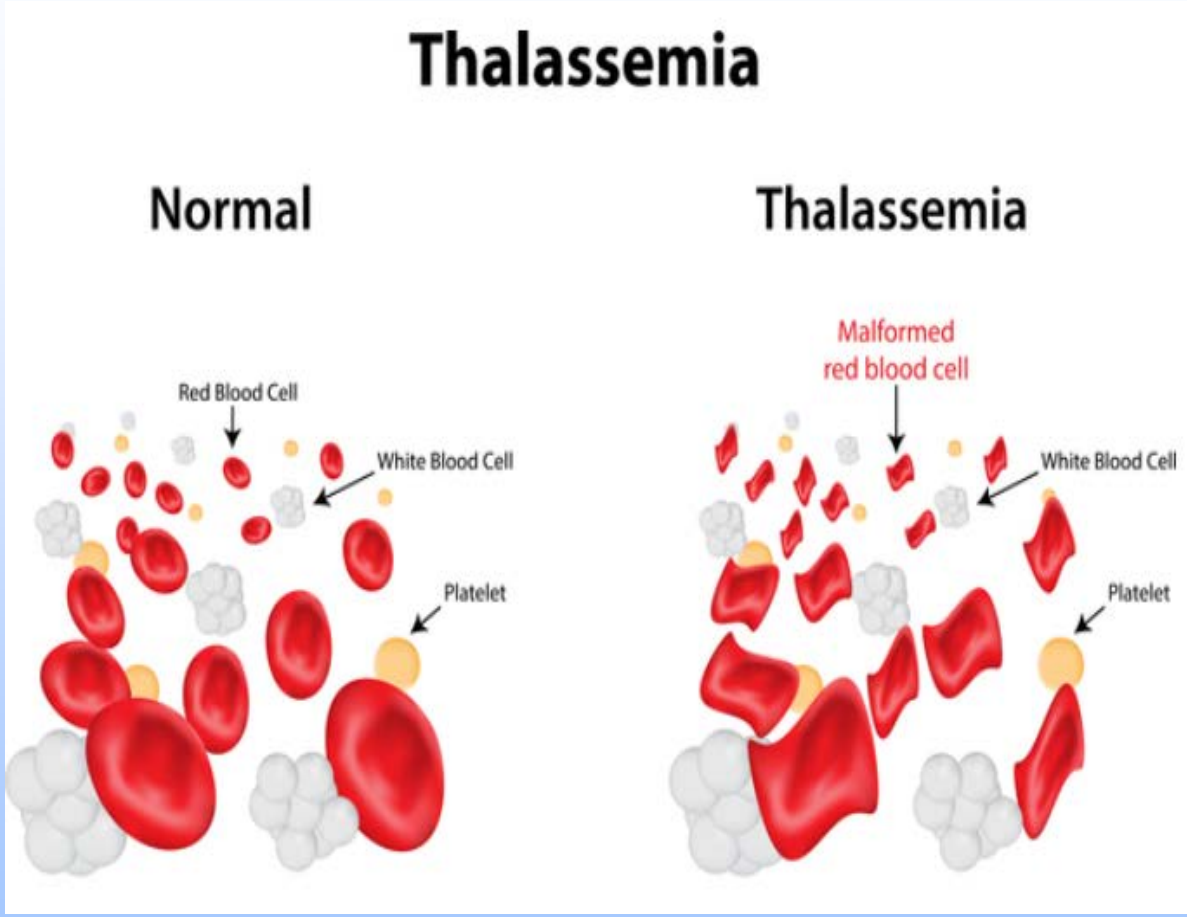
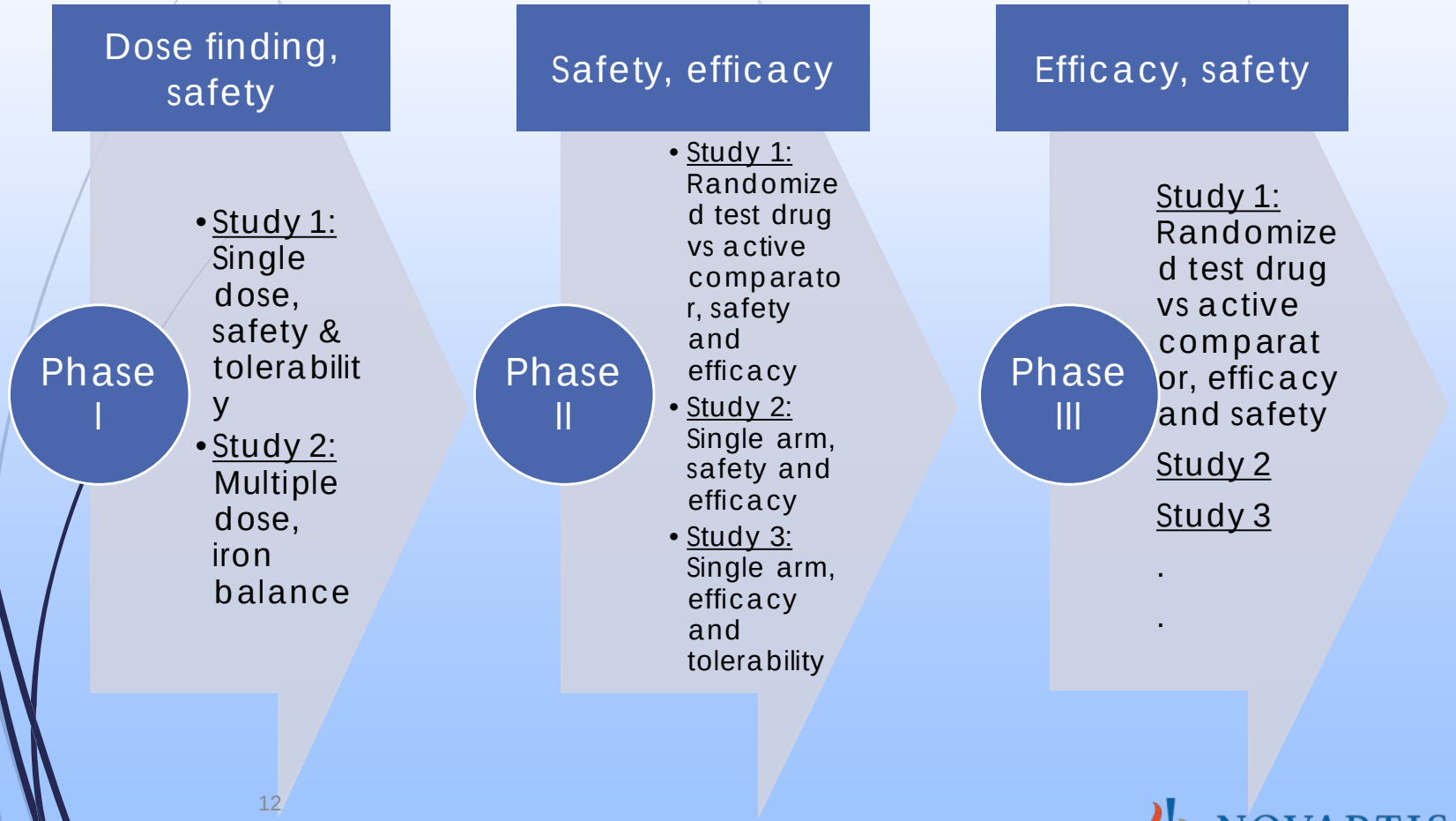
Case Study: Background

- Beta-thalassemia
- Genetic blood disorder
- Decreased production of hemoglobin
- Paleness
- Weakness
- Fatigue
- Anemia
- Requires frequent blood transfusions



Test drug development program



Phase III Study

A randomized, comparative, open label phase III trial on efficacy and safety of long-term treatment with Test Drug in comparison with active comparator in β-thalassemia patients with transfusional hemosiderosis

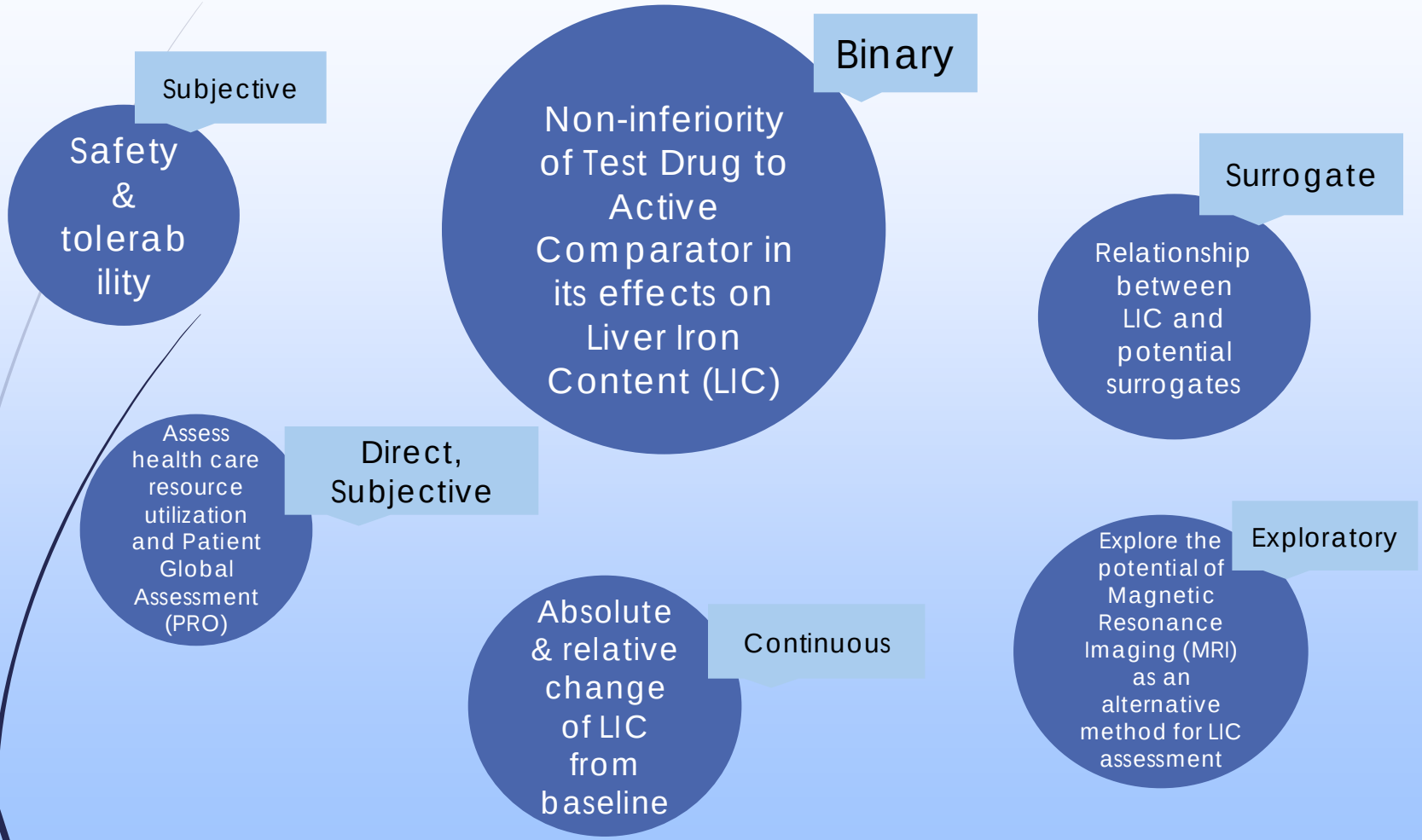
Active Comparator

- Iron Chelator
- Injection/Infusion
- Intramuscular, Subcutaneous, Intravenous
- Adults/ Children (>= 3 years)
- 8-24 hours for administration

Test Drug

- Iron Chelator
- Dispersible Tablet
- Oral
- Adults/ Children (>= 2 years)
- Once daily

Endpoint Variants



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Analysis of Endpoints

- LIC assessed by means of Liver Biopsy.

LIC at baseline	Success, if LIC after 1 year	Failure, if LIC after 1 year
2- <7 mg Fe/g dw	1 – < 7 mg Fe/g dw	< 1 mg Fe/g dw
≥7 - <10 mg Fe/g dw	1 – < 7 mg Fe/g dw	≥ 7 mg Fe/g dw < 1 mg Fe/g dw
≥10 mg Fe/g dw	Decrease in LIC ≥ 3 mg Fe/g dw	≥ 7 mg Fe/g dw Decrease in LIC < 3 mg Fe/g dw

- Missing assessments were treated as Failures.
- Success rates were calculated using SAS PROC FREQ, with option 'Riskdff'.
- Difference in proportion of success was compared.

Analysis of Endpoints

Comparison of LIC methods (Biopsy vs SQUID * vs MRI)

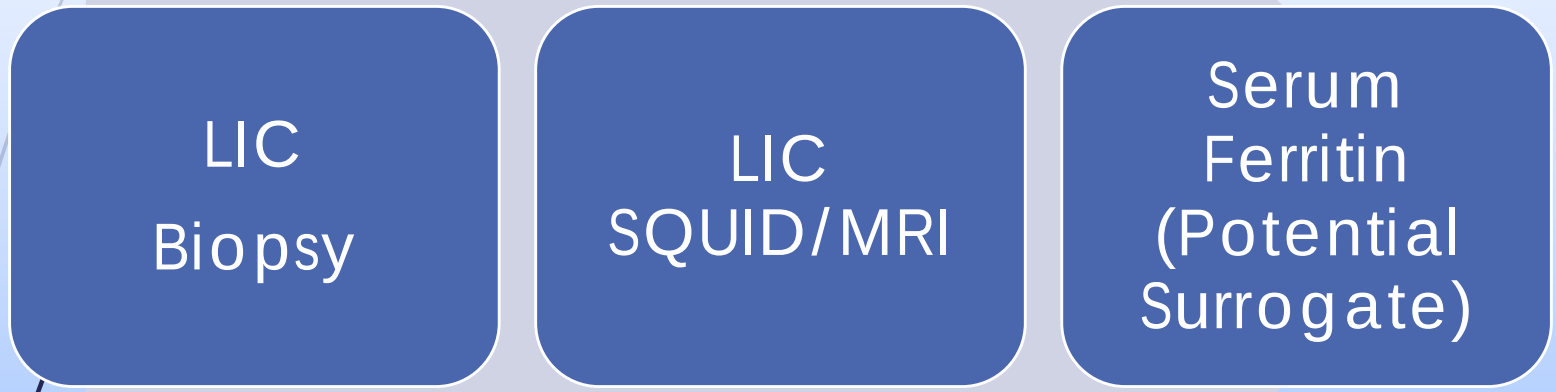
- Sub-group study based on LIC measured by 3 methods.
- Correlation analysis of LIC values between 3 measurement methods and between LIC and serum ferritin.

Serum ferritin as a Surrogate for LIC

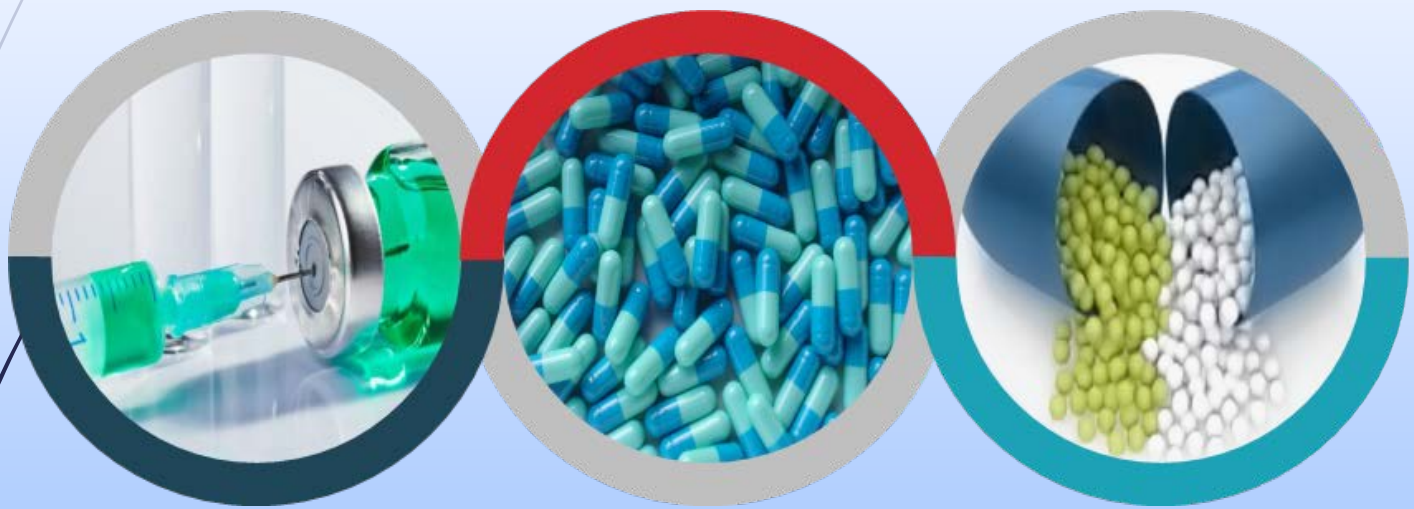
- MRI is expensive, access to MRI technology and expertise is limited worldwide and assessment not easy to perform.
- Sensitivity and specificity analysis based on various cut-offs for LIC and serum ferritin was performed.
- Utility of serum ferritin measurement to predict LIC level can predict clinical response, however, conclusive evidence could not be established.

* SQUID - Superconducting Quantum Interference Device

Evolution of the Endpoint



Drug forms influenced by patient-centric approach



Conclusion

- Keep up-to-date with technology, techniques, tools and even the types of data.
- Adapt to the changes in the industry.
- Future role will not be creating Tables, Listings & Graphs, but will be more non-clinical trial reporting such as data checks, understanding of the data with scientific context, data mining, meta-analyses and data visualization.
- Up-skill to put forward new ideas & contribute in decision making.

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Thank you

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