⬜ Observational Artifact

An observational artifact is a pattern or association that appears in data but is **not truly reflective of a biological or causal relationship** — rather, it results from **biases, confounders, or methodological limitations** inherent in observational studies.

⬜ Definition

Observational artifact refers to an **illusory finding** or **misleading pattern** that emerges in **non-randomized data** due to:

- Sampling bias
- Selection effects
- Incomplete control of confounders
- Temporal or institutional variations
- Unmeasured variables

⬜ Example

> A retrospective study finds that patients receiving 30 Gy in 3 fractions had lower local failure rates. However, the treatment choice was not randomized — it may reflect physician preference, patient performance status, or tumor burden.
> ➤ The "effect" may be an **observational artifact**, not a true causal relationship.

⚠ Why It Matters

* Observational artifacts can be **mistaken for real effects** * They often **influence clinical guidelines prematurely** * Without proper statistical control, they **bias interpretation**

⬜ Common Sources

- Lack of randomization
- Heterogeneous treatment practices over time
- Learning curves in institutions
- Retrospective data quality
- Publication bias favoring "significant" findings

Observational artifacts often masquerade as breakthroughs. Critical appraisal requires recognizing their methodological origin — not mistaking them for clinical truth.

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