

T1 Preanalytical Variables for Biospecimens

Ordering

- Restricted or lost consent
- Incorrect patient identification (ID) or collector ID
- Pairing patient ID with primary tube ID
- Improper labeling, mislabeling, no labeling

Collection

- Biological and environmental factors (age, sex, ethnicity, disease, location)
- Forgotten or duplicate collection
- Collection device types and age
- Anatomical location of collection
- Contamination of specimen (microorganisms, tube material, or additive)
- Empty tube or insufficient sample volume
- Diluted sample

Receiving

- Label removed or destroyed
- Biospecimen lost after collection
- Short-term storage temperature and time until processing

Processing

- Processing duration
- Aliquot volume
- Improper labeling, mislabeling, unlabeling
- Pairing primary tube ID with secondary tube ID

Long-term storage

- Time from processing to storage
- Storage duration, temperature, and facility
- Other environmental impact (sunlight, humidity, evaporation)
- Freeze–thaw cycles
- Emergencies/disasters (encapsulation in ice after refreezing, microbiological contamination)
- No labeling or destroyed labeling
- Missing or misplaced aliquots