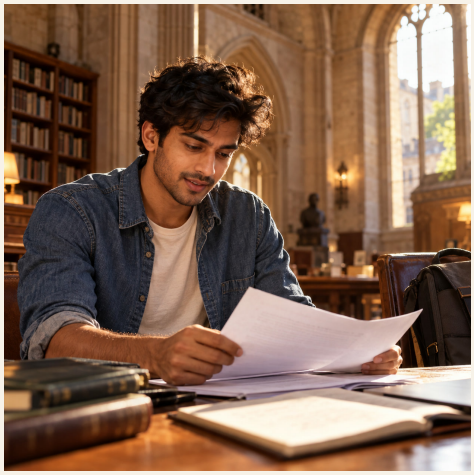
Researcher or student

Build a study log that preserves species, populations, formulations, comparators and analysis methods. Learn to separate laboratory characterization from clinical findings and retain negative results and serious harms alongside promising outcomes.



Finn / fictional visitor

YOUR LEARNING JOURNEY

Create a study log that makes findings comparable and records uncertainty, negative results and methodological differences. Preserve contradictory findings in the same log.

Assess study design, separate analytical questions from clinical ones, then locate the underlying primary records.

A registry entry describes a study record, not proof of benefit. A sponsor release is a sponsor account; distinguish it from a full paper and independent appraisal. Do not extrapolate animal findings into personal treatment predictions.

Open the current online guide

Sources and related guides remain accessible on the website. All role paths are open to every reader.

Portrait: fictional illustration, not a real patient, professional reviewer or endorsement. This handbook provides education, not individual medical or legal advice.

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Read in order for a foundation, or use the linked contents to find a specific topic. Page numbers refer to this edition.

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Continue with the reading path and books, then record your findings in the learning worksheet.

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Read a claim without losing its limits

Begin with one answerable question. “Does it improve wellbeing?” covers many different things. Pain, sleep, muscle strength, a blood measurement and hospital admission are separate outcomes. Write the exact substance, the people studied, the comparison and the outcome before deciding whether a finding answers your question.

An online experience is a report of what someone noticed. It can identify questions worth investigating, including possible harms. It usually cannot separate the substance from changes in training, food, other treatments, expectations or the natural course of a problem. Many similar posts still do not create a controlled comparison. Popularity and scientific certainty are different measurements.

Laboratory and animal experiments can investigate mechanisms and generate hypotheses. Human observational studies examine associations in real settings, with potential differences between groups. Randomized comparisons are designed to reduce those differences, but their usefulness still depends on execution, size, follow-up and the outcomes measured. The study design must fit the question; a small trial is not automatically a complete safety record.

Keep benefit and harm in the same notes. Record how many people were observed, how long they were followed, what events occurred and whether investigators considered them related to treatment. An event after treatment does not by itself establish causation. Conversely, an uncertain causal connection is not a reason to erase a serious event.

When reading numbers, retain the denominator. A hypothetical change from 2 in 100 to 1 in 100 is a one-percentage-point absolute reduction and a 50% relative reduction. Both descriptions concern the same comparison. Ask for uncertainty around estimates and whether the result was planned or selected from many analyses. A headline alone rarely supplies all of this.

Worked learning example

A post says a two-compound “stack” improved recovery. Studies of each ingredient separately cannot establish the effects or risks of that combination. Record the stack claim as a question, then look for research on that exact combination, outcome and population. An absent study means the question remains unanswered.

READ THE SOURCE

Testing Treatments - free evidence-literacy book

Read a study as a complete record

Begin with the primary paper and registry where available. A registry describes a planned or reported study; its presence does not prove benefit. Compare the registered population, outcomes and timing with the published account. Preserve publication date, study period and later update date as different facts.

Write the research question using population, intervention, comparator and outcome. Include species, formulation, route and duration. A comparison against placebo answers a different question from a comparison against an active medicine. A study in one population may leave other groups unrepresented.

Look at how participants entered the analysis. An estimate based on everyone assigned may differ from one describing participants who remained on treatment. Missing observations and treatment discontinuations can affect interpretation. Record the paper’s stated analysis and assumptions instead of merging estimates from different methods.

Check whether an outcome was primary, secondary or exploratory. Multiple measurements increase the opportunity for chance findings; the analysis plan and adjustments matter. A confidence interval describes uncertainty under the analysis assumptions. Statistical significance does not by itself establish a meaningful improvement in daily life.

Read withdrawals, adverse events and serious events alongside benefits. Retain reported causality assessments and comparator counts. Distinguish no event observed from evidence that an event cannot occur. Small studies and short follow-up may have limited ability to characterize uncommon or delayed harms.

Finally, separate the result from its interpretation. Note sponsor involvement, available methods and missing details. A sponsor release can report a development before full results are public; attribute it clearly and leave unresolved methods visible until the paper or registry supplies them.

Worked learning example

A headline reports one percentage while a paper supplies two estimates under different analysis assumptions. Label each estimate with its population and method; do not choose the larger number simply because it makes a stronger headline. The comparison is only meaningful when the definitions travel with the numbers.

READ THE SOURCE

Testing Treatments - evaluating treatment evidence

Testing the material: seven different questions

An analytical laboratory studies the material submitted to it. Start with the question you want answered, then ask which method can answer it. A report about identity cannot silently stand in for a report about amount, contamination or clinical effectiveness. The sample, formulation, analytical method and acceptance criteria all shape what the result means.

Identity asks whether the material matches its stated identity. Laboratories may compare molecular mass, amino acid sequence, structural features or chromatographic behavior with a suitable reference. A matching mass alone does not establish every structural detail. Ask which features the method can distinguish, and whether additional methods are needed for the particular material.

Purity asks what else a method detected. A chromatographic purity percentage describes separated signals under specified conditions. It is not automatically the proportion of all powder that is peptide. Water, counterions, residual solvents and impurities outside the method’s detection capability can require separate measurements. Two methods may produce different descriptions because they observe different properties.

Content, sometimes called assay or strength, asks how much target substance was measured. Read the units and calculation basis: mass per container, concentration or percentage of a stated claim. Biological potency asks a different question: whether the material produces specified biological activity in an appropriate assay. Chemical content alone does not establish biological activity, and an activity assay does not establish effectiveness in patients.

Sterility testing looks for viable microorganisms using a defined method and sample plan. A reported result concerns the material and conditions tested; it is not a universal guarantee covering every container or every contamination risk. Bacterial endotoxin testing is separate. Read its method, units, limit and sample-suitability information. Endotoxin testing does not cover every pyrogen. USP includes both Chapter 85 and Chapter 86 approaches; the latter uses recombinant reagents.

Stability asks whether specified qualities are maintained over time under defined conditions. A fresh COA is a snapshot, not a shelf-life study. Expiry support depends on the formulation, packaging and storage conditions studied. A reference standard is characterized material used for comparison. Traceability is a documented measurement chain to a reference, not a blanket endorsement of a laboratory or supplier. Measurement uncertainty describes uncertainty associated with a result; it should not be confused with permission to ignore a failed criterion.

One result cannot answer every question

A fictional sample has high chromatographic purity but no content, sterility or endotoxin results. The supported statement is that the submitted sample met the stated chromatographic criterion. Its amount and those microbiological properties remain unassessed. Nothing in that limited result establishes clinical benefit or suitability for human use.

READ THE SOURCE

USP authors: Reference Standards to Support Quality of Synthetic Peptide Therapeutics

FDA: Pyrogen and Endotoxins Testing-Questions and Answers, March 2026

USP Chapter 1085: Guidelines for Bacterial Endotoxins Testing

FDA: Expiration Dates-Questions and Answers

NIST: Metrological Traceability

Read a certificate of analysis without filling in the blanks

A certificate of analysis, or COA, records analytical findings for an identified material or sample. It is useful evidence only when its scope is understood. It is not interchangeable with a manufacturing history, clinical study, regulatory approval or guarantee about every item bearing a similar label. Begin with the identifiers rather than the biggest percentage on the page.

Match the laboratory name, report number, sample identifier and stated lot or batch. Check receipt, testing and issue dates, and whether the report was revised. Establish who selected and submitted the sample and what material the laboratory actually received. A report cannot establish the history of material it never handled. A seller’s screenshot may omit pages, qualifications or revisions; report authenticity can be checked through independently located contact details for the issuing laboratory.

For each result, read four things together: the property measured, the method, the units and the acceptance criterion. A specification describes tests and criteria used to judge the material. A pass means the reported finding met that stated criterion; it does not make unmeasured properties pass too. The appropriateness of the criterion is a separate question. If the report does not explain its basis, ask what standard or specification was used.

Read purity and content separately. Chromatographic peak-area purity describes signals separated by a particular analytical method. A content assay measures an amount using its own method and calculation basis. A product can have a high chromatographic percentage while containing less target substance than its stated claim. Water, counterions and other components are reasons that the mass of powder and the mass of target peptide are not necessarily identical.

Not tested means no result for that question; it is neither a pass nor a demonstrated failure. Not detected means the method did not detect the substance under its conditions and detection capability; it does not necessarily mean zero. A result below a quantification limit cannot automatically be treated as a precise amount. When relevant, ask about method suitability, the reference standard and measurement uncertainty rather than comparing bare numbers across unlike methods.

Keep the conclusion as narrow as the evidence. A chemical report without microbiological testing cannot establish sterility or endotoxin status. A single test date does not establish shelf life. A certificate for one submitted sample also does not show that a treatment works in humans. The practical reading question is: which test, on which sample, against which criterion, and what remains unknown?

Invented COA exercise: high purity, failed amount

This is an invented learning example, not a real product or report. Teaching Material A, lot EDU-001: identity is consistent with the stated sequence under the named method. HPLC purity is 99.2% area against an invented criterion of at least 98.0%, so that criterion passes. Content is 8.1 mg per container against a nominal 10.0 mg claim and an invented acceptance range of 9.0-11.0 mg, so content fails: 8.1 divided by 10.0 equals 81% of the claim. Biological potency, sterility and endotoxin were not tested; no stability study was supplied. Those questions remain unanswered. All limits here are fictional educational values, not product standards or use instructions.

READ THE SOURCE

USP authors: Peptide reference standards, purity and content

NIST: Reference materials and certified values

NIST: Traceability and uncertainty

FDA: Expiration Dates-Questions and Answers

Testing the person: understand the clinical question

A diagnostic laboratory studies specimens from a person to help assess health or investigate a clinical question. An analytical product laboratory studies material submitted for testing. These are different jobs. A blood report does not identify the contents of a product, and a product COA does not explain a patient’s symptoms or establish whether a treatment is appropriate.

Begin with the question the test is intended to answer. A test directory can explain the specimen required, the measurement method, its intended use, limitations and reporting details. Some tests are useful for one purpose but not another. Ordering recommendations are context-dependent. A list of tests mentioned online is not automatically a useful panel for every person, and this educational guide does not prescribe a monitoring schedule.

When reading a result, keep the patient and specimen identifiers, collection date, units, method and laboratory reference interval together. Reference intervals describe a comparison range used by that laboratory; they are not universal performance targets. Clinical decision thresholds may serve a different purpose from a reference interval. A result needs interpretation alongside symptoms, medical history and other findings, rather than being converted into a diagnosis from one isolated number.

Preparation, collection, transport and specimen condition can affect whether a result is interpretable. A laboratory's directory may specify handling requirements, specimen stability and reasons for rejecting a sample. Those details belong to the particular test and method. Do not transfer storage information for a blood specimen to a medication, or treat one laboratory's instructions as universal.

A change over time can raise a useful question without proving its cause. Differences in timing, clinical circumstances or analytical methods may matter. A normal result does not establish that an unapproved product is safe, and an abnormal result does not by itself establish that a product caused harm. The clinician and laboratory can help investigate unexpected or discordant results using the full clinical context.

In the United States, CLIA concerns laboratories testing human specimens for health assessment or diagnosis, prevention or treatment. CMS provides a public lookup for laboratory certification and demographics. Verify the particular performing facility and its certificate rather than assuming all sites within a company are equivalent. CLIA certification is not FDA approval of a peptide product, and it does not transform a product-purity report into a diagnostic test. Example laboratory directories are useful teaching resources, not endorsements or evidence that every listed service suits every person.

An HbA1c report needs context

Labcorp's HbA1c test page illustrates a useful directory entry: it names the method, specimen requirements, uses and limitations. It explains that conditions affecting red-cell survival and some hemoglobin variants can alter interpretation. If a fictional person's result changes after several simultaneous changes in health or care, the number alone cannot identify which change caused it. That is a question for clinical assessment, not a product testimonial.

READ THE SOURCE

CMS: Clinical Laboratory Improvement Amendments

CMS: Getting Started With CLIA

CMS: Official CLIA Laboratory Search

ARUP: Testing resources and laboratory directory

Labcorp: Hemoglobin A1c, test 001453

Primary-source toolkit

ClinicalTrials.gov: find a study’s registered design, eligibility, outcomes, status and posted results when available. Compare record versions with the paper. A registration entry alone does not establish a favorable result or clinical benefit.

Drugs@FDA: locate approval records, reviews and approved labeling for covered drug products. Match the application, product and date. It does not validate every similarly named preparation.

DailyMed: read company-submitted labeling currently in use. It includes approved and unapproved products, and its labeling may differ from the most recent FDA-approved version. Presence in DailyMed is not proof of approval; check Drugs@FDA for that question.

PubMed: locate biomedical citations and follow them to the actual study. An abstract is a starting point, not a replacement for methods, full results and limitations. Being indexed is not an endorsement of a conclusion.

FDA warning-letter database: find the agency’s stated concerns, letter date and any linked responses or closeouts. The database warns that later interactions may change the status of the issues. A missing letter is not a certificate of compliance.

Sources for this addition checked October 31, 2026.

READ THE SOURCE

ClinicalTrials.gov

Drugs@FDA

DailyMed - Scope and limitations

PubMed

FDA - Warning-letter database

Reading path and books

1. Choose a defined topic

Identify the exact molecule before searching across similar names or mechanisms.

2. Follow the dated chapters

Read laboratory, animal and human work as separate evidence stages.

3. Appraise the inference

Separate hypothesis generation, association and intervention evidence.

Continue in the Church Library

Choose the level that fits your background. Book links lead to the Library, where reading options and any affiliate disclosures are shown.

Testing Treatments - Evans, Thornton, Chalmers and Glasziou

Start with fair comparisons and uncertainty. The library entry includes an official free reading option. Published in 2011; use current official sources for regulatory questions.

The Art of Statistics - David Spiegelhalter

Go deeper into denominators, uncertainty and interpreting data. Read alongside the actual study rather than using a statistical slogan as a verdict.

Browse all Library rooms

Examples in practice

These examples identify published resources and their uses; they are not evaluated services.

Intertek - peptide characterization

Analytical example: provider-published descriptions of identity, impurity analysis, stability and biological activity assays. Read to compare the questions different methods answer; this is not an endorsement or independent accreditation verification.

Eurofins - peptide characterization and development

Analytical example: describes complementary separation, structural, impurity and stability methods. Published capabilities do not guarantee acceptance of a particular sample or suitability for a particular project.

ARUP - diagnostic testing resources

Diagnostic example: links to a laboratory test directory, specimen information, test fact sheets and clinical decision support. Use the entry for the specific test rather than extrapolating from a company name.

Labcorp - HbA1c test directory example

Diagnostic example: shows how one test page describes methodology, specimen requirements, intended use and limitations. It is a reading exercise, not a recommendation that everyone needs this test.

Questions and explanations

Am I reading about the same compound throughout?

Compare the full chemical identity and preparation, including relevant salt form, sequence or modification, rather than relying on a short name. Record any difference before combining findings across papers. For example, a modified analogue and its parent compound may share a mechanism label while remaining different interventions. Keep them in separate entries unless the evidence justifies the particular comparison being made.

What changed between studies, and which questions remain unresolved?

Build a comparison across species or population, preparation, comparator, duration, endpoint and analysis. Progressing to a later phase does not mean every uncertainty from earlier work has been resolved. For example, a short early-human tolerability study followed by a larger efficacy trial still may leave long-term or uncommon harms uncertain. Describe what each study adds and what it was not designed to answer.

Does the analysis support the conclusion, and what alternative explanations remain?

Compare the conclusion with the prespecified question, analysis population, handling of missing data and uncertainty around the estimate. Consider bias, concurrent changes and chance where the design leaves those explanations open. For example, an exploratory subgroup result selected from many comparisons should not be presented as the trial’s definitive overall finding. Preserve both the result and the methodological limits rather than treating statistical significance as a complete verdict.

Glossary

Comparator
The reference group or intervention against which an outcome is compared, such as placebo or another treatment.

Endpoint
An outcome defined for a study. A biological measurement and a patient-important outcome are not necessarily the same thing.

Formulation
The composition and presentation of a product, including ingredients beyond the active substance.

Adverse event
An unwanted medical occurrence during observation; occurrence does not itself establish a causal connection to treatment.

Investigational
Under investigation. This describes research status, not proof of safety or benefit.

COA
Certificate of analysis: a report of specified tests and results for an identified material or sample. Its meaning depends on scope and provenance.

Identity
Whether a material matches the named substance within the methods and comparisons used.

Purity
A method-dependent assessment of detected components; chromatographic peak-area purity is not automatically total mass purity.

Assay / content
A measurement of the amount of a specified substance, stated with units and a defined basis.

Potency
Biological activity assessed by a specified assay; the term is sometimes used differently, so inspect the report’s definition.

Sterility
The absence of viable microorganisms; interpreting a sterility-test result requires its sampling and method context.

Endotoxin
A component of certain bacteria that can provoke inflammatory reactions. Endotoxin testing is distinct from sterility testing.

Traceability
A documented connection to an origin or reference. Measurement traceability and supply-chain provenance are related but different questions.

CLIA
Clinical Laboratory Improvement Amendments: a U.S. framework for laboratories testing human specimens for specified health purposes.

Reference interval
A laboratory’s comparison range for a test in a defined reference population. It is not a diagnosis on its own.

Confidence interval
A range expressing statistical uncertainty under an analysis’s assumptions; it does not remove bias or establish applicability.

Learning worksheet

Study reading log

Use these prompts to record what you understand, what remains uncertain and which source could answer the question.

Learning prompt	Filled-in fictional example
Study reading log	Fictional example: Paper: short follow-up and an exploratory subgroup result. Registry: broader primary outcome. Open question: was the subgroup analysis prespecified? Keep the two results separate.

Record primary citation, registry identifier, publication date and funding.

Describe species or population, formulation, comparator, duration and endpoints.

Record analysis methods, effect estimates, uncertainty and important missing information.

Log null results, serious harms and reported causality separately from the authors' interpretation.

Educational information, not individualized medical or legal advice.

Explore another perspective in the Community Center