

Neurology, Pathology and Pharmacology: A Framework for Reading Mechanisms and Side Effects

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Layout demonstration — sample record, not a published paper.

Abstract

How does a drug travel from a neural pathway to a side-effect label? This record orders anatomy, pathology and pharmacology into one traceable chain: where the target sits, what the lesion changes, and which evidence a completed study would need at each step.

Keywords: neuroanatomy; pathology; pharmacology; side effects

1 Introduction

Neurology, pathology and pharmacology describe the same patient at three levels of resolution. A reader who meets them separately learns three vocabularies; a reader who meets them in order learns one argument. This record is arranged for the second reader.

The order is fixed on purpose: first the anatomy that names the pathway, then the pathology that explains what has gone wrong, then the pharmacology that intervenes. Reversing that order is what makes a side-effect list feel arbitrary.

Everything below is a specimen. No dose, no patient and no trial is claimed; the table demonstrates layout and marks the place a finished study would put its own numbers.

2 From pathway to target

A drug acts on a molecule, but the effect is read on a pathway. Writing the pathway first fixes the vocabulary: transmitter, receptor, circuit, symptom. Only then does the phrase *mechanism of action* have a referent.

$$E/E_{max} = [A]/(EC_{50} + [A]) \quad (1)$$

The relation above is why a small change in concentration is not a small change in effect at every point of the curve. Half of the argument about side effects lives in the shape of this function rather than in its maximum.

3 Reading a pathology report

Pathology supplies the constraint that pharmacology cannot argue away. A report answers three questions in sequence: what tissue, what change, how confident. The table keeps those columns separate, so a claim about a drug can be checked against the second column rather than the third.

Tissue	Change	Confidence
[region]	[lesion]	high
[region]	[lesion]	moderate
[region]	within normal limits	high

Table 1: Placeholder findings by tissue and confidence. Values demonstrate layout only.

Keeping confidence in its own column is what stops a reader from treating a negative finding as evidence of absence. The distinction costs one column and saves a paragraph of hedging.

4 Side effects as a second pathway

An unwanted effect is rarely a failure of the target. It is usually a second pathway that shares a receptor or a clearance route with the first. Naming that pathway turns a list of symptoms into a set of predictions.

- Which other tissues express the target?
- Which clearance route does the compound share?
- Which of the two can be measured before the dose is raised?

Each question is answerable before the next prescription, which is the point of writing them down. The specimen leaves the answers as slots because a real answer depends on a real compound.

5 What a finished paper adds

A completed version would fill the table with its own cohort, replace the placeholder curve with measured concentrations, and add the statistics that separate a signal from a sampling artefact.

References

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