# Expected Outcome

The **expected outcome** refers to the anticipated result of a surgical procedure under normal conditions, based on historical data, clinical standards, or institutional experience.

In CUSUM analysis, the expected outcome is used to establish a **reference value (k)**—typically the acceptable complication or failure rate. Each individual case is then compared to this expected performance level.

## Clinical Definition

For intracranial pressure (ICP) monitor placement, an expected outcome is:

- **Correct placement**
- **Functional monitoring system**
- **No complications** such as hemorrhage, infection, or misplacement

If the acceptable complication rate is 10%, then the **expected outcome rate is 90%**, and:

- $k = 0.10$ → expected failure rate

## Role in CUSUM

Each case contributes positively or negatively to the cumulative sum, depending on whether the actual outcome matches the expected outcome:

- **Success (0)** → better than expected

→ CUSUM decreases slightly (e.g., $C_n = C_{n-1} - 0.1$)

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* **Complication (1)** → worse than expected
  → CUSUM increases (e.g., ''Cₙ = Cₙ₋₁ + 0.9'')
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## Why It Matters

- Sets a clear **performance benchmark**
- Defines what is considered **normal vs. concerning**
- Anchors the CUSUM curve in **evidence-based practice**
- Prevents overreaction to single adverse events when outcomes are still within expected variation

## Adjusting the Expected Outcome

Expected outcomes may vary depending on:

- **Patient risk profile**

- **Surgeon experience**
- **Case complexity**
- **Institutional or national guidelines**

Therefore, the expected outcome must be **explicitly defined and periodically reviewed** to ensure meaningful performance monitoring.