

## The Rumack-Matthew Nomogram for Acetaminophen Poisoning

The Rumack–Matthew nomogram is a clinical tool used to estimate the risk of acetaminophen-induced liver injury after a single acute ingestion. It compares the serum acetaminophen concentration with the time since ingestion to determine whether treatment with acetylcysteine (NAC) is required. If the acetaminophen level plots on or above the treatment line, NAC should be started to prevent and treat hepatotoxicity.

### When the nomogram CAN be used\*

\*ALL criteria must be met

- Single acute ingestion (i.e. dose or doses taken within a 24-hour period)
- Known time of ingestion
- Serum acetaminophen level drawn  $\geq 4$  hours after ingestion

### When the nomogram CANNOT be used

- Repeated supratherapeutic ingestion
- Unknown ingestion time
- Presentation  $>24$  hours after ingestion

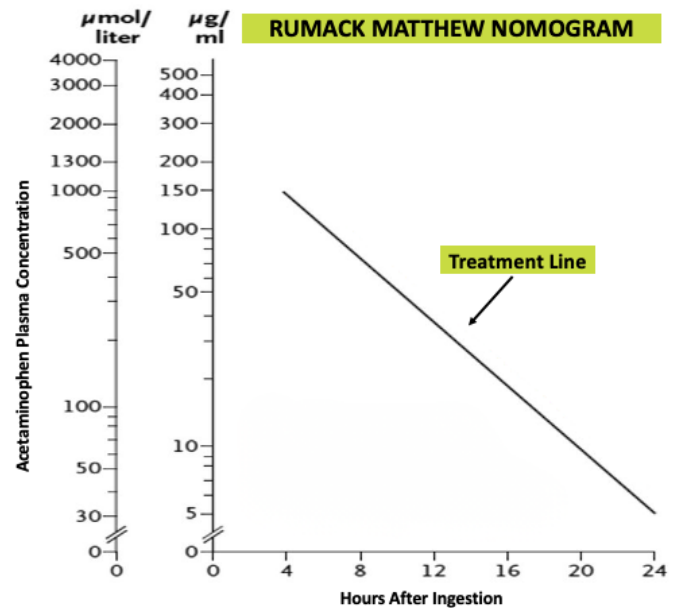
### Consult the Poison Centre for case-specific guidance

Step-by-Step use:

1. Ensure correct units are being used (i.e.  $\mu\text{mol/L}$  vs  $\mu\text{g/mL}$ ).
2. Confirm ingestion history. Use the nomogram only for acute ingestions (i.e. a dose or doses taken **within a 24-hour period**).
3. Determine time of ingestion. **Time zero** should be the *earliest possible time of ingestion* to ensure the most cautious assessment.
  - *Example:* A patient presents at 19:00 reporting ingestion between 02:00 and 18:00. Use 02:00 as **time zero**.
4. Obtain acetaminophen level.

Draw level immediately if  $\geq 4$  hours after time zero. If the level plots below the treatment line, draw an additional level at 4 hours after the last possible time of ingestion before ruling out the need for acetylcysteine (NAC).

*Example:* Ingestion occurred between 0700 and 1900. Patient presents at 2000. Draw acetaminophen level on arrival and again at 2300 if first level is not above the treatment line.



5. Plot and interpret the result. Plot the serum acetaminophen concentration against time zero on the nomogram.
  - On or above the treatment line: Start acetylcysteine (NAC).
  - Below treatment line: NAC generally not required. \*\*See next point.
6. In special cases (e.g. high-risk ingestions, extended-release formulations, or co-ingestion with opioids/anticholinergics): If the initial acetaminophen level (drawn  $\geq 4$  hours post-ingestion) plots below the treatment line, additional levels should be obtained before ruling out the need for NAC. **Consult the poison centre for case-specific guidance.**



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