
STANDARD OPERATING PROCEDURE

Paracetamol (Acetaminophen) Poisoning

Special Region (1)
Union of Myanmar

Version: 1.0

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Applies to: ER, Medical Wards, ICU

1. Purpose

To standardize a safe, time-critical, decision-driven approach to paracetamol poisoning that:

- Prevents acute liver failure
- Avoids delayed treatment errors
- Integrates with vs without drug level pathways

2. Core Clinical Principle

- Treatment is time-dependent, not symptom-dependent
- NAC is protective early, life-saving late, and safe always

3. Pathophysiology

- Toxic metabolite: NAPQI
- Detoxified by glutathione
- Overdose → depletion → centrilobular hepatic necrosis
- Injury begins before symptoms appear

Therefore: "Normal early labs do NOT exclude toxicity"

4. Toxicity Threshold

Scenario	Threshold
Acute ingestion	≥150 mg/kg
High-risk patient	≥100 mg/kg (consider lower threshold)
Massive overdose	≥300–500 mg/kg

5. Initial Approach (Consultant Framework)

Step 1: Stability

- ABCDE
- Look for encephalopathy / shock

Step 2: Define Ingestion Pattern

- Single acute ingestion
- Staggered overdose (high risk)
- Unknown timing

Step 3: Time Since Ingestion

Document exact time since ingestion to guide decision-making.

6. Investigations (Targeted, Not Delaying NAC)

Test	Purpose
Paracetamol level (≥ 4 hr)	Risk stratification
ALT/AST	Hepatotoxicity
INR	Severity / prognosis
Creatinine	AKI
Glucose	Liver failure marker

7. Decision Pathways (Core of SOP)

Pathway A: Paracetamol Level Available

7A.1 Validity Check

Use level ONLY if:

- Single ingestion

- Known time
- ≥ 4 hours post ingestion

7A.2 Interpret using Nomogram

Result	Action
Above treatment line	Start NAC
Borderline / uncertain	Start NAC
Below line (reliable history)	Observe

Do NOT trust nomogram if: staggered ingestion, unknown timing, late presentation (>24 hr). Switch to Pathway B.

Pathway B: Level Not Available / Unreliable (Real-World)

Start NAC IMMEDIATELY if ANY:

- Dose ≥ 150 mg/kg
- Unknown time
- 8 hours post ingestion
- Staggered overdose
- Any elevated ALT with history

"If the story is unclear, assume toxicity until proven otherwise"

8. Decontamination

Method	Indication
Activated charcoal	Within 1–2 hr (rare in late presenters)

9. NAC Therapy

9.1 IV NAC (Preferred – Hospital Standard)

Standard 21-hour protocol

Phase	Dose	Duration
1	150 mg/kg	1 hr
2	50 mg/kg	4 hr
3	100 mg/kg	16 hr

9.2 Oral NAC (if IV Unavailable)

Step	Dose
Loading	140 mg/kg
Maintenance	70 mg/kg q4h × 17

9.3 Practical Notes

- Continue NAC even if started late
- Do NOT stop at 21 hr blindly
- Reassess clinically and biochemically

10. Monitoring

Parameter	Frequency	Interpretation
ALT/AST	12–24 hr	Trend more important than value
INR	12–24 hr	Most important severity marker
Glucose	Regular	Early failure marker
Mental status	Continuous	Encephalopathy

11. When to Stop NAC

Stop NAC ONLY if:

- ALT decreasing or normal
- INR <1.5
- Patient asymptomatic
- Paracetamol level undetectable (if available)

If NOT improving → CONTINUE NAC

12. Severe Toxicity / Acute Liver Failure

Red Flags (Act Immediately)

- INR ≥ 3
- Encephalopathy
- Hypoglycemia
- Metabolic acidosis

Management

- Continue NAC (even >24 hr)
- ICU admission
- Maintain glucose
- Correct coagulopathy (if bleeding)
- Early referral (if transplant possible)

13. Special High-Risk Scenarios

13.1 Staggered Overdose

- Highest risk pattern
- Always treat

13.2 Unknown Time

- Treat as toxic

13.3 Late Presentation (>24 hr)

- If ALT elevated → treat
- If symptomatic → treat

14. NAC Adverse Effects

Reaction	Management
Anaphylactoid (IV)	Slow infusion + antihistamine
Hypotension (rare)	Supportive
Vomiting (oral)	Repeat dose

15. Disposition

Category	Action
Early, low-risk	Observe
Lab abnormality	Admit
Liver failure	ICU

16. Consultant Summary

Absolute rules:

1. Do NOT wait beyond 8 hours
2. Nomogram only for perfect cases
3. Staggered overdose = treat
4. NAC is safer than delay

5. Stopping NAC requires evidence, not time

17. References

- [1] Rumack BH, Matthew H. Acetaminophen poisoning. *Pediatrics*. 1975;55:871–6.
- [2] Chiew AL, et al. Evidence for acetylcysteine regimens. *Lancet*. 2018;391:157–68.
- [3] American College of Medical Toxicology. *J Med Toxicol*. 2016;12:1–18.
- [4] NICE Guideline NG39. Acute poisoning. 2023.
- [5] NPIS UK Guidelines. Paracetamol overdose. 2023.
- [6] WHO. Poisoning management guidelines. 2021.
- [7] *Harrison's Principles of Internal Medicine*, 21st ed.