LRI Emergency Department

Paracetamol poisoning

Version 96

Proforma to guide ED management of ORAL ingestions in adults

Includes overdoses due to therapeutic excess

Manage and document any co-ingestions separately

Disclaimer:
This is a clinical template; clinicians should always use judgment when managing individual patients

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Patient details

Full name

DoB

Unit number

(use sticker if available)

① Sources of further advice

- Go to toxbase.org or toxbasebackup.org for online management advice regarding Paracetamol poisoning, including IV and other routes (see ED INsite guidance page 'Drugs & Fluids' for login details
- **National Poisons Information Service** (NPIS) is available anytime if remaining uncertainties after advice from ED senior
  ☎ **0344 892 0111**
- **Liver unit** referrals should be made to the 'liver unit medical registrar' at the **Queen Elizabeth Hospital Birmingham** (see box 7 for criteria)
  ☎ **0121 627 2000**

② Significant ingestion?

Work out ingested dose in mg/kg

Total Dose ____ mg

Patient weight ____ kg = ____ mg/kg

Disregard any additional kilos in excess of 110kg

If pregnant, enter pre-pregnancy not actual weight

☐ **Yes**, as one of the below
- Ingested dose >75 mg/kg/24h ☐
- Reported dose unreliable ☐

☐ **No**, as none of the above

③ NAC treatment needed?

☐ **YES**, as one or more of the below
- 4-15h after single ingestion, level on or above treatment line ☐
- >15h after single ingestion, paracetamol is still detectable ☐
- >4h after last tablets of a staggered ingestion taken, paracetamol is detectable ☐
- >4h after an ingestion of uncertain timing, paracetamol is detectable ☐
- INR >1.3 * ☐
- ALT >53 IU/L * ☐

☐ **NO**, as none of the above

* *Call NPIS for advice (see box 1 for details) if INR or ALT are known to be chronically elevated due to other causes (e.g. warfarin or chronic liver disease) **AND** paracetamol cannot be detected or concentration is below the treatment line on the nomogram; patient **MAY** not need NAC*

④ Single ingestion >24h ago

Obtain INR, venous gas, U&E, LFT, Paracetamol level and FBC

<u>If jaundice or liver tenderness</u>
→ Start NAC immediately (do not wait for blood results) and admit to AMU.
NB: check if referral to a liver unit is required (see box 6 for criteria).

Otherwise await blood results

<u>If NAC treatment needed (see box 3)</u>
→ Start NAC and admit to AMU
NB: check if referral to a liver unit is required (see box 6 for criteria)

<u>If serum creatinine is abnormal</u>
(i.e. new rise above upper limit of normal or >10% from previous abnormal value)
→ Admit to AMU

<u>If none of the above</u>
Patient is not a risk of liver toxicity

Note times & tasks in the boxes below

DD/MM/YY Current date

HH:MM Current time

DD/MM/YY Date of ingestion

Time of ingestion (24h clock)
☐ Single ingestion; all tablets at
☐ Staggered; **last** tablets taken at
HH:MM hours passed since
HH:MM ☐ Timing unclear

HH:MM Sample needed at

Blood sampling delegated to

HH:MM Sample taken at

Result checking delegated to

HH:MM Start NAC before

NAC administration delegated to

HH:MM NAC started at

Significant ingestion (see box 2)? N → Manage self-harm unless ingestion was truly unintentional

Y

Ingestion >7 days ago in patient without any new symptoms, CKD or chronic liver disease? Y

N

Single ingestion >24h ago? Y → Manage as per box 4

N

- 'Single ingestion' means 'all taken in one go' or within 1h
- 'Staggered' means ingestion over longer than 1h; including therapeutic excess

Ingestion staggered or timing unclear? Y

N

Ingestion <1h ago **AND** >150mg/kg? Y → Give charcoal 50g PO with an IV antiemetic

N

Ingestion <4h ago? Y → Admit patient to EDU on 'Toxicology' pathway' unless co-ingestions make patient unsuitable for EDU admission

N

>150mg/kg ingested? N

Y

Will it be possible to act on blood results within 8h of ingestion? N

Y

Prescribe NAC as per boxes 7-8 and ensure it is started **within 1h of arrival** *
Manage any adverse reactions as per box 9

If necessary, delay moving on to next box (blood sampling) to ensure that 4h have passed since last tablets were taken; record time blood should be taken in box on LEFT paper edge *

Delay blood sampling until 4h after ingestion; record time blood should be taken in box on LEFT paper edge *

- Obtain INR, venous gas, U&E, LFT, paracetamol level and FBC *
- Record actual time blood was taken in box on LEFT paper edge
- Record blood results in boxes 5-6 *

* = new rise above normal or >10% from previously elevated value

* If you need to delegate a task to someone else, record this in the relevant box on LEFT paper edge

Is NAC Rx needed (see box 3)? N → Crea raised? * Y / N

Y

NAC can be stopped

* Hand drug chart to patient's nurse and ensure urgency is clearly understood

- (If not already,) prescribe NAC as per boxes 7-8 * (if possible, start NAC **within 8h of ingestion**)
- Manage any adverse reactions as per box 9

INR, ALT or creatinine raised? N → EDU care on 'NAC treatment' pathway unless unsuitable due to co-ingestions

Y

Admit to AMU (**NB**: Check box 6 for liver unit referral criteria)

Manage self-harm unless ingestion was truly unintentional

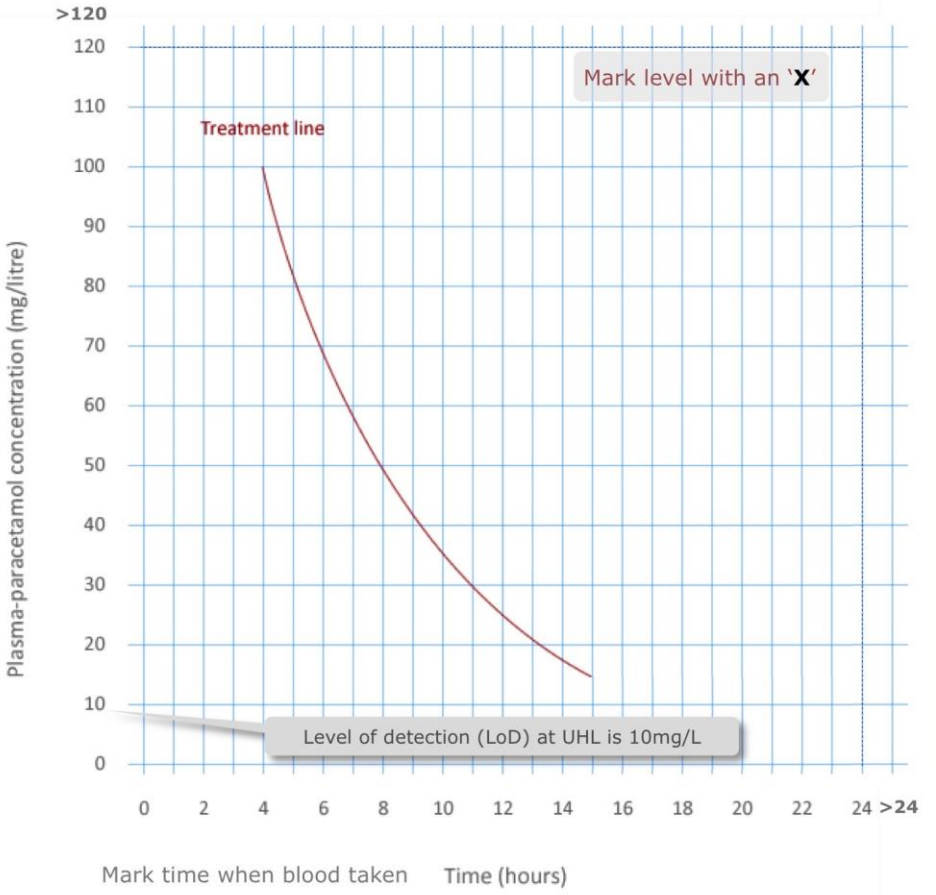
Provide Paracetamol OD Information Sheet

NB: discuss with ED senior if other blood results abnormal or if nausea or abdo pain

This patient was managed by

Print name Signature Role

⑤ Paracetamol blood level



⑥ Blood results

	initially	post-NAC	
Time			
liver unit referral criteria (**NB**: also include hepatic encephalopathy >grade II)			
pH			<7.3
pCO_2			
Bicarb			
Lactate			>3.5*
Glucose			
* >3 after fluid resuscitation/24h post-ingestion			
Paracetamol			
NB: Patients with paracetamol levels >700mg/L who are also in coma with a high lactate may require haemodialysis alongside NAC; d/w NPIS			
Na			
K			
Urea			
Crea			>300
Bili			
ALT			
Alb			
AP			
WBC			
Hb			
Platelets			
INR			
Prothrombin time			>20

⑦ NAC regimen

- *N-Acetylcysteine (NAC) ampoules contain 2G NAC in 10mL (200mg/mL)*
- *Regimen consists of 2 infusions given consecutively over 12h*
- *Tick applicable weight range (in pregnancy, here: **ACTUAL** weight)*
- *Prescribe NAC on fluid page of drug chart as per example in box 8*

Patient weight (kg)	First infusion: Add required amount of NAC to a 200 mL bag of Glucose 5%			Second infusion: Add required amount of NAC to a 1000mL bag of Glucose 5%		
	NAC 100mg/kg		Rate	NAC 200mg/kg		Rate
	Dose	Volume		Dose	Volume	
	mg	mL	mL/h	mg	mL	mL/h
☐ 40-49	4600	23	112	9000	45	105
☐ 50-59	5600	28	114	11000	55	106
☐ 60-69	6600	33	117	13000	65	107
☐ 70-79	7600	38	119	15000	75	108
☐ 80-89	8600	43	122	17000	85	109
☐ 90-99	9600	48	124	19000	95	110
☐ 100-109	10600	53	127	21000	105	111
☐ >109	11000	55	128	22000	110	111
Run time	2 hours			10 hours		

⑨ NAC adverse reactions

NAC can cause nausea, vomiting, flushing, urticarial rash, angioedema, tachycardia, bronchospasm and, rarely, shock.

Reactions are more likely in women, asthmatics, those with a family history of allergies and patients with low paracetamol levels. They are usually seen during infusion of the 1st bag (large amounts being given rapidly).

Reactions can often be controlled by simply stopping the infusion temporarily; consider giving chlorphenamine 10mg IV if not. Add salbutamol 5mg neb if bronchospasm.

If unsuccessful use anaphylaxis pathway.

NB: Once reaction settled, restart the infusion at the normal rate.

Previous reaction is **NO** contraindication to NAC. If patient reports previous reactions consider pre-treatment with chlorphenamine 10mg and ranitidine 50mg IV. Pre-treat with salbutamol if history of bronchospasm.

⑧ NAC example prescription

for 62kg patient as per table in box 7

Date	Infusion fluid		Additions to infusion		IV or SC	Line	Start Time	Time to run or ml/hr	Fluid Batch No.	
	Type/strength	Volume	Drug	Dose						Prescriber
DD/MM/YY	Glucose 5%	200mL	N-Acetylcysteine	6600mg = 33mL	IV		HH:MM	117 mL/h (i.e. runs over 2h)		Dr.'s Name
DD/MM/YY	Glucose 5%	1000mL	N-Acetylcysteine	13000mg = 65 mL	IV		HH:MM	107 mL/h (i.e. runs over 10h)		Dr.'s Name