

Name:

DoB:

Hospital number:

CHI:

Multi Disciplinary Care Pathway for **PARACETAMOL OVERDOSE**

**Ingested over a period of one hour or less -
presenting 8-24 hours after acute ingestion**

This care pathway includes the **ADULT** SNAP
based regimen for acetylcysteine and is **ONLY** for
use in **NHS LOTHIAN**

For advice contact the on-call toxicologist at the RIE (Monday – Friday 8.30
am – 6 pm) or the National Poisons information Service Tel 0344 892 0111
(out of hours)

Multi Disciplinary Care Pathway for
PARACETAMOL OVERDOSE – 8-24 HOURS

Date:

Hospital: RIE ☐ SJH ☐ WGH ☐

Clinical area: ED/A&E ☐ AMU ☐ MAU ☐ Obs Ward ☐

Patient Label, or

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NHS Lothian

**To be initiated once a PARACETAMOL overdose is suspected
Ingested over a period of one hour or less -
presenting 8-24 hours after acute ingestion**

KEY TO INITIALS OF ALL STAFF COMPLETING THIS CARE PATHWAY

Print name	Designation	Initials	Signature	Date
1				
2				
3				
4				
5				
6				

PATIENT: This document is a supplement to your record of treatment for an admission with a suspected or confirmed paracetamol overdose.

STAFF: Should be completed in addition to the Inpatient Record (nursing admission, medical clerking, Toxicology Questionnaire), NEWS observation chart, ED shock chart, Infusion charts and Prescription & Administration Record.

SUMMARY		Initials & time
Ingestion date.....	Was paracetamol bought for overdose: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Ingestion time.....	Total paracetamol ingestedg	
List all the drug(s) ingested	Patient's weight.....kg	
	CALCULATE The amount of paracetamol ingestedmg / kg	
	Notes	
	For obese patients weighing more than 110 kg, the toxic dose in mg/kg should be calculated using 110 kg, rather than the patient's actual weight.	
	For pregnant patients the toxic dose in mg/kg should be calculated using the patient's pre-pregnancy weight.	
Alcohol ingested? Yes <input type="checkbox"/> No <input type="checkbox"/>	There is a dosage calculator on TOXBASE® for calculating mg/kg.	

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Please tick boxes as appropriate and initial / time in conjunction with the Inpatient record.

STAGE 1 - IMMEDIATE ASSESSMENT

Ingested over a period of one hour or less - presenting 8-24 hours after acute ingestion

Give acetylcysteine **IMMEDIATELY** to all patients if it is thought that more than **150 mg/kg** body weight paracetamol has been ingested. **DO NOT WAIT** for the plasma paracetamol concentration.

The efficacy of the antidote declines rapidly during this period and it must therefore be started **URGENTLY**

Assessment for risk of liver damage Paracetamol ingested.....mg/kg (see calculation on page 2) <input type="checkbox"/>		Initial & time
Clinical priorities <ul style="list-style-type: none"> Is it thought that more than 150 mg/kg has been ingested Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes, START ACETYL CYSTEINE IMMEDIATELY DO NOT WAIT FOR BLOOD RESULTS <input type="checkbox"/> (Refer to SNAP based dosage table on page 5) If No, Wait for blood results to determine if acetylcysteine is required <input type="checkbox"/> 		
Blood sampling <ul style="list-style-type: none"> Obtain urgent samples for paracetamol concentration, U&Es, TCO₂, LFTs, FBC and INR <input type="checkbox"/> 		
On receipt of blood results assess the risk of liver damage: <ul style="list-style-type: none"> by plotting the paracetamol concentration on the graph on page 4 <input type="checkbox"/> Date, time & blood results documented on page 4 <input type="checkbox"/> 		
If treatment has not already been initiated: <ul style="list-style-type: none"> Commence acetylcysteine if paracetamol concentration is plotted on or over the treatment line (Refer to SNAP based dosage table on page 5) <input type="checkbox"/> Consider the use of acetylcysteine if the patient has an ALT above the limit of normal even if the paracetamol concentration is below the treatment line <input type="checkbox"/> Acetylcysteine is not indicated if the plasma paracetamol concentration is under the treatment line, the INR and ALT are normal, and the patient is asymptomatic AND there is no doubt about the time of ingestion <input type="checkbox"/> If creatinine is abnormal and the above criteria are met acetylcysteine is not required but renal function should be monitored as an inpatient and if required, treated conventionally <input type="checkbox"/> 		
Notes	A rise in ALT can suggest acute liver injury and in cases of severe poisoning the ALT rises rapidly and is commonly abnormal at first presentation to hospital Haemodialysis may be indicated alongside acetylcysteine if the patient has a very high paracetamol concentration and an elevated lactate. For advice contact local toxicologist or the National Poisons Information Service. Tel 0344 892 0111 out of hours	
If treatment has already been initiated: <ul style="list-style-type: none"> Continue acetylcysteine if paracetamol concentration is plotted over the treatment line <input type="checkbox"/> Discontinue acetylcysteine if paracetamol concentration is plotted below the treatment line; the INR and ALT are normal; patient is asymptomatic; AND there is no doubt about the time of ingestion <input type="checkbox"/> If creatinine is abnormal and the above criteria are met acetylcysteine is not required but renal function should be monitored as an inpatient and if required, treated conventionally <input type="checkbox"/> 		Initial & time
Medical staff of grade FY2 or above <u>must</u> review blood results prior to discontinuing therapy Results reviewed byDate.....Time.....		
If treatment with acetylcysteine is not indicated or discontinued and further blood tests are not required, go to Stage 4 'Subsequent Management & Discharge' [p 8]		

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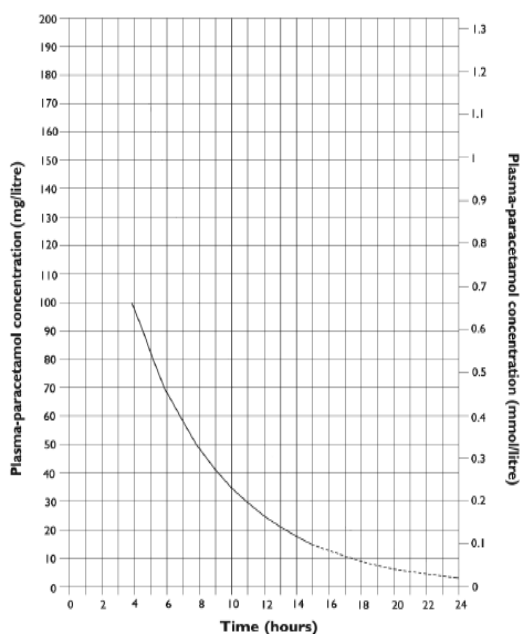
CHI:

NHS Lothian

Initial as you complete each aspect of care then complete the 'KEY TO INITIALS' table on page 2.

Plot patient's paracetamol concentration on the graph to assess if patient is at risk of liver damage

WARNING: PLEASE CHECK THE UNITS CAREFULLY AND USE THE CORRECT SCALE



Graph taken from TOXBASE®

Blood Results

Date/Time of sample

Urea

Sodium

Potassium

TCO₂

Creatinine

eGFR

Bilirubin

ALT

Alk Phos

Hb

MCV

WCC

Platelets

INR

Plasma paracetamol concentration.....
at.....hours post ingestion

Other

Initials

date / time

Initials

date / time

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STAGE 2 – INITIATION OF TREATMENT WITH ACETYLCYSTEINE

FOR OBESE PATIENTS WEIGHING more than 110 kg

Calculate acetylcysteine dose using 110 kg rather than the patient's actual weight

FOR PREGNANT PATIENTS

Calculate acetylcysteine dose using the patient's actual pregnant weight

THIS SNAP BASED DOSAGE TABLE IS ONLY FOR USE IN

NHS Lothian

Adult acetylcysteine prescription

(each ampoule = 200 mg/mL acetylcysteine)

Regimen	First Infusion		Second Infusion	
Infusion fluid	200 mL 5% glucose ¹ or sodium chloride 0.9%		1000 mL 5% glucose ¹ or sodium chloride 0.9%	
Duration of infusion	2 hours		10 hours	
Drug dose	100 mg/kg acetylcysteine		200 mg/kg acetylcysteine	
Patient Weight ²	Ampoule volume ³	Infusion Rate	Ampoule volume ³	Infusion Rate
kg	mL	mL/h	mL	mL/h
30-39	18	109	35	104
40-49	23	112	45	105
50-59	28	114	55	106
60-69	33	117	65	107
70-79	38	119	75	108
80-89	43	122	85	109
90-99	48	124	95	110
100-109	53	127	105	111
≥110	55	128	110	111

¹ Check capillary blood glucose at least once in all patients, and 4-hourly in patients with diabetes

² Dose calculations are based on the weight in the middle of each band

³ Ampoule volume has been rounded up to the nearest whole number.

Extended treatment – continue acetylcysteine at the dose and infusion rate used in the 2nd treatment bag

Patient's weight kg

Prescription and Administration record completed ☐

Date/time treatment commenced

Initial

REACTION to acetylcysteine

None ☐ Wheeze ☐
 Flushing ☐ Hypotension ☐
 Vomiting ☐ Other ☐
 Rash/Itch ☐ Specify.....

COMPLICATIONS of paracetamol ingestion

Abnormal liver function ☐ Encephalopathy ☐
 Acute kidney injury ☐ Haemorrhage ☐
 Hypoglycaemia ☐ Other ☐
 Acidosis ☐ Specify.....

Date and time of reaction

Initial

Date and time of complication

Initial

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STAGE 3 – END OF TREATMENT WITH ACETYLCYSTEINE

• **End bag 2 blood samples**

U&Es, TCO₂, LFTs, FBC, INR & **PARACETAMOL CONCENTRATION**

- **End of bag 2 blood results** - documented in table below

☐

Initial & time

Blood results

	<u>Admission Bloods</u>	<u>End of bag 2 bloods</u>	<u>End of extended bag 1 bloods</u>	<u>End of extended bag 2 bloods</u>	<u>End of extended bag 3 bloods</u>
Notes	* Copy from page 4	Obtain blood samples at the end of bag 2	Obtain blood samples at the end of extended bag 1	Obtain blood samples at the end of extended bag 2	Obtain blood samples at the end of extended bag 3
		Date/time taken Initial	Date/time taken Initial	Date/time taken Initial	Date/time taken Initial
Urea					
Sodium					
Potassium	*				
TCO ₂					
Creatinine	*				
eGFR					
Bilirubin					
ALT	*				
Alk. Phos					
Hb					
WCC					
Platelets					
INR	*				
Paracetamol	*				
Reviewed by		Initial	Initial	Initial	Initial
Decision		Continue / stop	Continue / stop	Continue / stop	Continue / stop

END OF BAG 2 bloods review:

• **Criteria for DISCONTINUING acetylcysteine after Bag 2 are:**

ALT is less than 50 U/L **AND**

ALT is less than double the admission measurement (even within normal range) **AND**

PARACETAMOL concentration is less than 10 mg/L

• **If criteria are NOT met continue with extended acetylcysteine**

***Patients with isolated INR rise of less than 0.5**

For patients who have an isolated INR rise of less than 0.5, stop acetylcysteine and recheck INR and ALT after 4-6 hours.

• **Criteria for DISCONTINUING acetylcysteine at this point are:**

INR is unchanged or falling **AND**

ALT is less than 50 U/L

• **If criteria not met – restart acetylcysteine at the dose and infusion rate of the last treatment bag.**

If creatinine is abnormal or is 10% greater than at presentation, further acetylcysteine is not required but renal function should be monitored as an inpatient. Re-check 12 hours later.

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- End of bag 2 blood results reviewed by medical staff (of grade FY2 and above) ☐
- Decision to discontinue or continue acetylcysteine documented in the table above and on page 7 ☐

Initial & time

STAGE 3 – END OF TREATMENT WITH ACETYLCYSTEINE

If criteria for discontinuing acetylcysteine at end of Bag 2 are met:

- **Discontinue** acetylcysteine. Time infusion discontinued..... ☐

Initial

Decision

- If further treatment or blood sampling is not required go to Stage 4 'Subsequent Management & Discharge'(page 8) ☐
- If monitoring of renal function is required obtain blood samples 12 hours later followed by a medical review ☐
- **If extended acetylcysteine is indicated follow advice below** ☐

Initial & time

If criteria for discontinuing acetylcysteine at the end of Bag 2 are NOT met:

- **Continue** extended acetylcysteine treatment at the dose and infusion rate of bag 2 (page 5) ☐
- Obtain blood samples for U&Es, TCO₂, LFTs, FBC & INR at the end of extended bag 1 ☐
- Extended bag 1 bloods due at obtained at ☐

Initial & time

End of Extended bag 1 bloods review:

- **Criteria for DISCONTINUING acetylcysteine after extended bag 1 are:**

INR is 1.3 or less and has not risen by 0.5 or more from admission measurement* **AND**

ALT is less than two times the upper limit of normal (less than 100 U/L) **AND**

ALT is less than double the admission measurement

- **If the criteria for discontinuing are NOT met continue with further extended acetylcysteine**

If creatinine is abnormal or is 10% greater than at presentation, further acetylcysteine is not required but renal function should be monitored as an inpatient. Re-check 12 hours later.

***Patients with isolated INR rise of less than 0.5**

For patients who have an isolated INR rise of less than 0.5, stop acetylcysteine and recheck INR and ALT after 4-6 hours.

- **Criteria for DISCONTINUING acetylcysteine at this point are:**

INR is unchanged or falling **AND**

ALT is less than two times the upper limit of normal (less than 100 U/L)

Otherwise commence 2nd extended bag of acetylcysteine

- End of extended bag 1 blood results reviewed by medical staff (of grade FY2 and above) ☐
- Decision to discontinue or continue acetylcysteine documented in the table on page 6 and in the decision box below ☐

Initial & time

Decision

- If further treatment or blood sampling is not required go to Stage 4 'Subsequent Management & Discharge'(page 8) ☐
- If renal function monitoring is required obtain samples 12 hours later followed by medical review ☐
- **If further extended acetylcysteine is indicated follow advice below** ☐

Initial & time

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If further extended treatment is required:

- Continue acetylcysteine at the dose and infusion rate used in the 2nd treatment bag (Page 5) ☐
- Ward level capillary blood glucose monitoring (BMs) at least four times daily ☐
- Recheck U&Es, LFTs, FBC and INR every 9 hours to assess the course of liver injury (1 hour before the end of each extended bag). Document results on page 6 ☐

Initial
& time

Discontinue further extended treatment when:

- INR 1.3 or less; OR falling towards normal on two consecutive blood tests, and less than 3.
- There is no clinical advantage to treating ALT rises after this normalisation in INR (indicating restoration of hepatic synthetic function)

Extended treatment with acetylcysteine was required

Yes ☐

No ☐

Initial
& time

If YES, number of extended bags required

Once treatment with acetylcysteine is discontinued and further blood tests are not required go to Stage 4
'Subsequent Management & Discharge' (page 8)

STAGE 4 – SUBSEQUENT MANAGEMENT & DISCHARGE

Target

Treatment with acetylcysteine tolerated

N/A ☐ Yes ☐ No ☐

- Patient eating and drinking.

Yes ☐ No ☐

- Seen by Psychiatry team member

N/A ☐ Yes ☐ No ☐

Comment.....

Initial/time

Discharge

- Treatment complete
- Criteria for discharge met

N/A ☐ Yes ☐ No ☐

Yes ☐ No ☐

Comment.....

- Discharge advice given, **including paracetamol patient discharge sheet** (available on TOXBASE®)

☐

- NOK informed

Yes ☐ No ☐

Comment.....

Left department Date..... Time.....

Initial/time

Follow-up

- Has follow-up been arranged?

N/A ☐ Yes ☐ No ☐

Comment.....

Initial/time

Notes

Medical follow-up arrangements are not normally required if blood results are within acceptable range