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Patient Label, or
Name:
DoB:
Hospital number:
CHI:

Multi Disciplinary Care Pathway for

PARACETAMOL OVERDOSE

Ingested over a period of one hour or less - presenting 0-8 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 – 0-8 HOURS** Date: **Hospital: RIE ☐ SJH ☐ WGH ☐** **Clinical area: ED/A&E ☐ AMU ☐ MAU ☐ Obs Ward ☐**	*Patient Label, or* Name: DoB: Hospital number: CHI:

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To be initiated once a PARACETAMOL overdose is suspected

Ingested over a period of one hour or less – presenting less than 8 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 In-patient Record (nursing admission, medical clerking, Toxicology Questionnaire), NEWS observation chart, ED shock chart, Infusion charts and Prescription & Administration Record

SUMMARY	Initials & time

Ingestion date……

Ingestion time……

List all the drug(s) ingested

……

……

……

……

……

Alcohol ingested? Yes ☐ No ☐

Was paracetamol bought for overdose: Yes ☐ No ☐

Total paracetamol ingested …….g

Patient's weight…….kg

CALCULATE
The amount of paracetamol ingested ……..mg/kg

(there is a dosage calculator on TOXBASE® for calculating mg/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.

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

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

There is normally no indication to start acetylcysteine without a plasma paracetamol concentration **provided the result can be obtained and acted upon within 8 hours of ingestion**

If there is going to be undue **delay (beyond 8 hours) in obtaining the paracetamol concentration, treatment should be commenced if more than 150 mg/kg paracetamol has been ingested**

TREATMENT MUST START WITHIN 8 HOURS IF MAXIMUM PROTECTION IS TO BE OBTAINED

STAGE 1 - IMMEDIATE ASSESSMENT

Assessment for risk of liver damage **Paracetamol ingested……mg / kg (see calculation on page 2)**	Initial & time

Less than 1 hour post-ingestion	
• Consider administration of activated charcoal if the patient presents within one hour of ingestion of more than 150 mg/kg paracetamol **Providing this has not been administered pre hospital by the Scottish Ambulance Service** • Charcoal administered (50 g for adults) Yes ☐ No ☐ If no, give reason…….....…	Initial & time

4 - 8 hours post-ingestion	
Clinical priorities are**:** • Blood samples: U&Es, TCO_2, LFTs, FBC, INR & paracetamol concentration ☐	Initial & time
On receipt of blood results assess the risk of liver damage: • By plotting the paracetamol concentration on the graph on page 4 ☐ • Date, time & blood results documented on page 4 ☐	
Decision • Commence acetylcysteine if the plasma paracetamol concentration is on or over the treatment line (Refer to SNAP based dosage table on page 5) ☐ • Consider use of acetylcysteine if the patient has an ALT above the limit of normal even if the paracetamol concentration is below the treatment line ☐	

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 in addition to acetylcysteine if a patient has very high paracetamol concentrations (greater than 700 mg/L) associated with coma and elevated lactate. For advice contact local RIE toxicologist or the National Poisons Information Service Tel 0344 892 0111 out of hours

• Acetylcysteine is not indicated if the plasma paracetamol concentration is under the treatment line, the INR and ALT are normal, the patient is asymptomatic **AND** there is no doubt about the time of ingestion ☐ • If creatinine is abnormal and the above criteria are met acetylcysteine is not required but renal function should be monitored as an inpatient ☐	Initial & time

If treatment with acetylcysteine is not indicated and further blood tests are not required, go to Stage 4 ‘Subsequent Management & Discharge’ [page 8]

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

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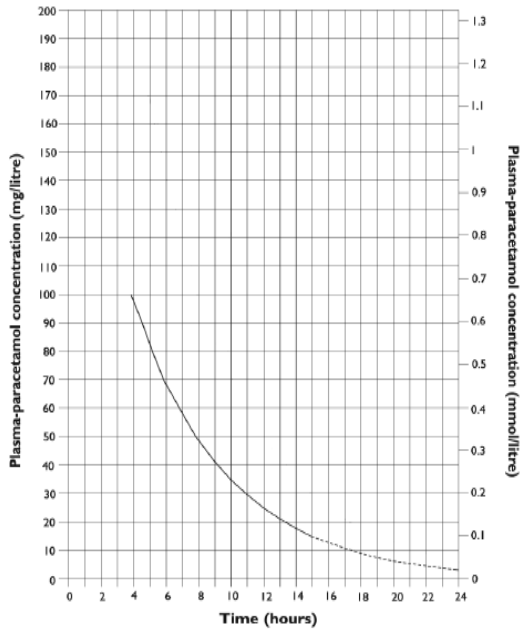
Plot the paracetamol concentration on the graph to assess if patient is at risk of liver damage

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



Graph taken from TOXBASE ®

Blood Results
Date/Time of sample
Urea
Sodium
Potassium
TCO_2
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				**COMPLICATIONS of paracetamol ingestion**			
None	☐	Wheeze	☐	Abnormal liver function	☐	Encephalopathy	☐
Flushing	☐	Hypotension	☐	Acute kidney injury	☐	Haemorrhage	☐
Vomiting	☐	Other	☐	Hypoglycaemia	☐	Other	☐
Rash/Itch	☐	Specify……		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, TCO_2, LFTs, FBC, INR & **PARACETAMOL CONCENTRATION**
- **End of bag 2 blood results -** documented in table below ☐ | Initial & time

Blood results

	Admission Bloods	**End of bag 2 bloods**	**End of extended bag 1 bloods**	**End of extended bag 2 bloods**	**End of extended bag 3 bloods**
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 Decision		Initial Continue / stop	Initial Continue / stop	Initial Continue / stop	Initial 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:	☐	Initial & time
• **Continue** extended acetylcysteine treatment at the dose and infusion rate of bag 2 (page 5) • Obtain blood samples for U&Es, TCO_2, LFTs, FBC & INR at the end of extended bag 1	☐ ☐	

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:		Initial & time
• 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	☐	
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 If YES, number of extended bags required ……	Yes ☐ No ☐	Initial & time
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

		Initial/time
Target Treatment with acetylcysteine tolerated • Patient eating and drinking • Seen by Psychiatry team member Comment……	N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ N/A ☐ Yes ☐ No ☐	
Discharge • Treatment complete • Criteria for discharge met Comment…… • Discharge advice given, **including paracetamol patient discharge sheet** (available on TOXBASE®) • NOK informed Comment…… Left department Date…….. Time……..	N/A ☐ Yes ☐ No ☐ Yes ☐ No ☐ ☐ Yes ☐ No ☐	
Follow-up • Has follow-up been arranged? Comment……	N/A ☐ Yes ☐ No ☐	
Notes	Medical follow-up arrangements are not normally required if blood results are within acceptable range	