ADDRESSOGRAPH, or

Name:
DoB:
Hospital number:
CHI:

PARACETAMOL OVERDOSE

Ingested over a period of one hour or less – presenting more than 24 hours after acute ingestion

Patients < 16 years

NHS Borders

This care pathway includes the Scottish and Newcastle Antiemetic Pretreatment (SNAP) based regimen for acetylcysteine and is **ONLY**for use in the Emergency department or ward 15, Borders General Hospital.

This version is not available on TOXBASE. For advice contact the on-call toxicologist at the RIE (Monday –Friday 9am-5pm) or the National Poisons Information Service (NPIS) out of hours.

There are 5 different care pathway documents for paracetamol overdose in patients <16 years, please ensure the correct document is used.

Review January 2022

Patients < 16 years
PARACETAMOL OVERDOSE – more than 24HOURS

ED presentation date..... Time.....

Ward admission date..... Time.....

Admitting Consultant.....

ADDRESSOGRAPH, or

Name:
DoB:
Hospital number:
CHI:

Expected length of stay: approx 24 hours

To be initiated once a PARACETAMOL overdose is suspected

Ingested over a period of one hour or less – Presenting more than 24 hours after acute ingestion

*KEY TO INITIALS OF **ALL** STAFFCOMPLETING THIS CARE PATHWAY*				
Print name	Designation	Initials	Signature	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

STAFF: **Should be completed in addition to the Clerking notes, PEWS observation chart, infusion charts, prescription & administration record.**

Patients < 16 years **PARACETAMOL OVERDOSE – more than 24 HOURS** Date: Clinical area: ED ☐ Ward ☐	ADDRESSOGRAPH, or Name: DoB: Hospital number: CHI:

SUMMARY	Initials & time

Ingestion date…… Ingestion time…… List all the drug(s) ingested (including prescribed) …… …… …… Alcohol ingested? Yes ☐No☐ Approx units.....	Was paracetamol bought for overdose: Yes ☐ No ☐ Total paracetamol ingested ……..g Patient's weight…….kg **CALCULATE** The amount of paracetamol ingested ……..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. The National Poisons Information Service advises that the **child's actual weight** should be used for calculating both the toxic dose and the acetylcysteine dose, **up to a maximum of 110kg**. **For pregnant patients** the toxic dose in mg/kg should be calculated using the patient's pre-pregnancy weight.

This document represents the care expected for a majority of your patients. It is expected that some patients will need care other than that noted. This is referred to as a 'Variance' and should be noted as 'Var' in the appropriate space & explained fully on the 'Varience' sheet, page .

Clinicians are free to exercise their own professional judgements as appropriate.

However, any alteration to practice noted in this document should be noted as a 'Variance' in notes.

NHS BORDERS

Patients < 16 years
PARACETAMOL OVERDOSE – more than 24HOURS
Date:

Clinical area: ED ☐ Ward ☐

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Ingested over a period of one hour or less–presenting more than 24 hours after acute ingestion

Wait for blood results before starting acetylcysteine unless the patient is clearly jaundiced or has hepatic tenderness. There is no evidence that treating with acetylcysteine before blood tests are available confers benefit or that delaying treatment for a short period while waiting for blood results worsens prognosis in patients who present more than 24 hours after overdose

IMMEDIATE ASSESSMENT AND MANAGEMENT	Initial & time
Assessment of hepatic injury Clinical features of hepatic injury (jaundice or hepatic tenderness) Yes ☐ No ☐ • **If Yes,** **START ACETYLCYSTEINE IMMEDIATELY** DO NOT WAIT FOR BLOOD RESULTS (Refer to SNAP based dosage on initiation/prescription chart) ☐ • **If No.** Wait for blood results to determine if acetylcysteine is required ☐	
Blood sampling • Obtain urgent blood samples for paracetamol concentration, U&Es, LFTs, GGT, FBC, INR ☐	
ON RECEIPT OF BLOOD RESULTS: • Date, time and blood results documented on page ☐	
If treatment has not been initiated START acetylcysteine if: • Paracetamol concentration is detectable (5mg/L or more) **OR** ☐ • INR is greater than1.3 (in the absence of another cause, e.g. warfarin) **OR** ☐ • ALT is above the upper limit of normal (50 U/L) ☐	
Patients with a chronically elevated ALT (e.g. chronic liver disease), may not require acetylcysteine treatment if the ALT and INR have not significantly changed from previously documented values. These cases should be discussed with the National Poisons Information Service (NPIS) Tel 13448920111 Haemodialysis may be indicated alongside acetylcysteine if the patient has a very high paracetamol concentration and an elevated lactate. For advice contact toxicologist or NPIS out of hours	
The patient is considered not to be at risk of liver toxicity if: • Paracetamol concentration is not detectable (less than 5mg/L) **AND** • INR is 1.3 or less **AND** • ALT is within normal range (50 U/L or less) **AND** • The patient is asymptomatic with no clinical features suggesting liver damage • If these criteria are met the acetylcysteine is not required • If these criteria are met and acetylcysteine has been started it can be discontinued	
Assessment of renal function • If acetycysteine is not required and the creatinine is normal the patient can be discharged. Provide the patient with a 'Patient Information Sheet' (available on TOXBASE) ☐ • If acetylcysteine is not required and the creatinine is abnormal the patient should remain in hospital for monitoring of renal function and if require, treated conventionally. ☐	
If treatment with acetylcysteine is not indicated and further blood tests are not required, go to 'Subsequent Management & Discharge' (pg 9)	

Patients < 16 years
PARACETAMOL OVERDOSE – more than 24HOURS
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Please tick boxes as appropriate and initial/ time in conjunction with inpatient record

Assessment blood results Date/Time of sample	**Repeat blood results (if required)** Date/Time of sample
Urea	Urea
Sodium	Sodium
Potassium	Potassium
Creatinine	Creatinine
Bilirubin	Bilirubin
ALT	ALT
AlkPhos	AlkPhos
GGT	GGT
Albumin	Albumin
Hb	Hb
MCV	MCV
WCC	WCC
Platelets	Platelets
INR	INR
Plasma paracetamol concentration……. At……hours post ingestion	**Plasma paracetamol concentration……. At……hours post ingestion**
Glucose	Glucose
pH	pH
Lactate	Lactate
HCO3	HCO3
BE	BE
Other	Other
Initials date/time	Initials date/time

NHS BORDERS

Patients < 16 years
PARACETAMOL OVERDOSE –more than 24HOURS
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REACTION to acetylcysteine				**COMPLICATIONS of paracetamol ingestion**			
None	☐	Wheeze	☐	Abnormal liver function	☐	Encephalopathy	☐
Flushing	☐	Hypotension Other	☐	Acute kidney injury	☐	Haemorrhage	☐
Vomiting	☐	Specify……	☐	Hypoglycaemia	☐	Other	☐
Rash	☐			Acidosis	☐	Specify……	
Date and time of reaction		Initial		Date and time of reaction		Initial	

MANAGEMENT OF SIDE EFFECTS:

- N-acetylcysteine may cause anaphylactoid reations in 2% of cases with this protocol. Flushing, pruritus, rash, hypotension, angioedema, brochospasm and vomiting are most common
- Reactions can be managed by stopping the infusion. Consider chlorphenamine for flushing/itch, nebulised salbutamol if there is brochospasm and ondansetron if there are GI effects.
- **Restart the infusion once the reaction has resolved at half the rate to completion of infusion**
- Previous reaction is NOT a contra-indication to N-acetylcysteine and cases should receive treatment if indicated. Reactions are now considerably less common with this protocol compared to standardregimes

Ondansetron oral or IV slow injection (nausea and vomiting) – Age 6 months -16 years	
Body weight	**Dose**
Up to 10kg	2mg three times a day
10 -40kg	4mg three times a day
41kg and above	8mg three times a day
Chlorphenamine oral (rash and itch)	
Age	**Dose**
1-23 months	1mg twice per day
2-5 years	1mg 4-6 hourly maximum 6mg per day
6-11 years	2mg 4-6 hourly maximum 12mg per day
12-16 years	4mg 4-6 hourly maximum 24mg per day
Chlorphenamine IV injection (rash or itch)	
Age	**Dose**
1-5 months	250 micrograms/kg, maximum 4 times daily
6 months-5years	2.5mg, maximum four times daily
6-11 years	5mg, maximum four times daily
12-16 years	10mg, maximum four times daily

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REVIEW OF TREATMENT WITH ACETYLCYSTEINE	
• **10 hour bloods**: normally **2 hours before the end of 2nd infusion** U&Es, LFTs, FBC, INR &**PARACETAMOL CONCENTRATION** ☐	Initial/time
• **10 hour bloods**: obtain usually **2 hours before the end of 2nd infusion** ☐ • Blood results documented in table below ☐ • **Results reviewed by Advanced Nurse Practitioner/senior medical staff** ☐	
10 hour blood review • **Criteria for DISCONTINUING acetylcysteine after 2nd infusion are:** INR 1.3 or less **AND** ☐ ALT less than 100 U/L **AND** ☐ ALT not more than double the admission measurement **AND** ☐ PARACETAMOL concentration less than 20mg/L ☐	
• **Decision to continue or discontinue acetylcysteine on page 8** ☐	
• **ALL PATIENT SHOULD REMAIN IN HOSPITAL FOR 20 HOUR BLOOD SAMPLING see page 8**	

Blood results

	Pre Treatment	**10 hour bloods**	**20 hour bloods**	**End of extended treatment bloods**	**End of extended treatment bloods**
Notes	* Copy from page 6	Blood samples 2 hours before the end of infusion 2	Blood samples 8 hours after the end of infusion 2	Blood samples 2 hours before the end of extended infusion	Blood samples 2 hours before the end of extended infusion
		Date/time taken Initial	Date/time taken Initial	Date/time taken Initial	Date/time taken Initial
Urea					
Sodium					
Potassium	*				
pH/HCO3/BE					
Creatinine	*				
eGFR					
Bilirubin					
ALT	*				
Alk. Phos					
Hb					
WCC					
Platelets					
INR	*				
Paracetamol	*				
Reviewed by Decision		Initial Continue / stop	Initial Restart / continue / stop	Initial Continue / stop	Initial Continue / stop

NHS BORDERS

Patients < 16 years **PARACETAMOL OVERDOSE –more than 24 HOURS** Date: Clinical area: ED ☐ Ward ☐	ADDRESSOGRAPH, or Name: DoB: Hospital number: CHI:

END OF TREATMENT WITH ACETYLCYSTEINE	
If criteria for discontinuing acetylcysteine at the end of the second infusion are met • Discontinue acetylcysteine once infusion 2 is **complete** ☐ • Acetylcysteine discontinued at……. ☐	
If Creatinine is abnormal lor is 10% greater than presentation and the criteria for discontinuing acetylcysteine are met, further acetylcysteine is not required but renal function should be monitored as an inpatient. Recheck 12 hours later	
once the criteria for discontinuing acetylcysteine are met, 2nd infusion is complete and further blood sampling is not required go to Stage 4 'Subsequent Management & Discharge' (page 9)	
If criteria for discontinuing acetylcysteine at the end of infusion 2 are NOT met: • **Continue** acetylcysteine treatment at the dose and infusion rate of infusion 2 ☐ • Obtain discharge bloods (U&Es, LFTs, FBC &INR) 2 hours befopre the end of the extra bag of acetylcysteine (20 hour bloods) ☐ • Discharge (20 hour) bloods due at…….Discharge (20 hour) bloods obtained at……☐ • Discharge (20 hour) bloods documented in table on page 7 ☐ • **Results reviewed by Advanced Nurse Practitioner/senior medical staff** ☐	Initial & time
Discharge 20 hour bloods review • **Extended or restarted acetylcysteine is indicated if:** INR is greater than 1.3 OR ALT has more than doubled from admission bloods ALT is 100 U/L or more **This applies to both patients who stopped treatment after 2nd infusion AND patients who continued treatment after 2nd infusion** • If criteria for extended acetylcysteine are not met, no further acetylcysteine is not required • If creatinine is abnormal or is 10% greater than at presentation, further acetylcysteineis not required but renal function should be monitored as an inpatient. Recheck in 12 hours later.	
Decision • If further treatment or blood sampling is not required go to 'Subsequent Management & Discharge' (page 9) ☐ • If monitoring of renal function is required, obtain blood samples 12 hours later and review by medical team ☐ • **If extended or restarted acetylcysteine is indicated follow advice below** ☐	Initial & time
Extended treatment is required if: • INR is greater than 1.3 OR the ALT has increased further on review of discharge (20hour) bloods ☐ • Continue acetylcysteine at the dose and infusion rate used in the 2nd treatment bag ☐ • Recheck U&Es, LFTs, FBC, VBG/CBG with lactate and INR every 10 hours to assess the course of liver injury (2 hours before the end of each extended bag). ☐	
Discontinue 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 or restarted treatment with acetylcysteine was required Yes ☐No ☐ If YES, number of extended bags required……	
Once treatment with acetylcysteine is discontinued go to 'Subsequent Management & Discharge' (page 9)	

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STAGE 4 – SUBSEQUENT MANAGEMENT & DISCHARGE

	Initial/time
Criteria for discharge Treatment with acetylcysteine tolerated N/A ☐ Yes ☐ No ☐ • Patient eating and drinking. Yes ☐No ☐ • Seen by CAMHS/Psychiatry team member N/A ☐ Yes ☐ No☐ Comment……..	
• Treatment complete N/A ☐ Yes ☐ No☐ • Discharge advice given, **including paracetamol patient discharge sheet** (available on TOXBASE®) ☐ 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

VARIANCES: <u>all</u> staff to identify & record variances. Types of Variance - break down into types:
A - Patient/Relative, B - Clinician, C - Hospital System, D - Community/External.

Record of Variance

Date	Time	Description of issue	Reason	Action	Initials	Var. code
EXAMPLE *28.09.15*	*00.15*	*Flushing*	*Reaction to acetylcysteine*	*Infusion stopped for 30 minutes. Chlorphenamine administered*	*BS*	*A*