ADDRESSOGRAPH, or

Name:
DoB:
Hospital number:
CHI:

INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL

(ingestions of excessive paracetamol with intent to treat pain or fever and without self – harm intent)

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 date January 2022

Patients < 16 years

INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL

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 an INGESTION OF

THERAPEUTIC EXCESS OF PARACETAMOL is suspected

(ingestions of excessive paracetamol with intent to treat pain or fever, without self- harm intent)

*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

INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL

Date:

Clinical area: ED ☐ Ward ☐

ADDRESSOGRAPH, or

Name:
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SUMMARY	Initials & time
Reason for the ingestion of a therapeutic excess of paracetamol……	
Were the patients/carers aware of the correct therapeutic dose of paracetamol? Yes ☐ No ☐	
If yes, why was an excess ingested?.....	
Therapeutic excess ingested from Date……Time……	
Last dose ingested Date……Time……	
List all drugs ingested (including brand names ie Lemsip) and the quantity of each…….....	
…….	
…….	
Total paracetamol ingested……g over……hours/days	
CALCULATE:	
Total paracetamol ingested (in any 24- hour period)	
……mg Patient's weight……kg Amount ingested……mg/kg	
Comments……	
……	

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 11.

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
INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL
Date:

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Please tick boxes as appropriate and initial/time

Therapeutic excess (ingestions of a greater than the licensed daily dose AND more than equal to 75mg/kg/24 hours for the treatment pain or fever without self – harm intent
In dental patients tooth extraction should not be carried out prior to investigations and treatment (if necessary) due to the increased risk of bleeding.

IMMEDIATE ASSESSMENT AND MANAGEMENT

Assessment of hepatic injury
Clinical features of hepatic injury(jaundice or hepatic tenderness)? Yes ☐ No ☐
If Yes,

- **START ACETYLCYSTEINE IMMEDIATELY** (Refer to SNAP based dosage table on infusion chart) ☐
- Obtain blood samples for paracetamol level, U&Es, LFTs, GGT,INR,FBC ☐

If No,

- ASSESS FOR RISK OF LIVER DAMAGE

Paracetamol ingested in any 24 hour period……..mg/kg (see calculation on page 3)

If maximum dose is more than 75mg/kg in any 24 – hour period

- Obtain blood samples for paracetamol level, U&Es, VBG, lactate, LFTs,GGT,INR,FBC, **at least 4 hours** after the last ingestion

If maximum dose is more than licensed 24-hour dose for the patient (see BNF) but less than 75mg/kg/24 hours over the proceeding 2days or more

Risk of toxicity is extremely small but consider blood tests fro paracetamol concentration, U&Es, VBG/CBG with lactate, LFTs, GGT, INR, FBC at least 4 hours after the last ingestion especially if:

- **There is doubt about the doses ingested, OR**
- **Other factors are present that may increase the risk of hepatoxixity, such as:**
  - Long term treatment with carbamazepine, phenobarbital, phenytoin, rifapacin, St John's Wort or other drugs that induce liver enzymes
  - Regular consumption of alcohol in excess of recommended amounts
  - Likely glutathione depletion e.g. eating disorders, cystic fibrosis ,HIV, starvation, cachexia

If maximum dose is consistently less than the licensed 24-hour dose for the patient(see BNF) AND consistently less than 75mg/kg over the preceding 24-hour period

- **Blood tests are not needed,** and the patient can be discharged
  (also see 'Subsequent Management & Discharge Advice' at end of this document)

Initial & time

On receipt of blood results assess risk of hepatotoxicity (document on page 5)

- Clinically significant hepatotoxicity isunlikely if **at least 4 hours or more** after the last paracetamol ingestion:
  - the paracetamol concentration is less than 10mg/l, **AND**
  - the ALT is within normal range (50UL), **AND**
  - the INR is 1.3 or less, **AND**
  - the patient has no symptoms suggesting liver damage
- Acetylcysteine can be discontinued if **ALL** the above criteria are met ☐
- If these criteria are met and acetylcysteine has been started it can be discontinued ☐
- **If these criteria are not met start acetylcysteine**(refer to SNAP dosage on infusion chart

Assessment of renal function

- If acetylcysteine is not required and the creatinine normal and 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 required, treated conventionally

The underlying clinical reason for chronic excess dosage should always be considered

Advanced Nurse Practitioner/ senior medical staff must review blood results prior to discontinuing therapy
Results reviewed by……Date……Time…….
Acetylcysteine discontinued Yes ☐ No ☐
If acetylcysteine is not indicated or discontinued and further blood sampling is required, page 9

Patients < 16 years
INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL

Date:

Clinical area: ED ☐ Ward ☐

ADDRESSOGRAPH, or

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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

Patients < 16 years
INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL
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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 anaphylactoidreations 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

Patients < 16 years
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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

Patients < 16 years
INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL
Date:

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If criteria for discontinuing acetylcysteine at end of 2nd infusion are met: Initial/time

- **Discontinue** acetylcysteine once 2nd infusion is **complete** ☐
- Acetylcysteine discontinued at ……..
- **The patient should remain in hospital for discharge bloods (20 hour bloods)**
  U&Es, LFTs, FBC, INR, - 8 hours after the acetylcysteine was discontinued
- 20 hour bloods due at ….…… 20 hour bloods obtained at …… ☐

If criteria for discontinuing acetylcysteine at end of 2nd infusion are NOT met:

- **Continue** acetylcysteine treatment at the dose and infusion rate of infusion 2
- Obtain 20 hour bloods, 2 hours before the end of the extra bag of acetylcysteine ☐
- U&Es, LFTs, FBC & INR ☐
- 20 hour bloods due at .....20 hour bloods obtained at..... ☐

FOR ALL PATIENTS:

- 20 hour bloods documented in table on page 10 ☐
- **Results reviewed by Advanced Paediatric practitioner/senior medical staff** ☐

20 hour bloods review

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

Decision Initial/time

- 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** ☐

If extended or restarted treatment is required:

date/time

- Continue acetylcysteine at the dose and infusion rate used in the 2nd infusion until parameters below are met. ☐
- Recheck U&Es, LFTs, FBC and INR **every 10 hours** to assess the course of liver injury (2 hours before the end of each extended bag). ☐
- Document results on page 7. ☐

Discontinue extended or restarted 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 ☐ date/time
If YES, number of extended bags required ……..…

Once treatment with acetylcysteine is discontinued go to 'Subsequent Management & Discharge' (page 9)

NHS BORDERS

Patients < 16 years **INGESTION OF A THERAPEUTIC EXCESS OF PARACETAMOL** Date: Clinical area: ED ☐ Ward ☐	ADDRESSOGRAPH, or Name: DoB: Hospital number: CHI:

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*