RHCG PARACETAMOL OVERDOSE GUIDANCE FOR ≥ 30KG AND ≥6 YEARS OF AGE ONLY.

Staggered paracetamol overdose

(Ingested total overdose in >1 hour time period in the context of self harm)

START acetylcysteine (NAC) in all patients

Take baseline bloods at least 4hrs since last ingestion (U&Es, HCO3, LFTs, FBC, INR, glucose, paracetamol level)

Assess for hepatotoxicity (ANY*)

1. Paracetamol level >10mg/L or
2. ALT >50 or
3. INR >1.3

If features of hepatotoxicity then continue NAC

If no features of hepatotoxicity then NAC not required

Psychiatry liaison referral, see UCAMHS referral flowchart for details. Referral to be sent by admitting team including estimated time to completion of infusion.

Take bloods 2hrs before the end of infusion 2: U&Es, HCO3, LFTs, FBC, INR, glucose and paracetamol level

Capillary blood gas (CBG) sampling every 6 hours whilst on NAC

Discontinue NAC after infusion 2 if: INR ≤1.3 **AND** ALT within normal value **AND** ALT <2x admission value **AND** paracetamol level <10

If criteria for discontinuing not met then proceed to infusion 3***

CAMHS REVIEW

Discontinue NAC after infusion 3 if: INR ≤1.3 (or has not increased from previous measurement) **AND** ALT within normal value **AND** ALT <2x admission value **AND** paracetamol level <10

If criteria for discontinuing not met then proceed to infusion 4***(and repeat if needed) until: INR ≤1.3, or INR falling on two consecutive bloods AND INR <3.0

*Clinical judgement required

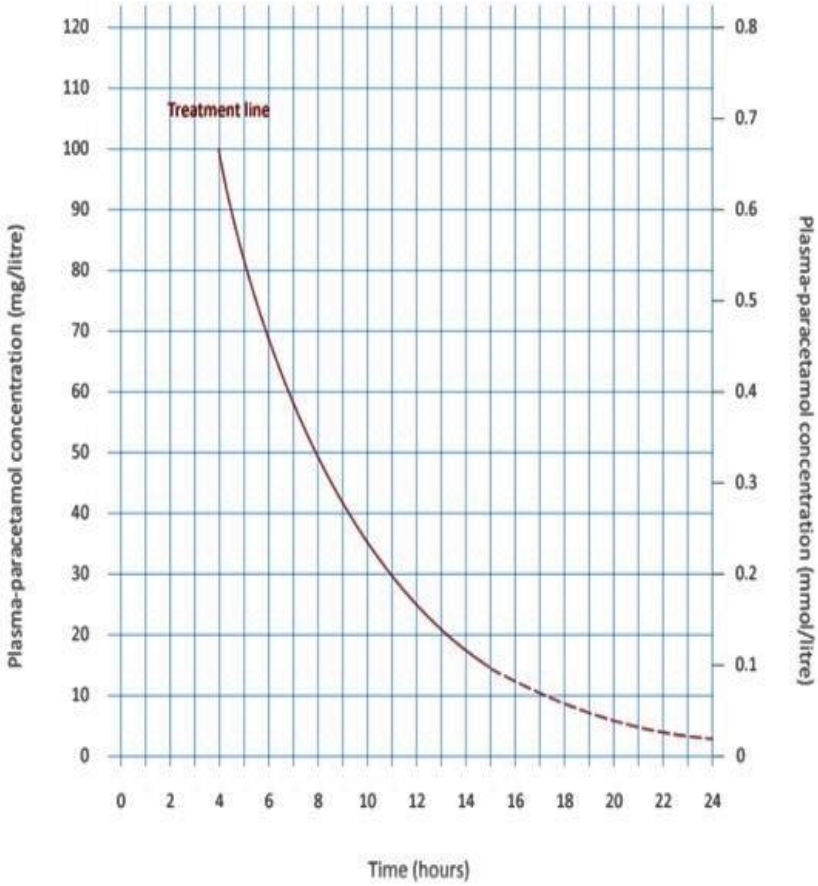
- Some patients have a chronically raised ALT/INR.
- Review old LFTs/INRs and if chronic derangement discuss with a senior clinician before proceeding to NAC.

Blood monitoring

- Checking a paracetamol level 2hrs before the end of bag 2 is NEW for this protocol.
- U&E, HCO3, glu, LFTs, FBC and INR should be done 2hrs before the end of each infusion 2. Ensure results are READY for the end of the infusion.
- If unable to achieve blood sampling at the correct time and a delay of >90 minutes is predicted then proceed to the next infusion to avoid prolonged omission of NAC. Bloods should be checked at the earliest opportunity and discontinuation criteria referred to.
- Capillary Blood Glucose (CBG) 6 hourly while on NAC.
- If rapid or progressive biochemical deterioration then discuss with senior and consider referral to regional transplant centre.
- IV NAC can be associated with minor rise in INR without an acute liver injury. (see guideline for details)

*** Bloods should be done 2 hours before the end of infusion 3 and 4.

Paracetamol treatment nomogram and 12-hr shortened N-acetylcysteine dosing schedule (SNAP protocol)



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If unclear which of the five paracetamol overdose protocols to follow, discuss with ED / paeds Reg / Cons.

In situations where paracetamol levels will be used to determine need for acetylcysteine (refer to appropriate protocol), plot the measured plasma concentration (in mg/L) against the time since ingestion. If plasma level falls above the line then give acetylcysteine as detailed below.

The nomogram is less accurate between 15-24 hours and accurate ingestion time is even more vital.

Actual weight should be used for calculating both the toxic dose and the acetylcysteine dose - up to a **maximum of 110 kg**

Reactions to acetylcysteine include flushing, nausea & vomiting.
Please use 'Acetylcysteine Antidote Adverse Effects – Features & Management' guidance to document any adverse events and guide further management.

Hypersensitivity and anaphylactoid reactions with acetylcysteine are not contraindications as the benefit of treatment still outweighs the risk of not treating.

True anaphylaxis is rare with acetylcysteine but can be managed by stopping the infusion and then restarting at a slower rate.

Table 1. 12-hr shortened N-acetylcysteine dosing schedule (SNAP protocol).

Regimen	First infusion		Second (& extended) infusion	
Infusion fluid	200mL sodium chloride 0.9% or 5% glucose		1000mL sodium chloride 0.9% or 5% glucose	
Preparation	Use 250mL infusion bag and remove 50mL and add required volume of acetylcysteine		Add required volume of acetylcysteine to 1000mL infusion bag	
Duration of infusion	2 hours		10 hours	
Drug dose	100mg/kg acetylcysteine		200mg/kg acetylcysteine	
Weight (kg)	Ampoule volume (mL)	Infusion rate (mL/h)	Ampoule volume (mL)	Infusion rate (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

Each ampoule = 200mg/mL acetylcysteine. Dose calculation based on weight in middle of band. Ampoule rounded up to nearest whole number.

Acetylcysteine Prescribing and Administration Chart for 12-hr shortened N-acetylcysteine dosing schedule (SNAP protocol) – **RHC Glasgow**

Name: _____

Address: _____

DoB: _____

CHI: _____

Affix patient data label

Infusion 1 & 2 only

Please ensure that acetylcysteine is also prescribed on the patient's HEPMA Kardex.

Weight:……kgs

(DO NOT USE If <30kg or patient <6 years of age)

Infusion 1	**Acetylcysteine 100mg/kg over 2 hours**									
Prescription						Preparation	Administration checks			
Date	Time	Dose (mL)	Diluent (200mL)	Infusion rate (mL/hr)	Prescriber's signature	Prepared/ Checked by	Date Time	Volume remaining (mL)	Volume infused (mL)	Checked by
Comments:			Stopped by:							
			Date:	Time	Signature					

Infusion 2	**Acetylcysteine 200mg/kg over 10 hours**									
Prescription						Preparation	Administration checks			
Date	Time	Dose (mL)	Diluent (1000mL)	Infusion rate (mL/hr)	Prescriber's signature	Prepared/ Checked by	Date Time	Volume remaining (mL)	Volume infused (mL)	Checked by
Comments:			Stopped by:							
			Date:	Time	Signature					

Extended treatment

If extended treatment with acetylcysteine is required (see clinical guideline), continue at the dose and infusion rate used for the second infusion and prescribe.

Recheck U&Es, bicarbonate, LFTs, FBC and INR 2 hours before the end of infusions 3 and 4 to assess the need to continue.

Refer to appropriate protocol regarding discontinuation of extended treatment

Acetylcysteine Antidote Adverse Effects – Features & Management

REACTION to acetylcysteine				COMPLICATIONS of paracetamol ingestion			
None	☐	Wheeze	☐	Abnormal liver function	☐	Encephalopathy	☐
Flushing	☐	Hypotension	☐	Acute kidney injury	☐	Haemorrhage	☐
Vomiting	☐	Other:	☐	Hypoglycaemia	☐	Other:	☐
Rash	☐	Specify.....		Acidosis	☐	Specify.....	
Date and time of reaction		Initial		Date and time of reaction		Initial	

MANAGEMENT OF SIDE EFFECTS

- N-acetylcysteine may cause anaphylactoid reactions in 2% of cases with this protocol. Flushing, pruritus, rash, hypotension, angioedema, bronchospasm and vomiting are most common.
- Reactions can be managed by stopping the infusion. Consider chlorphenamine for flushing/itch, nebulised salbutamol if there is bronchospasm and ondansetron if there are GI side 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 the 12-hour SNAP protocol compared to standard regimes.

Ondansetron oral or IV slow (over 2mins) injection (Nausea and vomiting) - Age 6 months-16 years

Body weight	Dose
Up to 10kg	2mg three times daily
10 - 40kg	4mg three times daily
41kg and above	8mg three times daily

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 and itch)

Age	Dose
1-5 months	250 micrograms/kg (maximum four times daily)
6 months - 5 years	2.5mg (maximum four times daily)
6 - 11 years	5mg (maximum four times daily)
12 - 16 years	10mg (maximum four times daily)