Question 12
Paracetamol supra-therapeutic ingestion

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Question Background

- Paracetamol toxicity was under 'expert knowledge' in the old curriculum
- New curriculum framework under investigations – paracetamol levels as 4 – 'proficient'
- Answers generally from Murray's Toxicology and the guidelines for the management of paracetamol poisoning in Australia and New Zealand (Med J Aust 2015; 203 (5): 215-218)

Question 12

- A 26 year old male has presented to your emergency department complaining of right upper quadrant pain and vomiting. He has recently been suffering with a sore throat and coryzal symptoms and admits to taking regular paracetamol tablets in addition to frequently taking a paracetamol containing cold and flu drink preparation for the past four days.

Question 12 part a

- a) List 3 risk factors for hepatic injury from supra-therapeutic paracetamol ingestion (3 marks)

Question 12 Part a (from LITFL)

Underlying hepatic impairment	Microsomal enzyme induction	Acute glutathione depletion states
viral hepatitis	phenobarbitone	acute illness with decreased nutrient intake
alcoholic liver disease	carbamazepine	anorexia/bulimia/ malnutrition
	phenytoin	chronic alcoholism
	rifampicin	HIV
	OCP	
	chronic alcohol ingestion	
	starvation	

Feedback

- Read whole question first to avoid duplication i.e this part was not about doses
- Being elderly not a risk factor in isolation
- Acute alcohol coingestion is protective and chronic alcohol is the risk factor (1)
- Only first answer on the line was marked

(1) Waring, W., Stephen, A., Malkowska, A. and Robinson, O. (2008). Acute Ethanol Coingestion Confers a Lower Risk of Hepatotoxicity after Deliberate Acetaminophen Overdose. Academic Emergency Medicine, 15(1), pp.54-58.

Question 12 Part b

- What is the paracetamol dose that may be associated with hepatic injury in the following situations? (3 marks)

Adult with risk factors	More than 4g/day or 100mg/kg/day (whichever is less)
Adult with no risk factors and supra-therapeutic ingestion over <24 hour period	At least 10g or 200mg/kg (whichever is less)
Adult with no risk factors and supra-therapeutic ingestion over >24 hours	At least 6g or 150mg/kg per 24 hour period

Question 12 part b feedback

- Would accept either dose/kg or total adult dose in g.
- Sorry if it wasn't clear I was still talking about supratherapeutic ingestion as some people answered as acute ingestion.

Question 12 Part c

- He is judged to be at risk and requires biochemical risk assessment
- State the relevant test results that require either no treatment or further treatment (2 marks)

No treatment required	ALT normal and serum paracetamol <120micromol (<20mg/dl) Either <132micromol/l or <120micromol/l or <20mg/dl accepted as depends on source.
N-acetylcysteine required	ALT >40mmol/l or paracetamol >20mg/dl or >120micromol Or “any other result” accepted

Question 12 part c feedback

- Nomogram does not apply to supratherapeutic ingestion
- Based on single untimed paracetamol concentration and ALT/AST
- Unfortunately question printed slightly differently and was meant to read 'relevant tests' rather than just one test
- No-one put units for the AST/ALT test (mmol/l) - would suggest that people do this

Question 12 Part d

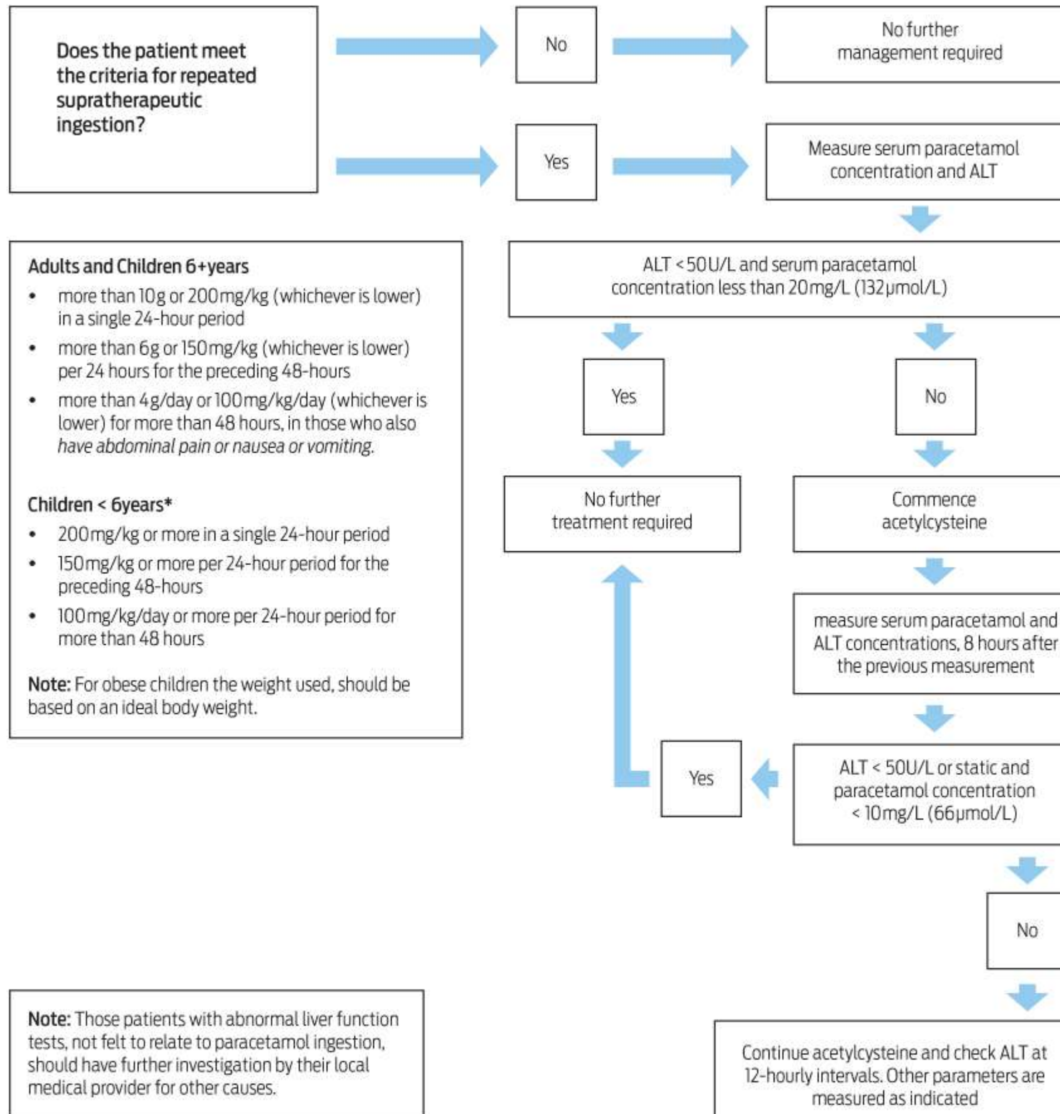
- He is assessed to require an N-acetylcysteine infusion.

- List 5 points that you will counsel the patient on regarding the N-acetylcysteine infusion and ongoing management of the supra-therapeutic ingestion (5 marks)

Question 12 part d

- Example answers
  - Length of infusion (8 hours minimum)
  - Need for repeat bloods at end
  - Side effects – Nausea/vomiting/anaphylactoid reactions
  - Possible need for longer course
  - Risk of liver failure if untreated

Question 12 part d feedback



- National guidelines state to check blds after 8 hours and can cease NAC if ALT static/falling and paracetamol undetectable
- May be a lot of variation in local practice as no-one put this
- Risk of anaphylactoid reaction approx 8-10%
- Use of SSU may vary with local practice
- Don't need to keep people in hospital until the ALT normalises - only until static/falling

Question 12 part e

- List 2 measures that could be undertaken in an emergency department to educate patients regarding safe paracetamol usage (2 marks)

- Was happy to accept any sensible answer

Question 12 part e feedback

- Was hard to mark sensible answers incorrect
- Good that nearly everyone put an answer as these were easy marks.

Pass Mark

- Pass mark was 10/15
- Pass rate was 42%

- If pass mark were set to 9/15 pass rate would be 63%