**Guideline: Management of paracetamol overdose**

**What constitutes a likely paracetamol overdose?**

Patients who present with a suspected paracetamol overdose can present in one of two ways:

1. Single acute overdose: patients who have ingested 75mg/kg over a period of 1 hour or less
2. Staggered overdose: ingestion of multiple doses over a period of >1 hour

Unless part of a suicide attempt, patients may not readily admit to having taken a paracetamol overdose (OD). Have a high degree of suspicion, particularly if ALT >1000 and perform a paracetamol level.

It is prudent to find out the exact time of the overdose and the weight of the patient (to calculate the toxic dose). The subsequent management is based on the timing of the overdose. The mainstay of treatment is N-acetylcysteine (NAC) and IV fluids.

**Assessment of suspected paracetamol overdose**

**Suspected paracetamol OD**

Determine time of OD

If any doubt of timing/unknowing timing/abnormal VBG and toxic dose taken >75mg/kg, start NAC straight-away

If time of OD known and less than 4 hours, move to box 2

Clinical assessment including signs of liver failure (particularly encephalopathy)

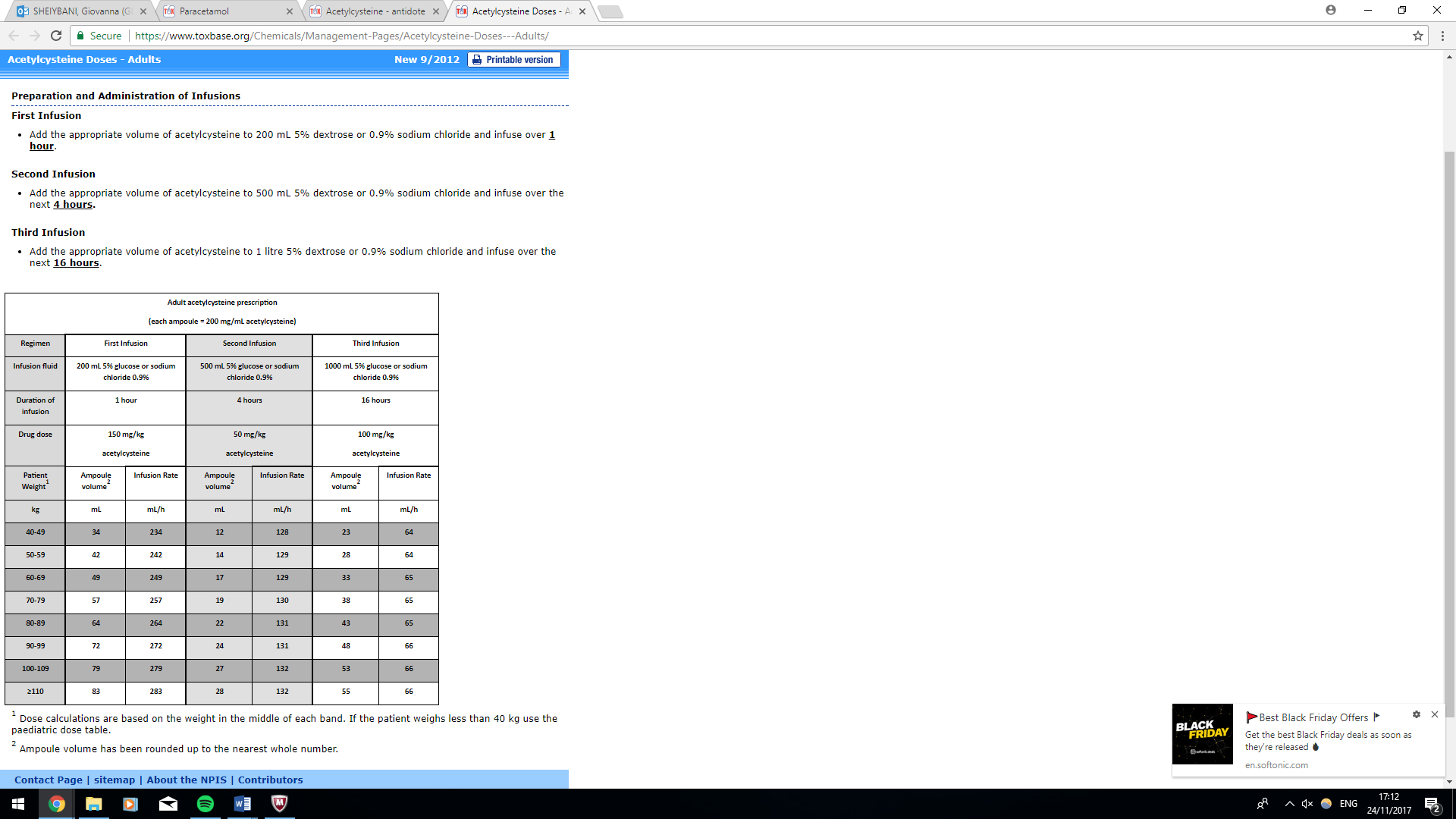
**Baseline bloods:**

FBC, U + Es, LFTs, calcium, phosphate, glucose, clotting including INR, VBG, paracetamol levels at 4 hours

Give IV fluids whilst waiting for paracetamol level, particularly if lactate is >2

**NAC dosing**

The following dosing has been taken from Toxbase® for ease of access.



**Assessment at completion of NAC treatment**

1. Repeat all bloods including clotting, VBG and liver function tests
2. If all normal, patient is now medically fit and can be referred for psychiatry review as required
3. If ALT abnormal but improving, lactate and PH normal and INR <2.0, no need to give more NAC. Patient could come back to AEC for repeat LFTs to facilitate discharge.
4. If ALT abnormal and markers of liver dysfunction abnormal (including a rising INR), give more NAC and discuss with Birmingham liver unit

**Management if initial bloods/assessment abnormal**

**Bloods/assessment abnormal**

PH < 7.3, lactate >2.5, encephalopathy, Cr >250 µmol/l, PT >50s, INR >3 on day 1

Ensure on NAC

Full acute liver disease screen (AST, GGT, autoimmune profile, caeruloplasmin, ferritin/transferrin Sats, TTG,viral hepatitis screen)

Discuss with Birmingham liver unit (07718863923 or 01213716148)

Full set of bloods + VBG at least 12 hourly

**What do these investigations tell us?**

* Glucose:
  + - Low glucose may indicate liver failure
* Phosphate:
  + Rising levels indicate severe liver cell necrosis
* PT and INR:
  + INR more useful than PT
* Must indicate on the blood form that INR needed in context of paracetamol overdose (rather than just the PT) as INR is a prognostic indicator
* Plasma paracetamol levels taken at >4 hours post-ingestion
* VBG:
  + PH
  + Lactate 🡪 if initially >2 with no other markers to indicate liver failure (i.e. PH is normal), for fluid resuscitation and repeat VBG

**Further assessment to decide if discussion with Birmingham liver unit required**

* The following table is a guideline of when discussion with the Birmingham liver unit should take place. If in doubt, contact the Gastroenterology SpR on-call or the Birmingham liver unit (07718863923 or 01213716148).

|  |  |  |
| --- | --- | --- |
| **Day 1** | **Day 3** | **Day 4** |
| Arterial PH <7.3 | Arterial PH <7.3 |  |
| Lacate >2.5 | Lactate >2.5 |  |
| Encephalopathy | Encephalopathy | Encephalopathy |
| Creatinine >250 µmol/l | Creatinine >250 µmol/l | Creatinine >350 µmol/l |
| PT >50s, INR >3 | PT >60s, INR >4.5 | Rising PT – any value |

* Other aspects to help guide decision to discuss with Birmingham:
  + A guide for worrying INR:
    - >2.0 at 24 hours
    - >4.0 at 48 hours
    - >6.0 at 72 hours
  + INR continuing to rise on day 3 and 4
  + Significant hypoglycaemia
  + Hypotension despite fluid resuscitation
  + It is worth noting that grade 1 encephalopathy can be difficult to detect. A hepatic flap with confusion indicates a grade 2 encephalopathy and this should prompt discussion. This is due to the fact that a grade 2 encephalopathy, although not a direct indication to transplant, they do not require anaesthetic support to be transferred should this decision be made.
* **It is better to discuss these patients when markers are worsening, even if they have not reached the criteria for liver transplant. Discuss with the Birmingham liver unit or the gastroenterology team.**