

**Paracetamol
Naloxone
Opkast
Kul**

- HVAD VED VI ?

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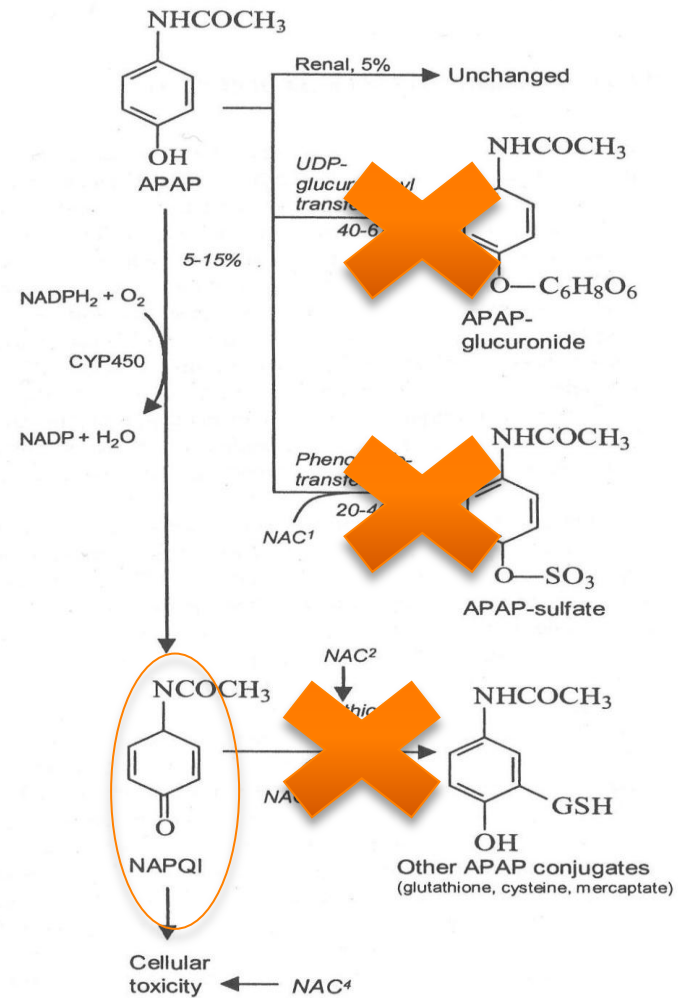
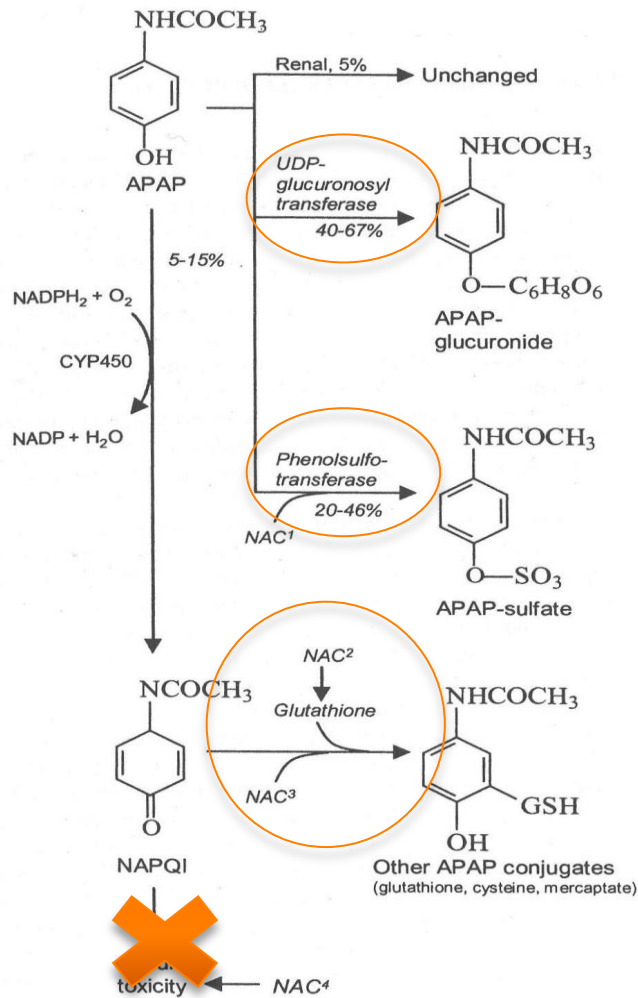
.....nothing to disclaim

- **Paracetamol**
NAC treatment is not indicated when **s-paracetamol** is **zero**
- **Naloxone**
After reversal of an opioid overdose the patient **MUST** always be **admitted** for observation for at least 4-6 hours
- **Activated charcoal**
Is **only effective** if administered within **1 hour** of drug ingestion
- **Induced emesis (vomiting)**
Syrup of ipecac is an effective way of **gastric decontamination**

...what we know.....myths?



Paracetamol – initial assesment



Paracetamol poisoning

Toxic hepatitis

- Symptoms develop with a **latency** of 1-3 days
- Day 1 – nausea and vomiting may occur, but otherwise the patient is unaffected and normal has biochemistry
- Day 2 – **increases in transaminase levels**, INR and s-creatinin
- Day 3 - progressing liver and renal failure
- **ANTIDOTE** – N-Acetylcystein (NAC) - stimulates glutathion production

Paracetamol poisoning

- S-paracetamol = 0
- Transaminase = normal
- Parentdrug – not metabolites
- NAPQI – $T_{1/2}$ - unpredictable in overdose
- Substantial amounts of toxic metabolites
- Before hepatic damage is measurable



S-paracetamol = 0

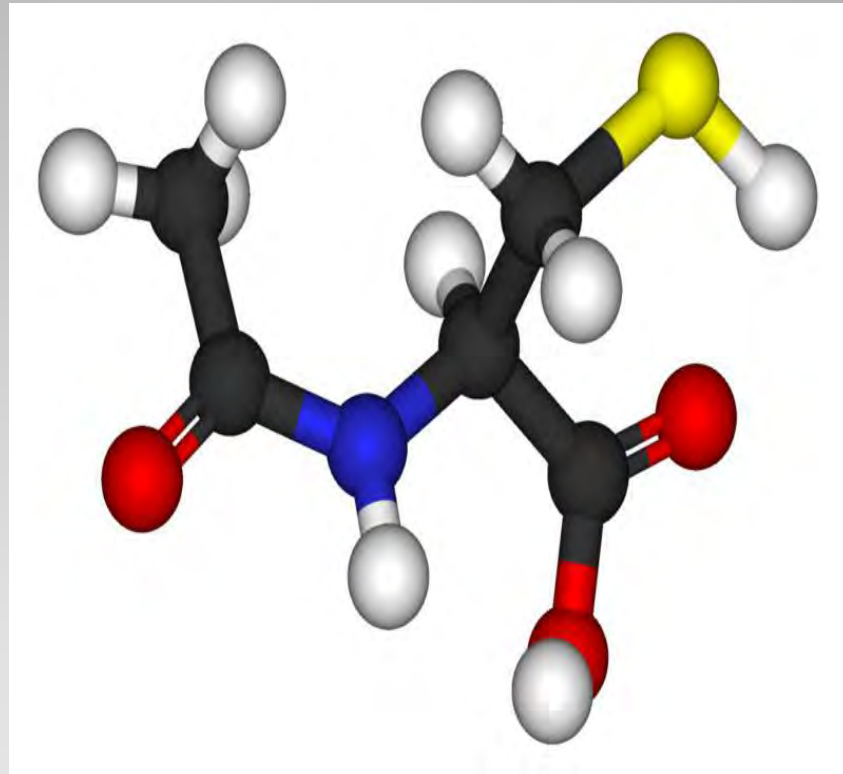
Suspicion !

- Unknown dose or large dose
- Start **upon arrival** regardless of time interval from ingestion
- **Don't wait** for S-paracetamol
- Liver function tests
 - **may be normal** even in severe cases



NAC – indications

- **Rash**
- Nausea
- Vomiting
- Cramps
- Diarrhea



- Angioedema (edema or swelling of the skin)

NAC is SAFE

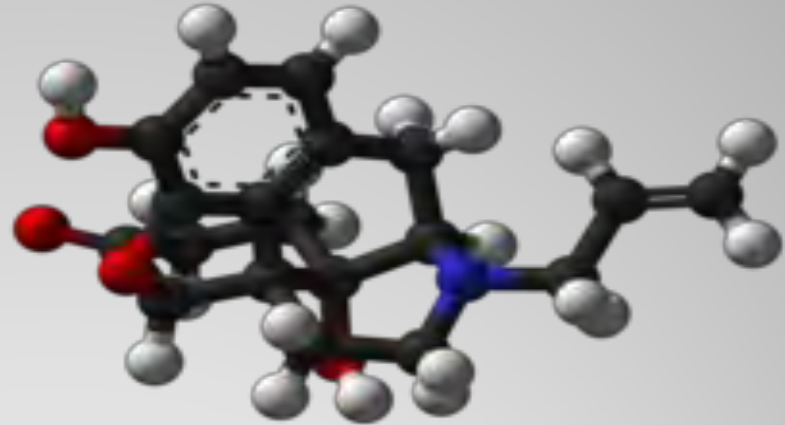
- Don't wait for S-paracetamol – treat if **suspected** ingestion
- NAC is SAFE
- If paracetamol poisoning is confirmed, highly likely or cannot be ruled out **treat with NAC** even if s-paracetamol is **ZERO**

Paracetamol - conclusion



Naloxone

- Primarily competitive μ -receptor **antagonist**
- **Rapid** reversal
- **Duration** 1-4 hours



- After reversal of opioid overdose the patient **MUST** always be **admitted** for observation for at least 4-6 hours

ref - Tintinalli J. Emergency medicine - a comprehensive study guide, 6th edition

Naloxone

Contact and death pattern among heroin users after initial contact with a MECU in Copenhagen

- To describe the development and pattern in the number of overdoses in Copenhagen during a 10 year period and to examine **48h** and 1 year **mortality rate**



Naloxone

- The unresponsive patient
 - 0,8 mg naloxone IV
 -in some cases 0,4 mg IM/SC supplement
- The reponsive but obtunded patient
 - naloxone is titrated to effect
- The patient is **released on scene** if a **substantial and lasting improvement is obtained** and mental status, hemodynamics, and pulse oximetry results are **acceptable**

Release-on-scene

- The MECU had **2854** contacts with 1731 patients for opioid overdose between 1994-98 and 2000-2003
- In 5.7 % (n=99) cases the patients had another MECU contact within 48 hours
- 14 patients (0.8 %) **died within 48 hours** of a MECU contact and a post treatment release on-scene

Naloxone

Autopsy reports

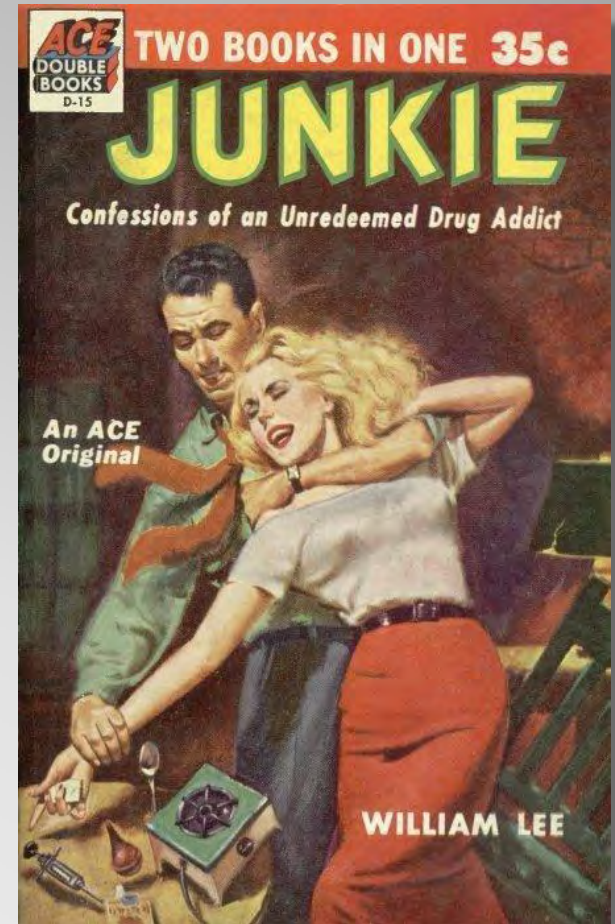
- 6 found with a *needle in the arm*
 - considered a **new** overdose
- 5 found with a single **fresh needle mark** – 2 with multiple - but **no** needles or other drugs
 - inconclusive
 - **likely new** or **possible rebound** overdose
- 1 found with **no signs** of new overdose
 - considered **possible rebound** overdose

Naloxone - 14 deaths.....

- TOX SCREENING

- in 5 of 7 inconclusive cases METHADONE was the suspected drug
- new overdose ?
- rebound overdose ?

Type of opioid



- Reversal of **heroin/morfin** overdose and release on-scene is **safe**
- Only in 0,4 % of cases a **rebound overdose** was considered possible
- Consider admittance if **Methadone**



Naloxone - conclusion



ELSEVIER

The
American Journal of
Emergency Medicine

www.elsevier.com/locate/ajem

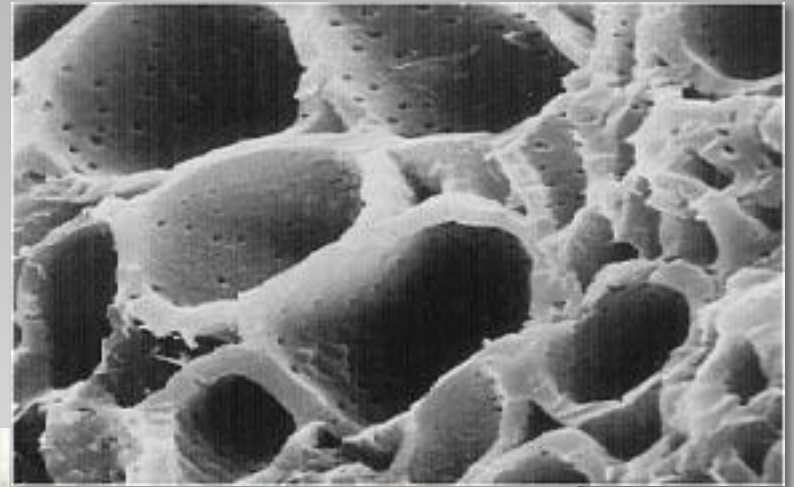
Original Contribution

Does naloxone alone increase resuscitation rate during cardiopulmonary resuscitation in a rat asphyxia model?

Meng-Hua Chen MD^{a,*}, Tang-Wei Liu MD^a, Lu Xie DPharm^b,
Feng-Qing Song MM^a, Tao He MM^a

Naloxone alone can increase resuscitation rate following asphyxial cardiac arrest in rats.

Naloxone – cardiac arrest ?



Activated charcoal

- Gastric decontamination
- Superb adsorptive properties
- Reduces systemic absorption
- Enhances elimination by interruption of the enterohepatic cycle for some drugs
-**theoretically** the single **most useful** treatment of acute oral overdose



Activated charcoal

- Lack of sound evidence of its benefits as defined by clinically meaningful endpoints
- “ a single dose of activated charcoal should not be administered routinely”
- “ the administration of activated charcoal may be considered if a patient has ingested a potentially toxic amount of a poison (which is known to be adsorbed to charcoal) up to one hour previously”

Position statement: single-dose activated charcoal. American Academy of Clinical Toxicology; European Association of Poisons Centres and Clinical Toxicologists.
Clinical Toxicology, 43:61-87, 2005

Activated charcoal – time factor



- Most patients **do not** present to the ED within 1 hour
- In 63 patients
 - median arrival time 136 minutes
 - only 15 presented within 1 hour
 - 4 of 10 who qualified for treatment received charcoal within 1 hour

Problem

Karim A, Ivatts S, Dargan P, Jones A: How feasible is it to conform to the European guidelines on administration of activated charcoal within one hour of an overdose? *Emerg Med J.* 2001;18:390-392.

- **Meta-analysis** - data from 64 controlled studies
- **Evaluate:**
 - the effect of activated charcoal on xenobiotic absorption during the first 6 hours after ingestion
 - influence of physical and pharmacologic properties

Activated charcoal – time factor

Jürgens, G. et al. The Effect of Activated Charcoal on Drug. Exposure in Healthy Volunteers: A Meta-Analysis. *Clin Pharmacol Ther.* **85**, 501-5 (2009)

- Most effective when administered **immediately**

BUT....

- 4 hours after ingestion, 25% of the participants achieved at least a 32% reduction in absorption - **especially** when activated charcoal was given with large charcoal-to-drug-ratios

Activated charcoal - metaanalyse

- An 18-month consecutive case series
 - activated charcoal **can be administered successfully** in the home by **the lay public**
- Significantly reduced the time to treatment

- ED : **mean of 73 ± 18.1 min**
- Home : **mean of 38 ± 18.3 min**



- However, many still consider this **evidence insufficient to recommend** that activated charcoal be stored in the home.

Activated charcoal – at home

Spiller HA, Rodgers GC Jr: Evaluation of administration of activated charcoal in the home. *Pediatrics*. 2001;108:E100.

- Prospective follow-up study from Finland
- Activated charcoal by either the **first-response unit** or **paramedics**
- Activated charcoal was administered to 555 patients with a mean of 88 minutes after ingestion
- No adverse effects noted, although 72 patients refused to drink the charcoal slurry
- **Feasible to administer activated charcoal in the prehospital setting**

Activated charcoal – prehospital

Alaspää AO, Kuisma MJ, Hoppu K, Neuvonen PJ: Out-of-hospital administration of activated charcoal by emergency medical services. *Ann Emerg Med.* 2005;45:207-212.

- Activated charcoal should be given routinely up til **4 hours** after ingestion
- The 1 hour limit is a guideline more than a cut off point
- In life-threatening poisonings, activated charcoal should be given **regardless of time** of ingestion
- Consider **prehospital** use



Activated charcoal – conclusion



Syrup of ipecac

- Gastric decontamination
- Acts **locally** and **centrally**
- **1997 Position statement**

American Academy of Clinical Toxicology
European Association of Poisons Centres
Clinical Toxicologists

- No additional useful materials were found



Syrup of IPECAC

Krenzelok EP, McGuigan M, Lheur P: Position statement: ipecac syrup. *J Toxicol Clin Toxicol.* 1997;35:699-709.

- Time to performing GI decontamination is **critical**

Delaying factors

- Time delay from administration to **onset of emesis** – mean time 58 minutes
- Uncertainty of the **effect** of the administered dose
- Ipecac can cause **sedation**

Syrup of IPECAC – a delay ?

Indications

- The patient meets criteria for gastric emptying.
- Orogastric lavage cannot be performed or is contraindicated because of the size of the formulation of xenobiotic
- Likely significant amount of xenobiotic in the stomach
- The benefits outweigh the risk from the contraindications

Contraindications

- The patient does not meet criteria for gastric emptying
- Activated charcoal is expected to be necessary in the next several hours
- Airway maybe lost in the next hour
- Caustic ingestion
- Foreign body ingestion
- Drugs of high aspiration potential
- Infant < 6 months
- Premorbid conditions that be decompensated

Syrup of IPECAC

Goldfrank's Toxicologic Emergencies

Indications

- **VERY FEW !!!!!**
 - *only recommended once in 2009 !*
- Xenobiotics that don't adsorb to charcoal
 - **Iron** and **Lithium**
- **Only children**
 - to small for NG tube for aspiration of pills

Contraindications

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Syrup of IPECAC

Giftliniens practical guideline

- No clinical benefit **vs** the recognized benefit of activated charcoal
- Administration of syrup of ipecac **delays** the administration of activated charcoal
- Given the **lack of evidence** demonstrating a clinically meaningful benefit *and* the **significant contraindications**, the **routine** administration of syrup of ipecac should be abandoned
- Contact your local poison center

Syrup of IPECAC - conclusion

- Don't wait for S-paracetamol – treat if **suspected** ingestion even in the face of normal transaminase levels
- A release on scene is **safe** in severe heroine/morfine overdose
- Activated charcoal should be given **routinely upto 4 hours** after drug ingestion
- Induction of emesis has an extremely limited role in the contemporary management of poisoned patients and should probably be **abandoned**

so....in conclusion

www.scandinavian-update.org



Is There A Doctor In The House?



Thank you