



# ИНТОКСИКАЦИЯ С МЕТФОРМИН, ПАРАЦЕТАМОЛ И САЛИЦИЛАТИ

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д-р Станимир Тепавски

# МЕТФОРМИН

## Symptoms of lactic acidosis



Vomiting



Stomach pain



Muscle cramps



Severe tiredness

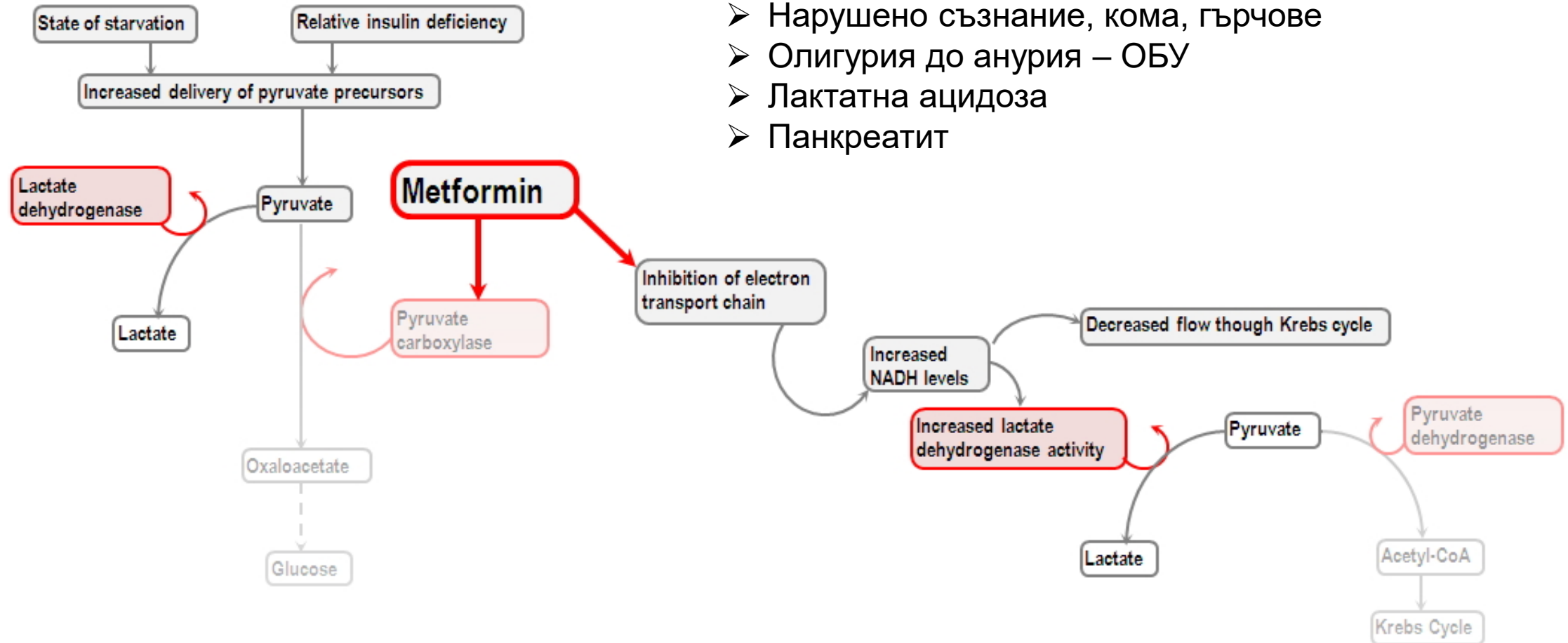


Difficulty in  
breathing



Reduced body  
temperature and  
heartbeat

- Гадене, повръщане, летаргия, абдоминална болка
- Нарушено съзнание, кома, гърчове
- Олигурия до анурия – ОБУ
- Лактатна ацидоза
- Панкреатит



## METFORMIN

(see full publication)

### General Recommendation

- ECTR is recommended in severe metformin poisoning (1D)

### Indications

ECTR is indicated if ANY of the following conditions are present:

- Lactate concentration  $> 20$  mmol/L (recommendation, 1D),  $> 15$  mmol/L (suggestion, 2D)
- pH  $\leq 7.0$  (recommendation 1D), pH  $\leq 7.1$  (suggestion, 2D)
- Failure of standard supportive measures (1D)
- Comorbid conditions that lower the threshold for ECTR initiation
  - Shock (1D)
  - Impaired kidney function (1D)
  - Liver failure (2D)
  - Decreased level of consciousness (2D)

### Cessation of ECTR is indicated when

- Lactate concentration  $< 3$  mmol/L (1D)

AND

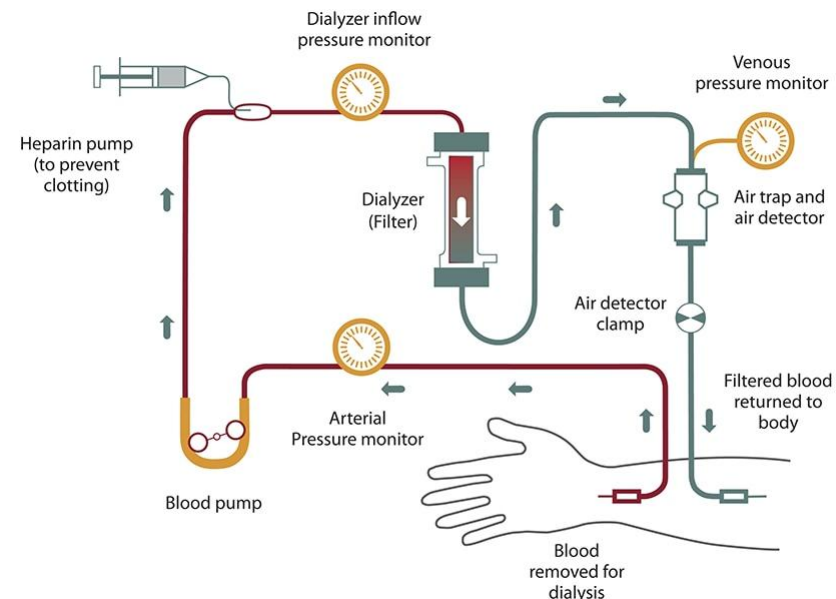
- pH  $> 7.35$  (1D)

### Choice of ECTR

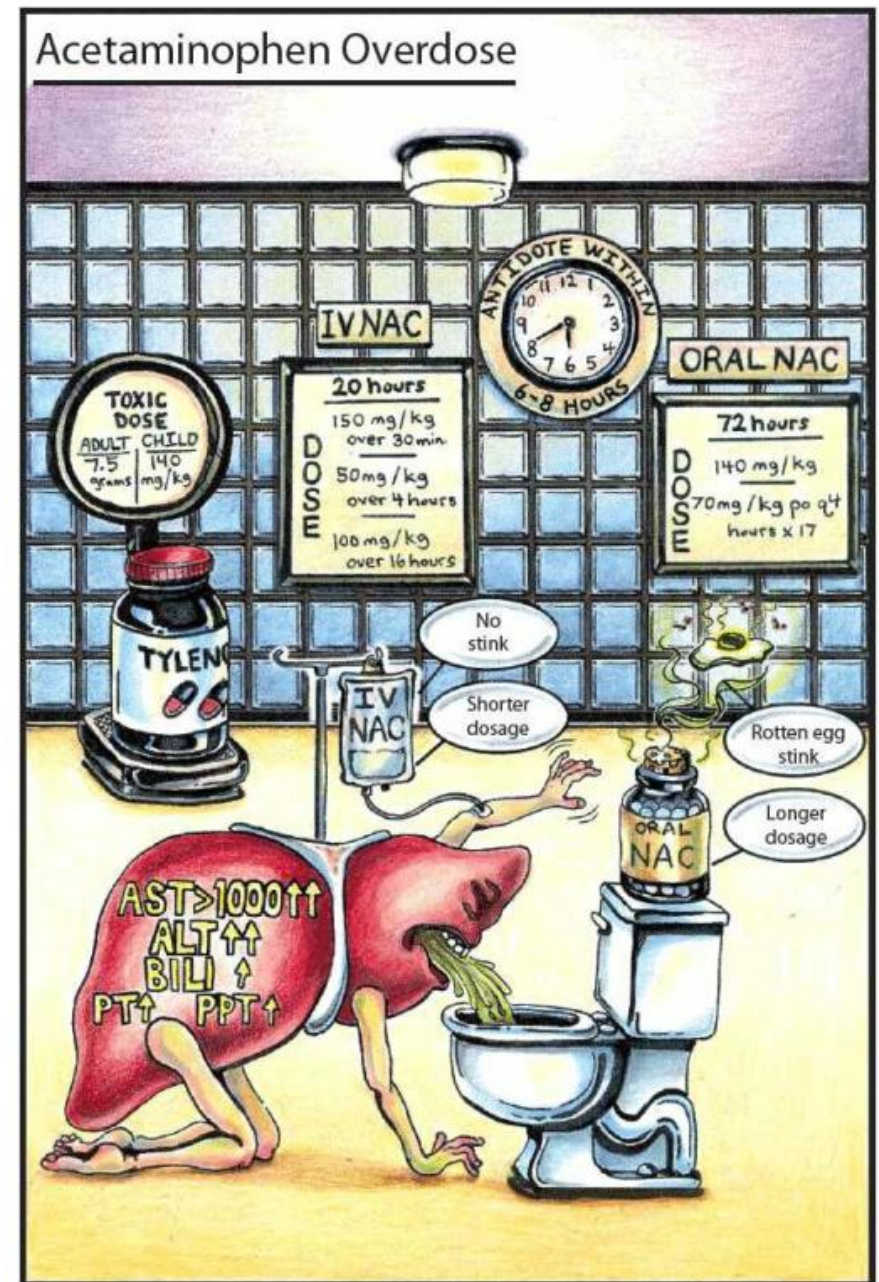
- Intermittent hemodialysis (with bicarbonate buffer) is preferred initially (1D)
- Continuous kidney replacement therapies may be considered if hemodialysis is unavailable (2D)
- Repeat extracorporeal treatment sessions may use hemodialysis (1D) or continuous kidney replacement therapy (1D).

### Miscellaneous

- Close monitoring of lactate and acid-base status is warranted after ECTR to determine the need for additional courses of extracorporeal treatment.



# ПАРАЦЕТАМОЛ





Симптоми:

Ранни – латентен период, гадене, повръщане, при големи интоксикации може да се наблюдава хипотония, ацидоза

24-48 часа – чернодробна некроза, енцефалопатия, метаболитна ацидоза, ОБУ

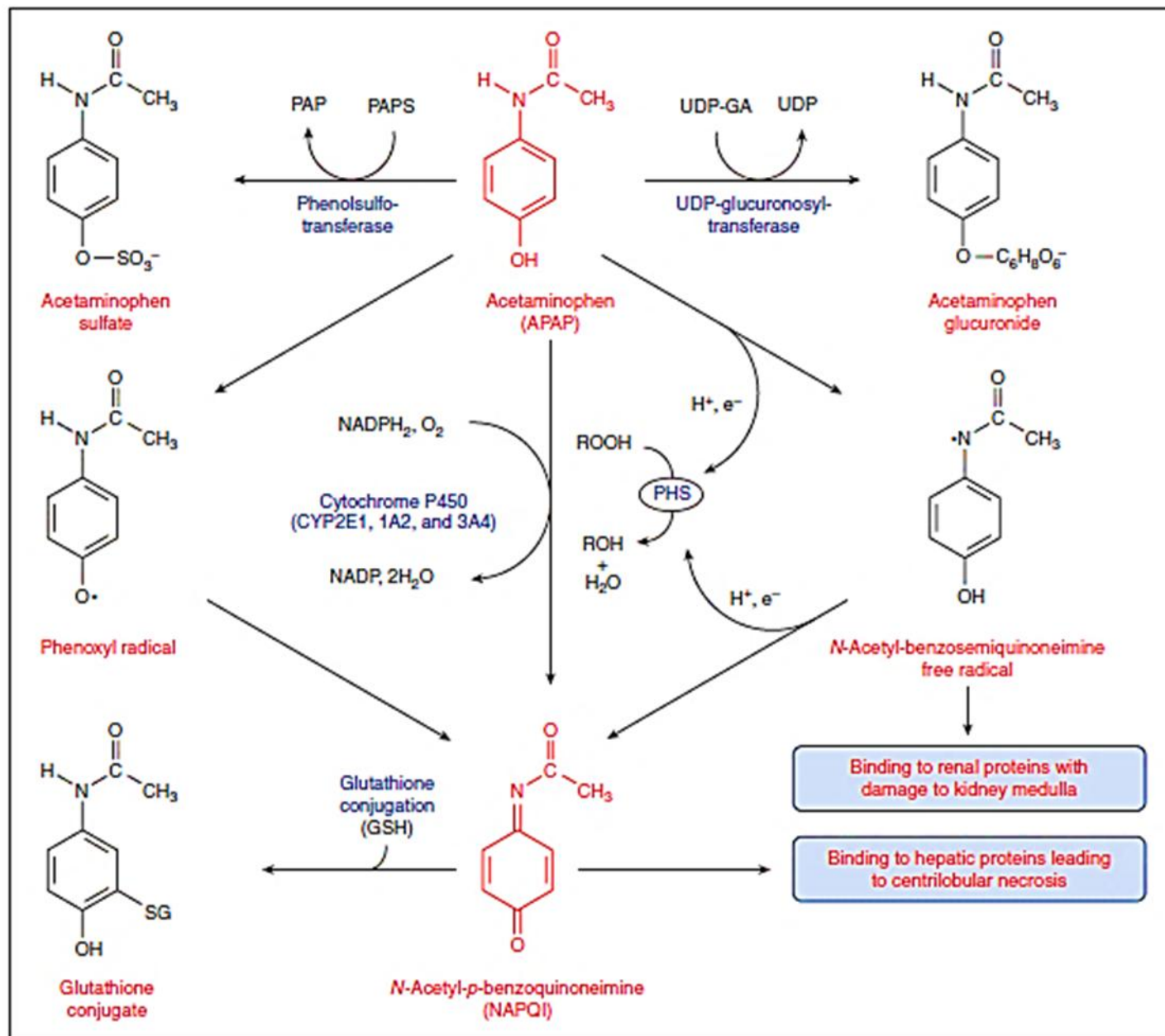
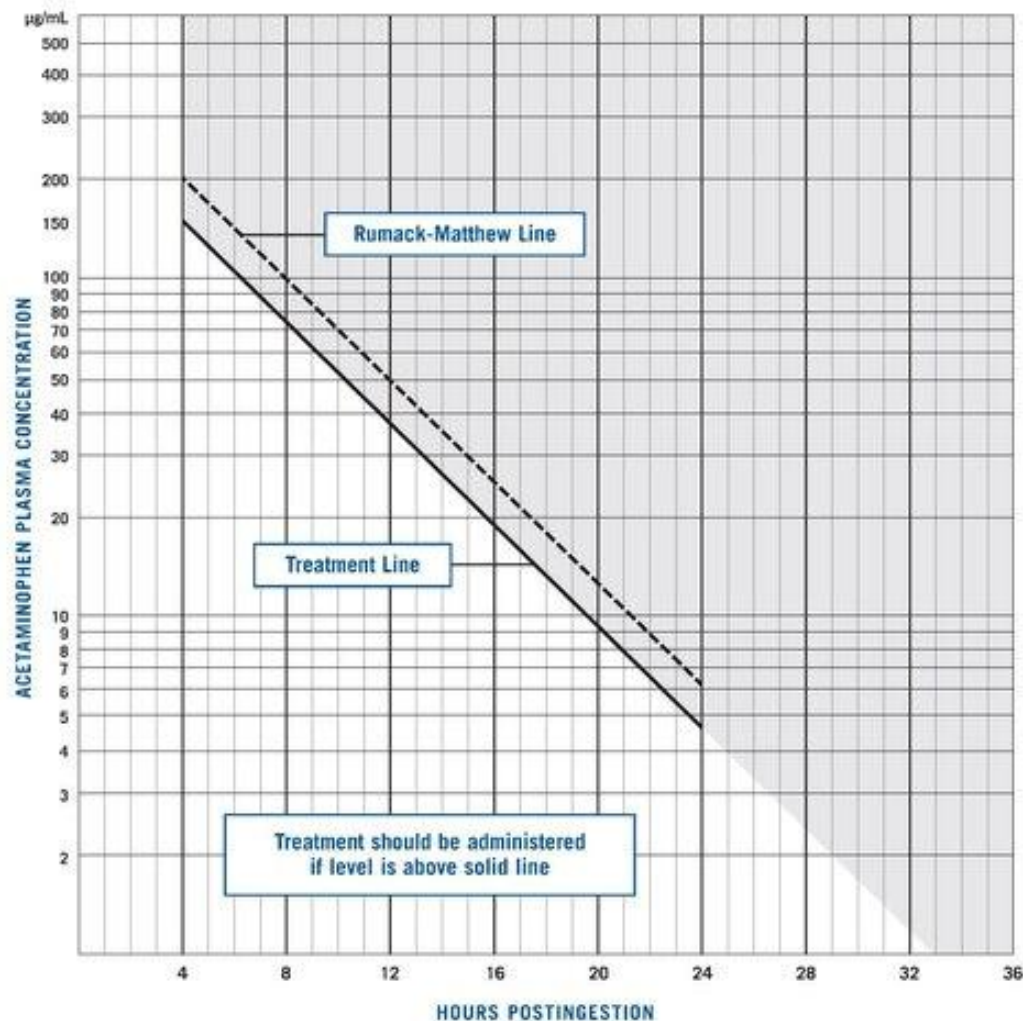


Figure 6-35. Activation of acetaminophen by cytochrome P450, leading to hepatotoxicity, and by prostaglandin H synthase (PHS), leading to nephrotoxicity. Conjugation with sulfonate, glucuronic acid, or glutathione represents detoxication reactions.

## Single Acute Acetaminophen Overdose Nomogram



**Nomogram:** acetaminophen plasma concentration vs time after acetaminophen ingestion (adapted with permission from Rumack and Matthew, *Pediatrics*. 1975;55:871-876). The nomogram has been developed to estimate the probability of whether a plasma acetaminophen concentration in relation to the interval post-ingestion will result in hepatotoxicity and, therefore, whether acetylcysteine therapy should be administered.

### CAUTIONS FOR USE OF THIS CHART:

1. Time coordinates refer to time post-ingestion.
2. Graph relates only to plasma concentrations following a single, acute overdose ingestion.
3. The Treatment Line is plotted 25% below the Rumack-Matthew Line to allow for potential errors in plasma acetaminophen assays and estimated time from ingestion of an overdose (Rumack et al. *Arch Intern Med*. 1981;141(suppl):380-385).

## ACETAMINOPHEN (PARACETAMOL)

[View full publication](#)

### General Recommendation

- ECTR is suggested in severe acetaminophen (APAP) poisoning (2D)

### Indications

ECTR is recommended:

- If the [APAP] more than 1000 mg/L (6620 µmol/L) and NAC is NOT administered (1D)
- If the patient presents with altered mental status, metabolic acidosis, with an elevated lactate, and an [APAP] is more than 700 mg/L (4630 µmol/L) and NAC is NOT administered (1D)
- If the patient presents with an altered mental status, metabolic acidosis, an elevated lactate, and an [APAP] is more than 900 mg/L (5960 µmol/L) even if NAC is administered (1D)

ECTR is not recommended

- On the basis of the reported ingested dose if NAC is administered (1D)

ECTR is not suggested

- On the basis of reported ingested dose alone even if NAC is NOT administered (2D)
- Solely on the basis of the [APAP] if NAC is administered (2D).

### Choice of ECTR

- Intermittent hemodialysis is the preferred ECTR in patients with APAP poisoning (1D)
- The following are acceptable alternatives if HD is not available:
  - Intermittent HP (1D)
  - CRRT (3D)
  - Exchange transfusion in neonates (2D)

### Cessation of ECTR

- ECTR is recommended until sustained clinical improvement is apparent (1D)

### Miscellaneous

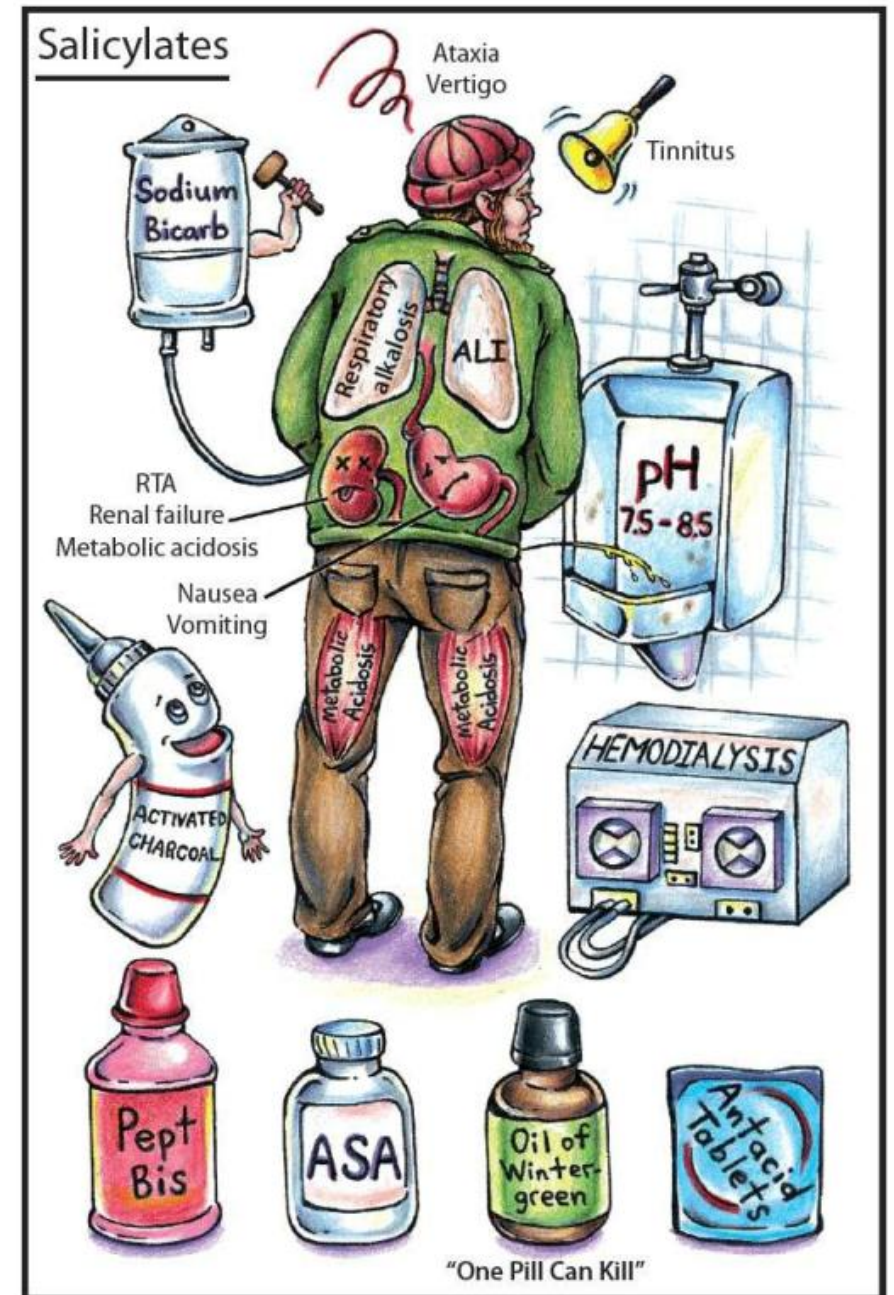
- NAC therapy should be continued during ECTR at an increased rate (1D)

Oral dosing:

140 mg/kg load then 70 mg/kg q 4 h x 17 doses



# САЛИЦИЛАТИ





## Механизъм на токсичност:

- Централна стимулация на дихателния център води до хипервентилация, което предизвиква респираторна алкалоза. В последствие се наблюдава дехидратация и компенсаторна метаболитна ацидоза.
- Нарушава се окислителното фосфорилиране и метаболизма на въглехидрати и мастни киселини, което допринася за метаболитната ацидоза.
- Развива се мозъчен и белодробен оток – механизмът не е ясен, вероятно промени в капилярния интегритет.

## Остра интоксикация:

- Гадене, повръщане, тахипнея
- Тинитус
- Летаргия
- Смесена респираторна алкалоза и метаболитна ацидоза
- Гърчове, кома, хипогликемия, хипертермия
- Белодробен оток и сърдечно-съдов колапс

## Хронична интоксикация:

- Обърканост, дехидратация, метаболитна ацидоза
- Инфекции, пневмония, гастроентерит
- Мозъчен и белодробен оток
- Морбидността и смъртността са по-високи

## SALICYLATES

(see full publication)

### General Recommendation

- ECTR is recommended in severe salicylate poisoning (1D)

### Indications

ECTR is recommended if ANY of the following are met:

- If [salicylate] > 7.2 mmol/L (100 mg/dL) (1D)
- If [salicylate] > 6.5 mmol/L (90 mg/dL) in the presence of impaired kidney function (1D)
- In the presence of altered mental status (1D)
- In the presence of new hypoxemia requiring supplemental oxygen (1D)
- If standard therapy (supportive measures, bicarbonate, etc.) fails (1D)

ECTR is suggested if ANY of the following are met:

- If [salicylate] > 6.5 mmol/L (90 mg/dL) (2D)
- If [salicylate] > 5.8 mmol/L (80 mg/dL) in the presence of impaired kidney function (2D)
- If the systemic pH is  $\leq 7.20$  (2D)

### Cessation of ECTR is indicated if:

- Clinical improvement is apparent (1D) *and*
- [salicylate] < 1.4 mmol/L (19 mg/dL) (1D) *or* ECTR has been performed for a period of at least 4-6 h when salicylate concentrations are not readily available (2D)

### Choice of ECTR

- Intermittent HD is the preferred modality in patients with salicylate poisoning (1D)
- The following are acceptable alternative if HD is not available:
  - Intermittent HP (1D)
  - CRRT (3D)
  - Exchange transfusion in neonates (1D)

### Miscellaneous

- It is recommended to continue intravenous bicarbonate therapy between ECTR sessions (1D).



Increasing pH *immediately* decreases the effective toxicity



Lower pH favors **non-ionized form**  
- Diffuses into tissues (**more toxic**)  
- Cannot be concentrated in urine  
(will diffuse out of the renal tubule)

Higher pH favors ionized form  
- Less tissue penetration (**less toxic**)  
- Trapped & excreted in urine

The Internet Book of Critical Care, by @PalmCrit



**БЛАГОДАРЯ ЗА  
ВНИМАНИЕТО**



[sp.tepavski@gmail.com](mailto:sp.tepavski@gmail.com)