

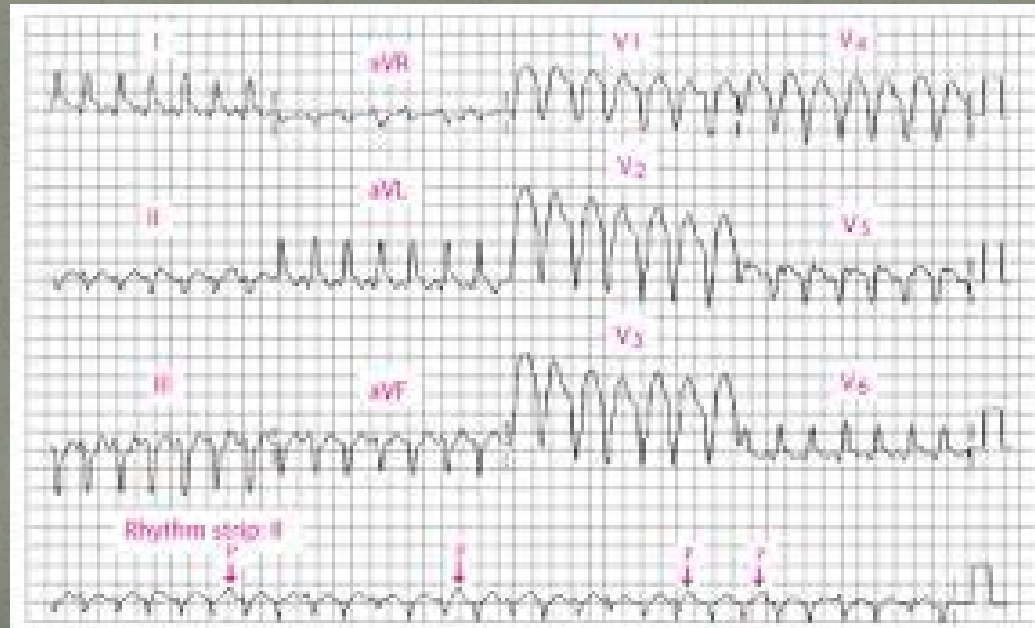
# Antidot tedavisinde yenilikler

Dr. Özgür Çevrim

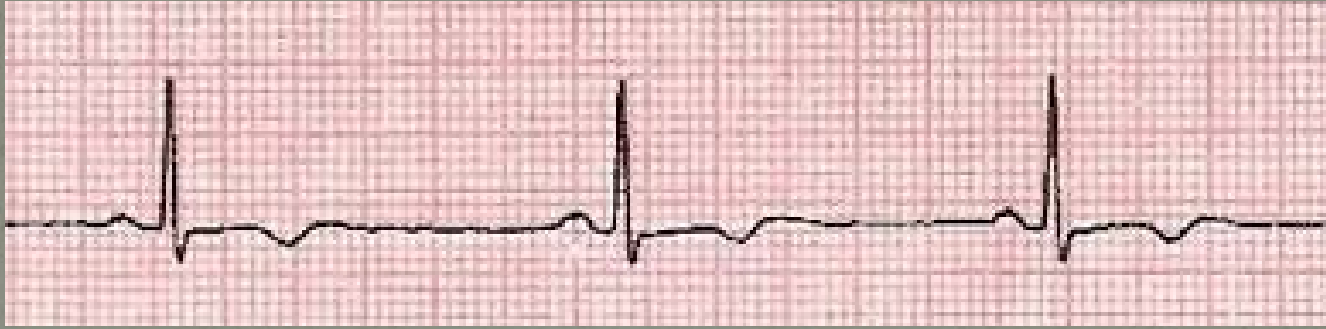
Şişli Etfal EAH Acil Tıp Kliniği - İSTANBUL

TATD - Klinik Toksikoloji Sempozyumu 25-27 Nisan 2014

- Olgu 1
- 38 yaş bayan hasta
- GKS : 8
- TA : 110/ 70 AKŞ : 180 mg/dl



- Olgu 2
- 47 yaş erkek hasta
- Acil servise GKS : 15 TA : 80/50





# ABCD

- ABCD hedefli resusistasyondan vazgeçmeyin.

# A

- Hava yolu açıklığını sağlamayan hastalar hemen entübe edilmeli .
- İstisna klinik olarak “opioid zehirlenmesi” şüphesi. O zaman ilk müdahale oksijen + naloxone olmalı.
- Naloxone dozu: 0.4-2 mg IV . Bu doz solunum depresyonu düzelene dek katlanarak arttırılır.
- Dikkat hipoglisemiye ekarte edin .



# A

- Benzodiazepin zehirlenmesinde veya şüphesinde Flumazenil vermeyin. Yarar: zarar oranı düşüktür. Nöbetlere yol açabilir.
- Do not administer flumazenil for presumed or known benzodiazepine overdose, as the risk benefit ratio of this agent is poor and withdrawal seizures can develop. \*

Seeger DL. Flumazenil--treatment or toxin. *J Toxicol Clin Toxicol.* 2004;42(2):209-16. [[Medline](#)].

# A

- Hava yolunu korumak için en iyi teknik entübasyondur.
- Rocuronium (esmeron), organofosfat veya digoksin zehirlenmelerinde in SK yerine tercih edilmelidir.
  - Organofosfat zehirlenmesinde SK etki süresi uzar. Bu zehirlenmede kolinesteraz toksin yüzünden inaktif hale gelmiştir.
- Digoksin zehirlenmesi hiperkalemiye neden olabilir. Bu durumda SK kullanımını kontrendikedir.



# A

- Kostik madde alımı olan hastalarda stridor veya ağızdan tükürük salgısında artışı varsa erkenden entübe edilmelidir.
- Alternatif yol cerrahi havayolu açılması olabilir.



# B

- Dialize edilebilecek toksinler için (aspirin, metanol, etilen glikol ) hemodializ ayarlayın.

# C

- Bradikardi + hipotansiyon: Digoksin, KKB veya beta bloker.
- Digoksin: Otomatisitede artış, deprese AV nodal ileti, karakteristik repolorizasyon bulguları, GİS bulguları.
- Beta-bloker: sıklıkla hipoglisemi ile ve propranolol etken mekanizma Na kanal blokajı ile .
- KKB



# C

- Monomorfik geniş kompleks taşikardi:
- Na kanallarının bloke olması nedeniyle aberan ileti vardır.
- Etkenler: TAD, antihistaminik, Type IA antiaritmik, kokain.
- Tedavi:  $\text{NaHCO}_3$  50 - 100 mEqv IV bolus, gerekirse QRS intervali ekstremite leadlerde  $<100$  msn olana dek tekrarlanır. Veya arteyal Ph 7.55 yakın olana dek tekrarlanır.

# C

- Polimorfik VT, torsade de pointes:
- Type IA, IC, ve III antiaritmik zehirlenmeleri; pentamidin; antipsikotikler; arsenik; antifungal; antihistaminler.
- Tedavi: Magnesium sulfat 2 gr IV 2- 5 dakika içinde. Gerekirse 2 ek doz daha yapılabilir.
- İsoproterenol tedavisi veya overdrive elektriksel pacing uygulanabilir.



# C

- Dar kompleks taşikardi + hipertansiyon: hiperadrenerjik durum.
- Etken: Kokain, amfetamin ve diğer sempatomimetikler.
- Tedavi: Benzodiazepin ve fentolamin.
- İstisnası, Refrakter hipertansiyon kardiyak iskemi varlığında Nitroglycerin veya Nitroprusside ile tedavi edilir.
- Senkronize kardioversion nadiren fayda eder.

# Disabilite

- “coma cocktail” = dextrose, oxygen, naloxone, and thiamine = OUT
- Gerekirse tek tek kullanılır.
- Hipoglisemi varlığında **mental status değişikliği, konfuzion, nöbet, fokal defisit, koma.**
- Tedavi: Glukoz ( Önce glukometre)



# D

- Zehirlenmeye baęlı veya geri çekilmeye baęlı nöbetlerde en iyi ilaç: artan dozlarda benzodiazepines ( diazepam 5 mg IV, tekrar ve iki katı her 5- 10 dakikada)
- Fenitoin genelde etkisizdir
- Propofol ikinci sıradadır.
- Eęer nöbetler Na kanal blokajına baęlı ise IV NaHCO<sub>3</sub> de benzodiazepinlere ek olarak verilmelidir.
- Yüksek doz piridoksin (5 g IV) sadece INH veya monomethylhydrazine (Gyromitra mantar) zehirlenmesinde verilebilir.

# E

- Ciddi hipertermi olan hastalarda ( $> 40^{\circ}\text{C}$ ) genellikle paralizi, sedasyon ve buzlu suda soğutma gerekir.
- Ciddi hipotermi olan hastalarda ( $< 30^{\circ}\text{C}$ ) agresif ısıtma teknikleri uygulanır..
- Terapötik hipotermi, bilinci olmayan ve kardiyak arrestten dönmüş ROSC hastalarda uygulanır.



# SON?

- Kardiyak hastalardaki durumun aksine zehirlenmiş hastalar uzamış CPR' a iyi cevap verebilir.
- 60 dakikadan uzun süren nabızsız ve göğüs kompresyonu yapılmış hastalar bile nörolojik olarak intakt olabilir.
- Ekstrakorperal dolaşım ile uzamış CPR' a destek verilebilir.
- Nörolojik iyileşmenin mümkün olmadığı nörotoksin ile zehirlenmiş hastalarda organ bağıışı düşünölmelidir (metanol, CO, siyanür)

## Poisoning syndromes (toxidromes)

Toxidrome	Mental status	Pupils	Vital signs	Other manifestations	Examples of toxic agents
Sympathomimetic	Hyperalert, agitation, hallucinations, paranoia	Mydriasis	Hyperthermia, tachycardia, hypertension, widened pulse pressure, tachypnea, hyperpnea	Diaphoresis, tremors, hyperreflexia, seizures	Cocaine, amphetamines, cathinones, ephedrine, pseudoephedrine, phenylpropanolamine, theophylline, caffeine
Anticholinergic	Hypervigilance, agitation, hallucinations, delirium with mumbling speech, coma	Mydriasis	Hyperthermia, tachycardia, hypertension, tachypnea	Dry flushed skin, dry mucous membranes, decreased bowel sounds, urinary retention, myoclonus, choreoathetosis, picking behavior, seizures (rare)	Antihistamines, tricyclic antidepressants, cyclobenzaprine, orphenadrine, antiparkinson agents, antispasmodics, phenothiazines, atropine, scopolamine, belladonna alkaloids (eg, Jimson Weed)
Hallucinogenic	Hallucinations, perceptual distortions, depersonalization, synesthesia, agitation	Mydriasis (usually)	Hyperthermia, tachycardia, hypertension, tachypnea	Nystagmus	Phencyclidine, LSD, mescaline, psilocybin, designer amphetamines (eg, MDMA, MDEA)
Opioid	CNS depression, coma	Miosis	Hypothermia, bradycardia, hypotension, apnea, bradypnea	Hyporeflexia, pulmonary edema, needle marks	Opiates (eg, heroin, morphine, methadone, oxycodone, hydromorphone), diphenoxylate
Sedative-hypnotic	CNS depression, confusion, stupor, coma	Miosis (usually)	Hypothermia, bradycardia, hypotension, apnea, bradypnea	Hyporeflexia	Benzodiazepines, barbiturates, carisoprodol, meprobamate, glutethimide, alcohols, zolpidem
Cholinergic	Confusion, coma	Miosis	Bradycardia, hypertension or hypotension, tachypnea or bradypnea	Salivation, urinary and fecal incontinence, diarrhea, emesis, diaphoresis, lacrimation, GI cramps, bronchoconstriction, muscle fasciculations and weakness, seizures	Organophosphate and carbamate insecticides, nerve agents, nicotine, pilocarpine, physostigmine, edrophonium, bethanechol, urecholine
Serotonin syndrome	Confusion, agitation, coma	Mydriasis	Hyperthermia, tachycardia, hypertension, tachypnea	Tremor, myoclonus, hyperreflexia, clonus, diaphoresis, flushing, trismus, rigidity, diarrhea	MAOIs alone or with: SSRIs, meperidine, dextromethorphan, TCAs, L-tryptophan

CNS: central nervous system.



## Drug- and toxin-induced temperature abnormalities

<b>Hyperthermia</b>	<b>Hypothermia</b>
<b>Increased heat production</b>	Opioids
Muscular hyperactivity/rigidity	Sedative-hypnotics
Sympathomimetics	Benzodiazepines
Cocaine	Barbiturates
Amphetamines	Alcohols
Phenylpropanolamine	Sympatholytics
Ephedrine	Beta blockers
Cathinones	Clonidine
Anticholinergics	Alpha-adrenergic antagonists
Drug withdrawal states	Hypoglycemic agents
Lithium	Antipsychotics
Central hallucinogens	General anesthetic agents
Phencyclidine	Carbon monoxide
Lysergic acid diethylamide (LSD)	Drugs which cause flaccid coma
Designer amphetamines (MDMA, MDEA)	
Synthetic cannabinoids	
Drugs causing recurrent seizures	
Isoniazid	
Theophylline	
Strychnine	
Neuroleptic malignant syndrome	
Serotonin syndrome	
MAO inhibitors	
Malignant hyperthermia	
<b>Impaired heat dissipation</b>	
Impaired sweating	
Anticholinergic agents	
Antihistamines	
Phenothiazines	
Tricyclic antidepressants	
<b>Increased metabolic rate</b>	
Uncoupled oxidative phosphorylation	
Salicylates	
Dinitrophenol, pentachlorophenol	
Thyroid hormone	
<b>Hypersensitivity reactions</b>	
Metal fume fever	
Polymer fume fever	

## Drug- and toxin-induced changes in blood pressure and pulse

Hypertension with tachycardia	Hypertension with bradycardia	Hypotension with tachycardia	Hypotension with bradycardia
Sympathomimetics	Alpha-adrenergic agonists	Beta-adrenergic agonists	Beta-blockers
Amphetamines	Phenylpropanolamine	Theophylline	Calcium-channel blockers
Cocaine	Phenylephrine	Albuterol	Cardiac glycosides
Ephedrine	Phentermine	Isoproterenol	Digoxin
Pseudoephedrine	Ergot alkaloids	Terbutaline	Digitalis purpurea
Theophylline	Sumatriptan	Caffeine	Oleander
Caffeine	Clonidine (early)	Disulfiram reaction (late)	Red squill
Methylphenidate	Guanfacine	Toxic alcohols	Bufotenin
Cathinones	Imidazolines	Isopropyl alcohol	Clonidine
Anticholinergics	Tetrahydrozoline	Carbon monoxide	Alpha-methyl dopa
Antihistamines	Oxymetazoline	Alpha-adrenergic antagonists	Cyanide
TCAs (early)	Cholinergic agents	Phenothiazines	Carbon monoxide (late)
Phenothiazines (some)	Organophosphates	TCAs	Opiates
Antiparkinson agents	Carbamates	Hydralazine	Sedative-hypnotics
Muscle relaxants	Steroid hormones	Heavy metals (acute)	Barbiturates
Clozapine	Glucocorticoids	Iron	Benzodiazepines
Central hallucinogens	Mineralocorticoids	Arsenic	Cholinergics
Designer amphetamines	Estrogen	Colchicine	Organophosphates
Lysergic acid diethylamide (LSD)	Progesterone	Nitrates	Carbamates
Phencyclidine (PCP)	Androgens	Sodium nitroprusside	Antiarrhythmics
Synthetic cannabinoids	Yohimbine		
Envenomations	Heavy metals		
Black widow spider bite	Lead		
Scorpion stings	Disulfiram reaction (early)		
Drug withdrawal states			
MAOIs (foods with tyramine)			
Nicotine			
Cholinergic agents (sometimes)			
Organophosphates			
Carbamates			
Thyroid hormone			



## Drugs and toxins associated with respiratory dysfunction

Tachypnea/hyperventilation	Bradypnea/hypoventilation
Sympathomimetics	CNS depressants
Amphetamines	Opioids
Cocaine	Sedative-hypnotics
Caffeine	Alcohols
Theophylline	Antidepressants
Nicotine	Antipsychotics
Cathinones	Sympatholytics
Central hallucinogens	Volatile inhalants (solvents)
Lysergic acid diethylamide (LSD)	Cholinergics
Phencyclidine	Muscle relaxants
Designer amphetamines	Antiepileptics
Synthetic cannabinoids	Respiratory muscle failure
Anticholinergics	Botulism
Drug withdrawal states	Carbamates
Salicylates	Neurotoxic snake envenomation
Dinitrophenol, pentachlorophenol	Neuromuscular blocking agents
Drug-associated hepatic failure	Organophosphates
Acetaminophen	Paralytic shellfish poisoning (saxitoxin)
Amanita mushrooms	Puffer fish poisoning (tetrodotoxin)
Cellular asphyxiants	Strychnine
Carbon monoxide	Tetanus
Cyanide	
Hydrogen sulfide	
Methemoglobinemia	
Toxins that induce pulmonary edema	
Opioids	
Pulmonary irritants	
Drugs that induce metabolic acidosis (respiratory compensation)	
Methanol	
Ethylene glycol	
Alcoholic ketoacidosis	
Iron	
Isoniazid	

## Empirical dosing of emergency antidotes to adult patients in extremis\*

Suspected toxin (or similar agent)	Antidote
Cyanide	5 g hydroxocobalamin IV, repeat x 1 (alternative is nitrite/thiosulfate kit)
Methemoglobinemia	2 mL/kg 2 percent methylene blue IV over 5 minutes
Digoxin	2 to 5 vials digoxin antibody (Fab) fragments IV
Calcium channel blocker	20 mL 10 percent calcium chloride IV, repeat x 2; 0.5 to 1 units/kg/hour insulin (and dextrose) IV
Local anesthetic	1.5 mL/kg of 20 percent intralipid bolus IV, may repeat several times (alternatively, after bolus infuse 0.25 mL/kg per minute for 30 minutes; maximum dose 10 mL/kg)
Sodium channel blockade	100 mL of 7.5 percent to 8.4 percent sodium bicarbonate IV, repeat x 2
Cholinergic agent	2 mg atropine IV , doubled every 3 minutes as needed
Isoniazid	5 g pyridoxine over 10 minutes or until seizures stop; remainder over 4 hours
Chloroquine	2 mg/kg diazepam IV over 30 minutes

\* Additional details about antidotes and further treatment of the poisons listed in this table can be found in the specific reviews discussing these poisonings.



## Drugs reported to potentially cause seizures or lower seizure threshold

### Psychotropic drugs

Tricyclic, tetracyclic antidepressants

Serotonin reuptake inhibitors

Neuroleptic agents (phenothiazines, haloperidol, clozapine)

Lithium

Bupropion

### Methylxanthines (theophylline)

### Narcotic analgesics (meperidine, propoxyphene)

### Antimicrobials

Penicillins, cephalosporins in high dose

Imipenem

Isoniazid

Antimalarials

Cyclosporine

Nalidixic acid

### Chemotherapeutic agents (methotrexate, chlorambucil)

### General anesthetics (ketamine, enflurane)

### Local anesthetics (lidocaine - in toxic doses, disopyramide, bupivacaine)

### Stimulants (amphetamines, cocaine)

### Antiarrhythmics (verapamil intoxication, mexiletine, procainamide, propranolol overdose)

### Antihistamines (diphenhydramine)

Baclofen

### Antiemetics (chlorpromazine)

## Agents most commonly ingested by children younger than six years of age from 2006 to 2011

Cosmetics and personal care products
Cleaning products (household)
Analgesics
Foreign bodies/toys/miscellaneous
Topical preparations
Cough and cold preparations
Vitamins
Antihistamines
Pesticides
Plants
Gastrointestinal preparations
Antimicrobials
Arts/crafts/office supplies
Cardiovascular drugs
Hormones and hormone antagonists
Electrolytes and minerals

*Data from: Annual Reports of the American Association of Poison Control Centers Toxic Exposure Surveillance System.*



### Medications and toxins potentially fatal to toddler in one or two doses

Drug	Estimated minimum fatal dose	Major effects
Benzocaine (eg, Orajel®)	<20 mg/kg	Methemoglobinemia, seizures
Beta blockers	Unclear	Seizures, hypoglycemia, bradycardia, hypotension
Calcium antagonists	<40 mg/kg	Bradycardia, hypotension
Camphor	Approximately 50 mg/kg	Seizures, CNS depression, respiratory depression
Chloroquine	<30 mg/kg	Seizures, arrhythmias
Clonidine	Unclear	Bradycardia, hypotension, CNS depression
Diphenoxylate (eg, Lomotil®)	1.2 mg/kg	CNS depression, respiratory depression
Imidazoline-derived sympathomimetics (eg, Visine®, Afrin®)	Unclear	Lethargy, miosis, hypotension, bradycardia, respiratory depression, shock
Lindane	Approximately 6 mg/kg	Seizures, CNS depression
Methadone	Approximately 5 mg/kg	CNS depression, respiratory depression
Methyl salicylate	Approximately 200 mg/kg	Seizures, acidosis, cardiovascular collapse
Opioids (eg, methadone, long-acting morphine)	Unknown	Miosis, CNS depression, respiratory depression
Phenothiazines	Approximately 20 mg/kg	Seizures, arrhythmias, CNS depression
Phenylpropanolamine	Unclear	Arrhythmia, intracranial bleed
Quinidine	Approximately 50 mg/kg	Seizures, arrhythmia, CNS depression
Quinine	Approximately 80 mg/kg	Seizures, arrhythmias, retinal injury
Sulfonylureas	<1 mg/kg	Hypoglycemia
Theophylline	Approximately 50 mg/kg	Seizures, arrhythmias
Tricyclic antidepressants	Approximately 15 mg/kg	Seizures, arrhythmias, hypotension
Toxic alcohols (eg, methanol, ethylene glycol)	0.3 mL/kg	CNS depression

Adapted from:

- Çocukta ABCDE prensipleri aynı.
- Semptomlara yaklaşımda kullanılan tablolarda fark yok.
- Gastrik lavaj 1 saat dışında önerilmiyor. İstisnası ?



Son söz...

Önlenebilir nedenlerden insanlarımız ölmesin.  
Özgür Çevrim

