Medical Toxicology Rotation

Arranging the Rotation

For medical students please contact Nikol Levine at nlevine@ucsd.edu (619-543-3829) who is the rotation coordinator.

For residents and pediatric fellows please contact Lindsey Kuhn at lkuhn@ucsd.edu (619-543-6229) who is the rotation coordinator.

Medical Toxicology Rotation

Welcome to the Medical Toxicology Rotation. We are happy to have you rotate through and are committed to teaching you as much as we can while you are here. Included in this packet is a guide for the rotation and also a worksheet with checklists and questions that you will need to return (in mailbox of tox offices of Dr. Schneir) at the end of the rotation.

Rotation Director:

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Full time UCSD Staff:

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Aaron Schneir M.D. Medical Toxicology Education Director
Chris Tomaszewski M.D. Assistant Medical Director San Diego Division, California Poison Control Center

Other Staff:

Sean Carstairs M.D. Navy-Balboa
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UCSD Medical Toxicology

Medical Toxicology Fellows:

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Weekly Schedule

Monday:   930 AM-12 PM Toxicology Journal Club  
12-1pm California Poison Control Center Conference (Alternating Mondays)  
Location: Toxicology Conference Room  
Note: Mondays are the most important days for rotators to be present. Please do your best not to miss this day.

Tuesday:   1st Tuesday-EM conference 0730-930 AM 3rd floor conference room*  
2nd Tuesday-EM conference 0730-930 AM 3rd floor conference room*  
3rd Tuesday- no conference; ask day prior when to arrive  
4th Tuesday- conference at noon, main auditorium of hospital  
5th Tuesday-EM conference 0730-930 AM 3rd floor conference room*  
*(overlooks main lobby of hospital)

Wednesday: 9:30 AM Poison Center Case Review (Toxicology conference room)

Thursday: Rounds (ask day prior when to arrive)

Friday: 9:30 AM Poison Center Case Review (Toxicology conference room)

Note: Bedside consultations and rounds are done based on attendings/fellows schedules.

Dress Code: Most days you will be in the hospital at some point seeing patients so please dress appropriately—wearing a white coat is preferred. Scrubs are fine. Ties are not needed (this is San Diego).
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Components of Rotation

1. **Medical Toxicology Journal Clubs.** Journal Clubs are on Monday mornings between 9:30 AM and 12 PM. There is an alternation each week between review of recent articles and a specific topic. Rotators will be assigned an article to present every Monday except the first day of the rotation. The fellows will try to assign you an article that is relevant to your practice.

   Presenting an article: Please succinctly review. If someone can read the entire article while you are presenting and you are still presenting—you are taking too long 😞

2. **California Poison Control Center Case Conferences.** These occur every other Monday from 12 to 1pm and are a chance for almost all of the medical toxicologists in California to discuss cases. Each site (San Diego, San Francisco, Fresno, and Sacramento) alternates presenting cases. All rotators are expected to attend.

3. **Presentations.** Once during the rotation, each rotator is required to do a presentation. **Presentations are done at the beginning of Journal Club on Mondays (you can present any Monday during the rotation).** You will see example presentations by fellows/rotators prior to yours.

   Details: 10 minute presentation with a printed 1-2 page handout **(no PowerPoint)** Toxicology topic of your choice. There is a list of recently done topics to avoid doing on the wall in the conference room. Please **obtain, read, and cite primary literature** in your preparation of this (Wikipedia, erowid can sometimes be helpful but are NOT primary literature). If there is any question regarding a relevant topic please let us know and we will help out. Please remember to focus on toxicology aspects. For example if reviewing a drug, reviewing therapeutic adverse effects, pharmacokinetics is good but we also want to know about actual overdoses.

   _____ Please place your name on the handout and place a copy in Dr. Schneir’s mailbox along with this worksheet at the end of the rotation.

4. **Bedside consultations.** It is expected that rotators will take call (**8 times if rotating for the month, 4 times if rotating for two weeks**). For those rotating for the month we also desire you to take call for one weekend of the month. We currently do bedside consultations at both UCSD hospitals (Hillcrest and Thornton), Scripps-Mercy, Rady Children’s, VA Medical Center, and Balboa-Navy. While on call you will be responsible for evaluating patients and writing the consultation notes with the help of the fellow. **You will then be expected to follow these patients as long as we are rounding on them.** You will be expected to round with the fellow if you are taking call on a weekend.
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Coordinating call:

1) On the first day of your rotation E-MAIL all three fellows and list:
   a. What days you are going to take call. You can choose these based on
      the master schedule that is on the door of the conference room. For
      residents please select days when you are the only resident on call.
      For students, ideally select days when you are the only student and
      only if need be when a resident is on.
   b. What is the best way to get hold of you (pager or cell).
   c. Best e-mail to contact you at.

2) On the days you are on call TEXT PAGE the fellow on call and tell him/her
   that you are on and give them the best number(s) to get hold of you.

5. Phone consultations. Every Wednesday and Friday at 09:30 the fellows will
   pull poison center cases that they desire to review. The fellow and faculty will
   discuss the cases and direct the rotators in contacting the providers, obtaining
   more information and giving recommendations.

6. Daily Rounds: done on patients we are actively following. Time is variable.

7. Didactic Teaching: done on various topics throughout the rotation by faculty and
   fellows.

8. Online Teaching Modules. At the website: http://toxicology.ucsd.edu/modules.htm
   there are PowerPoint lectures with audio on various toxicology topics. Some of these
   lectures may be given to you live during the rotation and negate any need to review
   them online. For the following rotators please watch the following lectures and
   place check box that you have completed:

   Emergency Medicine Residents and Medical Students:
   ___ Antidote Update
   ___ Botulism
   ___ Carbon Monoxide
   ___ Cardiac Glycosides
   ___ Hot and Altered
   ___ Snake Bites
   ___ Urine Drugs of Abuse
   ___ Wide Anion Gap Acidosis

   Pediatric Residents/Fellows:
   ___ Antidote Update
   ___ One Pill Can Kill
   ___ Tiny People Tiny Doses
   ___ Urine Drugs of Abuse
   ___ Wide Anion Gap Acidosis
9. **Questions for emergency medicine residents and medical students.** In the conference room the toxicology questions are printed out from the two most recent Physician’s Evaluation and Educational Review in Emergency Medicine (PEER VII and PEER VIII) that were written by Dr. Schneir. Accompanying the questions are comprehensive discussions of the answers. During the month please go through all of these questions.

_____ Please check box you reviewed all questions.

10. **Reading.** There are 4 articles/reviews that have been placed on our website to read. Pediatric residents/fellows: read “Toxicology Testing in Kids” and “Methemoglobin”. Everyone else: Read all 4 articles—additional on Serotonin Syndrome and Charcoal.

Please check below box that you have done.

___ Toxicology Testing
___ Methemoglobinemia
___ Serotonin Toxicity
___ Charcoal

Access at [http://toxicology.ucsd.edu/Tox%20Rotation.htm](http://toxicology.ucsd.edu/Tox%20Rotation.htm)

11. **Text.** The latest edition of *Poisoning & Drug Overdose* Editor Kent Olson is a great quick reference, particularly when performing bedside consultations. One copy will be left in the conference room for all to use as desired (please leave it there).

   Medical students will be provided a copy to borrow during the rotation-has to be returned to get a grade.

   Navy residents should have a copy provided/rotated by Navy.

   UCSD Emergency Residents will have a copy to borrow during the rotation.

12. **Poison Center:** In the main hospital (first floor west of the reception desk in the lobby room 1-145 in southwing code to get in is 543) is where the San Diego Division of the California Poison Control System is located. **Medical students are required to visit at least once during the rotation and listen to at least 5 calls.** Please list nature of the 5 calls you listened to below:

   1. __________________________________________
   2. __________________________________________
   3. __________________________________________
   4. __________________________________________
   5. __________________________________________

Please email Lee Cantrell the managing director to arrange a time during the month to meet there. His email is: [lcantrell@calpoison.org](mailto:lcantrell@calpoison.org)
Questions for Rotators on Medical Toxicology Rotation UCSD

Pediatric Residents/Fellows and All

1. T or F Initial dosing of antivenom for rattlesnake envenomation is identical in children and adults.
2. What is the pediatric dosing of glucose for hypoglycemia?
   a. Neonates? ________________
   b. Children? ________________
3. How do you dose activated charcoal to children? ________________
4. T or F QRS prolongation in the setting of poisoning is evidence of sodium channel blockade.
5. A child presents after accidentally ingesting a parents “heart” medication. The ecg reveals occasional PVC’s and the serum potassium is 6.0. The most likely agent is? ______________________
6. A two-year-old accidentally ingests an unknown medication. Physical examination reveals sedation, miosis, and respiratory depression. Naloxone administration reverses all of the adverse effects. What medication could induce these symptoms other than opioids? ________________
7. Bradycardia and hypotension can be caused by many drugs including beta blockers, calcium channel blockers, alpha-two agonists, and cardiac glycosides. Match the physical examination or laboratory finding with each.
   a. Miosis - ________________
   b. Hyperglycemia-______________
   c. Hypoglycemia-______________
   d. Hyperkalemia (two answers possible)-_________________
8. In distinguishing beta blockers from calcium channel blockers. Which one would generally be expected to manifest with cold and clammy skin? ________________
   and which one with warm and dry skin? ________________
9. What toxic pharmaceutical additive has been occasionally added to acetaminophen and has caused outbreaks of pediatric deaths characterized by renal failure? ______________________
10. Name 6 agents that have been used in date rape.
   a. ___________________
   b. ___________________
   c. ___________________
   d. ___________________
   e. ___________________
   f. ___________________

11. Name 3 drugs that can cause methemoglobinemia.
   a. ___________________
   b. ___________________
   c. ___________________

12. What recreationally abused drug bought over the counter classically causes a false positive screen for phencyclidine (PCP) on a urine drugs of abuse panel?

13. A child appears “drunk” but has no ethanol present. A chem. 7 is normal but an osmolar gap exists and ketones are positive in the urine. What is the most likely agent?____________________________

14. T or F Fluorescein is added to ethylene glycol (antifreeze) so physicians can identify the presence of it in the urine.

15. A child has a generalized convulsion while out boating with his family. He presents confused with normal vital signs. Name the potential non-ingested toxin that needs to be considered.________________________

16. A child presents with ataxia and hypoglycemia. Name the most likely agent________________

17. A child ingests pills that are used to treat his mother’s “positive ppd”. What is the antidote? ______________________

18. T or F Generally, the presence of vomiting and diarrhea within 6 hours after a mushroom ingestion predicts the ingestion of a benign mushroom.

19. T or F Lead toxicity predominantly manifests as a sensory neuropathy.

20. How does iron poisoning cause a metabolic acidosis?________________________________________________

21. T or F There is no benefit of beginning N-acetylcysteine treatment for an acute acetaminophen overdose at 0-4 hours s/p ingestion as compared with 4-8 hours.
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Questions Geared for Emergency Medicine Residents, Medical Students—Peds Residents/Fellows if Desired

1. List 5 reasons why it is considered standard of care to check an acetaminophen concentration on all patients who intentionally overdose?
   a. __________________________
   b. __________________________
   c. __________________________
   d. __________________________
   e. __________________________

2. Name 3 characteristics of carbon monoxide make it so dangerous?
   a. __________________________
   b. __________________________
   c. __________________________

3. T or F Headache is the most common symptom of carbon monoxide poisoning.

4. Name two screening questions that can help determine if the symptoms a patient has are related to carbon monoxide poisoning?
   a. __________________________
   b. __________________________

5. T or F The results of urine drugs of abuse screens are essential to help manage most intentionally poisoned patients.

6. T or F QT prolongation is reflective of sodium channel blockade.

7. T or F Acetaminophen can effectively treat hyperthermia.

8. Name 5 toxidromes/clinical syndromes induced by drugs that can cause hyperthermia.
   a. __________________________
   b. __________________________
   c. __________________________
   d. __________________________
   e. __________________________
9. Blood Gases:
   Interpret the following blood gases and name one drug/drug class associated with it.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Interpretation</th>
<th>Drug?</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH 7.20 pCO2 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH 7.20 pCO2 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH 7.60 pCO2 20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH 7.46 pCO2 20</td>
<td></td>
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</tr>
</tbody>
</table>

10. T or F Selective serotonin reuptake inhibitors are generally considered more dangerous in overdose than tricyclic antidepressants.

11. What is the treatment for tricyclic antidepressant-induced convulsions?____________________

12. What is the treatment for diphenhydramine-induced QRS prolongation?____________________

13. T or F Carboxyhemoglobin and methemoglobin can be measured accurately on venous blood.

14. T or F Alcoholic ketoacidosis is typically characterized by a relatively normal mental status.

15. Hyperammonemia in the absence of hepatotoxicity is characteristic of which drug?____________________ Name the antidote for it.____________________.

16. It is quite rare to die from a rattlesnake envenomation. Name 3 ways it could happen.
   a. ______________________
   b. ______________________
   c. ______________________

17. What electrolyte can be used as evidence of acute digoxin poisoning?____________________
18. Name 3 agents/plants other than digoxin that can cause cardiac glycoside poisoning.
   a. ______________________________
   b. ______________________________
   c. ______________________________

19. An injection drug user presents with ptosis, mydriasis, and has dysphagia. What toxin are you concerned about? ______________________________

20. Name 3 physical examination findings of opioid withdrawal?
   a. ______________________________
   b. ______________________________
   c. ______________________________

21. T or F Opioid withdrawal is typically associated with an altered level of consciousness.

22. Name 2 drugs that when administered therapeutically to a patient who is on lithium can produce lithium toxicity.
   a. ______________________________
   b. ______________________________

23. Roughly what is the average amount of ethanol metabolized per hour (mg/dL)? ______________________________ What does it depend on? ______________________________

24. Name 3 characteristics of drugs make them amenable to removal by hemodialysis?
   a. ______________________________
   b. ______________________________
   c. ______________________________

25. Name 5 toxins that can be effectively removed by hemodialysis.
   a. ______________________________
   b. ______________________________
   c. ______________________________
   d. ______________________________
   e. ______________________________
Toxicology Unknowns (Classic presentations: name the poison/syndrome)

1. Child presents with significant vomiting and diarrhea. KUB reveals pills in stomach. Poison? ___________________________
2. COPD patient presents with convulsion, tremors, tachycardia, wide pulse pressure and is noted to have hypokalemia. _________________________
3. Patient with bipolar disorder presents tremulous, confused, hyperreflexic. _____________________________
4. Psychiatric patient who has had no changes/additions of any medications presents with severe rigidity, confusion, elevated CPK and a rectal temperature of 107 F. _____________________________
5. Patient presents with severe vomiting and diarrhea and subsequently develops multi-system organ failure and alopecia. _____________________________

The following drugs/syndromes have induced toxicity: name the antidotes/treatment

Sulfonylureas ____________________________
Beta Blockers ____________________________
Calcium Channel Blockers __________________
Digoxin ____________________________
Acetaminophen ____________________________
Atropine ____________________________
Methanol ____________________________
Ethylene glycol ____________________________
Serotonin toxicity ____________________________
Malignant Hyperthermia ____________________________
Methemoglobinemia ____________________________
Cyanide ____________________________
Organophosphorous compounds ____________________________