

**TH 4120 Therapeutics II**  
**Content – Exam #1**  
**March 4, 2004**

Name \_\_\_\_\_

- 1) Which of the following best describes the mechanism of action of zolpidem for the treatment of sleep disorders?
  - a. Blocks histamine-1 receptors which leads to sedation
  - b. Acts at BZ-1 receptors**
  - c. Enhances pineal gland secretions
  - d. Enhances GABA activity
  - e. Induces sleep through anticholinergic side effect
  
- 2) Treatment with clozapine requires monitoring weekly CBCs for the first six months of therapy because this agent may potentially cause which adverse effect?
  - a. Hemolytic anemia
  - b. Eosinophilia
  - c. Leukocytosis
  - d. Agranulocytosis**
  - e. Thrombocytopenia
  
- 3) Which of the following does not undergo hepatic oxidation?
  - a. Oxazepam**
  - b. Diazepam
  - c. Chlordiazepoxide
  - d. Alprazolam
  - e. Flurazepam
  
- 4) Which of the following medications has been shown to induce a manic episode?
  - a. Theophylline**
  - b. Diphenhydramine
  - c. Warfarin
  - d. Montelukast
  - e. Dextromethorphan
  
- 5) Which of the following should be considered for patients suffering from treatment refractory obsessive-compulsive disorder?
  - a. Lithium
  - b. Risperidone
  - c. Temazepam
  - d. Propranolol
  - e. Clomipramine**

- 6) Which of the following is false regarding randomization?
- a. Using a lottery system to randomly assign patients to treatment groups is an appropriate randomization technique
  - b. Forms the basis for the validity of statistical tests used to analyze the study results
  - c. Tends to create groups that are comparable in key baseline characteristics when large sample sizes are involved
  - d. Occurs when subjects have an equal chance of being assigned to treatment groups
  - e. **Increases the chance for bias from the investigators when assigning treatment groups**
- 7) Which of the following adequately describes rebound insomnia?
- a. New complaint of early morning awakening while being treated for difficulty falling asleep
  - b. Benzodiazepines no longer induce sleep
  - c. Insomnia worsens when patients do not utilize the drug and try to discontinue use of benzodiazepine
  - d. **Increased nervousness and enhanced difficulty falling asleep when patients try to discontinue use of benzodiazepine**
  - e. Sleep hygiene therapy is inadequate
- 8) Which of the following is a symptom of moderate lithium toxicity?
- a. Ataxia
  - b. Nystagmus
  - c. Seizures
  - d. **Anorexia**
  - e. Coarse tremor
- 9) A study was performed to evaluate the effectiveness of adding rosiglitazone to sulfonylureas for lowering HbA1C in Type 2 diabetics. Adding rosiglitazone reduced HgA1C levels from 9.3% to 8.9%, an average difference of 0.4% (95% CI 0.2 to 0.6). Which of the following statements is true?
- a. Adding rosiglitazone results in both a statistically significant and clinically significant decrease in HgA1C
  - b. **Adding rosiglitazone results in a statistically significant decrease in HgA1C, but clinical significance is questionable**
  - c. Statistical and clinical significance cannot be determined without a p value.
  - d. Adding rosiglitazone results in a non-statistically significant decrease in HgA1C, but clinical significance is apparent
  - e. Adding rosiglitazone results in both a non-statistically and non-clinically significant decrease in HgA1C

- 10) Which of the following treatment strategies is considered first-line for treatment of bipolar depression?
- a. **Lamotrigine**
  - b. Paroxetine
  - c. Phenelzine
  - d. Carbamazepine
  - e. Amitriptyline
- 11) Which of the following statements is true regarding external validity?
- a. External validity refers to the extent to which results actually reflect what happened in the study
  - b. External validity is strengthened when study subjects are blinded
  - c. External validity is directly dependent on a study's power
  - d. **External validity refers to the degree to which the results can be applied to patients routinely encountered in clinical practice**
  - e. External validity is strengthened if the study is deemed to not be internally valid
- 12) The mechanism of action of methylphenidate and amphetamines in ADHD is not well understood. Which statement is the best description of their hypothesized mechanism of action in ADHD?
- a. Both restore the overall balance of neurotransmitters in the central nervous system through inhibition of reuptake of serotonin only
  - b. Both restore the overall balance of neurotransmitters in the central nervous system through inhibition of reuptake of dopamine only
  - c. Both restore the overall balance of neurotransmitters in the central nervous system through inhibition of reuptake of norepinephrine only
  - d. **Both restore the overall balance of neurotransmitters in the central nervous system through inhibition of reuptake of multiple neurotransmitters**
  - e. Both restore the overall balance of neurotransmitters in the central nervous system through inhibition of catechol O-methyltransferase activity.
- 13) Which of the following is a risk factor for depression?
- a. Male Gender
  - b. Pregnancy
  - c. Alcohol Use
  - d. Medical Illness
  - e. **Age 20-40**

- 14) Which of the following atypical antipsychotics is associated with the lowest average weight gain?
- a. Clozapine
  - b. Olanzapine
  - c. Risperidone
  - d. Quetiapine
  - e. **Ziprasidone**
- 15) Which of the following is a symptom of serotonin withdrawal syndrome?
- a. Headache
  - b. **Insomnia**
  - c. Myoclonus
  - d. Diarrhea
  - e. Diaphoresis
- 16) Which of the following is a complication of glucocorticoid administration?
- a. Addison's disease
  - b. **Cushing's disease**
  - c. Hyperkalemia
  - d. Weight loss
  - e. Suppressed appetite
- 17) When treating a patient for hyperthyroidism with RAI, which of the following medications should be used as adjunct therapy?
- a. Thionamides 6 to 8 weeks prior to RAI and continued for 4 weeks
  - b. **Iodides a few days after RAI**
  - c. Thionamides 2 to 4 weeks after RAI
  - d. Iodides 2 to 4 weeks prior to RAI
  - e. Clonidine at any time to alleviate symptoms
- 18) Which of the following etiologies of hyperthyroidism is associated with a decreased Radioactive Iodine Uptake?
- a. Grave's disease
  - b. Toxic adenoma
  - c. **Subacute thyroiditis**
  - d. Pituitary adenoma
  - e. Multinodular goiters

- 19) Which of the following statements about stimulants used to treat ADHD and Tourette's syndrome is correct?
- a. Stimulants are indicated as first-line agents for the treatment of ADHD in patients with comorbid Tourette's syndrome.
  - b. Stimulants are absolutely contraindicated in ADHD patients with comorbid Tourette's syndrome because of serious adverse effects.
  - c. Stimulants must always be combined with TCAs in ADHD patients with comorbid Tourette's syndrome to prevent worsening of Tourette's syndrome.
  - d. Stimulants may help to suppress Tourette's syndrome in ADHD patients with a past history or family history of Tourette's syndrome.
  - e. **Stimulants may unmask or exacerbate Tourette's syndrome in ADHD patients with a past history or family history of Tourette's syndrome.**

- 20) Subclinical hypothyroidism is characterized by which of the following?

- a. Symptoms of hypothyroidism, decreased TSH, T<sub>4</sub> and T<sub>3</sub>
- b. No symptoms of hypothyroidism, decreased TSH, T<sub>4</sub> and T<sub>3</sub>
- c. Possible symptoms of hypothyroidism, decreased TSH and normal T<sub>4</sub> and T<sub>3</sub>
- d. **Possible symptoms of hypothyroidism, increased TSH and normal T<sub>4</sub> and T<sub>3</sub>**
- e. No symptoms of hypothyroidism, increased TSH, T<sub>4</sub> and T<sub>3</sub>

**TH 4120 Therapeutics II**  
**Exam #1 – Application**  
**March 4, 2004**

Name \_\_\_\_\_

S: DS is an 11 yo wm who was diagnosed with ADHD a little over a year ago. At that time, his mother stated that DS had been more hyperactive, impulsive, and that he always seemed to be “on to go”. His teacher also complained that he had difficulty listening, was unable to follow instructions, did not wait his turn, and seemed to get bored during activities. Upon diagnosis, DS’s symptoms were so severe that his mother had a hard time finding an after school program that would accept him. DS’s symptoms had greatly improved since his diagnosis *until* about 1 month ago. Now, DS is experiencing similar symptoms – however, they do not appear to be as severe as they were upon diagnosis. DS’s mother states that his medication is taken as prescribed.

PPH: ADHD, diagnosed ~1 year ago

PMH: None

Meds: Concerta 54mg po every day (Pt has received thjs dose for the past 9 months.)  
Past medications: Methylphenidate 15mg po bid (Changed to Concerta 54mg po every day 9 months ago)

Allergies: NKDA

FH: Both father and uncle have a history of hyperactivity during childhood and were diagnosed with ADHD. His mother suffers from migraine headaches.

SH: Lives with brother and both parents in upper class St. Louis suburb

ROS Occasional headaches

Vitals (today):	BP 110/60	P 62	Wt 36kg	Ht 55”
Vitals (6 months ago):	BP 108/58	P 63	Wt 34kg	Ht 54”

1. Please assess DS's ADHD. Be sure to include current status, etiology. Also, please include at least two contributing factors which may be affecting DS's ADHD. (4 points)
  - ❑ Status: Uncontrolled ADHD (1 pt)
  - ❑ Etiology: thought to be due to imbalance of neurotransmitters (1 pt) and/or genetics
  - ❑ Contributing Factors: positive family history (1 pt); tolerance to medications (1 pt) – Students should have tolerance as contributing factor – be lenient for other contributing factor clear. However, second contributing factor should be consistent with this case.
  
2. Please evaluate DS's current therapy for ADHD. Be sure to include appropriateness, efficacy, and compliance. (6 points)
  - ❑ Appropriateness: Concerta (long acting stimulant) is appropriate for ADHD once a patient has been stable on a short-acting stimulant. (1 pt) The dose, route and frequency are also appropriate. (1pt)
  - ❑ Efficacy: does not appear to be efficacious at this time (2 pt); ineffectiveness likely due to tolerance to the medication (1 pt)
  - ❑ ADRs – none present; (Students may put “tolerance” however, credit is given above)
  - ❑ Compliance – Mother states giving patient medication as prescribed. (1 pt)
  
3. Provide specific recommendations for what to do with DS's current ADHD drug therapy. Please be sure to include a plan for existing therapy, any new therapy needed and justification for each recommendation. (10 points)

- ❑ Concerta: Discontinue Concerta (2 pts)

Rationale: Patient is likely experiencing tolerance to the medication. (1 pt) Patient is receiving the maximum recommended dose; therefore therapy must be discontinued and a short-acting stimulant must be initiated. (1 pt)

- ❑ Initiate a short-acting stimulant
  - Options include the following: (1 pt for drug, 1 pt for route, 1 pt for dose, 1 pt for frequency)
    - Dexedrine 2.5-5mg po
    - Adderall 2.5-5mg po once daily (may also recommend multiple daily doses)

Note: students should not start methylphenidate IR because patient has received in past...

No credit should be given if student initiates a long acting agent.

- Rationale: Once a patient is on max dose of a LA-product and is not experiencing symptomatic relief...the agent must be switched to a short-acting & titrated up accordingly...*Start with short-acting and then converted to long-acting preparation once an effective dose is established.* This allows for closest titration of effect and monitoring of side effects. (2 pts)

Credit may be given if justification is correct even though wrong drug is selected.

## TH 4120 Exam 1 – Case 2 – 30 points total

CC/HPI: RS, a 40 year-old man, is brought to the ER by the police because of extremely agitated behavior. His wife had called the police because he was on the roof of their home with a gun shooting into the shingles. RS had worried for some time that the mortgage balance in the house was too large; now he was yelling that the house was “killing his spirit” and that he couldn’t handle it any longer. He had told his wife that he was “inadequate as a husband and a father for their 2 children”. In your interview with him in the ER, he tells you that for the past week he has been hearing the voice of his deceased father telling him to kill himself after destroying the house and he has been thinking about death for a couple months. This has caused him great distress. He was recently fired from his job as a computer analyst for “down sizing”. His wife reports that he has had poor sleep over the past month with difficulty falling asleep and waking up during the night, unable to go back to sleep. He states his mood is depressed and he has lost 15 pounds in the past 2 weeks as a result of decreased appetite.

PPH: Positive for two past episodes of depression, one at age 22 and the other at age 35. Both episodes resolved after an 8-week course of imipramine 250mg/day.

PMH: Hypertension  
Atrial Fibrillation  
GERD

Meds: Diltiazem 120 mg bid  
HCTZ 25 mg qd  
Coumadin 4 mg qd  
Protonix 40 mg qd

Allergies: penicillin (rash)

FH: mother has a history of depression and died of MI at age 65; Father died at age 70 with colon cancer; 2 older brothers with diabetes and high blood pressure

SH: denies tobacco, drug or alcohol use; lives with wife at home and two children

ROS: negative for all systems; only came in because police made him

PE: patient refused

VS: BP: 136/92 P: 84, irregular RR: 14 Temp: 36.8 Weight: 78kg Height: 5’11”

Mental Status Exam: patient refused

Labs:

Na: 142 K:4.0 Cl: 103 CO<sub>2</sub>: 24 BUN/SCR: 14/1.1 Ca: 10 Gluc: 105mg/dL

INR: 1.9 PT: 28.3

WBC: 6.7 HGB: 14.0 HCT: 49.5 PLT: 250 (normal differential)

T3 total 125ng/dl t-3 uptake 27% t-4 free 1.2ng/dl TSH 2.0 MIU/L



1. The attending ER physician's initial impression is that RS has depression. Assess RS's depression stating the severity and features of depression specific to this patient. Using DSM-IV criteria, support your assessment of depression with a list of five symptoms that have been present during the same 2 week period and represent a change from previous functioning.(10 pts).

*(Please note: You may summarize symptoms to save time)*

**Major Depressive Disorder (+2), severe (+2) with psychotic features (+1) (5pts).**

**Give 1 pt if student states "depression" and not major depressive disorder.**

Pt meets diagnosis for MDD based on the following (in bold): (Please note, 1 point is given for each correct symptom listed)

- A. Five (or more) of the following **symptoms** have been present during the same **2 week** period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.
  1. **Depressed mood most of the day, nearly every day, as indicated by either subjective report (feels sad/empty) or observation made by others (tearful) (1 pt)**
  2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day
  3. **Significant weight loss when not dieting or weight gain (change of  $\geq 5\%$  of body weight in 1 month) or decrease or increase in appetite nearly every day (1pt)**
  4. **Insomnia or hypersomnia nearly every day (1 pt)**
  5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
  6. Fatigue or loss of energy nearly every day
  7. **Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick) (1 pt)**
  8. Diminished ability to think or concentrate or indecisiveness, nearly every day
  9. **Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide (1 pt)**

2. After admission to the Acute Psychiatric Unit, the Psychiatry Service determines that RS has psychotic features with his depression and suggests initiating ziprasidone and an antidepressant. Please suggest the recommended starting dose, suggested titration schedule, goal dose and instructions for appropriate administration of ziprasidone, and duration of therapy. (5 pts)

**Recommended starting dose:** ziprasidone 20 mg bid (1 pt)

**Titration schedule:** Titrate by 40mg/day every 2 days (1 pt)

**Goal dose:** ziprasidone 120mg per day (1pt)

**Instructions for administration:** Must be taken twice a day with food (1pt)

**Duration:** Taper and discontinue the antipsychotic 6 weeks after psychosis resolves (1 pt).

3. Before ziprasidone is initiated, two baseline monitoring parameters are necessary. Please list the two baseline monitoring parameters and justify the need for these measurements. (5 pts)

- EKG (1 pt)

Justification: Due to risk of QT prolongation (1 pt)

- Potassium and magnesium (2 pts)

Justification: Hypokalemia and hypomagnesemia increase the risk for prolonged QT intervals (1 pt)

Full credit may be given if student lists potassium and magnesium as two separate parameters.

4. RS returns to clinic in 6 months and you see him for follow-up. He has been taking escitalopram 10 mg po qd and states he feels so much better. However he tells you, almost embarrassed, that he has noticed increased difficulty with his "sexual self". He states that he has a decreased sexual drive which has begun to affect his marriage. His wife thinks he must be depressed again. After discussing this with the clinic Nurse Practitioner, you both decide RS is experiencing SSRI-induced sexual dysfunction. Please recommend drug therapy changes to alleviate this adverse effect. Provide justification for the antidepressant that you recommend for the patient. (10 pts)

**Drug (3 pt), dose (2 pt), frequency (2 pt)**

- Add or change to agent that does not significantly affect sexual dysfunction and titrate maximal effective doses:

1. **Bupropion 100 mg bid x 3 days then 100 mg TID (or bupropion SR 150 mg qd x 3 days then 150 mg bid or bupropion XL 150 mg qd) Appropriate titration schedule should be given for full credit??**

or

2. **Nefazodone 100 mg bid**

or

3. **Mirtazapine 15 mg qhs**

**Justification: Antidepressant therapy with an agent that does not significantly affect sexual activity should be used in place of/in addition to escitalopram. (3 pts)**  
**TH 4120 Exam 1 – Case 3 – 10 points total**

S: Mr. G is a 57 yo self-employed male who presents to his PCP.

CC: "My heart's pounding out of my chest, I'm more irritable than normal". He also complains of excessive sweating, palpitations, trouble breathing and weight loss. He states he has a "mass" in his neck and that it has been growing for some time; he's embarrassed that he waited this long to be seen, but his new health insurance just became active. He's very concerned because he's having trouble breathing and swallowing.

PMH: Gout – last attack Christmas, 2001

PSH: S/p bunionectomy 1998

FH: Non-contributory

Meds: OTC Advil prn HA

Vitals: BP 156/92 HR 124 O2 sat 90% Ht 5'9", Wt 58kg

Last weight 2001: 65kg

ROS/PE

General: white male in distress; appears anxious

Skin: dry

Extremities (-) LEE

HEENT: non-remarkable

CV: tachycardic

Pulm: CTA B

GI: (+) BS

GU: non contributory

Neurologic: non-contributory

**3/4/04 Labs:**

TSH 0.03mIU/L

T<sub>4</sub> 8.74 ug/dL

T<sub>3</sub> resin uptake 40%

RAIU 37%

Thyroid antibodies (-)

Chem 7 / CBC WNL

Uric acid WNL

UA: (-) ketones, (-) glucose (-) protein

**Mr. G's PCP diagnoses him with hyperthyroidism secondary to toxic multinodular goiter.**

1. Please provide a justification/rationale for the diagnosis of this patient. (2 points)
  - Hyperthyroidism b/c TSH decreased, (1 point) and T3 resin uptake elevated (1pt)
  - Goiter present on exam
2. What etiologies of hyperthyroidism can be ruled out in this patient and why? (2 points)
  - **NOT** Graves' Disease b/c of negative thyroid antibodies (1 pt)
  - **NOT** thyroiditis, ectopic tissue or exogenous ingestion b/s RAIU is high (1 pt)  
Students need to mention thyroid antibodies and something about RAIU. If not mentioned – give ½ credit.
3. Please select and recommend drug therapy only for this patient. Please include adjunct medications, if needed. Be sure to provide the rationale/justification and duration of therapy for all treatments chosen. (6 points)

The regimen below is okay and should be given credit IF the student also recommends surgery.

- PTU 300-600mg/d (divided 3-4x/d) or MMI 30mg/d (qd or in divided) (1 point) for 6-8 weeks until pt is biochemically stable
- Iodides: Lugols solution or SSKI (1 pt) 10-14 days prior to surgery (1 pt) to decrease vascularity of the gland (1 pt)
- Propranolol 20-40mg po qid titrate to HR <90 (1pt) to control symptoms (1 pt)

Otherwise:

RAI 131 (1pt) because it is treatment of choice (1 pt)

Iodides (dosed same as above) (1pt) allows for RAI uptake (1pt) – give after RAI

Propranolol (as above)