WCC “How to ...” Series:

HOW TO Create Good Test Questions?
By Gloria Velarde, R.N., M.S.N.
Nursing Faculty
Creating Good Test Questions

- Why?
  - It’s the hardest and most important part of your role as an instructor.
  - It serves to measure your teaching effectiveness!
  - DID YOUR STUDENTS LEARN?
Creating Good Test Questions

- Purposes of this session ---

1. What do you need to get started in constructing a valid test?

2. What are some basic tips in the actual writing of test items?
Creating Good Test Questions:

- What do you need to get started in constructing a valid test?
  - KNOW the course you’re teaching
  - What is the Department’s intent in offering this course?
  - What is expected in all sections of this course?
Creating Good Test Questions:

- What do you need to get started in constructing a valid test?

- **KNOW** what’s in the Master Syllabus Form (MSF)
  - The MSF is WCC’s official document describing the content (description, outcomes, units, objectives, evaluation methods, assessment methods) of a course. Each course has a syllabus which is followed by all instructors who teach sections of a course.
Creating Good Test Questions:

- What do you need to get started in constructing a valid test?

- MSF (cont.)
  - Specifically, know the course’s objectives and evaluative criteria.

- All MSFs can be found on the WCC website: [http://www.wccnet.edu/departments/curriculum/progd ata.php?levelone=syllabi](http://www.wccnet.edu/departments/curriculum/progd ata.php?levelone=syllabi)
Creating Good Test Questions:

- What do you need to get started in constructing a valid test?
  - MSF Sample
    - NUR 115 Pharmacology
  - Look at (p. 3):
    - Outcomes/Assessment
    - * Objectives/Evaluation
Creating Good Test Questions

<table>
<thead>
<tr>
<th>Course</th>
<th>Course Title</th>
<th>Course Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUR 11S</td>
<td>Pharmacology</td>
<td>This course includes basic principles of Pharmacology and major drug classifications among a body systems approach and the nursing process. Pharmacology builds on previous knowledge of Pathophysiology and drug dosage calculation. General mechanisms of drug action, clinical indications for use, common adverse reactions, general nursing implications, and significant drug interactions are discussed. This is a required course in the nursing program, but may also be taken for transfer with consent of the instructor.</td>
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<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Assessment</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Methods for determining course effectiveness</td>
</tr>
<tr>
<td>(Applicable in all sections)</td>
<td></td>
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</tbody>
</table>

1. Recognize drug classifications and related prototypes.
2. Recognize the effects of each prototype on disorders and disease in each body system.
3. Recognize nursing implications for prototypical drugs in self-classification through the application of the nursing process.

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>Objectives</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Applicable in all sections)</td>
<td>Methods for determining level of student performance of objectives</td>
</tr>
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</table>

Outcome 1 - Recognize drug classifications and related prototypes.
1. Identify what drug classifications and related prototypes can be used to treat diseases and disorders in the following:
   a. Infections
   b. Cardiovascular system
   c. Neurologic system
   d. Digestive system
   e. Endocrine system
   f. Reproductive system
   g. Respiratory system

Outcome 2 - Recognize the effects of each prototype on disorders and disease in each body system.
1. Identify the pharmacological action of each prototype, specifically, the pharmacokinetics and pharmacodynamics.
2. Identify the therapeutic effect of the prototype.
Creating Good Test Questions:

- What do you need to get started in constructing a valid test?
  - Determine the level of learning based on the objectives
    - Cognitive levels based on Bloom’s taxonomy
Creating Good Test Questions

<table>
<thead>
<tr>
<th>Cognitive domain</th>
<th>Knowledge</th>
<th>Comprehension</th>
<th>Application</th>
<th>Analysis</th>
<th>Synthesis</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall previously learned material; all that is required is to bring the necessary information to mind.</td>
<td>Comprehend the meaning of material, the lowest level of understanding.</td>
<td>Use material that has been learned in new and defined situations and problems.</td>
<td>Break material down into its component parts and to understand its underlying structure.</td>
<td>Combine parts to form a whole, to synthesize a variety of elements into an original and significant whole.</td>
<td>Evaluate a total situation, to judge the value of material for a certain purpose, combining the elements of all other categories and value judgments.</td>
<td></td>
</tr>
</tbody>
</table>
Creating Good Test Questions

What do you need to get started in constructing a valid test?
- Select Test Questions based on the:
  - Level of Learning *
  - Longer range program outcomes/objectives
- Ex) for Nursing Program – the RN licensure exam is multiple-choice
Creating Good Test Questions

• Moving on to the 2\textsuperscript{nd} purpose of this “HOW TO” session ...
Creating Good Test Questions

What are some basic tips in the actual writing of test items?

Types of Written Test Questions:

- #1 - True/False
- #2 - Matching
- #3 - Multiple Choice
- #4 - Short Answer
- #5 - Essay
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- What are some basic tips in the actual writing of test items?
  - NOTE: There are other methods of evaluating student learning within specialized courses:
  - Oral presentations
  - Student portfolios
  - Performance observations
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Test Writing Tips:

#1 - True/False Questions

Cognitive level: Knowledge

TIPS:

- Avoid double-negatives
- Avoid long, complex sentences
- Clarify determinants carefully – i.e. Never, all, may, few
Creating Good Test Questions

- Test Writing Tips:
  - #1 - True/False Questions
    - TIPS (cont.):
      - Use only one central idea in each item.
      - Don’t lift items straight from the book.
      - Make more false than true (60/40) – students are more likely to answer ‘true’.
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Test Writing Tips:

#2 – Matching

Cognitive level: Knowledge, some Comprehension

TIPS:

- Need 15 items or less.
- Give good directions on basis for matching.
- Use items in response column more than once to reduce risk of guessing.
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Test Writing Tips:

- #2 – Matching

TIPS (cont.):

- Use related material in each exercise.
- Make all responses plausible.
- Put all items on single page.
- Put responses in some logical order (i.e. alphabetically, chronologically, etc.)
- Responses should be short.
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Test Writing Tips:

#3 – Multiple Choice Questions

Cognitive level: Application, Synthesis, Analysis and Evaluation

TIPS:

- Avoid double-negatives
- Stem – should be represent a single, clear problem/area – a student who knows content, should be able to answer question before reading alternatives.
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Test Writing Tips:

#3 – Multiple Choice Questions

TIPS (cont.):

Alternative responses:

- Avoid “all...” or “none ...” of the above.
- Make all distracters plausible and related.
- List in a logical or numerical order, if applicable
- Have 4 alternatives – list on separate lines
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Test Writing Tips:
- #3 – Multiple Choice Questions
  TIPS (cont.):
  - Make each MC item an independent question from others on test.
  - Place correct answer at random
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Test Writing Tips:

- #4 – Short Answer Questions
  - Cognitive level: Application, Synthesis, Analysis and Evaluation
  - TIPS:
    - Use direct questions – not an incomplete statement (i.e. fill-ins).
    - Try to phrase questions so there is only one possible answer.
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Test Writing Tips:

#4 – Short Answer Questions

TIPS (cont.):

- For definitions, give term vs. definition.
- For numbers, indicate the degree of precision expected (e.g. round to the nearest tenth place).
- Allow enough space/blanks for response and easy scoring.
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Test Writing Tips:

#5 – Essay Questions

Cognitive level: Application, Synthesis, and Evaluation

TIPS:

- Give clear, specific directions – give definitive area for student to answer.
- Use check-list point system to score model answer (have or keep samples)
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Test Writing Tips:

- #5 – Essay Questions

  TIPS (cont.):
  - Don’t give students a ‘choice’ of questions to answer.
  - Provide reasonable time for answering these questions.
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- Test Writing Tips:
  - A Word on Test Banks
    - Can be helpful for having a large pool of questions to start with.
    - Make sure any test question relates to the objectives of the course.
Creating Good Test Questions

Summary of General Test Writing Tips:

• Let’s look at some sample test questions ..........
## Creating Good Test Questions

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<tr>
<th>Course Objectives</th>
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<th>Evaluation</th>
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<tbody>
<tr>
<td>Indicate the objectives that support the course outcomes given above.</td>
<td>(applicable in all sections)</td>
<td>Methods for determining level of student performance of objectives</td>
</tr>
<tr>
<td><strong>Course Evaluations</strong></td>
<td>Outcome 1 - Recognize drug classifications and related prototypes.</td>
<td>Obj. 1 - Multiple choice, fill-in-the-blank, matching and short essay questions.</td>
</tr>
<tr>
<td>Indicate how instructors will determine the degree to which each objective is met for each student.</td>
<td>1. Identify what drug classifications and related prototypes can be used to treat diseases and disorders in the following: a. infections b. cardiovascular system c. neurologic system d. digestive system e. endocrine system f. reproductive system g. respiratory system</td>
<td></td>
</tr>
<tr>
<td>Outcome 2 - Recognize the effects of each prototype on disorders and diseases in each body system.</td>
<td>1. Identify the pharmacological action of each prototype, specifically, the pharmacokinetics and pharmacodynamics. 2. Identify the therapeutic effect of the prototype.</td>
<td>Obj. 1-4 - Multiple choice, fill-in-the-blank, matching and short essay questions.</td>
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Creating Good Test Questions

What is the level of learning expected based on how the objective is stated:

- ANS: Knowledge
- Possible test question:

Identify the major drug classification or subclass for lisinopril (Prinivil).

a) hematopoietic
b) ACE inhibitor
c) cardiotonic
d) diuretic
e) alpha blocker
Creating Good Test Questions

<table>
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<tr>
<th>Outcome 3 - Recognize nursing implications for prototypical drugs in each classification, using the Nursing Process:</th>
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<tr>
<td><strong>Assessment</strong></td>
</tr>
<tr>
<td>1. Identify therapeutic effects of prototypes</td>
</tr>
<tr>
<td>2. Identify side effects and adverse effects of prototypes</td>
</tr>
<tr>
<td>3. Identify what assessments need to be made before a prototype can be administered</td>
</tr>
<tr>
<td>4. Identify when it is appropriate that a prototype not be administered.</td>
</tr>
<tr>
<td>5. Identify that a patient has understood drug Information</td>
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</table>

Obj. 1-17 - Multiple choice, fill-in-the-blank, matching and short essay questions.
Creating Good Test Questions

What is the level of learning expected based on how the objective is stated:

- **ANS:** Comprehension

Possible test question:

A desired or therapeutic effect of gemfibrozil (Lopid) is:

a) reduced blood pressure.
b) increased PTT.
c) increased heart rate.
d) reduced LDL levels.
## Creating Good Test Questions

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<tr>
<td>6. Identify that a patient needs more information regarding their medications</td>
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<tr>
<td>7. Identify patients at risk of drug–drug and/or drug-food reactions and interactions</td>
</tr>
<tr>
<td>8. Identify that a patient may be at risk for drug side effects and adverse effects</td>
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</tbody>
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<th>Planning</th>
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<tbody>
<tr>
<td>9. Determine what information the patient or care provider needs regarding the prototype to provide safe and effective drug administration.</td>
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</tbody>
</table>
Creating Good Test Questions

- What is the level of learning expected based on how the objective is stated:
  - ANS: Application/Analysis

- Possible test question:

Which of the following statements made by a client receiving atorvastatin (Lipitor) indicates a need for further teaching?

a) “I should take my medication with dinner.”

b) “I will limit my alcohol intake to 1 or 2 drinks per day.”

c) “I will maintain a steady intake of green leafy vegetables.”

d) “I will limit fluid intake to one-and-a-half to two liters daily.”
Creating Good Test Questions

Summary of General Test Writing Tips:

- Test Questions should be constructed to evaluate the appropriate level of learning based on the Master Syllabus Form’s course objectives.
- Writing good test questions takes time.
- Good test questions evaluate student learning and serve as a means to modify instructional methods and teaching focus.
Creating Good Test Questions

• Summary of General Test Writing Tips:
  • Besides testing at the appropriate learning level, other points to follow for all tests:
    • Clear and unambiguous – both test items and directions.
    • Fair – tests on key points or content that is emphasized in class
    • Start off with a few easier items.
    • Appropriate length – not too short or too long.
    • NO TYPOS!!
Creating Good Test Questions

Summary of General Test Writing Tips:

- Tests are intended to be reviewed and revised regularly.
  - Look at item analysis of each test.
  - Have your colleagues review/take your tests.
  - Hold test reviews with students.
  - Consider having two versions of test.
Creating Good Test Questions

Additional Resources:

- [http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/quizzes.htm](http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/quizzes.htm)
- WCC Curriculum & Assessment Handbook – 2007 (available from WCC website under Staff)