Writing Multiple Choice Test Questions

Cincinnati Children's
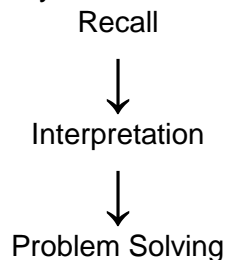changing the outcome together

Purpose

Good test questions measure the knowledge and skill(s) required to answer correctly.

What kinds of questions should we write? That depends. As test writers, we should ask ourselves, "What's the goal of the content?" and "What is the goal of the test?".

Taxonomy

Questions have their own taxonomy:

Recall

↓

Interpretation

↓

Problem Solving

Testing recall is good, but testing how to use that recall is even better.

Questions Should

Reinforce learning and application
- Seeing content again in a test format reinforces the information and increases retention.
- However, tests should not introduce new content. If content wasn't important (or relevant) enough to include during the activity, it's not important enough to put on the test.

Test right answer/action, not "what not to do"
- You want to reinforce appropriate action or knowledge. You don't want to reinforce wrong answers.

Have practical application
- The best questions incorporate case scenarios. What good is information you know but can't apply?

Questions Should (cont.)

Not be overly difficult, tricky, or misleading
- Being tricky or misleading often tests the taker's testing ability or their understanding of American English and it's nuances. Neither is a true test of content comprehension.

Not be trivia
- Trivia is not the level of discrimination appropriate for a physician. The very meaning of trivia is that it is trivial or insignificant – such as the disease was first described in 1608. That does not help your patient now.

Match the level of discrimination of the content.
- You wouldn't teach a class about rocket science and ask questions on the test about elementary math – and vise versa.

Answers

Answer options should be:
- Stated positively
- Logical misconceptions of the right answer
- Consistent in length

The optimal # of options: 3!*

*Some exclusions: Social Work = 5

Other Suggestions

- No "all/none of these", "EXCEPT", "Mark all the correct/multiple answers", or True/False

- Each MOC question must be supported by justification for correct answer. References for further learning requested.

- Don't use 'you'. This asks learners about their perspective, not necessarily the correct answer.

MOC = Maintenance of Certification

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Example #1 ✓

The Passenger Syndrome or Social Loafing is an obstacle to teamwork which can be most closely defined as:
a. Individual participants give 100% effort in every group environment
b. **In a group environment, the effort level of the individual participants is less than 100%**
c. Decision making based on personal needs
d. Deference given due to someone's reputation, experience or personality
e. Focus on the task to the point of blocking out all other inputs

Justification: Awareness of obstacles to effective team communication will help improve situational awareness and help reduce communication breakdowns

References: (Greenberg, Regenbogen et al. 2007, Patterson, Geis et al. 2012)

Example #2 ✓

4 y/o boy follow-up for functional constipation. After presenting with stool impaction, he completed an outpatient disimpaction with oral medications over 3 days, and then started a maintenance dose of Miralax™ daily. He is now passing softer stools but is still only going 1-2 times per week. Which is the most appropriate behavioral intervention to improve his stool frequency?
a. Ensure he is using a raised adult toilet rather than a floor-level training potty
b. Encourage him to sit on the toilet before meals to avoid gastro-colic reflex
c. Withhold desired activities like TV or videogames until after he stools in the toilet
d. **Keep a calendar on which he can place stickers when he stools in the toilet**

Take Home: Behavioral interventions, especially positive reinforcement and making time to sit on the toilet, are key to

Example #2 (cont.)

forming the habits that will sustain frequent and effective stooling.

Explanation of correct answer:
Sticker charts to track and reward desired behaviors are a mainstay of behavioral modification for toddlers and young school-age children. Older children may benefit from a "token economy" in which they earn rewards or privileges for sustained appropriate behavior, e.g. 20 min later bedtime if the child maintains sitting schedule for 2 days in a row. Rewards need not be pricey, and parents know their children best regarding what will motivate.

Explanation of incorrect answers:
Raised toilets pose challenges for kids, due to needing to use leg and gluteal muscles to stay on the toilet while needing to relax their pelvic floor. We recommend a floor level potty for toddlers and a stool to support feet of older kids.

Example #2 (cont.)

The gastro-colic reflex can be a big help, in that it stimulates the colon during and after a meal, so kids should try to sit on the toilet after meals or snacks.

Unless the activity is an extraordinary privilege, withholding desired daily activities until after the child stools can increase tension in a battle of wills, and demands children stool on command, which may not be possible for the child.

Example #3 ✗

Heroin is one of the top 10 drugs seized by law enforcement in Hamilton County. In 2014, what place did heroin hold on that list?
a. 1st place
b. **2nd place**
c. 3rd place
d. 4th place

Trivia. Not helpful for a physician to diagnose/treat.

Source:
http://www.deadiversion.usdoj.gov/nflis/2005annual_rpt.pdf#search=heroin

Examples – Post-Test Questions

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Example #1 ✗

After an acute brain injury, cerebral autoregulation is:
a. Generally preserved in pediatric patients
b. Dysregulated with overcirculation and hyperemia in injured tissues
c. Dysregulated without secondary injury
d. Dysregulated with hypovolemia and secondary ischemia of injured tissues
e. Pressure passive which may result in B, C, or D

> Multiple correct answers.

Example #2 ✓

The regulation of affect and behavior in child development is:
a. deeply embedded in the child's relationships with others
b. primarily a social work concern
c. is only addressed by psychopharmacology
d. is a core feature of cognitive behavior therapy

Example #3 ✓

The prednisone dose for treating an asthma exacerbation should be:
a. 0.5-1mg/kg for 5-7 days
b. 1-2 mg/kg for 5-7 days
c. 1-2 mg/kg for 14 days
d. 20 mg/day for 5-7 days

Example #4 ✓

What is the level of evidence (AAN) for therapeutic non-invasive brain stimulation in chidren with hemiparetic CP?
a. Class A: Established effective, ineffective or harmful, at least 2 class I studies
b. Class B: Probably effective, 1 class I or two consistent class II studies
c. Class C: Possibly effective, 1 class II or two class III studies
d. Class U: Data inadequate or conflicting

Example #5 ✗

Developmental psychopathology:
a. is the result of an interplay of intra-individual and extra-individual contacts
b. emphasizes the sole use of psychopharmacology
c. is practiced by psychologists alone
d. is a hindrance to the use of DSM5

> Answer A is double the length of all other answers.

Example #6 ✗

A child's brain is influenced by early experiences (positive and negative). These will be a foundation for success in school because:
a. The brain is fully developed and starting to process information
b. The brain is developing rapidly.
c. The child's brain has different receptors than adult brains.

> Answer B is half the length of all other answers.

Example #7 ✓

Behavioral obese risk assessment should be done for children beginning at _____:
a. 1 year old
b. 2 years old
c. 3 years old
d. 4 years old

Example #8 ✗

Toxic stress in children can impact:
a. Distrust of adults
b. Inability to develop healthy peer relationships
c. Short attention span
d. All of the above

> All of the above

Example #9 ✗

Common symptomatology for asthma includes all except:
a. cough
b. wheezing
c. night cough
d. fever

> Reinforces exception instead of common symptoms

References

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