PNCB
Item Writing Manual and Style Guide

Updated: November 2024

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I. Introduction

Item writing for the Pediatric Nursing Certification Board (PNCB) requires that item writers learn and continue to refine skills using PNCB style.

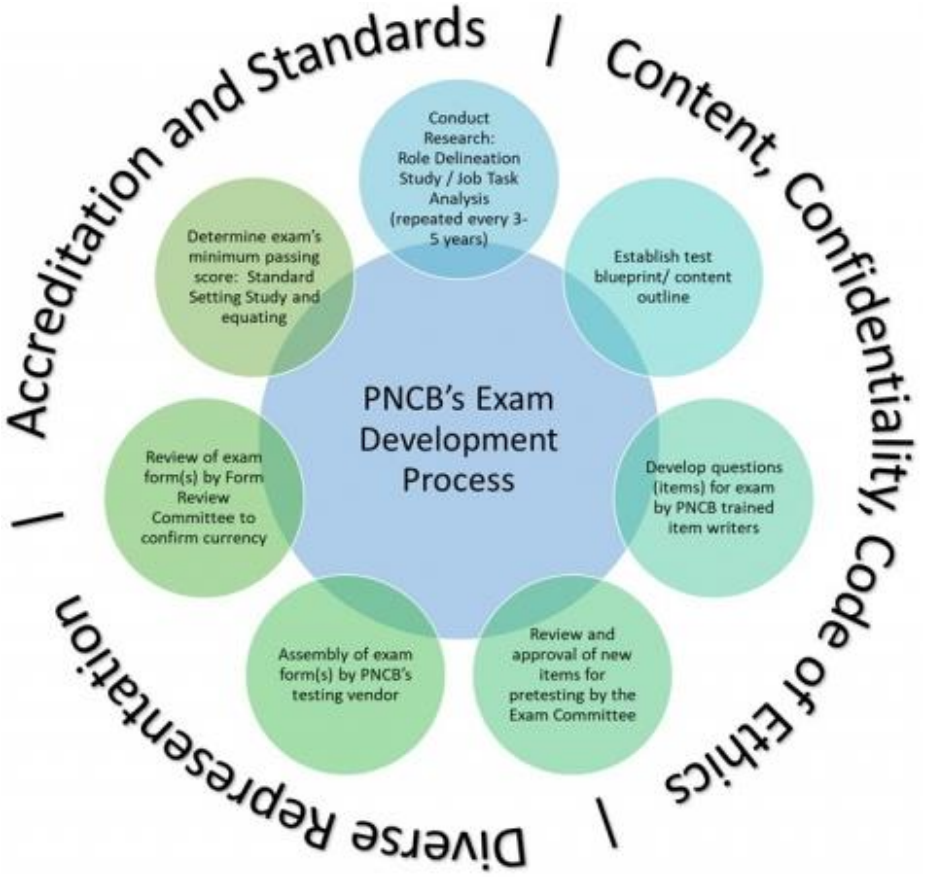
PNCB's 2022-2027 Strategic Plan charges us to "advance the competence and capabilities of nursing professionals who care for children." To accomplish this, our work is directly supported by a rigorous exam development process that includes item writing. Item writers are tasked with developing questions that appropriately measure the skills, knowledge, and abilities of test-takers to determine their qualification for certification. At times, item writers may be asked to write items for practice tests or Pediatric Updates modules.

This manual contains important guidance to help build item writing skills. The role of an item writer is to identify strong ideas for items and to develop the content into test questions that appropriately assess knowledge worthy of determining a candidate's certification. On certification exams, asking the right question in the right way matters.

This manual provides guidance for best practices in item writing, supported by the science of measurement and assessment, known as psychometrics.

A. Item Development Process

PNCB's robust item development process is outlined in the image below and each task within the process is detailed on our website: **https://www.pncb.org/about/pncb-exam-development**.



II. Item Writing Basics

A. Components of an Item

Test items, or test questions, are used to assess some aspect of knowledge. The purpose of test items is to differentiate between test-takers who have the knowledge and those who do not. Therefore, items should be developed so that test-takers who have the knowledge are able to demonstrate it by answering the item correctly, and those without the knowledge answer the item incorrectly.

All PNCB exam items are to be written as **multiple choice** items with four response options, from which the test-taker selects a single correct answer. Alternate item types, such as Fill-in-the-Blank or True/False, are not acceptable for PNCB exams.

The **stem** situates the test-taker in a scenario or with details and context that will be used to assess their knowledge. The stem, typically 1-3 sentences long, appears before the response options. PNCB allows two types of stems: closed stems and open stems.

- A **closed stem** asks a complete question and ends with a question mark.
  - Example: How long does a newborn typically sleep between feedings?

- An **open stem** is formatted with an incomplete sentence, or a lead-in statement and all of the response options complete the stem.
  - Example: A newborn sleeps 4 hours on average between feedings. The mother asks if the infant should be awakened to feed more often. The best guidance includes

Other components of an item include the **key** (correct answer) and **distractors** (incorrect options). There are four response options, one key, and three distractors in every PNCB item.

The **key** is the ONLY correct option among the response options. The **distractors** are intended to attract test-takers who lack knowledge and are guessing. Distractors are plausible, but incorrect, and not readily dismissed by test-takers. When a distractor is easily dismissed, it improves test-takers' odds of guessing correctly. Review the sample item below to see a stem, key, and distractors together.

SAMPLE ITEM		
STEM >	The MOST important reason to frequently review a child's use of a peak expiratory flow device is because	
DISTRACTOR >	a. noncompliance is prevalent.	**RESPONSE OPTIONS**
DISTRACTOR >	b. values and technique vary by brand.	
KEY >	c. technique and effort affect measurements.*	
DISTRACTOR >	d. personal best measurement must be validated.	

B. Content in Items

For each certification exam, PNCB conducts an initial role delineation study (RSD) followed by a job task analysis (JTA) study every 3-5 years to determine the knowledge, skills, and abilities necessary for each nursing or advanced practice role. The final products of this research include:

- the **content outline** that identifies the domains, subdomains, and tasks covered on the exam and
- the **test specifications** that detail how many items align to each domain (major area of the exam).

To ensure the validity and defensibility of exams, items must assess knowledge directly related to specific areas on the content outline.

SAMPLE CONTENT OUTLINE	
DOMAIN >	**III. Management**
SUBDOMAIN >	A. Acute and Chronic Illness
TASK >	1. Interpret physical assessment findings
TASK >	2. Interpret laboratory and diagnostic test results
TASK >	3. Manage child's pain (pharmacological and non-pharmacologic)

The example item below is mapped to Domain III, Subdomain A, and Task 1, so the mapping reads III.A.1. In the item example below and throughout this manual, the key is denoted with an asterisk (*****).

> Example: A child presents with headache, fever, and a pruritic, circumferential ring rash on the forearms. Assessment reveals swollen joints, and the rash is warm to the touch. When obtaining the child's health history, it is MOST important to ask whether the child has
>
> a. had a tick bite recently.*****
> b. been on a field trip with the school.
> c. had physical contact with a cat.
> d. been in contact with anyone with a similar rash.

PNCB maintains a bank of items for each of its exams. Based on the knowledge an item assesses, it is classified, or mapped, to the respective area on the exam's content outline. Annual item writing assignments reflect needs of each exam's bank. Thus, the content outline is an essential document used by the test developers who assemble exams, PNCB staff, item writers, item reviewers, and individuals preparing to take the exam. Content outlines for PNCB's exam are available on each exam's *Study Resources* page on the **www.pncb.org** website. While the content outlines are publicly available, item writing assignments are **confidential**.

PNCB ensures items assess knowledge **appropriate** for the exam's purpose, population, and role. Both the CPN and PMHS exams address knowledge that was obtained through on-the-job experience either as a pediatric nurse (CPN) or as an APRN with specialized knowledge in pediatric mental health (PMHS). The CPNP-AC and CPNP-PC exams are written to encompass knowledge expected after graduation from a master's or doctoral pediatric nurse practitioner program at entry to practice in acute and primary care settings, respectively.

PNCB exam items must represent what is most prevalent and realistic to practice, not obscure or rarely encountered content. Avoid writing items about information that is not expected to be committed to memory, guidance that changes periodically, or details that would likely be looked up by the practicing nurse in the moment (e.g., immunizations required for country-specific international travel).

Writing well-developed items for exams that are important enough for establishing credentials takes time and effort. That effort includes exploring topic ideas (based on the item writing assignment) and considering how it relates to practice experience, as well as utilizing references. Consider the material thoroughly before developing an item; the most obvious question on a topic has likely already been written many times.

C. Cognitive Levels

The complexity of an item is linked to the objective of the question and the cognitive processing the candidate must engage in to respond. PNCB items are written to one of three cognitive levels: **recall, application, or analysis**.

PNCB's ability to assess the candidate's knowledge, skills, or abilities is strengthened by items that require **higher-level thinking**. Application and analysis items requiring the test-taker to apply knowledge or analyze information to identify a correct response are more relevant and valuable to the exam's purpose than items that require recall of information. Writing higher cognitive level items requires delving into topics to understand the related knowledge and to determine what is most relevant to practice and clinical decision-making.

The table below includes definitions of each cognitive level and a selection of sample stems that demonstrate each cognitive level. When reviewing these stems, consider how the knowledge required to answer differs at each level.

Recall	Application	Analysis
Requires recollection of terms, facts, or other information that may be memorized.	Requires the use of information or knowledge in a specific situation, such as to select an appropriate action or response. Application items may include conditions (if X then Y). Application items frequently include a scenario; however, the amount of data and problem-solving is less than that of an analysis item.	Requires identification of the significance and implications of several pieces of information (if X and Y, then Z) to determine priorities, next steps, diagnoses, or actions. Analysis items often include a scenario.
Cystic fibrosis involves dysfunction of the:	A school-age child with cystic fibrosis asks about participating in sports. Which of the following responses is the BEST?	An adolescent with cystic fibrosis would be MOST likely to adhere to which airway clearance technique?

As item writers develop items, it is important to keep the test-taker in mind. Consider what the test-taker must do to answer the item. The process of answering recall items is straight-forward, but answering analysis or application items requires an additional step or multiple steps.

D. Item Writing Best Practices

Stems

- Write **clear** stems that include all necessary information to respond to the item
  - Tell me more: Test-takers should be able to form a possible answer after reading the stem without relying on the response options to understand what the item is asking.

- Write **focused** stems that address a single objective
  - Example: An infant presents with fever, copious secretions, and intermittent periods of apnea. Physical examination reveals tachypnea, retractions, nasal flaring, and wheezing. What is the ~~diagnosis and~~ best treatment plan based on the current condition?

- Write **succinct** stems
  - Tell me more: Extraneous information that is unnecessary for answering the item may distract, confuse, or create anxiety for test-takers. It is also unfair to unnecessarily burden test-takers with a heavy reading load.

- Present information in a **meaningful order**
  - Explanation: Describing the child first in the stem helps orient the test-taker to the scenario.
  - Tell me more: When including several assessment findings in the stem, list in the order the assessment occurs, generally from head to toe.
  - Example: A 10 year old presents with a 6-month history of headaches twice a month described as frontal, pounding, lasting for most of the day, and accompanied by nausea and light sensitivity. Which is the BEST initial treatment?

- Include **measurements** in a comprehensible way
  - Explanation: Measurements are vital signs, laboratory test results, ventilator settings, etc.
  - Tell me more: If using one or two measurements, list them in the stem. If using more than two measurements, list the data below the stem.
  - Example: An 8 year old who was restrained during a motor vehicle collision has a Glasgow Coma Scale (GCS) score of 12, is in moderate respiratory distress, and vital signs are as provided below. Which of the following additional physical exam findings requires IMMEDIATE intervention?

- For clinical scenarios, only include the **setting** if it is medically relevant

- Only refer to a child's **gender or sex** if it is medically relevant
  - Tell me more: Gender or sex may be appropriately included, such as when a condition is more prevalent in children of a specific sex.

- Only include references to a child's **age** if it is medically relevant
  - Tell me more: If age is important to include, consider if a specific age is necessary or whether referring to an age group (i.e., infant, toddler) is reasonable.

- It is acceptable to write **'best option' stems**, which ask test-takers to identify the BEST or MOST appropriate option
  - > Tell me more: Options may be correct, just not the BEST or MOST appropriate option. The key must be supported by a reference and/or evidence-based practice, not opinions, nor can the key only be true in a specific hospital system or state.
  - > Example: An infant presents with fever, copious secretions, and intermittent periods of apnea. Physical examination reveals tachypnea, retractions, nasal flaring, and wheezing. Which of the following management strategies is the MOST appropriate?

- Avoid **broad/undirected** stems
  - > Explanation: These stems are unfair because test-takers may be unable to understand what is expected of them. Broad or undirected stems allow for many possible answers.
  - > Example: When completing a physical assessment on a child, it is important to
  - > Example: Which of the following statements is accurate related to precautions necessary for a child who is immunosuppressed?

- Avoid writing **negative** stems that ask about an exception (where the distractors are factually correct, and the key is factually incorrect)
  - > Explanation: Negative stems test whether test-takers can identify the wrong answer instead of the correct one. Negation requires additional cognitive processing and forces test-takers to switch their focus from identifying correct answers to identifying incorrect answers. Also, negation may be overlooked by test-takers, especially during stressful testing events.
  - > Example: All of the following studies are used to diagnose malrotation EXCEPT:
  - > Example: Which of the following is NOT a diagnostic study used to diagnose malrotation?
  - > Example: Which is the LEAST likely cause of….

- Acceptable uses of negation include references to **contraindication,** as well as asking about when additional education is warranted
  - > Explanation: These items address knowledge that is specifically learned in the context of avoidance or warnings, meaning that this knowledge is important and relevant to clinical practice. Assessments about caregivers' and children's levels of understanding and when additional education is warranted are part of routine assessments.
  - > Example: Which of the following medications is CONTRAINDICATED for an adolescent with irritable bowel syndrome?
  - > Example: Following guidance about child safety for a toddler, which of the following statements by the caregiver indicates a need for FURTHER education?

- Avoid **teaching** or including introductory statements in stems
  - > Explanation: The purpose of the certification exam items is to assess knowledge and not to teach.
  - > Example: ~~Assessing changes in pulmonary function affecting the child's functional status is important.~~ Which of the following devices provides an objective method of measuring asthma severity and pulmonary function?

Response Options

- Ensure that options are **balanced**; as much as possible, try to write all options with similar length, complexity, tone, tense, and specificity (see some strategies in the table below)
  - > Tell me more: Response options can be balanced as a set of four options or in pairs.

Principle	Example
Use **lead verbs** to create parallel structure	When examining an apprehensive 2 year old, which of the following techniques is BEST? a. **make** eye contact and focus on the child b. **begin** with the child seated in the caregiver's lap***** c. **have** the caregiver position the child on the exam table d. **provide** explanations throughout the examination procedure
Begin or end **pairs of response options** with the same term (or, as in the last example, create pairs with two options addressing tests and two related to treatment)	A child has returned from placement of a ventriculoperitoneal (VP) shunt. Positioning the child in which position is MOST appropriate? a. **flat** on operated side b. **flat** on unoperated side***** c. **supine** with head of bed elevated 45 degrees d. **supine** with head of bed elevated 90 degrees A 6 month old has an excoriated, erythematous rash in the diaper area with pinpoint satellite lesions. Which topical treatment would be MOST appropriate? a. 1% hydrocortisone **cream** b. mupirocin **ointment** c. nystatin **ointment*** d. tacrolimus **cream** For an adolescent presenting with scaly, copper-colored rashes limited to the torso, palms of hands, and soles of feet, what is the next BEST step? a. **obtain** a scrapped skin culture of the rash b. **obtain** a treponemal automated test***** c. **prescribe** topical steroids d. **prescribe** oral antifungals

- Avoid **repetition** at the beginning of each response option
  - > Tell me more: To improve readability, the repeated word or phrase can be moved into the stem (see the example in the table below).

Original	Revised
When educating the parents of a newborn with physiologic jaundice, it is important to include that bilirubin levels a. **peak at the** second **post-natal day.** b. **peak at the** third **post-natal day.** c. **peak at the** fifth **post-natal day.** d. **peak at the** seventh **post-natal day.**	When educating the parents of a newborn with physiologic jaundice, it is important to include that bilirubin levels **peak on which of the following post-natal days?** a. second b. third c. fifth d. seventh

- When including **numeric ranges**, each option should be distinct with no overlap
  - > Tell me more: Sometimes overlap can create a partial key, lead to poor statistics, or encourage the belief that more than one option is correct.

- When including **lists** within options, include one term from the key's list in each of the other options
  - > Tell me more: This reduces the likelihood that a test-taker with partial knowledge will get the item correct based on recognizing only one element of the key. One option is to include a different element of the key in each distractor (Example 1). Alternatively, eliminate or shorten lists in options by moving common elements from the options in the stem and leaving one element in each response option to reduce the test-taker's reading load (Example 2). If using this approach, the most well-known elements should be in the stem. The underlined elements highlight how both approaches can be accomplished.
  - > Example 1: Which of the following are risk factors for sudden infant death syndrome (SIDS)?
    a. cold weather, maternal smoking during pregnancy, and overheating*****
    b. firstborn, frequent awakening, and maternal smoking during pregnancy
    c. frequent awakening, overheating, and recent immunizations
    d. cold weather, firstborn child, and recent immunizations
  - > Example 2: The risk factors for sudden infant death syndrome (SIDS) include cold weather, maternal smoking during pregnancy, and
    a. firstborn.
    b. frequent awakening.
    c. overheating.*****
    d. recent immunizations.

- When including **quotations** in response options, use quotation marks to denote speech
  - > Tell me more: When using quoted responses, the options should reflect appropriate language as expected from the speaker, for the recipient (whether a child/parent/caregiver), or by the nurse/nurse practitioner.

Inappropriate/ Unrealistic	Prior to starting a patient on bosentan, education is provided to the family. Which statement by the family demonstrates their understanding? a. "It is a phosphodiesterase type 5 inhibitor." b. "It is necessary to follow renal function tests monthly." c. "It is an endothelin A&B receptor blocker."***** d. "It is administered 3 times daily."
Appropriate/ Realistic	A child with pulmonary artery hypertension will be taking bosentan at home. Which of the following caregiver statements demonstrates an understanding of discharge instructions related to this medication? a. "We will need to monitor the color of our child's urine and stool."***** b. "This medication needs to be given at the exact same time every day." c. "Our child is likely to have occasional episodes of shortness of breath and weakness." d. "Monthly appointments will be scheduled for bloodwork to check our child's kidney function."

- Avoid using **universal terms** such as 'never,' 'always,' and 'only'
  - > Tell me more: When test-takers see these words, they often dismiss the option because few things are universally true. The same applies to qualifiers such as 'usually,' 'often,' 'rarely,' 'seldomly,' and 'commonly.' These words are acceptable in stems and may be appropriate when used in response options that represent quoted text.

- Avoid being **tricky**
  - > Tell me more: The purpose of an item is to identify who possesses the required knowledge, not to trick or confuse the test-taker.

Keys

- Ensure the key is the **only correct option**

- Ensure the key **blends in** among the distractors
  - > Tell me more: If the stem is covered up, the key should not stand out. To select the correct option, test-takers must need to read the stem.
  - > Tell me even more: If a technical, significant, or scientific term appears in the stem and is also used in the key, try to remove the term, replace it with a synonym, or add the term to a distractor.
  - > TIP! Oftentimes, item writers spend more time crafting the key than the distractors, making the key longer, detailed, or more nuanced. This can cause the key to stand out. Try shortening the key or adding more detail to one or more distractors to create balance.

Distractors

- Ensure that distractors are **plausible**
  - > Tell me more: Easily dismissed distractors improve the odds that a test-taker who is relying on guessing will select the correct answer. It should not be easy for individuals to guess correctly. Only test-takers who have the knowledge should get the item correct.

- Ensure that distractors are **wrong**
  - > Tell me more: It is critical that distractors are incorrect under any plausible interpretation.

- Consider commonly **mistaken or misunderstood aspects** related to the knowledge being tested to craft plausible distractors
  - > Tell me more: Think about what is confusing to students. Think about including information that is correct but related to another or similar situation or diagnosis, such as a differential diagnosis.

- Do not **fabricate** terms such as names for studies, conditions, procedures, or medications
  - > Tell me more: All medical information must be factual and existent. While clinical scenarios may be made up or altered, distractors cannot include invented terminology.

E. Fairness and Bias in Item Development

Fairness is an important requirement for test items, particularly for those used to determine qualification for certification or licensure. That accountability begins with the item writer.

Bias in item development can be considered in three main categories: **construct, content, and language**.

- The **construct** is related to ensuring that the content of the item is meaningfully associated with an area on the content outline. Content should be universal (not specific to a region or system) and avoid novel, obscure, outdated, controversial, or evolving topics.
- The **content** must be supported by an approved reference, defensibly linked to a specific page number or limited page range, such that PNCB can easily confirm the key. Content should be avoided if it may be considered offensive, derogatory, exclusionary, or may cause an emotional reaction from test-takers based on a personal attribute. All information necessary to answer the item must be provided. No extraneous information should be included.
- The **language** used in items must be carefully crafted to appropriately represent populations and avoid unnecessary or offensive terms. The wording of the item should establish a clear expectation for the test-taker. The language component to fairness includes additional guidelines addressed in Section III.A.

Biased or unfair items impact the exam's validity. Items are **valid** when they are aligned to an area of the content outline. Validity is also supported by identifying an approved reference with the page citation(s) that support the key.

F. Using References

PNCB provides a list of **approved references** that can be found on each of the certification exam's *Study Resources* webpage.

The credential-specific Exam Committee reviews the list annually and offers recommendations to include or remove references from the approved list. Inclusion of any textbook as a reference does not reflect any endorsement by PNCB or represent any proprietary relationship with the textbook's publishers or authors.

Items must be referenced to a PNCB-approved reference: (1) from a textbook included on the approved list for the exam; or (2) citied from a nationally recognized guidelines, which are evidence- or consensus-based, such as those from AAP, CDC, and FDA. (Note: If using a web-based citation as a reference, the link to the guideline or webpage must be included in the item's "Feedback" field in the online portal, and must include the title of the webpage/guideline, the date of publication and when it was accessed, and a specific page number, when relevant.)

When providing a citation for a textbook, the most recent edition is required when the textbook is available via a PNCB e-library platform (VitalSource or AAP). Citing from the most recent previous edition (no older than 7 years) can be used when the textbook is not available through a PNCB e-library platform. When documenting an item's reference citation, item writers need to provide the name of the textbook, the edition, and the specific page number (or limited page range) in support of the stem and key. While not required, reference citations may also be provided to support the incorrectness of distractors. **PNCB**

suggests that item writers record the reference citation early in the writing process so it's readily available when submitting items.

While journal articles may be reviewed for content ideas, items must be referenced to PNCB-approved references (specific to the exam you are writing for). The exception is the use of journal articles that are nationally recognized clinical practice guidelines.

G. Legal Defensibility

The correct response to any item used on the exam must be supported in a current PNCB-approved pediatric reference. This requirement is part of ensuring the exam's legal defensibility. To further validate accuracy and currency, all newly written exam items will also be reviewed by other subject-matter experts who are members of either the Exam Committee or Form Review Committee.

If a test-taker challenges his or her exam results, PNCB may be called upon to defend the candidate's score, a process that may include validating the accuracy of items with references.

Legal defensibility also dictates that items must be the original work of the item writer. **Do not plagiarize by using verbatim text from the cited reference.** Items cannot be copied from another source such as review material or textbook.

Once an item is submitted by the item writer it is owned by PNCB, and PNCB subsequently has exclusive rights to its use. Items developed for PNCB cannot be work that was previously developed for another purpose (by the author or third party), nor may the item be reused by the author for any purpose in the future.

The use of artificial intelligence (AI) is strictly forbidden when developing items for PNCB exams.

H. Developing Items

While numerous approaches for developing exam items exist, the table below shows one structured approach. For the example in the table, the item writer followed these steps to create and finalize an item:

1. Review the content outline mapping (provided in the assignment)
2. Write an objective for the knowledge the item will assess (Ask: What should the test-taker be able to do?)
3. Explore the topic within approved references and other sources for ideas on approaching the item, and then identify a PNCB-approved reference citation to support the key
4. Draft a stem
5. Draft the key
6. Draft distractors (creating more than 3 distractors can be beneficial so that as the item is finalized, the weakest distractors can be discarded)
7. Review the drafted item to ensure the stem and key connect to the content outline mapping and objective
8. Refine the item as needed
9. Use the Item Review Checklist (Appendix B) to finalize before submitting

SAMPLE ITEM DEVELOPMENT PROCESS	
Content outline mapping	I.B.2. (CPN Content Outline mapping: I. Health Promotion, B. Provide anticipatory guidance and education across the pediatric age continuum for the child, family, and/or community related to, 2. Injury prevention)
Objective	Test-takers will demonstrate an understanding of the increasing priority for childproofing as toddlers become more mobile
Reference	Wong's Essentials of Pediatric Nursing, 11th ed. (2022), page 355
Stem	When obtaining a history to assess for safety, which of the following questions is the PRIORITY to ask the parent of a typically developing 19 month old?
Key	– "How have you childproofed your home?"*****
Distractors	– "What does your child prefer to eat?" – "When did your child start to walk?" – "What type of baby monitor do you use?" – "In what position does your child sleep?"

The basic idea for the clinical content to be assessed can come from several sources. Consider content that is relevant to practice and knowledge worthy of determining certification from these sources:

- □ clinical experiences
- □ rounds and care conferencing
- □ courses or classes
- □ current literature (i.e., journal articles)
- □ common mistakes in practice
- □ frequently confused concepts
- □ clinical practice guidelines
- □ evidence-based reviews
- □ outdated beliefs or practices

TIP! After drafting an item, leave it for a while. Later, with fresh eyes, re-read the item. Consider the objective and what information the test-taker really needs to respond to the item. Refine the item using the Item Review Checklist (Appendix B).

I. Clinical Stems

Scenario-based items are typically application or analysis items. For example, a diagnosis is not stated, but must be deduced from information in the stem and then an appropriate action identified, such as priorities, diagnostic studies, interventions, treatments, or next steps.

Clinical stems contain the essential information required to select the correct option. Significant information might include age, gender, medical history, presenting symptoms, laboratory values, and physical examination findings. The stem should not include irrelevant information unless it is linked to

misconceptions regarding the management-treatment decision represented in any of the distractors.

> Example: A 2 month old [age] presents with bilious vomiting [symptom] for 24 hours. Physical examination is unremarkable [examination result], and there is no weight loss [examination result].

> Example: An adolescent male [gender], who is mildly obese and otherwise healthy, presents with a limp and pain in the right knee that has been increasing in intensity for the past few days [symptom]. There is no history of trauma [clinical history] and physical examination is significant for external rotation and limited abduction of the right hip and knee [examination result].
> *Note: Inclusion of the age group and gender in the stem are appropriate because the prevalence of slipped capital femoral epiphysis (SCFE) is greater among adolescent males than adolescent females.*

Lead-in questions and incomplete statements should be short and concise, clearly directing the test-taker to the planned cognitive task.

Closed Stem: Clinical Stem + Lead-In Question

> Example: A 2 month old presents with bilious vomiting for 24 hours. Physical examination is unremarkable, and there is no weight loss. Which of the following diagnostic study should be obtained to confirm the MOST likely diagnosis?

Open Stem: Clinical Stems + Incomplete Statement

> Example: A 2 month old presents with bilious vomiting for 24 hours. Physical examination is unremarkable, and there is no weight loss. The MOST appropriate diagnostic study to establish the diagnosis of malrotation is:

Refer to Appendix D for examples of lead-in questions and incomplete statements to be used in clinical stems. The examples in this resource are helpful for considering stem closings that best fit with the item writer's objective and ensure items assess higher cognitive levels.

III. PNCB Style

A. General

Age Groups

- When medically or developmentally relevant, it is acceptable to use 'newborn,' 'infant,' 'toddler,' 'preschooler,' (or 'preschool-age child'), 'school-age child,' and 'adolescent.'
- Terms such as 'baby,' 'teen,' and 'teenager' should be avoided unless used within a quotation from a caregiver.
- When a specific age is unimportant, the use of 'child' is preferred to 'patient.'

Gender

- In most items, gender is not essential to answering an item correctly, so PNCB avoids its inclusion.
- When gender is not addressed in the stem, avoid including gender references in the options.
- The word 'their' may be used as a gender-neutral, singular, possessive pronoun when needed for readability.

Inclusive Language

- Use a variety of terms to refer to a child's **caregiver(s)**
  - > Tell me more: Children do not come exclusively from two-parent families, and two-parent families are not exclusively comprised of a father and a mother. The individual responsible (medical decision-maker) for a child's care may not even be a parent. Vary your use of the terms caregiver(s), parent(s), mother, or father, to promote balance and representation within your items and within our exam banks.

Item Types

- Only multiple choice, single correct response items are accepted
  - > Tell me more: Stems phrased as True/False, Fill-in-the-Blank, or Select-all-that-Apply items are not acceptable for PNCB exams.

Names

- Do not use proper names for patients, caregivers, and providers.

Person-Centered Language

- Use person-centered language to avoid labeling the child or others based on a disease, condition, status, or membership
  - > Example: a ~~diabetic~~ child with diabetes
  - > Example: ~~an obese~~ child with obesity **or** a child with a BMI in the 98th percentile

Referring to Healthcare Professionals

- Avoid referring to 'the nurse' or 'the nurse practitioner' to ask what the RN or NP should do
  - > Example: When selecting an appropriate gauge needle, ~~the nurse should~~ it is important to

- Using 'the nurse' or 'the nurse practitioner' may be appropriate for professional practice items, such as those assessing knowledge about licensure, regulations, ethics, or professional boundaries
- Avoid using 'you' in the stem
  - > Tell me more: Using 'you' suggests the test-taker can select a personal preference or choice instead of the correct action or response.
- Use the term **healthcare provider** instead of physician
  - > Tell me more: A physician may not be the only healthcare professional on the team prescribing care, medications, or treatments.

B. Stems

Closed Stems

- End in a question mark
- When response options are phrases, the first word of each option begins with a lowercase letter
- When response options are complete sentences, the first word is capitalized and the option ends with a period
- Ensure each response option grammatically completes the stem
  - > Example: When an item is written with a closed stem, which of the following BEST describes the formatting requirements?
    a. stems end with a colon
    b. options begin with an uppercase letter
    c. stems end with a question mark*
    d. options are written as complete sentences

Open stems

- There is NO terminal punctuation (i.e., period or question mark) at the end of the stem
- The first word in each response option begins with a lowercase letter (unless it's a proper noun)
- Ensure each response option grammatically completes the stem
- When options are a list (such as of diagnostic studies, medications, microorganisms, or treatments), the stem ends with a colon, and periods are unnecessary at the end of the options
  - > Example: A child with chest pain is afebrile and has no cough. The physical exam is unremarkable except for diminished breath sounds on the entire left side. The MOST likely diagnosis is:
    a. asthma
    b. bacterial pneumonia
    c. mycoplasma pneumonia
    d. pneumothorax*
- When options complete the open stem, no colon is used and each option ends in a period
  - > Example: The style rules for formatting an item written with an open stem include
    a. placing a colon at the end of the stem.
    b. ending the stem with a question mark.
    c. punctuating each option with a period.*
    d. beginning the option with a capitalized word.

Capitalization

- Use capitalization to emphasize important words in the stem
  - Tell me more: Specific words are capitalized to help ensure that the test-taker does not overlook a term related to the item's task. These terms include MOST, BEST, NEXT, FIRST, FIRST-LINE, INITIAL, PRIORITY, IMMEDIATE, and CONTRAINDICATION.

Data Sequencing

- Provide data in the stem such as physical presentation, complaints, symptoms, findings, etc., in a logical sequence (e.g., head to toe)
  - Example: A caregiver presents with their infant describing tiring with feeding, diaphoresis, and heavy breathing. Vital signs include a HR of 175 beats/min, RR of 60 breaths/min, SpO_2 97% in room air, and BP of 80/50. Physical examination reveals cyanosis, rales over bilateral lung fields, a harsh, blowing, 3/6 holosystolic murmur, liver edge 3 cm below the right costal margin, and 2+ pulses in all extremities. The MOST likely diagnosis is:

Length

- Stems are usually 1-3 sentences long
  - Tell me more: Clinical scenario items may have longer stems. The first sentence addresses the presentation, the second addresses findings (e.g., physical examination, diagnostic studies), and the third addresses the test-taker's task with a closed stem.

Theories

- Avoid writing items that expect the test-taker to recognize or identify specific theorists by name

Which vs What

- "What" is most appropriately used in a question when there is only one possible correct answer
- "Which" is most appropriately used when there are many possible answers, but the focus of the question is only on the one possibility included as the key; use "Which of the following…" with a noun/subject to define what is being referred to
  - Example: *What* is the normal range for blood glucose?
  - Example: *For which* of the following infants is the monthly administration of palivizumab (Synagis) injections recommended?
  - Example: The monthly administration of palivizumab (Synagis) injections is recommended for *which* of the following infants?

C. Response Options

All or None

- Avoid using "All of the above" or "None of the above" options

Distractors

- Distractors should attract a test-taker who lacks the knowledge and is guessing

D. Terminology

Acronyms

- Acronyms or abbreviated terms may be used when they are readily recognized or well known and if the term will be reused within the item
- The acronym or abbreviation follows the expanded term in parentheses and then is used alone in subsequent mentions within the item
    - > Example: The Health Insurance Portability and Accountability Act (HIPAA) was initially passed into law in 1996. When was the HIPAA Privacy Rule added?

Bacteria

- When including the name of a bacterium or bacteria in an item, the genus name is italicized and the first letter is capitalized, and the species name is italicized but not capitalized
    - > Example: *Chlamydia trachomatis*

Medications

- Provide the generic name for medications, not the brand name
    - > Tell me more: One exception is PMHS exam items that include medications explicitly prescribed by brand name. When using brand names, the generic name is listed first (lowercase), and the brand name follows (capitalized) in parentheses.
    - > Example: guanfacine ER (Intuniv)

Specific Terminology

- Use **radiograph** instead of x-ray
- Use **motor vehicle collision** instead of car accident

E. Exhibits

Exhibits can include tables or images such as graphs, radiographs, or photographs. Their use must serve a purpose when included in an item, meaning it must be necessary to answer the item. When images are provided, such as radiographic images, photographs, or growth charts, ensure that the exhibit does not include any personal identifiers (e.g., name). In addition, the image must be legally available for PNCB's exclusive use, and therefore it may no longer be used by the item writer or used by others, such as for teaching purposes. Images must be clear and legible.

F. Standardized Laboratory Units

When providing laboratory values within the stem, exhibit, or response options, always include the unit of measurement. Refer to Appendix C for a list of standardized laboratory units for use on PNCB exams and practice tests.

IV. Appendices

A. Visual Guide to Item Development

PNCB has compiled a visual guide to item development to support you. Follow this link to access the most up-to-date **Item Writing Infographic**.

B. Item Review Checklist

Stem

- □ Does the stem only include information necessary to answer the item?
- □ Does the stem avoid introductory or teaching statements?
- □ Does the stem include a clearly defined task, understandable without reading the options?
- □ Are the data included in the stem presented in a logical order?
- □ Is the stem written without the use of negation? (Allowed exceptions: Asking about contraindications or when further or additional teaching is indicated.)

Response Options

- □ Are options balanced with similar length and complexity?
- □ Are all response option grammatical answers (for closed stems) or grammatical completions (open stems)?

Key

- □ Is the key identified?
- □ Is the key the only correct response option?
- □ Does the key blend in among the distractors?
- □ Is the key supported by a complete citation from an approved reference for the exam?
- □ Can the key be selected without reading the stem?

Distractors

- □ Can one or more of the distractors be easily dismissed?
- □ Does a single distractor stand out in any way?
- □ Are the distractors plausible, yet incorrect?

Exhibit *(when provided)*

- □ Is the table or image (e.g., radiograph, growth chart, photograph) clear and deidentified?
- □ Is the table or image necessary for answering the question?
- □ Is the image legally available for PNCB's exclusive use?

Overall

- □ Does the item align to the assigned content outline mapping?
- □ Is the item free of issues that may arouse potential concerns for bias or fairness?
- □ Does the item comply with PNCB style?
- □ Is the item assessing knowledge worthy of determining the test-taker's qualification for certification?

C. Standardized Laboratory Units

Category	Laboratory Study	Units
Arterial Blood Gases	Base excess (BE)	mEq/L
	HCO_3	mEq/L
	O_2 saturation (SaO_2)	%
	PCO_2	mmHg
	PO_2	mmHg
Chemistries	Amylase	unit/L
	Blood urea nitrogen (BUN)	mg/dL
	Calcium	mg/dL
	Carbon dioxide (CO_2)	mEq/L
	Chloride	mEq/L
	Creatinine	mg/dL
	Glucose	mg/dL
	Ionized calcium	mmol/L
	Lactate	mg/dL
	Magnesium	mg/dL
	Osmolarity (urine or serum)	mOsm/kg
	Phosphorus	mg/dL
	Potassium	mEq/L
	Sodium	mEq/L
	Uric acid	mg/dL
Coagulation Studies	Partial thromboplastin time (PTT)	seconds
	Prothrombin time (PT)	seconds
CSF Studies	Glucose	mg/dL
	Polymorphonuclear cells (PMNs)	cells/mm^3
	Protein	mg/dL
	WBC	cells/mm^3
Hematology and Markers of Inflammation	Absolute Neutrophil Count (ANC)	/mm3
	C-reactive protein (CRP)	mg/dL
	Erythrocyte sedimentation rate (ESR)	mm/hr
	Hematocrit (Hct)	%
	Hemoglobin (Hgb)	g/dL
	Lymphocytes	%
	Monocytes	%
	Neutrophils	%
	Platelet count	/mm^3
	Red blood cell count (RBC) (also erythrocyte count)	x 10^{12}/L
	Reticulocyte count	%
	White blood cell count (WBC) (also leukocytes)	/mm^3
Liver Function/ Enzyme Studies	Alanine transaminase (ALT)	unit/L
	Albumin	g/dL
	Ammonia	mcg/dL
	Total bilirubin	mg/dL
	Total protein	g/dL
Urinalysis	Bacteria	100,000 CFUs
	Glucose	mg/dL

	Protein	mg/dL
	RBC	RBCs/hpf
	WBC	WBCs/hpf
Other	Blood lead level	mcg/dL
	Hemoglobin A1c	%
	Lipase	units/L

D. Clinical Stems

Examples of lead-ins and questions to use with clinical stems (for assessing higher cognitive levels)	
Assessment	– Which of the following findings indicates a need for further assessment? – Which assessment finding is a PRIORITY concern? – Which of the following assessments should be obtained FIRST? – The MOST important history information is: – Which of the following questions is MOST appropriately asked initially? – Which of the following information is MOST important to obtain? – Which of the following tests should be ordered? – Which of the following abnormal findings is expected when performing the assessment? – Which of the following findings is expected (or requires further investigation)? – Which factor is the MOST important to consider? – Which of the following laboratory test results are expected?
Diagnosis	– The MOST likely diagnosis/cause is: (or) This clinical description is indicative of: – Which of the following findings would support the diagnosis? – Which of the following presentations is MOST common in [condition]? – These signs and symptoms are MOST consistent with: – The vital signs are suggestive of which of the following conditions? – Which of the following risks is associated with [condition]? – Which of the following manifestations should be anticipated? – Which of the following symptoms is MOST expected with this diagnosis? – Which of the following children is at GREATEST risk for [condition/complication]?
Management	– Appropriate management includes: – Which is the MOST important first step? (or) The NEXT step in management is to – After [action], the next BEST action is (or) The best INITIAL management includes – Which of the following treatments/medications is MOST appropriate? – Which of the following interventions is indicated? (or) Which of the following actions is recommended? – The addition of which of the following treatments is the MOST appropriate NEXT step? – Which exam finding requires a referral (or consultation with) to a(n) [specialist]? – Monitoring for which of the following complications is indicated? – Which of the following responses is likely to be the MOST beneficial? – Which of the following interventions is likely to be the MOST effective?
Priorities	– Which of the following findings is the PRIORITY concern? – Which of the following evaluations should occur FIRST? – The IMMEDIATE action is to initiate: (or) What is the MOST appropriate NEXT step? – Which of the following laboratory tests should be obtained FIRST? – Which of the following interventions should be implemented FIRST? – Which of the following interventions is the PRIORITY in the plan of care? – Which potential complication is MOST significant?
Guidance	– Which of the following recommendations is the MOST appropriate? – The BEST anticipatory guidance includes – The caregiver's readiness to learn can best be assessed by asking which of the following questions? – Which information should be included in teaching? – Which of the following caregiver statements BEST demonstrates an understanding of the treatment? – Which of the following is the MOST important information to address caregiver concerns about [issue]?

E. Sources

Haladyna, T. M. (1994). *Developing and Validating Multiple-Choice Test Items*. Lawrence Erlbaum, Inc.

Haladyna, T. M. & Downing, S. M. (2005). Construct-Irrelevant Variance in High-Stakes Testing. *Educational Measurement: Issues and Practice*, 2005;23(1).

Zieky, M. (2016). Fairness in Test Design and Development. *Fairness in Educational Assessment and Measurement* (pp. 9-31).

F. Writing for Pediatric Updates Modules

Introduction and Overview: Writing items for continuing education (CE) module post-tests

The PNCB's Pediatric Updates modules support the professional learning needs and ongoing competence of APRNs who provide care to the pediatric population. Learners must read the reference(s) provided then demonstrate knowledge by achieving a minimum score on the assessment to earn CE contact hours. The purpose of the post-test is to assess learning after reading the module's references. Items in the post-test should focus on information that is most relevant to clinical practice to further support APRN competence.

A primary difference between items written for certification exams and those written for the CE is the scope of knowledge. For certification exams, the scope of knowledge that can be assessed is very broad, encompassing areas detailed in the exam's content outline which were validated by a job task analysis (JTA). However, the scope of knowledge assessed in a Pediatric Updates module is very narrow, representing only the content contained in the module's reference(s). The learner is expected to have foundational advanced practice knowledge to understand each reference's content.

To ensure fairness in the post-test, items must be written to the expected scope of knowledge. Thus, the item's correct response(s) **must be found in the provided reference.** The item writer is responsible for identifying the specific page(s) and sections in the reference used that support the key.

The learner should not be able to answer an item based on a reference's title or information in the introductory paragraph, the learner should rely on knowledge gained from reading the specified reference. Optimally, items should require the application of knowledge learned from the reference rather than simply requiring factual recall.

Stepwise Approach to Create Items for a CE Post-test

The basic tenets of PNCB item writing best practices and style outlined in this Item Writing Manual should be applied to writing items for CE modules. The following information builds upon those foundational practices.

- First, read the PNCB-provided reference and note the most important **key points.**

- Consider various ways that the item's stem can be written to **accurately assess** the learner's knowledge of these key points.
  - Sometimes, knowledge related to an important point may best be assessed with a recall item; however, try to develop *application* or *analysis* cognitive level items (addressed in Section II.C.) by using brief clinical scenarios in the item's stem. Refer to Appendix D, which provides examples of lead-ins and questions for clinical stems.

    TIP! A clinical scenario should only be used if some judgment about information within it (e.g., physical examination findings) is required to answer the question. A common flaw is when the item writer introduces an unneeded clinical scenario to

create a higher cognitive level item when the item can be answered without the scenario.

> For items that address an author's practice recommendations or findings from specific research explicitly reported in the reference where other similar research exists with different findings, the item's stem can acknowledge this by using a phrase such as, "*According to the referenced article [or textbook]*,..."

> Consider if knowledge is best assessed using an **alternate question format (AQF)** (described in next section).

TIP! Do not write an AQF item when the knowledge can be readily assessed using the standard multiple choice, single response approach.

> Routinely critique each version of the stem for clarity and whether it assesses the related knowledge and is able to be answered from the reference. Consider if plausible distractors (incorrect options) can be written.

– Complete items by writing and critiquing **distractors**.

> Distractors are always plausible but must be incorrect, even if not addressed in the reference.

> The best distractors come from within the same reference but there may be times when a distractor is crafted based on other knowledge expected of the learner (i.e., an APRN). For example, an item about medications used to treat a specified condition may have a plausible, yet *incorrect*, distractor that is a recognizable medication not discussed within the reference.

TIP! Use references from the PNCB e-Library (VitalSource and American Academy of Pediatrics) as a helpful resource for identifying ideas for plausible distractors and to expand your knowledge of content covered in the reference.

Alternative Question Formats (AFQs)

In Pediatric Updates module post-tests, the standard 4-option, multiple choice, single correct response item is the most prevalent and the preferred type of item. Item statistics support that learners generally do better with this style of item. However, AQFs add variety and are permitted in the CE modules. Acceptable AFQs are:

- multiple answer (a type of multiple choice)
- matching
- sequencing
- hotspot

The number of AQF items used in any *Pediatric Updates* module is limited, and item writers will be advised in their annual assignment of any expectations related to their use.

Multiple Answer

A **multiple answer** item is a type of multiple choice that allows for more than 4 response options and more than one key.

> The item follows the same best practices detailed in this manual for developing a standard, 4-option, multiple choice item, including: ensure a well-defined stem, create balance between the options, blend the key(s) among the distractors, and ensure the distractors are plausible but incorrect.
> Other guidelines for developing a multiple answer item include:
  - provide at least 2 distractors and 5-8 response options (4 options are permissible, although it increases the odds of learners guessing correctly)
  - identify the number of correct responses for the learner at the end of the stem

> Example: Which of the following findings should prompt neuroimaging in an adolescent who has new onset severe headaches? **SELECT THREE (3)**

e. unitemporal pain
f. male gender
g. café au lait spots
h. increased pain with Valsalva
i. diplopia

Matching

A **matching** item is constructed with an instruction in the stem for the learner, followed by two columns of data. The left column lists the **responses**, and the right column lists the **possible matches** for each response. Because the stem is an **instructive statement**, it is punctuated with a period.

> The stem should **define the content in each column** (e.g., MATCH the name of each procedure with its description.)
> The clearest approach for this instruction is to **keep both nouns singular**, for example:

Original stem: MATCH the *diagnoses* to their typical *presenting symptoms*.
Improved stem: MATCH each *diagnosis* to its typical *presentation*.

> Guidelines for developing and submitting a matching item include:
  - strive to limit each response in left column to **no more than 8 words**
  - the possible matches in the right column should be **single words** or **short phrases**
  - provide an **extra distractor**, when feasible, to the right column so the number of responses and possible matches are not equal; this decreases the learner's ability to guess or only have partial knowledge of the content
  - include a **minimum of 3 and a maximum of 5 matches**
  - keep the content for the matches in each column **homogenous**, with a theme that ties the responses together (e.g., bacterial infections and causative organisms)
  - order responses in the left column in a **logical order** (e.g., alphabetical, numerical), and put the correct match across from it (*Note: options in the right column end up getting shuffled for learners)*

> Example: MATCH the symptom(s) of overdose to over-the-counter product associated with misuse by adolescents.

agitation, dry flushed skin, confusion, urinary retention =	diphenhydramine
cardiac conduction disturbances and arrhythmias =	loperamide
methemoglobinemia =	nitrite inhalation
nausea, vomiting, tachycardia, hypertension =	nicotine
additional distractor -->	alcohol intoxication

Sequence

A **sequence** item type directs the learner to sequence (or rank) a list of responses. This is an infrequently used AQF in Pediatric Updates modules, but may be appropriate for certain types of tasks.

> **Ordering** can be based on a variety of parameters such as the order of actions
> The number of options to be sequenced should be **limited to 3-4**
> Strive to keep the wording for each limited to **no more than 8 words**

> Example: For a child with Tourette syndrome and co-morbid ADHD, RANK the recommended tiered algorithm approach to psychopharmacologic treatment from FIRST STEP (1) to FOURTH STEP (4):

- 1 = alpha-2 agonist
- 2 = psychostimulant
- 3 = alpha-2 agonist PLUS psychostimulant
- 4 = atomoxetine

Hotspot

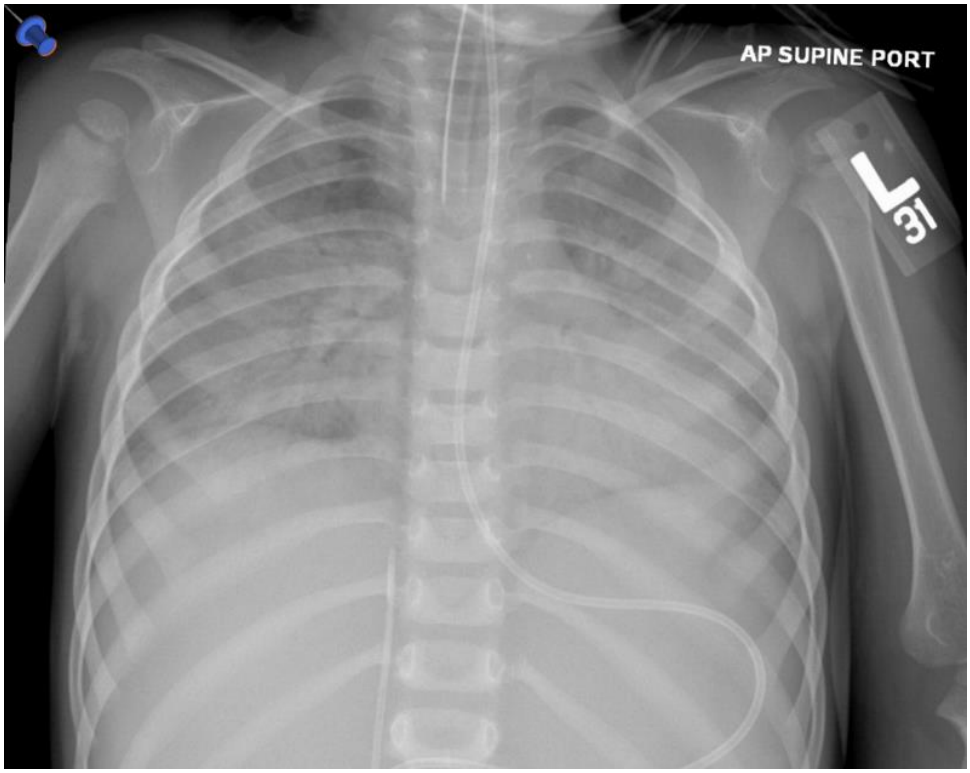
A **hotspot** item type uses images, such as radiographs, and the stem directs the learner to identify a specific area or field within the image.

Note: Any images used in items must be available for PNCB's use, free of any potential copyright infringement, and de-identified. Once ownership to PNCB is granted, the image may not be shared with others or used by the item writer for other purposes (e.g., teaching).

> The stem is a **succinct statement** directing the learner's task, punctuated with a period
> Learners are instructed to drag-and-drop **positioning markers** to identify an area

- Example: Use your mouse to drag-and-drop the **BLUE** pin in an area of the LEFT hemithorax containing peripheral air bronchograms. Repeat to place the **ORANGE** pin in an area of the RIGHT hemithorax containing peripheral aid bronchograms.

  **Note-the orange pin will appear after the blue pin is placed.*



Item Writing Templates and Feedback Sections (with Examples)

Pediatric Updates item writers are provided with a template for submitting content for the annual assignment, with one template used for each item. The template contains fields to be completed for each item, which include:

- committee member's name
- module topic (e.g., Current Concepts, Rx)
- citation for assigned reference
- item stem and response options (highlight the key)
- item feedback includes:
  - the key(s)
  - where the answer can be found within the reference
  - an explanation for the learner about why the key is correct
  - explanations for the learner about why the distractors are incorrect
  - additional learning points about the topic, (i.e., anything new the writer learned about the topic, why the committee member feels passionate about the topic, additional resources for students)

The content written for the item feedback should be succinct but inclusive of enough information to offer clarity for the learner who did not select the correct answer(s). Examples are provided below for items written for Pediatric Updates modules for Acute Care, Pharmacology, and Primary Care.

Example: Acute Care: 2024 Clinical Cross-Section

The MOST common causes of mortality for a child who has ingested wintergreen oil are pulmonary congestion and:

- cerebral edema
- gastrointestinal bleed
- methemoglobinemia
- ventricular arrhythmia

The correct answer is:
A - cerebral edema

Where in the reference can the correct answer(s) be found?
Page 243, section "Oil of Wintergreen," paragraph 2

It is the best answer because…
Oil of wintergreen is an essential oil found in numerous household products such as lotions, oils, and analgesic balms. It is comprised almost entirely of methyl salicylate, metabolizing to salicylic acid if ingested. Severe methyl salicylate poisoning is identical to other forms of salicylate poisoning and ingesting less than a teaspoon may be fatal to children. Pulmonary or cerebral edema is often the cause of death from ingestion.

Why are the other options incorrect?

- Gastrointestinal bleeding is a potentially severe adverse effect of non-steroidal anti-inflammatory drugs (NSAIDs).
- Methemoglobinemia in children can occur with benzocaine toxicity.
- Ventricular arrhythmia, which can occur with accidental ingestion of a number of medications, is not a common occurrence with oil of wintergreen ingestion.

PNCB committee members offer these key learning point(s) or additional information about the topic:
What is something new that you learned about this topic?
The American Association of Poison Control Centers (AAPCC) has reported that nearly half of the U.S. poison control center calls are for pediatric exposures. Approximately 99% of these exposures are unintentional and occur in children less than 6 years of age. Personal care products and cosmetics are the most reported types of pediatric ingestion, followed by household cleaning products and analgesics. Fortunately, most exposures do not require medical intervention in a healthcare setting (Bolick et al., 2020). Caregivers and healthcare providers must contact the national poison helpline (800-222-1222) for guidance regarding potential toxic exposure.

Bolick, B., Reuter-Rice, K., Madden, M., and Severin P. (Ed.) (2020). Toxicologic exposures. *Pediatric acute care: A guide for interprofessional practice.* (2nd ed., pp. 1010-1024). Elsevier.

Example: Pharmacology 2024 Current Concepts

A 6 year old weighing 20 kg, who is otherwise healthy, has been experiencing headaches 3 to 4 times per year that last most of the day. Treatment with medication has not been previously tried, and parents are now seeking advice. Which management is MOST appropriately recommended?

- give acetaminophen 300 mg as soon as a headache starts
- administer zolmitriptan nasal spray 5 mg as needed up to 3 times daily
- ensure hydration is maintained and give naproxen 500 mg at the onset of headache
- encourage rest for 2 hours and follow with ibuprofen 300 mg if the headache persists

The correct answer is:
A - give acetaminophen 300 mg as soon as a headache starts

Where in the reference can the answer be found?
Page 164, section "Medication Options", paragraph 2
Page 166, Table "Common Abortive Therapy Options"

It is the best answer because…
OTC medications, such as acetaminophen, are safe and effective for the treatment of headaches in children. Parents should be counseled that the medication should be taken as soon as the child feels the headache developing.

Why are the other options incorrect?

- Ibuprofen, similar to acetaminophen, is an effective OTC product that parents can use for treating their child's headache pain. However, ibuprofen is dosed at 10 mg/kg and therefore, 300 mg in the option is too high. Abortive medications are most effective when taken as soon as the headache starts, and while rest is important, medication administration should not be delayed.
- Encouraging oral fluid intake may help manage headaches, particularly those related to poor hydration, but the naproxen dose in the answer option is too high for this child. Naproxen is dosed at 10-20 mg/kg, which would be a dose between 200 and 400 mg.
- Zolmitriptan is available as a nasal spray formulation and is an option as an abortive treatment for children who experience acute migraines. The maximum dose for a child of any age is 10 mg per day. It is unlikely that this medication would be prescribed as the initial abortive therapy if a trial of acetaminophen or ibuprofen had not been attempted and pending further investigation of the child's headaches to determine if they are migraines. It is also recommended that a triptan medication be used after or in conjunction with another analgesic agent.

PNCB committee members offer these key learning point(s) or additional information about the topic:
What anticipatory guidance, counseling, or education would you provide to children, adolescents, and families?
A comprehensive educational handout for caregivers on migraine headaches in children from the AAP can be found at the following site: https://www.healthychildren.org/English/health-issues/conditions/head-neck-nervous-system/Pages/Migraine-Headaches-in-Children.aspx

Example: Primary Care: Behavioral/Mental Health Focus 2024

An adolescent reports poor sleep, difficulty concentrating in school, and persistent worrisome thoughts that get "stuck" in their head about participating on the soccer team, occurring over the past 7 months. The adolescent who has excelled at soccer denies recognizing any specific triggers and is distressed about grades declining from an A+ to A-. The MOST likely diagnosis is:

- generalized anxiety disorder
- obsessive-compulsive disorder
- panic disorder
- social anxiety disorder

The correct answer is:
A - generalized anxiety disorder

Where in the reference can the answer be found?
Page 622, section "Generalized Anxiety Disorder," paragraph 1

It is the best answer because…
Generalized anxiety disorder (GAD) is characterized by a persistent state of worry occurring across multiple settings. Intrusive thoughts that feel "stuck" are common with GAD. Often, a specific trigger or stressor is not identified as the cause. Children with GAD tend to have intrusive thoughts about everyday occurrences, such as school activities and team tryouts. Furthermore, GAD tends to be associated with thoughts and feelings of perfectionism, need for continual reassurance, struggle with criticism, and fear of consequences.
The *DSM-5* (American Psychiatric Association, 2013) criteria for the diagnosis of GAD include excessive worry that persists for more than 6 months, is difficult to control, and is accompanied by 1 of the following symptoms: edginess or restlessness, fatigue, impaired concentration, irritability, muscle aches or soreness, or difficulty falling or staying asleep.

Why are the other options incorrect?

- Children with obsessive-compulsive disorder (OCD) also commonly have intrusive thoughts that feel "stuck;" however, they tend to be thoughts that are more fixated on terrible events. An example is persistent worry about the potential death of a parent, believed to be caused by the child's imperfect behavior. Children with OCD tend to have compulsive, repetitive behaviors.
- Social anxiety disorder is most common in children 6 to 12 years of age. *DSM-5* diagnostic criteria include the child experiencing extreme distress and fear of judgment by others, inclusive of their peers. Children with social anxiety disorder typically try to avoid social gatherings and are often labeled by teachers as shy.
- Panic disorder is described as a surge of anxiety that causes physical symptoms such as trembling, racing heartbeat, chest pain, sweating, or dizziness. It differs from GAD as the symptoms are extreme and sudden without a persistent feeling of anxiety.

PNCB committee members offer these key learning point(s) or additional information about the topic:
What consensus guidelines or other sources can be listed for further learning (such as the CDC website or reputable online tools)?

Guidelines from the American Academy of Child and Adolescent Psychiatry (AACAP) for the assessment and treatment of children with anxiety disorders can be freely accessed at the following citation:

- Walter, H. J., Bukstein, O. G., Abright, A. R., Keable, H., Ramtekkar, U., Ripperger-Suhler, J., & Rockhill, C. (2020). Clinical practice guideline for the assessment and treatment of children and adolescents with anxiety disorders. *Journal of the American Academy of Child and Adolescent Psychiatry*, *59*(10), 1107–1124. https://doi.org/10.1016/j.jaac.2020.05.005

I am passionate about this topic because…
From a PNCB committee member: *"I actively practice in the developmental-behavioral mental health subspecialty. In recent years, particularly post-pandemic, we have seen a massive influx of referrals for behavioral mental health evaluations, resulting in very lengthy waitlists for appointments. The increased demand for pediatric mental health providers has highlighted not only the discomfort in diagnosing and treating behavioral and mental health conditions in primary care but has also inadvertently revealed a knowledge gap in how general childhood development impacts presentation of these conditions. This often delays early intervention as patients and families wait for a specialized developmental behavioral evaluation. I hope that in the future, a heavier focus on developmental deviations and delays (rather than on typical milestone completion) in advanced practice curriculum and certification content can help to bridge some of that knowledge gap."*

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: American Psychiatric Association.