



**ASSESSING HOW
PEDIATRIC HOSPITALISTS
THINK: MCQ VS SCT ?**

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THE AUTHORS HAVE NO DISCLOSURES



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BACKGROUND

- Clinical reasoning is at the core of Pediatric Hospitalists' (PH) professional competence.
- To maintain professional competence PH need to engage in authentic self-assessment exercises that challenge clinical reasoning in addressing diagnostic and therapeutic problems they encounter in daily practice.
- Multiple choice (MCQ) are reported to measure knowledge.
- Script concordance (SCT) are said to better assess higher cognitive processes involved in clinical reasoning.
- No studies have determined whether SCT questions actually promote higher order thought processes.

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OBJECTIVES

- To determine how Pediatric Hospitalists (PH) think when answering MCQ vs SCT questions.
- To determine PH perceptions of the MCQ vs SCT format for assessment of clinical competence

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METHODS: QUESTION SELECTION/DEVELOPMENT

- 4 Case-based MCQ and 4 SCT questions.
 - MCQ from AAP PREP-SA
 - SCT from cases on AAP SOHM listserv or authors' practice
- Similar vignettes: **3 MANAGEMENT; 1 DIAGNOSIS**
 - Adolescent with **COMPLICATED PNEUMONIA**
 - Neonate with **SERIOUS BACTERIAL INFECTION**
 - Preschooler with **PROLONGED FEVER AND RASH**
 - Older Infant with **FEBRILE SEIZURE**
- 10 PH national educational experts reviewed questions for **content validity** and **response process validity**.

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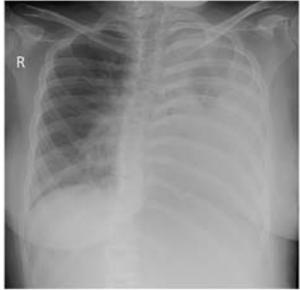


EXAMPLE MCQ QUESTION

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A 15-year-old girl was admitted to the hospital 3 days ago for a large left-sided pneumonia with associated pleural effusion. At the time of admission, she was started on ceftriaxone and placed on oxygen via nasal cannula. Over the last 3 days, she has had daily fevers along with a persistent cough. Her vital signs this morning are temperature 39.0°C, heart rate 100 beats/min, and respiratory rate 35 breaths/min. Her oxygen saturation is 94% on 3 liters/min of oxygen via nasal cannula. Daily chest radiographs, which are unchanged since admission, demonstrate the persistence of the pneumonia and pleural effusion. On physical examination, she has mild respiratory distress, prolonged expiration, and unchanged decreased breath sounds over the left side of her chest. She has a grade 2/6 systolic ejection murmur.



Radiographic findings as described for the girl in the vignette. Courtesy of B Pless

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Of the following, the MOST appropriate next step is

- A. bronchoscopy with bronchoalveolar lavage
- B. echocardiogram
- C. open lung biopsy
- D. sputum culture
- E. video-assisted thoracoscopic surgery (VATS)



EXAMPLE SCT QUESTION

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It is your first day caring for a 15 yo previously healthy white male admitted 8 days ago. He is s/p PICU stay for treatment for toxic shock with fluids, steroids and inotropic support. He initially presented with a 2 day history of dry cough, sore throat, fever and recurrent emesis. On admission he treated with Azythromycin, and Cetriaxone and Vancomycin. Clindamycin was started on Day 2 when the rapid strep was positive, Ceftriaxone and Azythromycin were discontinued and Vancomycin was continued for 7 days. BC, CSF and UC were negative. The plan from the previous hospitalist team is to discharge him home today on oral Clindamycin. Over the past 24 hours he has had temperatures up to 38.3 x 2, is on room air and able to ambulate, although he "feels dizzy". He complains of some pain over the left chest. CXR on admission to the PICU and today are shown below.

If you were considering the risk-benefit ratio of the following treatment...	...and the following new information became available...	...you would then consider the treatment... -2: strongly contraindicated -1: contraindicated 0: neither more or less indicated +1: indicated +2: strongly indicated
Performing a thoracentesis	Chest ultrasound shows loculated fluid	[]-2 []-1 []0 []+1 []+2
Discharge on per plan on oral Clindamycin with close ID f/u	Parents were told the plan is to discharge today on oral Clindamycin to complete at 2 week course and are threatening to sign out against medical advice	[]-2 []-1 []0 []+1 []+2
Consult surgery for VATS	Chest ultrasound shows free flowing fluid	[]-2 []-1 []0 []+1 []+2

METHODS: MIXED STUDY DESIGN

- 12 PH with varied levels of experience
- **"Think Aloud"** answering MCQ and SCT questions
- A research assistant:
 - Reordered MCQ vs SCT questions randomly
 - Recorded over the phone while answering questions
 - Interviewed participants about the experience
- Transcribed recordings de-identifying participants.
- 3 investigators coded transcripts by cognitive level
Using Bloom's Taxonomy for coding
- Post-test interviews were coded to triangulate results

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CODING: BLOOMS TAXONOMY REVISED

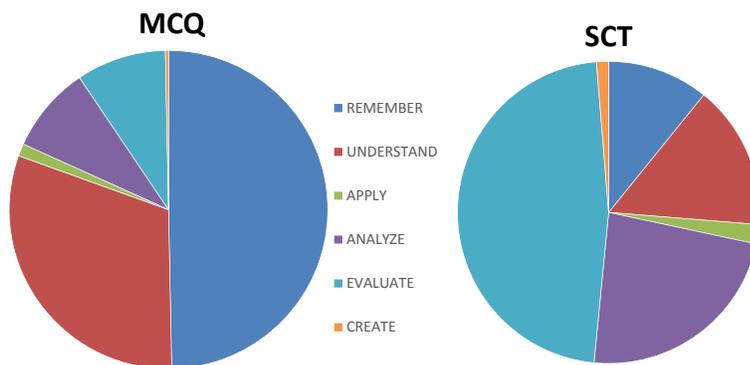
- **REMEMBER**- State previously learned information-Recall, Match, Select
- **UNDERSTAND**- Demonstrate understanding of previously learning information by interpreting- (WBC of 26,000 is high) **A=B**
- **APPLY**- Solve problems by applying knowledge- (500:1 rule for analyzing a bloody CSF tap)- **A+B=C**
- **ANALYZE**: Examine –break information into parts by identifying causes or synthesize information to determine meaning. Make inferences and find evidence to support generalizations. Put pieces together to determine meaning. **A+B +/- C=D**
- **EVALUATE**: Make judgments about information, validity of data or quality of work based upon a set of criteria **A+B= C NOT D**
- **CREATE**: Synthesize information together in a different way by combining elements in a new pattern or proposing an alternative solution

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RESULTS:

COGNITIVE DISTRIBUTION OF COMMENTS

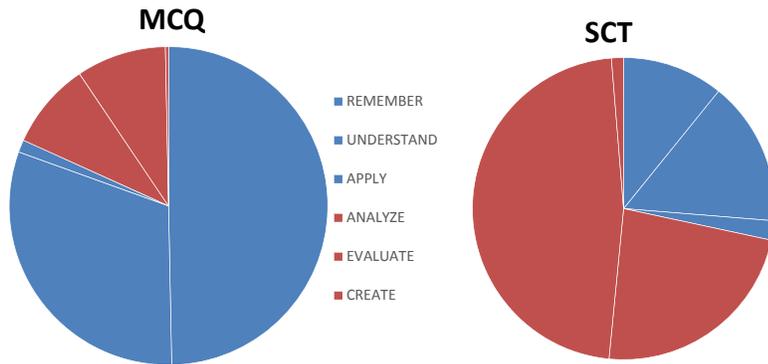


Investigators had 86% coding concordance

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RESULTS: COGNITIVE DISTRIBUTION OF COMMENTS



Significantly more comments were **higher cognitive processes (analyze, evaluate, create)** for SCT vs MCQ (72% vs 18%) compared with **lower order (remember, understand, apply)**
Chi square $p < .01$.

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INTERVIEW THEMES:

MCQ:

"Black-and-White": Easier to answer

Comfort with the MCQ format

Pattern recognition: Playing a game-identify key features to determine where the question is leading.

Answer prior to reading the possible options.

One correct answer with limited options.

Eliminate options that were clearly wrong.

Challenge: select the next step in management when in life more than one option would be done simultaneously; wanting an answer not listed.

SCT:

More difficult because of missing information: More **ambiguous**

NO absolute correct answer = ANXIETY

Likert scale answers did not provide **cueing**

Question construction more complex=Read more carefully to understand what was being asked.

Included additional psychosocial factors

Tacit knowledge critical in dealing with ambiguity

More realistic.

Tested clinical reasoning

Think sequentially to analyze new information.

Quality of thinking -at a higher cognitive level

Better distinguished clinical expertise

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LIMITATIONS

- Small sample size
- Single institution
- Limited number of questions

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CONCLUSION:

- Pediatric Hospitalists **utilize higher order thought processes** when answering SCT versus MCQ.
- Pediatric Hospitalists **perceived** that SCT questions better assessed clinical reasoning and real-world clinical competence.

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