

Computer-Based Simulation

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Computer-Based Simulation

Definition

“This testing format . . . requires the examinee to manage a simulated patient in simulated time. The examinee can select options for history-taking and physical examination. Diagnostic studies and treatment are ordered via free-text entry, and the examinee controls the advance of simulated time and the location of the patient in the health care setting.”

Dillon & Clauser (2009)

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Key Issues

“ . . . selecting an assessment method involves [attention to purpose and] context-dependent compromises.” (van der Vleuten & Schuwirth, 2005)

Reliability depends on sampling: content, judges, instruments, contexts

Validity: authenticity and integration of competencies

Educational impact

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Pros

Fidelity – clinical realism

Engaging

Assess:

- **Diagnostic decision-making skills**
- **Therapeutic intervention skills**
- **Developing and implementing a patient management plan**

20 + year NBME research legacy

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Cons

Scoring is difficult

USMLE Step 3: 9 CCS, 25 min/CCS \approx 4 hrs

Less efficient than MCQs per unit of testing time

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Costs

- **MCQs are more cost-effective**
- **Complex software and large database needed to support real-time delivery of the CCS test format**
- **Test delivery can be challenging**
- **Accurate and timely reporting of results is difficult**

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Risks

- **Continuous test administration throughout the year**
- **Small case pool due to effort required for case development**
- **Examination security can be compromised via examinee grapevine**

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Feasibility

“... increased complexity in testing format results in a reduction of the number of times the examiner is able to assess the examinee, per unit of testing time. Without an increase in test length and time, a loss in score precision should be expected and, again, this likely outcome needs to be carefully measured against the value added by the simulation format.”

Dillon & Clauser (2009)

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References

Dillon GF, Clauser BE. Computer-delivered patient simulations in the United States Medical Licensing Examination. *Simulation in Healthcare* 2009; 4: 30-34

Van der Vleuten CPM, Schuwirth LT. Assessing professional competence: from methods to programmes. *Medical Education* 2005; 39: 309-317.