### Outcomes-based Evaluations:

The Moore, Green, and Gallis model (2009) describes 7 Outcome Levels:

<table>
<thead>
<tr>
<th>Level</th>
<th>How Evaluated; examples</th>
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<tbody>
<tr>
<td>Level 1</td>
<td>Participation</td>
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<tr>
<td>Level 2</td>
<td>Satisfaction</td>
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<tr>
<td>Level 3A</td>
<td>Learning: Declarative Knowledge (Knows)</td>
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</tbody>
</table>
- Standard activity evaluation form: attendee opinion-were learning objectives met?  
- Expanded activity evaluation form: Quiz at end asking for response to learning objectives e.g. list 3 stimulant medications.  
- Written examinations e.g. Board examination |
| Level 3B | Learning: Procedural Knowledge (Knows How) | 
- Can explain knowledge/skill/attitude verbally or in written form |
| Level 4 | Learning: Competence (Shows How) | 
- Can demonstrate in simulation or practice situation |
| Level 5 | Performance (Does) | 
- Uses new knowledge/skill/attitude in practice (real-life) |
| Level 6 | Patient Outcome | 
- Improvement in patient outcome measures
  - example: 25% reduction in ADHD rating scale scores |
| Level 7 | Community Health | 
- Improvement in systems (clinic, hospital, community)
  - Impact beyond your own patients
  - example: schools screen using Vanderbilt ADHD scale |

### Outcome Measures:

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Strengths/Weaknesses</th>
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<tbody>
<tr>
<td>Behavior Change</td>
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- Educational activities should be transformative;  
- If there is no change in behavior after an educational activity then at best, it was entertainment; at worst, it was a waste of time.  
- Assessing behavior change is difficult and expensive  
- Behavior Change may be a planned change, an observed change or a reported change.  
- Behavior Change that is unobserved may be the most important kind as it reflects internalization of the knowledge, skill or attitude. |
| Sign-in sheet | 
- "Eighty percent of success is showing up"-Woody Allen  
- Does not indicate learning, retention or change in performance (outcome) |
| Satisfaction Survey | 
- Attendee’s opinion whether met stated educational objectives (outcome)
  - Can be done electronically
  - Can provide feedback to faculty on content and delivery
  -- May not necessarily predict learning, retention or change in performance. |
| **Pre-test/post-test** | - Activity participants complete multiple choice questions concerning activity content before and immediately after activity.  
- This method measures learning that occurred as a result of the activity.  
- Strength is immediate feedback for participants and the faculty regarding what learning has occurred  
- May not predict retention of the learning or change in performance. |
| **Audience Response System** | - Electronic live audience response system (ARS) uses “clickers” or web-based smartphone application (app) such as Poll Everywhere ([www.polleverywhere.com](http://www.polleverywhere.com))  
- Anonymity gives more accurate assessment of audience’s understanding but not of individual learner’s needs  
- Can be combined with Case-based/Vignettes to tap into higher order skills  
- Can be used as pre-test/post-test  
- Data can be saved; used to revise educational activity or class progress |
| **Post-activity assessment** | - Can be incorporated into standard activity evaluation form or separate quiz  
- ex. Multiple choice from lecture; relevant Board question(s); factual short answer or reflection on lecture, activity or experience  
- One Minute Paper- talk to peer or write down key point, questions that session raised, points that weren’t clear; can occur during or at end;  
- Variable response and response quality  
- Verbal responses invite more participation but hard to quantify impact  
- Written response needs time to write, score and analyze  
- Written responses can be collected into Portfolio for future mutual review with individual |
| **Direct Observation** | - Direct observation of student for use and application of new skills.  
- Checklist (Mini-CEX) standardizes observations  
- Patient problems vary in clinic  
- Variable quality of skill performance across learners  
- Multiple observations of same individual increases validity  
- Difficult to schedule observation and review  
- Multiple agendas challenging to balance |
| **Simulation/Standardized Patient** | - Skill acquisition monitoring (Formative) - safe environment to try it out, make mistakes, get feedback and review;  
- Can be Competency Assessment (Summative); demonstrates meets a standard  
- Complicated to arrange; expensive; time-consuming |
| **Commitment to Change (CTC)** | - Participants are asked to write one to three changes that they plan to make as a result of our activities (Level 4 measurement).  
- Evidence that stating in writing a **commitment to change** (CTC) predicts actual change in practice (Domino 2011);  
- Measured effectiveness (**performance in practice**)—Level 6) requires system for follow-up letter, fax-back or electronic survey and subsequent analysis  
- Self-report measure but there is data supporting indicative of change.  
- Requires ongoing contact with learner; needs administrative staff |
| Patient Outcome                                                                 | -If learners within the same system can use electronic health record to compare before/after educational activity  
|                                                                                                                                       | -Quality improvement methodology can be used  
|                                                                                                                                       | -Patient/Family surveys useful for professionalism/communication  
| Portfolios                                                                         | -If learners within your program/rotation can collect evidence of change (presentations; written reports; reflections; learning plans; literature searches; community activities; quality improvement projects, etc)  
|                                                                                                                                       | -Encourages self-directed learning and “deep learning”  
|                                                                                                                                       | -hard to measure; hard to compare learners;  
| “Community” outcomes                                                               | -Difficult to measure broad impact  
|                                                                                                                                       | -Maintenance of Certification (MOC)  
|                                                                                                                                       | -Participation in “Communities of Learning” might enable systems of measurement as use of Milestones expands to include “Expert” learners.  