The University of Vermont College of Medicine has been engaged for several years in a program of iterative curriculum improvement. Goals of this improvement include enhanced self-directed learning and increased time with faculty spent on application of knowledge and clinical reasoning skills. The Neurology Clerkship faculty reanalyzed the usefulness of lectures. The faculty sought to employ active learning methods to optimize teaching time with faculty and enhance life-long learning behaviors. In addition, since the Neurology Clerkship uses three geographically separate training sites, it was important to use a format that could be employed at a distance or asynchronously by a number of different faculty. A group case discussion (GCD) format was therefore developed and used in lieu of lecture.

New didactics were designed with the following priorities:

- Encourage self-directed learning by the students
- Limit the number of teaching sessions that were repeated every 3 ½ weeks
- Be interactive: Encourage student and faculty discussion
- Emphasize the clinical presentation, symptoms, signs & lab results, rather than be disorder or disease- based
- Align with the competencies of the clerkship
- Allow any Neurology faculty member to lead any of the case discussions, regardless of their area of expertise

The learning objectives of the didactic sessions were reviewed and reformulated to reflect US Neurology Clerkship Core Curriculum Guidelines and the clerkship competencies.

Idealized cases were developed to match the revised objectives and replace didactics. At home study materials were compiled, and study questions were written to help students prepare for the sessions.

Students were given 4-8 cases to read for each session. They prepared answers to questions about the cases after reviewing appropriate references and, if desired, by watching online video lectures.

A faculty neurologist moderated each GCD. Faculty were prepared by providing them a packet containing the cases, the answers to the case questions and the explanations for the answers.

Students completing their Neurology Clerkship in two remote satellites sites were able to participate in GCDs along with the faculty moderator and students based in Burlington, Vermont by using teleconferencing technology.

- Sixteen hours of lectures were replaced by eight hours of GCDs. Ten topics were covered by lecture and more than 16 topics were covered by GCD. In addition to the 2 hour GCD, 3 hours per GCD was allotted for student preparation.
- Students were reliably prepared and participated in the GCDs creating an interactive experience that allowed the moderator to evaluate and supplement the student’s knowledge based on their answers.
- A National Board of Medical Examiners Neurology Examination was introduced and revealed that UVM students performed at the national mean, despite elimination of lectures from the clerkship.
- Overall, evaluation of the clerkship has increased steadily since GCD inception. Students at remote satellite sites were able to effectively participate in GCDs and gave similarly favorable feedback about the experience compared to those students who were locally based.

<table>
<thead>
<tr>
<th>LECTURE</th>
<th>GCDs</th>
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<tbody>
<tr>
<td>Teleconferencing</td>
<td>Yes</td>
</tr>
<tr>
<td>Active learning</td>
<td>No</td>
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<tr>
<td>Assessment</td>
<td>Exam</td>
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<tr>
<td>Adaptable format</td>
<td>No</td>
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<tr>
<td>Flexibility in faculty assignment</td>
<td>Limited by expertise</td>
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<tr>
<td>Facts delivered</td>
<td>Extensive</td>
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<tr>
<td>Content covered</td>
<td>Limited</td>
</tr>
<tr>
<td>Knowledge application and clinical reasoning</td>
<td>Absent</td>
</tr>
</tbody>
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STUDENT ACCEPTANCE OF GCDs

Evaluation of Clerkship Quality (min 1, max 5)

Pre: = 3.6 Post: = 4.0

FACULTY MODERATOR ACCEPTANCE OF GCDs

Polled on 8-12-14: GCDs are a more effective way to teach clinical medicine than a lecture format

Faculty moderators: Strongly agree = 6, agree=6, neutral =1, disagree=1, strongly disagree= 0

**Take-Home Points**

- GCDs offer many advantages over lecture format including assessing performance, flexibility and the use of active learning.
- GCDs are a more efficient way to cover a learning objectives in a limited amount of time.
- Students at remote locations can effectively participate in GCDs by teleconferencing technology.
- Students & faculty prefer GCDs over lecture format, though GCDs require preparatory work.