Longitudinal Integrated Clerkships

January 31, 2013
A CALL FOR REFORM IN MEDICAL SCHOOL AND RESIDENCY:
A report by the Carnegie Foundation

2010

School of Medicine
UNIVERSITY OF COLORADO
ANSHUTZ MEDICAL CAMPUS
The Carnegie Report Findings

Acad Med. 2010;85:220-7

“Medical training is inflexible, excessively long, and not learner-centered. We found that clinical education is overly focused on *inpatient clinical experience*, supervised by clinical faculty who have less and less time to teach and who have ceded much of their teaching responsibilities to residents, and situated in hospitals with marginal capacity to support their teaching mission. Students lack a holistic view of patients and often poorly understand nonclinical physician roles.”
Haven’t we done enough?
Longitudinal Integrated Clerkships

- Definition of an LIC
- The case for change
- New pilots
- Summary
Longitudinal Integrated Clerkships

- Participate in the comprehensive care of patients over time
- Have continuous learning relationships with clinicians
- Meet the majority of core clinical competencies across multiple disciplines simultaneously

Consensus LIC definition
CLIC 2007
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thur</th>
<th>Fri</th>
<th>Weekend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ObGyn Surgery</td>
<td>ObGyn Rounds</td>
<td>FM Rounds</td>
<td>IM Rounds</td>
<td></td>
<td>Call - 8 AM - 11 PM Students rotate weekends on call in ER, Surgery and Labor &amp; Delivery</td>
</tr>
<tr>
<td></td>
<td>7:30 AM</td>
<td>8:30 AM</td>
<td>9:00 AM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Small Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00 PM</td>
<td>ObGyn Clinic</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5:00 PM</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6:00 PM</td>
<td>Weekday Call 6 pm - 11 pm (On Call in ER, Surgery and Labor &amp; Delivery) - approx. every 10 days.</td>
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<tr>
<td>Week 2</td>
<td>Mon</td>
<td>Tue</td>
<td>Wed</td>
<td>Thur</td>
<td>Fri</td>
<td>Weekend</td>
</tr>
<tr>
<td></td>
<td>Surgery Rounds</td>
<td>Surgery -OR</td>
<td>Peds Rounds</td>
<td>Psychiatry Rounds</td>
<td></td>
<td>Call - 8 AM - 11 PM Students rotate weekends on call in ER, Surgery and Labor &amp; Delivery</td>
</tr>
<tr>
<td></td>
<td>7:30 AM</td>
<td>8:30 AM</td>
<td>9:00 AM</td>
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<td>12:00 PM</td>
<td>Small Group</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Neurology- 1 student rotates every other week</td>
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<tr>
<td>5:00 PM</td>
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</tbody>
</table>

School of Medicine
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

www.medschool.ucdenver.edu
THE CASE FOR CHANGE
Challenges of the 3\textsuperscript{rd} year

- Competition with resident education, clinical productivity, and research.
- Current environment: fragmented (e.g. inpatient/outpatient, specialty clinics/services, 80 hour work week, shorter attending rotations).
- Erosion of relationship with the patient, inpatient team, faculty.
- Lack of authentic roles in patient care.
- Lack of exposure to undiagnosed patients.
- Limited observation of skills, professionalism, communication.
- Lack of continuity regarding skills development across 3\textsuperscript{rd} year.
The case for Longitudinal Integrated Clerkships

Research over the last decade has shown potential educational advantages of LIC’s in both rural and urban settings.

Educators and students perceive evaluation to be fairer, more accurate and more representative of student performance.

The doctor-student relationship matures and effects both enhanced student learning and greater educator satisfaction.

Med Ed 2011; 45:436-7
Are LIC’s transforming medical education worldwide?

The University of Minnesota introduced the 1st LIC in 1971

Next generation of LIC’s in 1990’s: Australia, Canada, South Africa, U.S.

Consortium of Longitudinal Integrated Clerkships (CLIC)

Northern Ontario School of Medicine- 1st medical school in which all students undertake LIC clinical training 2008

Sanford School of Medicine- all students will receive LIC clinical training beginning in 2013
# Learning environments: Cambridge Integrated Clerkship vs. Harvard Comparison Group

<table>
<thead>
<tr>
<th>Student Descriptions</th>
<th>27 CIC students</th>
<th>40 Comparison students</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfying</td>
<td>5.41</td>
<td>4.67</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Confidence building</td>
<td>4.96</td>
<td>3.87</td>
<td>&lt;.005</td>
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<tr>
<td>Rewarding</td>
<td>5.78</td>
<td>4.77</td>
<td>&lt;.001</td>
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<tr>
<td>Humanizing</td>
<td>5.44</td>
<td>3.88</td>
<td>&lt;.001</td>
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<tr>
<td>Transformational</td>
<td>5.44</td>
<td>4.62</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

Using a 6-point Likert scale: “At this point, how well would you say that the following adjectives describe your clerkship experience?”

## Learning environments: Cambridge Integrated Clerkship vs. Harvard Comparison Group

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<th>40 Comparison students</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boring</td>
<td>1.44</td>
<td>1.90</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>Marginalizing</td>
<td>1.89</td>
<td>3.43</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Hectic</td>
<td>5.37</td>
<td>4.65</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Stressful</td>
<td>5.26</td>
<td>4.62</td>
<td>&lt;.005</td>
</tr>
<tr>
<td>Frustrating</td>
<td>3.63</td>
<td>3.75</td>
<td>.709</td>
</tr>
</tbody>
</table>

Using a 6-point Likert scale: “At this point, how well would you say that the following adjectives describe your clerkship experience?”

**Acad Med 2012; 87:643-50.**
Educational Outcomes of the Harvard Medical School-Cambridge Integrated Clerkship: A Way Forward for Medical Education.
Hirsh, David; Gauberg, Elizabeth; MD, MPH; Ogur, Barbara; Cohen, Pieter; Krupat, Edward; Cox, Malcolm; Pelletier, Stephen; Bor, David
DOI: 10.1097/ACM.0b013e31824d9821

Figure 1. Comparison of how well 27 Cambridge Integrated Clerkship (CIC) students and 40 traditionally trained comparison students felt they met the structural goals of engaging continuity of care (following patients before admission and after discharge), having meaningful engagements with patients, making a difference in patients' health or well-being, and maintaining continuity of supervision (amount of feedback and mentoring by faculty). The bars show the percentage of students who said that they had "often" or "very often" engaged in the activities or received the feedback and mentoring. For all goals, P < .001.
Retention of knowledge: 3\textsuperscript{rd} – 4\textsuperscript{th} year

![Graph showing the retention of knowledge for different fields across the 3\textsuperscript{rd} and 4\textsuperscript{th} years. The graph compares YAP Surgery, Trad Surgery, YAP OB/GYN, Trad OB/GYN, YAP Int Med, Trad Int Med, YAP Total, and Trad Total.]
Outcomes of Different Clerkship Models: Longitudinal Integrated, Hybrid, and Block

Communication, curriculum, & culture (C3)
  - outcome: Perception of student experiences with patient-centered behaviors

Communication, curriculum, & culture (C3)
  - outcomes: Perception of role modeling by clinical teachers

Student evaluations of the clerkship: Perception of teaching, observation of skills, feedback, and clerkship overall

Student focus group outcomes: Satisfaction with clinical year

Skill and knowledge-based outcomes: Clinical skills performance

Knowledge acquisition

Narratives

“This is a lovely 30-year-old pregnant woman with Protein S deficiency.” Where it goes from there depends on the audience. For the neurologist, it was “who presents at seven weeks pregnant with a lifetime of HA with visual S.” For the MFM doctor, it was “an otherwise uncomplicated pregnancy, being anticoagulated on daily lovenox.” For the OB it was “presenting at term for induction of labor because of oligohydramnios” For the postpartum team, it was “whose baby girl was born by uncomplicated vaginal delivery.” Ultimately, I saw Ms. P with six different providers in six different settings. and was inspired to learn and relearn information about migraines, prothrombotic disorders, abnormal uterine bleeding, and normal labor and delivery. The first baby I ever delivered belonged to a family I had known for nine months.”

—Student CC, from the first year of the HMS-CIC, now a resident in obstetrics–gynecology

Acad Med 2009; 84: 844-50
Narratives

Yet later, after months of broad-spectrum antibiotics, Ms. O continues to experience a rocky course. The integrated clerkship has allowed us to follow her care through different institutions; to visit her in a cross-town hospital, and to admit her with fevers and anemia. Through Ms. O we have learned about issues ranging from abscesses to malnutrition, from feeding tubes to skin ulceration. We have seen a strong and smart woman grow delirious and unintelligible. Each time we see Ms. O, attempting to understand her evolving health adds another piece to our medical repertoire. Each time we grow to understand a bit more about the toll that hospitalizations and chronically deteriorating health can have on a patient and her family.

—Student JS, from the first year of the HMS-CIC, now a resident in internal medicine

Acad Med 2009; 84: 844-50
In comparison, LIC students...

- Perceive better clinical learning opportunities
- Perceive more access to patients
- Report more longitudinal exposure to disease
- Report promotion of patient-centered attitudes—prevented erosion of idealism and empathy
- Are better prepared to care for patients: greater understanding of ethical decision-making and how social context affects patients
- Are more likely to receive feedback and mentoring
WHAT WILL THE ACTION FIX?
Student a benefit, not a burden...

- Daily Financial Impact

- Time since commencing attachment

- ‘Turning Point’ where the student attachment is of daily benefit to the practice

- ‘Break Even Point’ for the attachment
Foundations of Doctoring Preceptor Data

Preceptor Settings, by Setting

- Private
- Underserved + DH
- Kaiser
- UH, TCH, VA

- 2007-2008
- 2008-2009
- 2009-2010
- 2010-2011
- 2011-2012
IS THERE A NEED FOR REPLACING THE CURRENT EDUCATIONAL MODEL?
Longitudinal Integrated Clerkships:

Better for learners and patients….

Acad Med 2009;84:821

Better for preceptors….

Med Ed 2011;45:455-63
Pilots

16 week Combined HAC/AAC/RRC/OPC Block + Denver Health Pilot = Experience for Colorado Springs
Colorado Springs Branch Timeline

University of Colorado School of Medicine
Colorado Springs Branch
Timeline*

Jan 2012
Notify LCME of intent to explore branch

Jun 2012
Groundbreaking – UCFS Lane Center for Academic Health Sciences

Aug 2012
Vote on Memorial Health System lease

Oct 2012
Receive funding for branch

Jan 2013
Submit application to LCME and HLC

Aug 2013
Class of 2017 matriculates (160 students)

Jan 2014
UCFS Lane Center for Academic Health Sciences completed

Aug 2014
Class of 2018 matriculates (184 students)
24 students accepted to branch

Aug 2015
Class of 2019 matriculates (184 students)
24 students accepted to branch

Apr 2016
24 students from Class of 2018 begin fully implemented curriculum in Colorado Springs

Pilot Rotations
Third Year Clinical Curriculum
Class of 2014 through Class of 2017

First full class of students at branch

*All branch activities are contingent on approval of the SOM accrediting body (LCME).
16 Week + Denver Health Pilot

- Needed to develop other models (CO Springs)
- Centralized longitudinal learning experience
- Relationships important- benefit of continuity for patients, preceptors, and students
- Reduces loss of learning every 4-8 weeks as in traditional model
16-week combined clerkship pilot

- Proposed expansion to Estes Park, Cortez, Del Norte, Fort Collins, an Alamosa for a total of 13-14 students
- New learning opportunities in pharmacotherapy, critical care stabilization, transitions of care
- Opportunities to benefit the state of Colorado
Denver Health Pilot

12-month pilot of longitudinal integrated clerkships

~8 Students recruited from urban-underserved track

~2 week intensive clinical experiences: (e.g., inpatient medicine, OB, surgery, peds)

Followed by longitudinal integrated clerkships
Structure

• Inpatient immersions
  ▫ IM, surgery/anesthesia, obstetrics during first block
  ▫ Pediatrics, neurology, psychiatry scattered later in the year

• Integrated ambulatory experiences with follow up of cohort patients across health care venues
  ▫ IM, FM, peds, OB/gyn, surgery, neuro, psych, radiology, MSK, ER settings (including PES, DECC, AUCC)

• Small group didactics
  ▫ Student driven with faculty facilitation
  ▫ Case-based, PBL format
  ▫ Cover core curriculum from all traditional clerkships over the course of the year
  ▫ Developmentally progressive in content

• Independent learning time
  ▫ Follow up of cohort patients to different care venues
  ▫ Attend other clinics of individual interest
  ▫ Independent study and small group preparation time
# Mock Annual Schedule

## LIC experience: 11 immersion weeks

<table>
<thead>
<tr>
<th>week 1</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>week 2-5</td>
<td>Surgery/anesthesia immersion</td>
</tr>
<tr>
<td>week 6-7</td>
<td>medicine immersion</td>
</tr>
<tr>
<td>week 8</td>
<td>L&amp;D immersion</td>
</tr>
<tr>
<td>week 9-20</td>
<td>LIC</td>
</tr>
<tr>
<td>week 21</td>
<td>psych immersion</td>
</tr>
<tr>
<td>week 22-32</td>
<td>LIC</td>
</tr>
<tr>
<td>week 33</td>
<td>neuro immersion</td>
</tr>
<tr>
<td>week 34</td>
<td>ICC</td>
</tr>
<tr>
<td>week 34-40</td>
<td>LIC</td>
</tr>
<tr>
<td>week 41</td>
<td>peds immersion</td>
</tr>
<tr>
<td>week 42-45</td>
<td>LIC</td>
</tr>
<tr>
<td>week 46-50</td>
<td>RCC</td>
</tr>
<tr>
<td>week 51-52</td>
<td>ICC</td>
</tr>
</tbody>
</table>

## 33 integrated weeks

- Year long overview:

## Additional Information:

- Mock Annual Schedule

## Website:

www.medschool.ucdenver.edu
Didactic sessions

• Dedicated group of teaching faculty
• Student works with faculty to develop learning goals, content, assigned readings, and format
• Goals:
  – Frequent reinforcement of basic sciences
  – Clinical care and case discussions
  – Integration of EBM
  – Medical simulation (CAPE)
  – Social sciences, communication, humanism, ethics
  – Unique urban underserved curriculum
Faculty: teaching and advising

• Development team consisting of a DH faculty representative from each department
  – Recruit faculty preceptors in their department
  – Develop and teach the curriculum
  – Participate in evaluation meetings

• Core clinical teaching teams of preceptors
  – Each faculty assigned 1-2 students to work with longitudinally over the course of the LIC
Advising and Assessment

• Each student has an assigned mentor
  – Monthly meetings to provide review of evaluations, develop progressive learning goals, career mentorship
• Regular clinical evaluations from each specialty preceptor
• Sequential shelf exams are evaluative and formative
• Mid-year faculty assessment meeting to provide formal evaluation and feedback to each student
• Final grades to be assigned by CBD based on evaluations, projects and exams at the end of the year
Steps towards implementation in April, 2014

In progress now:

- Demonstrating value of an LIC to the DH institution
- Traditional block integration
- Recruitment of faculty: identification of development team
- Development of the clinical experience
Next steps: 2013-2014

- Recruitment of preceptors and teaching teams
- Faculty development
- Develop tools for evaluation and assessment
  - Competencies
  - Projects
  - Exams
  - Grading
- Develop didactic curriculum
- Recruitment and selection of students
- Housestaff education and training
- Budget: development, operation, indirects
- Other resources: program coordinator, community room, didactic learning space, computers, etc.
- Program evaluation
- Create a blueprint and adapt LIC plans to other sites
Opportunities...

Yes, but....
# Yankton Budget

## Yankton Ambulatory Program

**Projected FY10**

<table>
<thead>
<tr>
<th>Teaching</th>
<th>Projected FY10</th>
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<tbody>
<tr>
<td>Ambulatory Yankton Int Med</td>
<td>$34,090.00</td>
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<tr>
<td>Ambulatory Yankton Fam Med, OB, Peds, Surg</td>
<td>$85,250.00</td>
</tr>
<tr>
<td>Lectures *</td>
<td>$5,700.00</td>
</tr>
<tr>
<td>Active Learning **</td>
<td>$40,960.00</td>
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</table>

**Coordinators**

| 3rd Year Campus Coordinator - Palliative Care | $2,101.00      |
| 3rd Year Campus Coordinator                  | $94,097.00     |
|                                              | $262,198.00    |

* Includes Palliative Care lectures

**Small Group, Palliative Care, Small groups, Oral Psych Exams, Bedside Teaching**

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## Yankton Ambulatory Program

**FY 09 - final numbers for FY09**

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<table>
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<tbody>
<tr>
<td>Coordinators *</td>
<td>92,061</td>
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<tr>
<td>Attendings</td>
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<td>Bedside Teaching/Active Learning</td>
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<tr>
<td>Lectures*</td>
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<tr>
<td>Small Group*</td>
<td>24,012</td>
</tr>
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<td></td>
<td>245,990</td>
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</table>

* Includes Palliative Care
In case you missed it...

Longitudinal Integrated Clerkships

Create a dynamic integrated learning environment

Provide a broader understanding of all aspects of illness

Permit a deeper connection with patients

Transform the student’s role by challenging and empowering

Improve patient care

Inspire commitment, advocacy, and idealism

Acad Med 2009; 84: 844-50
Many thanks to the LIC Advisory Committee: Jennifer Adams, Terri Blevins, Evelyn Brosnan, Bonnie Caywood, Amy Collins-Davis, David Gaspar, Jennifer Gong, Lindsey Lane, David Matero, Brandon Sawyer