An Ambulatory Clinical Teaching Unit: Filling the Outpatient Gap in Internal Medicine Residency Training

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Abstract
The majority of time in a core General Internal Medicine (GIM) residency is spent focusing on inpatient medicine, with relatively little time devoted to ambulatory medicine. The Royal College of Physicians and Surgeons of Canada has mandated an improvement in ambulatory exposure. Unfortunately, most ambulatory experiences tend to lack formal structure, a dedicated educational curriculum, and graduated learner-specific responsibilities. The recent Royal College recognition of GIM as a subspecialty places renewed emphasis on core IM training providing a more comprehensive exposure to outpatient medicine as management of patients with multiple complex conditions may be best managed by a general internist. In July 2015, McMaster University opened an outpatient medicine clinic which is designed to be an Ambulatory Clinical Teaching Unit (A-CTU). The A-CTU provides a structured clinical environment which is focused on the management of medically-complex patients. It uses a multidisciplinary model, graded learner levels of responsibility and a dedicated educational curriculum. The unique structure of the A-CTU allows for the assessment of milestones and EPAs (entrustable professional activities) pertaining to consultation skills and chronic disease management, in keeping with competence by design.

Résumé
La majeure partie du temps du programme de base de résidence en médecine interne est consacrée à la médecine relative aux malades hospitalisés, et peu de temps est consacré à la médecine ambulatoire. Le Collège royal des médecins et chirurgiens du Canada demande qu’une amélioration soit apportée au volet ambulatoire. Malheureusement, la plupart des expériences ambulatoires tendent à manquer de structure, de programme éducatif défini ainsi
Introduction
There has been a recent push by the Future of Medical Education in Canada (FMEC) and the Royal College of Physicians and Surgeons of Canada (RCPSC) to emphasize the importance of “generalism” in training programs across Canada, particularly in the area of Internal Medicine.\(^1\) The FMEC and RCPSC also mandate that trainees have more exposure to ambulatory learning environments. Additionally, the RCPSC is moving towards “Competency-Based Medical Education” (CBME), which requires educators and institutions to implement a system and curriculum to help facilitate this transition.\(^2\) With an increasing number of patients with complex, chronic, multi-system diseases, coupled with current fiscal constraints, the management of these patients is being shifted from the inpatient to the outpatient setting.\(^3\) There is therefore a need to ensure the presence of a robust framework that can meet the needs of patients, learners and educators.

Need for Structured Ambulatory Experience for Core Internal Medicine Training
Internal Medicine training programs have traditionally focused on inpatient medicine, with comparatively little time or exposure devoted to ambulatory medicine. Inpatient experiences such as Clinical Teaching Units (CTUs) tend to be highly structured, have a core educational curriculum, and have pre-specified levels of responsibility for all learners from clinical clerks to PGY1 to PGY3 trainees. Conversely, ambulatory experiences tend not to be well structured, have little or no formal educational curriculum, and have no pre-specified levels of responsibility for trainees. Furthermore, many ambulatory experiences that are scheduled tend to conflict with inpatient care responsibilities, further highlighting this disconnect.\(^4\)

To help bridge this gap in Internal Medicine residency training, the Ambulatory Clinical Teaching Unit (A-CTU), located within the Boris Clinic at McMaster University Medical Centre, was developed and implemented in July 2015. This unique model is designed to meet the growing needs of medically-complex patients, facilitate the implementation of CBME, whilst at the same time, provide learners with a dedicated ambulatory curriculum, and trainee-specific levels of responsibility - all in the ambulatory setting.

Clinical Infrastructure Conducive to a Teaching Environment
One of the many unique features of the A-CTU is rapid access to same-day diagnostic testing, allied-health consultation, and close physical proximity and access to medical and surgical subspecialties. This clinical environment facilitates multidisciplinary team assessment, joint diagnosis and development of a management plan, and efficient transfer of information between the referring and treating physicians. Creating an A-CTU within a newly designed clinic allows for cohesive integration of the clinical and educational components, including fostering a new collaborative outpatient educational culture. As a result of the rapid access to testing and services, learners can actively partake in the “patient journey” from initial consultation through to definitive diagnosis.
and management including real time direct interaction with different subspecialties and allied health services.

**Team Structuring of an A-CTU**
The clinical structure of the A-CTU is similar to that of the traditional CTU, consisting of an attending physician, senior medical resident, and junior learners. In addition, the A-CTU has dedicated staff from physiotherapy, occupational therapy, social work and pharmacy to help foster a collaborative multidisciplinary team environment and to optimize care and resources. This system adopts the team-based specialty care practiced in many family medicine units and subspecialty clinics dealing with chronic conditions (e.g. diabetes). This approach has not, to our knowledge, been extended to the care of patients with multisystem complex conditions managed by GIM physicians. A triaging system has been developed that balances the needs of the trainees with the delivery of health care. Patient numbers are monitored to ensure that the educational mandate is not compromised. The triage system matches diverse cases of varying complexity to the level of the learner, while maintaining the A-CTU’s obligation to meet community and patient needs for outpatient consultation. Nurse practitioners, physician assistants and a non-teaching stream address volume issues and wait time directives.

**Learner Observation and Assessment**
Multiple opportunities exist within the A-CTU for learners to be closely observed both directly and by video monitoring located within each consulting room allowing for real-time and delayed performance observation. Direct observation coupled with graded levels of responsibility provide an ideal environment for preceptors and educators to implement milestones and EPAs, both of which are in keeping with the direction from the RCPSC. These will be implemented as the A-CTU continues to mature. This infrastructure allows for learners to focus on refining their consultation skills as well as managing chronic diseases in the ambulatory setting; both of which are pillars of ambulatory GIM.

An assessment curriculum has been developed across the A-CTU, where initial competencies require the residents to master basic data gathering, examination skills, data analysis, generation of a differential diagnosis and a management plan. Later, they are taught and assessed on competencies in the manager role, collaboration, time and resource management and communication. The most senior learners are evaluated around more complex clinical cases focusing on mastering the role of the resident as a teacher, patient advocate, increasing awareness of the determinants of health at an individual and population level, and opportunities for primary and secondary prevention. Senior level learners also develop skills in working within health care teams using health care extenders such as Physician Assistants and Nurse Practitioners to optimize patient care and flow. The infrastructure within the A-CTU therefore can facilitate the implementation of not just EPAs and milestones, but the entire CanMEDS 2015 framework.

The educational curriculum for the A-CTU includes noon-hour subspecialty teaching rounds, afternoon report, and a clinical skills simulation lab. Afternoon report sessions are based on recent cases encountered within the A-CTU, and focus primarily on the ambulatory management of these patients. Subspecialty teaching rounds are learner-driven and facilitated by sub specialists, including General Internists, and serve to address the learning goals of the trainees as well as deliver the academic curriculum. The learners also have a scholar role within the educational structure. The senior residents have a role in leading the afternoon reports under the supervision of the attending physician. The junior learners are responsible to present their cases and to learn how to access and use the literature to support clinical decisions as applicable to individual patients. Based on situativity theory, these sessions are interactive by design, and allow for consolidation of information and concepts in the context of real clinical interactions.

**Incorporating the A-CTU Within the Core Internal Medicine Training Program**
Residents within our Internal Medicine program spend a total of six weeks on the A-CTU rotation. They have a four-week block as a PGY1, and a two-week block in a Junior Attending role as a PGY3. PGY2 Family Medicine residents participate in the A-CTU as a clinical elective for four-weeks. This block format minimizes disruption to other clinical rotations and serves as an additional longitudinal clinic rotation for GIM trainees. This also ensures learners have a dedicated ambulatory GIM block. The block format allows for sufficient time to deliver the educational curriculum described above. Although learners will be exposed to different faculty, the educational framework and assessment process will maintain continuity in the learner education experience. Residents from the Department of Family Medicine are also incorporated into the A-CTU. The incorporation of learners from different training programs have allowed for increased collaboration and understanding of different specialties. The goal is to improve communication between primary and specialty care physicians, and the infrastructure of the A-CTU serves to facilitate this.
Resident Feedback and Areas for Improvement

Over the first six months of the clinic, we have received feedback from core internal medicine (n=25) and family medicine (n=11) learners. Overall, the rotation was viewed favorably. The scores are listed in the table below. The clinic has a dedicated educational sub-committee, which meets between two to three times per year. This subcommittee monitors the clinic evaluations and makes necessary changes when needed. The resident evaluations are reviewed at these meetings.

As the A-CTU is a new and novel rotation, we understand that there will be shortcomings in the initial phases of the rotation. The resident feedback has been helpful in identifying potential weaknesses and areas of improvement. One of the areas, which scored poorly within the organization of the rotation, was the lack of opportunity to perform procedures within the clinic. During the first six months of the A-CTU, there was no designated area for procedures, and all the procedures had to be coordinated through interventional radiology. As the clinic infrastructure has grown, there is now a designated procedure room. This can be used for procedures such as paracentesis, thoracentesis, lumbar puncture, and skin biopsy. In addition, the A-CTU will be receiving a dedicated point of care Ultrasound (POCUS) in January 2017. The McMaster core Internal Medicine residency program will be initiating a formal POCUS curriculum, and the A-CTU will be one of the rotations where residents work on POCUS competencies.

In the initial phases of the A-CTU, there were times when teaching sessions were scheduled but missed due to the patient care activities. We have improved this administratively by altering the times we schedule patients to ensure that there is protected time for various teaching sessions. In addition, we have formally scheduled the teaching sessions into the daily patient schedule, thus reminding both faculty and learners that these sessions are protected and mandatory.

Another area for improvement within the clinic is the opportunity to provide learners with face-to-face feedback during the rotation. Ideally, supervising physicians work in the clinic in a block fashion so that they could provide feedback after a time of continuous exposure. However, this is not feasible in our institution. Each resident will usually have exposure to 3-4 different supervisors during their rotation. To ensure formal feedback takes place, feedback sessions will be formally scheduled.

**Faculty Development**

Faculty development is critical to ensuring that faculty preceptors are competent to implement this educational

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### Table 1. Rotation evaluation by core internal medicine residents from July-Dec 2015 (n=25)

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>3.9/5</td>
<td>Well organized rotation with balanced responsibility and learning. There was a lack of opportunity for procedures.</td>
</tr>
<tr>
<td>Curriculum</td>
<td>3.9/5</td>
<td>Majority of learners felt that the rotation allowed time for learning activities, case based learning and use of evidence. A small number of learners stated that there was no chance to teach junior learners. (There are PGY-1 residents but no medical students in the clinic.)</td>
</tr>
<tr>
<td>Collaboration</td>
<td>4.4/5</td>
<td>Learners felt there was support good from faculty and a strong presence from the allied health team.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>3.8/5</td>
<td>Majority felt there was formal face to face evaluation from the supervising physicians. In some cases this did not happen and was reflected in the feedback.</td>
</tr>
<tr>
<td>Overall Rating</td>
<td>5/7</td>
<td>(Overall rating of the rotation is on a 7 point scale.)</td>
</tr>
</tbody>
</table>

For each subcategory a 5 point scale was used. 1- Strongly disagree, 2-disagree, 3-neither agree or disagree, 4-agree, 5-strongly agree.

For the overall rating a 7-point scale was used. 7-Outstanding rotation, 4- Good Rotation which meets expectations, 1- One of the worst rotations. There were no specific descriptors provided for the numbers in between.

### Table 2. Rotation evaluation by family medicine residents from July-December 2015 (n=11)

<table>
<thead>
<tr>
<th>Category</th>
<th>Score</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Education</td>
<td>6.5/7</td>
<td>Learners commented positively on the informal noon rounds.</td>
</tr>
<tr>
<td>Quality of skills acquisition</td>
<td>5.6/7</td>
<td>Learners commented on the lack of opportunity to perform procedures.</td>
</tr>
<tr>
<td>Quality of learning environment</td>
<td>6.5/7</td>
<td>The learners were in a supportive environment allowing for feedback and education.</td>
</tr>
<tr>
<td>Supervisor/Health Care Provider</td>
<td>6.5/7</td>
<td>Learners felt that the attending physicians were very supportive.</td>
</tr>
</tbody>
</table>

Each category used a 7-point scale. 1- Strongly disagree, 4-neutral, 7 strongly agree. There was no overall rating provided by the department of Family Medicine.
model within the A-CTU. Workshops have been developed to provide faculty with an outpatient education toolkit. This included strategies for facilitating an afternoon report and how to incorporate educational components into patient reviews. Faculty development will also focus on assessment strategies for both EPAs and milestones, in keeping with CBME.

In conclusion, the A-CTU provides a novel approach to ambulatory medicine exposure and education for internal medicine trainees. Furthermore, this model allows for the development of skills specific to ambulatory medicine, and allows trainees to be intimately exposed to the paradigm shift in internal medicine, with the large emphasis placed on outpatient management. The infrastructure within the A-CTU also serves as a model for the implementation of milestones and EPAs, both of which are part of the competence by design initiative by the RCPSC.

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References