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What do medical students learn when they follow patients from hospital to community? A longitudinal qualitative study

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Context: Although longitudinal community-based care of patients provides opportunities for teaching patient centredness and chronic disease management, there is a paucity of literature assessing learning outcomes of these clerkships. This study examines learning outcomes among students participating in longitudinal community based follow-up of patients discharged from the hospital.

Methods: The authors conducted a thematic analysis of 253 student narratives written by 44 third-year medical students reflecting on their longitudinal interactions with patients with chronic medical illnesses. The narratives were written over three periods: after acute hospital encounter, after a home visit and at the end of the 10-month follow-up. Analysis involved coding of theme content and counting of aggregate themes.

Results: The most frequent theme was 'chronic disease management' (25%) followed by 'patient-centred care' (22%), 'health care systems' (20.9%), 'biomedical issues' (19.7%), 'community services' (9.5%) and 'student's role conflict' (2.3%). There was a shift in the relative frequency of the different themes, as students moved from hospital to community with their patients. Biomedical (44.3%) and health systems (18.2%) were the dominant themes following the acute hospitalization encounter. Chronic disease management (35.1%) and patient centredness (31.8%) were the dominant themes after the 10-month longitudinal follow-up.

Conclusion: Longitudinal community-based interaction with patients resulted in learning about chronic disease management, patient centredness and health care systems over time. Students shifted from learning biomedical knowledge during the acute hospitalization, to focus on better understanding of long-term care and patient centredness, at the end of the module.

Keywords: *longitudinal community-based clerkship; chronic disease management; patient-centred care; medical student learning*

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Medical students have traditionally been taught in hospital settings, which are a rich repository for acute, episodic clinical teaching. Inpatients tend to have severe illnesses requiring high-intensity care, but the rapid turnover of patients and health care teams often limits students' experiences to brief encounters with a disease-based model of care. There is inadequate opportunity to teach about care continuum, cost effectiveness, chronic disease management, family and patient perspectives and the impact of the social environment on illness in a busy hospital setting (1–3). Furthermore, intensive, prolonged exposure to the inpatient setting can

negatively impact medical students' attitudes towards management of chronic diseases (4, 5).

Medical schools have attempted to address this deficiency in ambulatory and continuing care clinical exposure by offering community-based and integrated clerkships. These clerkships are typically 2–6 week block rotations (6). However, block clerkships are limited in their scope for nurturing long-term student–patient relationships. The recent Carnegie report calls for reforms in medical education and includes recommendations to increase opportunities for integrative and collaborative learning and to foster lifelong learning through habits

of inquiry (5). Providing students with rich patient-centred experiences and allowing time for reflection and self-appraisal is a strategy that supports this philosophy. Several medical schools, in university-affiliated community-based settings, notably the Harvard Medical School/Cambridge Integrated Clerkship (7) and those in rural medical settings, utilize immersion learning. Examples include the parallel rural community curriculum in the Flinders University School of Medicine (8) and the rural physician associate programme in the University of Minnesota Medical School (9) which have successfully implemented longitudinal integrated clerkships (10).

Longitudinal patient contact provides students with opportunities to establish effective long-term relationships with patients and their families and allows direct exposure to and appreciation of temporal change in disease course, the impact of education and social and significant life change on the patient's illness. Students may also develop greater insight into the humanistic and social aspects of medicine such as the patient's illness experience through engaging in the patient's life habits and family relations. This can foster development of a sustained partnership between student and patient, provide insight into whole person medicine and improve integrated care which are the core precepts of primary care (11–14). However, not all medical schools, especially those in urban academic medical centres, are able to offer this community-focused, longitudinal integrated experience. A longitudinal Family Medicine clerkship provides opportunities to balance students' inpatient exposure with complementary community-focussed integrated longitudinal education in an urban medical school.

There is a paucity of literature reporting outcomes of these longitudinal clerkships, especially in assessing learning of the humanistic and social side of medicine. This is because clerkship assessment is usually by self-examination and structured clinical examination which emphasize the biomedical aspects of medicine. Student reflective narratives have the potential to both foster reflection and offer insight into student learning (15–19). Reflective narratives have been used to teach and assess learning in patient care (20), systems-based practice and practice-based learning (21), as well issues of professionalism (22) and empathy (23). Reflective narratives on patients, whom students have met face-to-face and developed a personal attachment to, offer students the opportunity for perspective taking, especially important for students who have not had any personal experience with illness or injury. They also foster identification with the patients, especially in presenting ideas, beliefs, life circumstances and perspectives that are not congruent with one's own (24).

The aim of this descriptive study was to report, using qualitative analysis of the narratives, what students learned from the longitudinal care of patients, followed

over a 10-month period from an acute hospitalization, to continuing clinics and home visits during a Family Medicine clerkship. The secondary aim was to examine whether the longitudinal interaction of the student with the patients led to any transformative learning over time. We hypothesize that the community-based continuity component would enhance student learning in the areas of continuity of care, patient centredness and preventive care. This study was approved by the Institutional Review Board.

Methods

At the Duke-NUS Graduate Medical School in Singapore, a 1-year longitudinal Family Medicine clerkship was developed in 2008 to teach core precepts of primary and family care. This included a community-based component to enhance learning about chronic disease management and community-, patient- and family-centred care. This component involved students following hospitalized patients to the community with continuing clinic visits and home visits. Students were asked to reflect on their patient encounters and submit written reflective narratives.

Participants

Participants were two consecutive classes of third-year medical students consisting of a total of 44 students from the Duke-NUS Graduate Medical School who rotated through a required 10-month-long longitudinal Family Medicine clerkship in 2009/2010 (21 students) and 2010/2011 (23 students).

Curriculum

The third-year curriculum comprised a longitudinal Family Medicine clerkship and a research project. The research project occupied 4 of 5 weekdays and the clerkship took up 1 day each week. The Family Medicine clerkship is a 160-hour experience consisting of three modules: the Knowledge Foundation Module (KFM), the Continuing Clinics Module (CCM) and the Patient Centred Care module (PCCM). It spans a 10-month period. KFM consists of 40 hours of classroom-based teaching over a 2-week period. The CCM consists of 20 bimonthly community clinics. The clerkship is graded on an Honours, High Pass, Pass or Fail basis.

The learning objectives of the PCCM module are to (1) participate in the illness experience from the perspective of the patient and care givers, (2) engage in the management of chronic medical conditions and (3) gain exposure to care continuity between hospital/community and other health care providers.

In the PCCM, students identified two patients with chronic conditions whom they encountered in the hospital wards during the first month of the clerkship. The students were expected to keep in contact with their

patients for the duration of their clerkship, make at least two home visits, accompany the patients on their clinic visits and visit them in hospital in the event of re-hospitalization. Groups of 5–6 students and one faculty mentor formed a PCCM group. The students also received one overview of the module requirement by the Clerkship Coordinator, two face-to-face tutorials and a home visit demonstration by the faculty mentor.

Students were required to reflect on their hospital and community encounters with their patients and to submit written narratives addressing all three components of the following: (1) the world of the patient and its impact on illness, (2) the impact of illness on the patient's world and (3) the patient's interactions with the health care system.

Each student was required to submit three reflective narratives per patient. The first narrative was after the first encounter in the hospital ward and was due in month 2 of the clerkship. The second narrative was after the home visit and was due in month 4 of the clerkship. A final end-of-module narrative served as a summary of their longitudinal experience. The written narratives without patient identifiers were submitted electronically to the faculty mentor and shared with their PCCM group.

The PCCM accounted for 30% of the grade, and was graded based on completion of an adequate narrative and small group participation. A narrative was considered adequate if students addressed all three components of the above-mentioned guiding statements.

Data collection and analysis

The primary data source comprised student narratives submitted at the three stated time points. Each student submitted a total of six narratives (three narratives per patient followed) over 10 months. Student narratives were electronically submitted to a research administrator who de-identified the narratives by assigning a code number that permitted longitudinal linkage of narratives for each student and his/her patient. The de-identified narratives were then provided to faculty coders for analysis. Narratives were analysed using a previously validated narrative coding method (25–27). The first two faculty coders (RP and FFV) independently read through an initial sample of 60 narratives several times to identify themes. The faculty also kept a list of quotes illustrating the themes. Content was analysed in part using the three original guiding statements: the world of the patient and its impact on illness, the impact of illness on the patient's world and the patient's interactions with the health care system and on drawing on the grounded theory analysis methodology (28). The first two coders met after their independent coding and constructed categories of themes using an iterative process of discussion, refining and revision of the coding schema, and consensus building. They selected typical quotes from the

narratives for illustration of each theme. Two themes were identified for each narrative to permit equal weighting of narrative themes by student. A third coder (DL) was then added and trained in the coding schema. Each of the remaining narratives after the initial 60 was independently coded by at least two coders, with agreement reached by consensus discussion for each narrative. Where consensus could not be reached by the two primary coders, the third coder not assigned to the narrative would act as an adjudicator. Theme frequency was determined by counting. Theme frequency was also determined for narratives from each of the three time points to examine temporal patterns across the longitudinal experience.

Member checking (29), a common technique to support validity, was performed after the coding was completed by faculty. Two students who had completed the Family Medicine clerkship, who were also participants in the study, were asked to examine and code a random sample of 24 narratives already coded by faculty pairs.

Results

A total of 44 students participated in the Family Medicine clerkship. Mean age was 26 years (range 23–34), gender distribution was one-third males and two-thirds females. Forty-three students were science majors prior to entering medical school and 1 student was humanity major. All 44 participants completed and passed the clerkship.

Data from the two classes are reported in aggregate because no difference in theme frequency or distribution was seen in the narratives from the two cohorts. A total of 88 patients were followed during the PCCM module by the 44 students. Eleven patients were lost to student follow-up after the home visit. Each student submitted one narrative per patient after the first and second encounters. Therefore, 88 narratives were submitted after the first encounter in the hospital (Narrative 1) and 88 narratives were submitted after the home visit (Narrative 2). However, due to patients being lost to follow-up, only 77 narratives were submitted at the end of the module (Narrative 3). A total of 253 (88+88+77) narratives were analysed.

Each of two faculty coders (RP and FFV) independently identified two themes for each of the initial sample of 60 narratives. They then met and agreed on six unique themes (see Table 1 for illustrative quotes). The two coders then returned to the 60 initial narratives and coded them according to the agreed upon schema. The two coders agreed on themes for 90% of the sample with agreement on the remaining 10% reached by consensus. The third coder, DL, was then added and trained. Each of the remaining 193 narratives was then coded by two of the three coders. The coder pairs for each narrative

Table 1. Thematic content and illustrative quotes selected from 253 student reflective narratives, Duke-NUS Graduate Medical School 2009–2011

Themes	Illustrative quotes
Chronic Disease Management (<i>n</i> = 128)	The diabetic nurse educator was able to discuss lifestyle and diet management with Mr. L. This freed up time for the doctor ... she gave very practical everyday information that he finds very useful ... (Female 27 Narrative 3) With regards to his medications, he has been semi compliant and takes medications on alternative days. He has not been using his medications despite feeling breathless ... (Female 26 Narrative 2)
Patient centred care (<i>n</i> = 112)	In the cardiology ward we debated about the cause of her latest complaint of chest pain – new infarct or psychological and then rush on to the next patient when she refused angiogram again. On hindsight, the aetiology may not be relevant as she does not want any angiogram or intervention and she is on maximum doses of every cardiac medication. As a guest in her home, I sit beside her rather than stand over her, and I am forced not to rush. I realise she is a person and not a bed number ... (Male 23 Narrative 2) ... this is a perfect example of the gradual but certain changing of paradigms in healthcare. What was once accepted as the norm, doctor's paternalism in making decisions for patients was being over-ridden in this case by the patient's own wishes ... (Male 25 Narrative 3)
Health systems (<i>n</i> = 105)	When asked, they are not aware of any central manager for her mother's case so their appointments do not synchronize. Mdm. S's case really needs a centralized manager or permanent doctor in hospital, as she has so many co morbidities ... I can understand patient confusion and possible medication errors as the patient navigates the health system ... Communication between providers ... (Female 28 Narrative 2) ... his financial problems. He receives \$300/month from the Community Development Council and is in the process of applying for financial assistance from Medifund ... (Male 27 Narrative 2)
Biomedical care (<i>n</i> = 100)	... The leg swelling could be due to a cardiac, renal or liver pathology. As she has a history of diabetes, nephrotic syndrome ... (Female 24 Narrative 1) ... In view of his long standing diabetes, autonomic neuropathy as a cause for orthostatic hypotension should be considered ... (Male 22 Narrative 1)
Community Services (<i>n</i> = 45)	The nurses from TOUCH home care service have been dressing his wounds. As he finds it difficult to travel to hospital, home based nursing and medical services are very appreciated by the family ... (Male 27 Narrative 3) The Family Care Centre is next to their block and it is convenient for Mrs P to see the counsellor there. These centres also provide financial counselling which is useful, since they don't seem to understand how to utilise their resources. This centre within the neighbourhood is better than coming back to the hospital to see the medical social worker ... (Female 26, Narrative 2)
Student's role conflict (<i>n</i> = 12)	I did not expect Mr Y to ask me for money. I know he was having financial trouble, but I am just a student. I could give him something, but would he keep asking me ... (Male 26, Narrative 2)

were able to agree on 92% of themes, and a third coder was used for adjudication in 8% of the narratives. In total, 506 themes were derived from the 253 narratives (two themes per narrative). No new themes emerged beyond those identified from the first 60 narratives. In other words, theme saturation was achieved with the first 60 narratives.

Member checking confirmed findings of the six themes and student members agreed with the coding schema as being reflective of the narrative content for the 24 narratives assigned to them.

A discussion of the narrative content for each theme is as follows.

Chronic disease management

Under this theme, students wrote about understanding chronic disease management, disease progression and the importance of patient education and self-management. Student narratives also showed appreciation of the care continuity and team-based collaborative care by health care providers. Students recognized challenges to lifestyle and medication compliance and noted the use of alternative therapy in chronic diseases. For example, one student wrote:

... there are problems with his compliance to medications. I got the impression he was not very concerned about what medicines he is receiving and

even less concerned about taking them regularly. When the pharmacist relayed information he appeared disinterested and mumbled occasionally ... Later he told me that he prefers to take his traditional Chinese medication for treatment of hypertension, and as his traditional practitioner told him not to mix the medications, he plans to stop taking his tablets ...

Patient centredness

Students wrote about understanding the illness experience from the patient's perspective, the importance of relating to the patient as a person and attention to patient preference in illness management, as well as the importance of emotional and physical comfort and the role of the family in the patient's care. For example, one student wrote:

... seeing Mdm. T at home and waiting with her at the clinic enabled me to see her out of the traditional medical student/patient relationship. Seeing other parts of her life enabled me to see her more completely as a human being rather than a patient ...

Health systems

Students reported better understanding of the working of the health systems as their narratives progressed in time. This understanding often came from having to navigate the health system with the patients, for example attending clinics, filling prescriptions and visiting patients in hospital during readmissions. Students often reflected on the high cost of health care for the patients and their families and showed awareness of the availability of health care financing. For example, one student reflecting on his elderly patient wrote:

Our health care system does not offer free health care for all ... Although we discussed application for Medifund (emergency funds for needy patients), Mr L still feels he will not be able to cope with his medical bills and he is considering refusing treatment ... I now have insight into elderly who have no spouse or children. They are concerned about not having enough money to last while they are alive and worry immensely when they fall ill that they have not enough for their medical bills.

Biomedical care

This theme typically reflected a disease- and treatment-based perspective. Students demonstrated a consolidation of their medical knowledge through their description of patients' symptoms and illness progression. As an example one student wrote:

'... The clinical question is when to stop her ciprofloxacin. The risk of MRSA, C diff colitis has to be weighed against her risk of recurrence of osteomyelitis'.

Community services

Students described their enhanced understanding of the role and availability of different community resources in managing patient's social and medical needs. They cited specific examples of such services that they learnt about, including home nursing care, meals on wheels and elder care services. For example, one student wrote ...

'I first came to know about meals on wheels through the case of Mr. BT ... I think it is a good community programme that allows patient to remain independent and reduce need for institutionalization ...'.

Students' role conflict

Less frequently, students expressed a role conflict in their narratives. This included feelings of inadequacy in meeting patients' needs and confusion about their roles as health care learners versus friends to the patients. For example, one student reflected:

... While I am touched and feel privileged that Mdm. H found it easy to share her problems with me, I realised how awkward it can be to suddenly be involved in someone else's personal issues. However, I realise that such an interaction is not uncommon in medical practice ...

Of the 506 themes, the most frequent was 'chronic disease management' ($n=128/25\%$) followed by 'patient centred care' ($n=112/22\%$), 'health care systems' ($n=106/20.9\%$), 'biomedical issues' ($n=100/19.7\%$), 'community services' ($n=48/9.5\%$) and 'student's role conflict' ($n=12/2.3\%$).

We noted a shift in the relative frequency of the different themes, as students moved from hospital to community with their patients (see Fig. 2). The most frequent theme in Narrative 1, after the hospital encounter was biomedical (44.3%) followed by health systems (18.2%) and patient centredness (12.5%). However, for Narrative 2, after the first home visit, the dominant themes were chronic disease management (31.8%), patient centred care (23.3%) and health systems (21%). The most frequent themes in Narrative 3, after 10 months of regular follow-up of the patient, were chronic disease management (35.1%), patient centredness (31.8%) and health systems (23.4%). Figure 2 represents the theme distribution at the three time points.

Discussion

We performed a qualitative analysis of student narratives written during a longitudinal experience following two patients from a hospital admission to their homes and communities over 10 months. The longitudinal community experience was associated with an increased understanding of chronic disease management, patient centredness, health care systems, community services and biomedical aspects of diseases. Our overall results

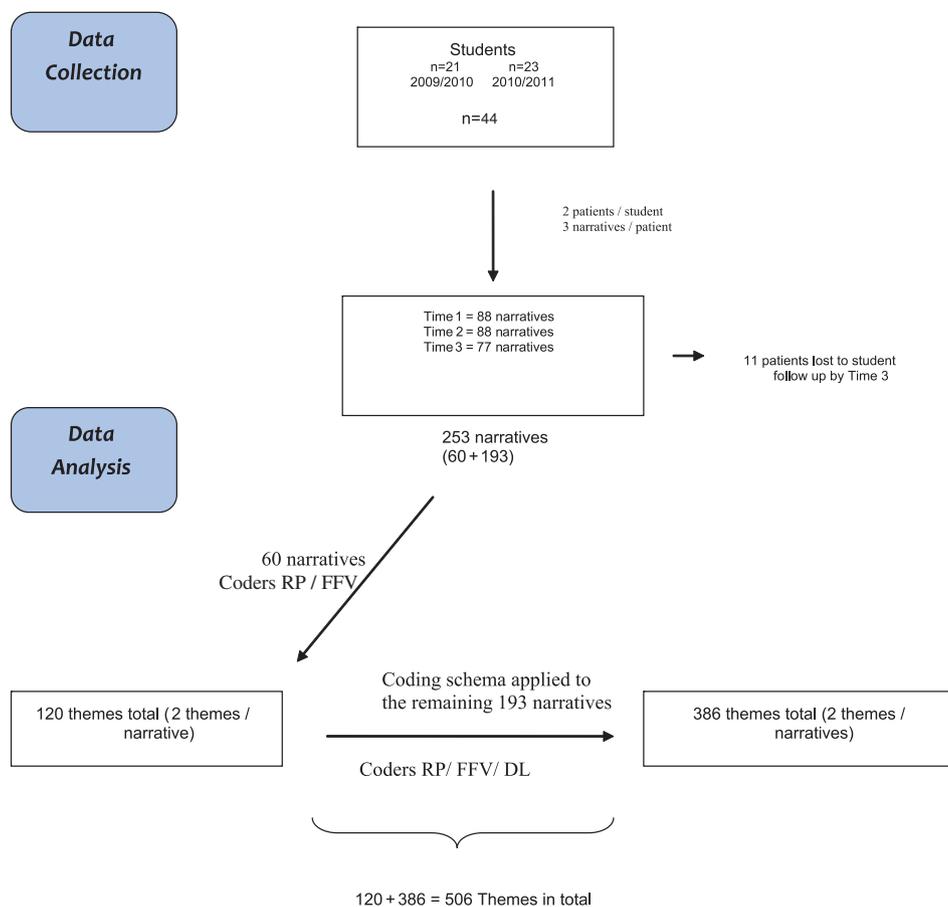


Fig. 1. Schema for data collection and flow of student narratives: Duke-NUS Graduate Medical School, Family medicine clerkship 2009–2011.

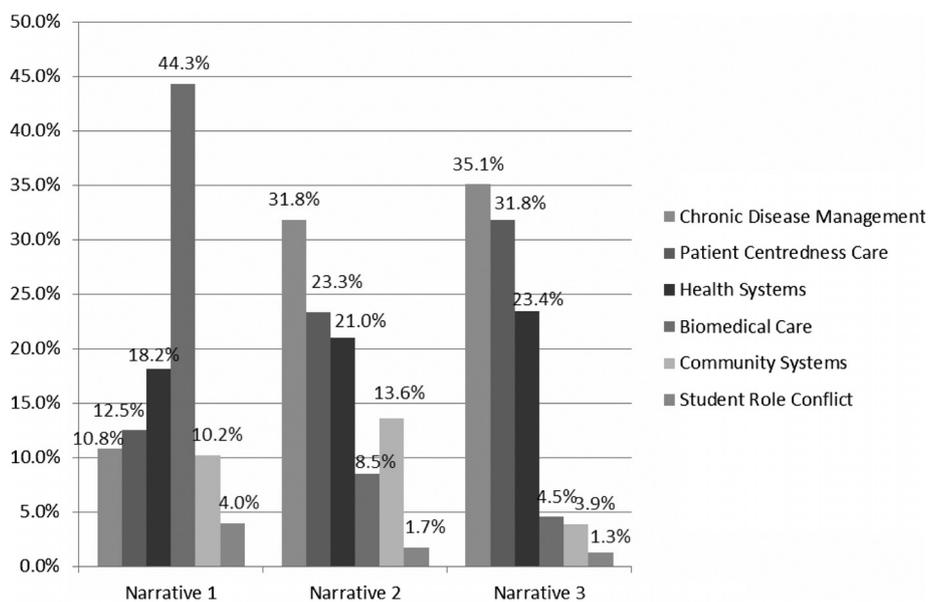


Fig. 2. Relative theme frequency, expressed as percentage, after analysis of the 253 narratives represented according to time frame: Family Medicine clerkship, Duke-NUS Graduate Medical School 2009–2011.

demonstrated learning that coincided with the learning objectives of the PCCM experience.

We also found a temporal change in learning themes over the 10 months. Dominant themes changed from biomedical to psychosocial and community-based between the beginning and end of the experience. Several authors have advocated for longitudinal clerkships and patient care in the community (5, 6, 7, 12, 13, 30–32), but reports about how learning in these clerkships differed from learning during block rotations are limited. Our study provides an insight into how long-term relationships with patients can alter student perspectives about the role of community, family and personal values in illness experience and disease progression.

An unexpected finding from the narratives was that students reported conflicts in their roles as medical students; for example, in the blurring of the role between health care provider and friend. We speculate that longitudinal patient care, with its constant interaction with the patients and increasing patient demands, resulted in some students feeling overwhelmed and ill-prepared to respond to patient expectations. This is an aspect that the faculty will need to anticipate and address in longitudinal non-hospital-based experiences. Another unanticipated finding was that students often stated the facts of their encounters and told a story without writing reflectively. This could be attributed to our students being predominantly trained in the sciences rather than in the humanities. Reflective writing is a skill that may need to be taught, to better help students to learn from their clinical encounters (33, 34).

Our study has several strengths. All students submitted narratives and the dataset was complete. Theme saturation was reached within 60 of 253 narratives, and the three coders achieved excellent consistency in theme identification. Other than the Family Medicine clerkship, the only other curriculum during the third year was the research project. As such, our results were likely reflective of the exposure to the longitudinal PCCM experience rather than learning from other clinical settings. This is a unique aspect of our study since most third year medical school curricula comprise multiple clerkships and isolating the learning from a particular patient care experience would be a challenge in those settings.

Our study has some limitations. This is a descriptive study with no control group. Thus we were not able to attribute all learning to the longitudinal construct of the PCCM. The number of students was small at 44. However, we believe that our data remain robust because we achieved theme saturation within the numbers of narratives analysed. The narratives were based on three guiding questions that gave students a cue and structure. It is possible that the students may have had a more variation in the themes if the narratives were free flowing. Our students followed only two patients through their

illness experience. Although two is a small number, the students were able to learn patient centredness, care continuity and chronic disease management from the longitudinal community experience. Previous authors have reported transformative learning from the illness narrative of longitudinal follow-up of even a single patient and family (24).

Conclusion

The 2010 Carnegie report advocated ‘standardizing learning outcomes and individualizing the learning process, promoting multiple forms of integration, incorporating habits of inquiry and improvement, and focusing on the progressive formation of the physician’s professional identity’(6). Our study suggests that student participation and immersion in patients’ lives through a hospital-to-community longitudinal experience can combine those processes in a developmentally appropriate manner. Students’ learning can change with a single patient’s lens. The diverse perspectives of individual patient’s experiences can be harnessed as a powerful, previously untapped or underutilized teaching tool. Future studies will examine how patients themselves experience the longitudinal care from students, whether the learning gained by students is durable, and if students apply their newfound knowledge, skills and attitudes to hospital and outpatient assessment and management of future patients in the form of richer and more meaningful biopsychosocial histories and patient-centred management plans.

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