

## Interprofessional and intraprofessional teams in a standardized patient assessment lab

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### Abstract

**Purpose:** To report on the relative quality of patient care plans produced by students working in interprofessional or intraprofessional teams, as well as student expectations and experiences working with the different collaborative models.

**Methods:** Students from the health disciplines of pharmacy, nutrition and physical therapy were assigned to work in one of three team types: (a) pharmacy + nutrition + physical therapy; (b) pharmacy + physical therapy; or (c) pharmacy-only. The 90 min assessment lab was conducted in a professional practice lab at the College of Pharmacy and Nutrition, University of Saskatchewan. A case study approach was used with trained patient-actors role-playing a hospitalized patient newly diagnosed with a vertebral compression fracture. Together, each student team interviewed a patient-actor and developed a comprehensive care plan.

**Results:** Students exceeded their expectations with regard to their ability to participate in the patient interview process, develop the care plan, and communicate with the patient and other team members. The nutrition and physical therapy students exceeded their expectations more than the pharmacy students. No significant differences were found between team types as to recommendations made for calcium and vitamin D supplements, the use of a pharmacologic agent, or exercise. On average, interprofessional teams scored higher with recommendations made for pain management, patient education, patient follow-up, global assessment of the care plan, and total score obtained for the plan.

**Conclusions:** Pharmacy students working in teams with other health disciplines produce more complete patient care plans than pharmacy-only teams. Assessment lab activities also appear to increase student support for interprofessional teams and appreciation for contributions made by other health care professions.

**Keywords:** *Interprofessional, assessment lab, pharmacy, nutrition, physical therapy, osteoporosis*

### Introduction

Although there is general support for interprofessional collaboration in health care, most practitioners do not work in teams (Edmunds & Calnan, 2001). In addition to overcoming structural and attitudinal barriers to teamwork (Sutter & Nathan, 1993; Gilbert, 1995; Sheppard, Hunt, Lupton, & Begley, 1995; Ray, 1998; Chen, Crampton, Krass, & Benrimoi, 1999; Farris & Schopflocher, 1999; Cook, Gerrish, & Clarke, 2001; Edmunds & Calnan, 2001; Elston & Holloway, 2001), the collaborative skills needed for the expansion of team-based health care must be learned and practiced (Barr, 2000). Undergraduate programs, where this training should begin, tend to

focus on discipline-specific activities taught to students isolated from students in other health professions (Edmunds & Calnan, 2001). As a result, team-based health care is a concept that is poorly understood and poorly applied by most health care providers (Wagner, 2000). It would seem incumbent on educators, therefore, to provide undergraduate health care students with more opportunities to learn and train together, thereby developing the skills needed to work collaboratively as health care professionals.

Interprofessional education at the undergraduate level is generally accepted as the most appropriate means for achieving these objectives (Elston & Holloway, 2001). This shared approach to learning

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promotes a common philosophy of care and greater understanding of the roles of other health professions (Elston & Holloway, 2001). It also helps to develop the student's appreciation for professional commonalities, respect for professional differences, recognition of the need to promote equal status for all team members, and effective ways to resolve inter-professional conflict (McNair, Brown, Stone, & Sims, 2000). It can also effectively address prejudices and negative stereotypes (Barr, 2000). Unfortunately, interprofessional education is still quite limited and opportunities to develop these skills are not well incorporated into most undergraduate health care programs.

Scheduling courses and classes to accommodate students from more than one health discipline is a major challenge, and instructors are rarely given recognition for teaching in another college or department within the university (Long, 2001). Furthermore, differences in the students' ages, requisite education, clinical experience, and the academic policies of programs make it difficult to bring together the students of the various health professions. Finally, attitudinal barriers due to different professional goals and longstanding professional rivalries can weaken attempts to provide students with interprofessional learning experiences (McPherson, Headrick, & Moss, 2001).

The University of Saskatchewan is home to a range of undergraduate health care programs including dentistry, kinesiology, medicine, nursing, nutrition, pharmacy, and physical therapy. In support of interprofessional education, the College of Pharmacy and Nutrition initiated an osteoporosis patient assessment lab in 2003. At the time of the study (2005), a number of initiatives were being developed and implemented at the University as part of a national effort to improve interprofessional education.

The purpose of this paper is to report on the relative quality of the care plans produced by interprofessional and intraprofessional student teams, as well as student expectations and experiences working with the different collaborative models.

## Methods

### *Participants*

In 2005, a total of 128 students, including 74 fourth year pharmacy, 25 third year nutrition, and 29 second year physical therapy students participated in the osteoporosis assessment lab. Although participation in the assessment lab was mandatory, participation in the research component was voluntary. The research protocol was approved by the Behavioural Research Ethics Board of the University of Saskatchewan. Those students agreeing to participate in the research component were asked to provide signed consent.

Prior to being randomly assigned to their teams, the students were stratified to achieve the maximum number of pharmacy-nutrition-physical therapy teams. The result was 25 teams consisting of one pharmacy, one nutrition, and one physical therapy student (PH-N-PT); four teams of two pharmacy and one physical therapy student (PH-PT); and 19 teams of two pharmacy students and one team of three pharmacy students (PH-only).

In addition to the pedagogical components of the assessment lab, those agreeing to participate in the research component were asked to complete two pen-and-paper questionnaires. The first questionnaire was distributed and collected prior to the assessment lab and the assigning of team membership. The second questionnaire was distributed one week after the assessment lab once the students had completed and handed in their patient care plans.

To avoid coercion or any perception of coercion by the instructors or other students, or bias toward non-participants, all instructors and researchers (with the exception of one graduate student who was not directly involved in the assessment lab or in the evaluation of care plans) were blinded as to whether students had agreed to participate in the research component. All students were given the opportunity to complete and hand in the two questionnaires. Those completed by non-participants were subsequently removed by the graduate student and not included in the analysis.

### *Standardized patient actors*

Prior to the start of the assessment lab, six female patient-actors were recruited and trained to role-play a patient with a newly diagnosed vertebral compression fracture. They were provided with a script and coached to respond in a consistent manner to student inquiries. During the lab, the "standardized patients" wore hospital gowns and were required to lie supine on cots with sheets and pillows to simulate the hospital environment.

### *Patient assessment lab and de-briefing session*

The assessment lab was conducted over a consecutive three-day period (September 27–29, 2005) in the College of Pharmacy and Nutrition's Professional Practice Lab; each student team attended one of the three days set aside for this task. Prior to the lab, all students were given access to the current clinical practice guidelines for the diagnosis and management of osteoporosis in Canada (Brown & Josse, 2002).

At their designated lab times, students were instructed to work in their assigned teams to assess one of the six standardized patients. The activity took approximately 90 min, with the first half-hour allocated for orientation

and chart review, followed by 35 min for the patient interview, and the remaining 25 min for discussion of the findings and group work among the members of the team. To support the collection of patient information and care plan development, students were permitted to use discipline-specific consultation forms with which they were already familiar.

In the week following the assessment lab, students were required to meet in their teams to discuss and finalize their care plans. Each team was instructed to submit one written patient care plan. Following submission of their care plans, debriefing sessions were held separately for pharmacy, nutrition and physical therapy students; interprofessional debriefing sessions were not possible because of scheduling constraints. Since a number of pharmacy students worked in pharmacy-only teams, both the nutrition and physical therapy practice coordinators attended the pharmacy debriefing session to discuss the roles of their professions in patient assessment.

#### *The assessment lab questionnaires*

Each questionnaire (completed before and after the assessment lab) included a unique identifier number (for matching purposes only), the student's designation (pharmacy, nutrition or physical therapy), gender, age and number of years of university completed. The questionnaires also asked students to indicate if they had prior experience working with another health care discipline, interviewing a patient, or developing a care plan.

Students were presented with a series of six statements designed to allow comparison of responses given before and after the assessment lab (Appendix 1). Students were asked to rate their responses using seven-point Likert scales anchored by strongly agree (1) and strongly disagree (7) with a neutral midpoint (4). The objective was to determine if any change occurred in student support for team-based practice, as well as identify changes in their perceived ability to participate effectively in a collaborative patient assessment activity and development of a patient care plan. The items were developed by the researchers as an appropriate measuring tool did not exist in the literature. In addition, students were asked to provide written comments about the assessment lab.

#### *Scoring the care plans*

Using pre-defined criteria (available from the authors upon request), the patient care plans were scored based on recommendations for calcium supplements, vitamin D supplements, pharmacologic agent, pain management, exercise, education, and patient follow-up. Each possible recommendation was scored between one (no recommendation offered) and five (complete and appropriate recommendation). A global

assessment score of the care plan was also determined (scored between 1 and 7). The total possible score for the care plan ranged from eight to 42. The evaluator of the patient care plans was a licensed pharmacist with a PhD in Nutrition. To reduce the potential for bias, the evaluator was not directly involved in the assessment lab and was blinded to student identity as well as individual team composition and size.

#### *Analysis*

Analysis of the pre- and post-lab questionnaires included frequency and proportional statistics ( $\chi^2$ ). The Kruskal–Wallis and Bonferroni tests were used to compare responses between four distinct student types: (1) nutrition student in an interprofessional team (N); (2) physical therapy student in an interprofessional team (PT); (3) pharmacy student in an interprofessional team (PHi); and (4) pharmacy student in a pharmacy-only team (PHo). Comparisons of the Likert scales from the pre- and post-lab questionnaires were carried out using the Wilcoxon Signed Rank test. Analysis of the care plan scores by team type (PH-N-PT: pharmacy-nutrition-physical therapy; PH-PT: pharmacy-physical therapy; PH-only: pharmacy-only) was carried out using the Kruskal–Wallis and Bonferroni tests.

## **Results**

#### *Demographics*

Signed consent was obtained from 25 nutrition students (100%), 29 physical therapy students (100%) and 69 pharmacy students (93%). The students participating in the study were predominantly female (Table I). The distribution of students by gender across the three health disciplines varied somewhat (males: 22% pharmacy, 8% nutrition and 14% physical therapy), but was not statistically significant ( $\chi^2 = 2.74$ ,  $p = 0.26$ ). Differences in gender distribution based on team assignment were not statistically significant ( $\chi^2 = 0.62$ ,  $p = 0.73$ ).

Pharmacy students, on average, were slightly older (24 years) than either the nutrition (22.5 years) or physical therapy students (22.5 years) (K–W  $\chi^2 = 13.6$ ;  $p < 0.01$ ). On average, pharmacy students reported completing five years of university education compared to nutrition and physical therapy students who reported four years (K–W  $\chi^2 = 24.0$ ;  $p < 0.001$ ).

Pharmacy and physical therapy students were more likely than nutrition students to report past experience working with other health disciplines ( $\chi^2 = 29.4$ ;  $p < 0.001$ ), interviewing patients ( $\chi^2 = 94.1$ ;  $p < 0.001$ ), and developing care plans ( $\chi^2 = 82.6$ ;  $p < 0.001$ ). Pharmacy students were also more likely than physical therapy students to report past

Table I. Demographics and previous experience by student type.

Item	Student type				
	Total <i>n</i> (%)	PHi <i>n</i> (%)	PHo <i>n</i> (%)	N <i>n</i> (%)	PT <i>n</i> (%)
Gender					
Female	100 (81.3)	21 (70.0)	33 (84.6)	23 (92.0)	25 (81.3)
Male	23 (18.7)	9 (30.0)	6 (15.4)	2 (8.0)	4 (13.8)
Years of university					
Three	14 (11.4)	1 (3.3)	0 (0.0)	2 (8.0)	11 (37.9)
Four	52 (42.3)	7 (23.3)	17 (43.6)	19 (76.0)	9 (31.0)
Five	30 (24.4)	13 (43.3)	10 (25.6)	4 (16.0)	3 (10.3)
Six	11 (8.9)	3 (10.0)	3 (7.7)	0 (0.0)	5 (17.2)
7 or more	16 (13.0)	6 (20.0)	9 (23.1)	0 (0.0)	1 (3.4)
Prior experience with other disciplines					
Yes	76 (61.8)	16 (53.3)	32 (82.1)	4 (16.0)	24 (82.8)
No	47 (38.2)	14 (46.7)	7 (17.9)	21 (84.0)	5 (17.2)
Interviewing patients*					
Yes	96 (78.8)	29 (96.7)	39 (100.0)	2 (8.0)	26 (92.9)
No	26 (21.3)	1 (3.3)	0 (0.0)	23 (92.0)	2 (7.1)
Developing care plans*					
Yes	90 (73.8)	28 (93.3)	39 (100.0)	1 (4.0)	22 (78.6)
No	32 (26.2)	2 (6.7)	0 (0.0)	24 (90.0)	6 (21.4)
Total	123 (100)	30 (100)	39 (100)	25 (100)	29 (100)

PHi, pharmacy student (inter-professional team); PHo, pharmacy student (pharmacy-only team); N, nutrition student (inter-professional team); PT, physical therapy student (inter-professional team); \* One PT student did not respond.

Table IIa. Pre-lab attitudes and expectations by student type.

Item	Student type					K-W (sig.)
	All ( <i>n</i> = 123) Mean (SD)	PHi ( <i>n</i> = 30) Mean (SD)	PHo ( <i>n</i> = 39) Mean (SD)	N ( <i>n</i> = 25) Mean (SD)	PT ( <i>n</i> = 29) Mean (SD)	
I am confident that I will be able to participate in a meaningful way in the patient interview*	2.49 (1.28)	2.57 (1.50)	1.92 (0.87)	3.56 (1.23)	2.24 (0.99)	28.493 ( <i>p</i> < 0.001)
I am confident in my ability to contribute to developing an appropriate patient care plan <sup>†</sup>	2.50 (1.18)	2.57 (1.43)	2.00 (0.97)	3.12 (0.73)	2.59 (1.21)	17.605 ( <i>p</i> < 0.01)
I am confident that I will be able to communicate effectively with the standardized patient <sup>‡</sup>	2.36 (1.15)	2.60 (1.28)	1.85 (0.78)	3.04 (1.21)	2.21 (1.07)	19.712 ( <i>p</i> < 0.001)
I am confident that I will be able to communicate effectively with the other students in my group <sup>¶</sup>	2.33 (1.18)	2.80 (1.47)	1.95 (0.76)	2.88 (1.17)	1.90 (0.98)	18.024 ( <i>p</i> < 0.001)
I could do a better job of gathering information if I were able to interview the patient myself	4.64(1.42)	4.33 (1.21)	4.95 (1.22)	4.48 (1.64)	4.69 (1.71)	4.892 ( <i>p</i> = 0.180)
I could develop a better care plan if I were able to work alone rather than as a member of a small group	5.18 (1.19)	4.87 (1.17)	5.46 (1.07)	4.88 (1.17)	5.38 (1.32)	6.829 ( <i>p</i> = 0.078)

Scales ranged from strongly agree (1) to strongly disagree (7); PHi, pharmacy student (inter-professional team); PHo, pharmacy student (pharmacy-only team); N, nutrition student (inter-professional team); PT, physical therapy student (inter-professional team); \* Bonferroni (*p* < 0.05): N ≠ PHi, PHo, PT; <sup>†</sup> Bonferroni (*p* < 0.05): N ≠ PHo; <sup>‡</sup> Bonferroni (*p* < 0.05): PHo ≠ PHi, N; <sup>¶</sup> Bonferroni (*p* < 0.05): PHo ≠ PHi, N; PT ≠ PHi, N.

Table IIb. Post-lab attitudes and experiences by student type.

Items	Student type					K-W (sig.)
	All ( <i>n</i> = 118) Mean (SD)	PHi ( <i>n</i> = 27) Mean (SD)	PHo ( <i>n</i> = 37) Mean (SD)	N ( <i>n</i> = 25) Mean (SD)	PT ( <i>n</i> = 29) Mean (SD)	
I was able to participate in a meaningful way in the patient interview portion of the lab*	2.12 (1.37)	2.85 (1.54)	1.92 (1.19)	2.12 (1.51)	1.72 (1.07)	14.476 ( <i>p</i> < 0.01)
I was able to contribute to developing an appropriate patient care plan	2.06 (1.36)	2.48 (1.50)	1.83 (1.19)	2.12 (1.48)	1.90 (1.29)	6.208 ( <i>p</i> = 0.102)
I was able to communicate effectively with the standardized patient	2.17 (1.26)	2.41 (1.19)	2.05 (1.31)	2.48 (1.36)	1.83 (1.10)	8.874 ( <i>p</i> < 0.05)
I was able to communicate effectively with the other students in my group	2.10 (1.24)	2.41 (1.15)	1.95 (1.25)	2.20 (1.56)	1.93 (0.96)	5.11 ( <i>p</i> = 0.164)
Could do a better job of gathering information if I were able to interview the patient by myself <sup>†</sup>	4.43 (1.60)	4.96 (1.02)	4.73 (1.59)	3.52 (1.58)	4.34 (1.80)	12.460 ( <i>p</i> < 0.01)
Could develop a better care plan if I were able to work alone rather than as a member of a small group	5.05 (1.54)	5.33 (0.88)	4.49 (1.73)	5.28 (1.59)	5.32 (1.59)	6.755 ( <i>p</i> = 0.080)

Scales ranged from strongly agree (1) to strongly disagree (7); PHi, pharmacy student (inter-professional team); PHo, pharmacy student (pharmacy-only team); N, nutrition student (inter-professional team); PT, physical therapy student (inter-professional team); \* Bonferroni (*p* < 0.05); PHi ≠ PHo, PT; <sup>†</sup> Bonferroni (*p* < 0.05); N ≠ PHi, PHo.

experience developing a care plan ( $\chi^2 = 9.0$ ; *p* < 0.01).

#### Pre-lab: Attitudes and expectations

Overall, students indicated they were somewhat confident in their ability to participate in a meaningful way in the patient interview and care plan development, as well as their ability to communicate with the patient and the other members of the team (Table IIa). Students only marginally agreed they could more effectively gather patient information and develop a care plan as a member of a small group, rather than do the work on their own.

Significant differences were seen between student types (PHi, PHo, N, PT). Nutrition students were generally less confident in their ability to participate in the patient interview, or to communicate effectively with the patient and the other members of their team. Although differences were not always statistically significant, physical therapy students and pharmacy students assigned to work with other pharmacy students appeared to have the most confidence in their abilities, and were more supportive of working in groups to complete the assigned tasks.

#### Post-lab: Attitudes and experiences

Following the assessment lab, no differences were found between student types in their perceived ability

to contribute to care plan development, to communicate effectively with team members, or in their support of working together to develop the care plan (Table IIb). Students did differ significantly in their perceived ability to participate in the patient interview, to communicate with the patient, and in their support of working together to interview the patient. Pharmacy students working with nutrition and physical therapy students believed they were less able to participate in the patient interview in a meaningful way. As well, nutrition students were more likely to support the idea of interviewing the patient on their own rather than as part of a small group.

#### Comparing pre-lab and post-lab attitudes and expectations/experiences

In comparing the pre- and post-lab responses for all students, significant differences were found in four of the six statements (Table III). Collectively, students exceeded their expectations in terms of being able to effectively participate in the interview, develop the care plan, and communicate with the patient and members of the team. No significant differences were seen in their preference for working alone or as part of a group.

Among the student types, nutrition students and physical therapy students exceeded their expectations with regard to their ability to contribute to the interview and the patient care plan. Nutrition students



Table III. Differences in pre- and post-lab attitudes and expectations/experiences.

Items	Student type				
	All (n = 118) Difference Z-value* (sig.)	PHi (n = 27) Difference Z-value* (sig.)	PHo (n = 37) Difference Z-value* (sig.)	N (n = 25) Difference Z-value* (sig.)	PT (n = 29) Difference Z-value* (sig.)
Interview portion of the lab pre value—post value	0.373 – 2.810 (p < 0.01)	-0.296 – 0.592 (p = 0.554)	0.027 – 0.935 (p = 0.350)	1.440 – 3.248, (p < 0.01)	0.517 – 2.122 (p < 0.05)
Contribute to patient care plan pre value—post value	0.466 – 3.970 (p < 0.001)	0.111 – 0.962 (p = 0.336)	0.189 – 1.374 (p = 0.169)	1.000 – 2.789 (p < 0.01)	0.690 – 2.520 (p < 0.05)
Communicate with patient pre value—post value	0.179 – 2.060 (p < 0.05)	0.185 – 0.498 (p = 0.618)	-0.216 – 0.165 (p = 0.869)	0.560 – 1.964 (p < 0.05)	0.357 – 1.802 (p = 0.072)
Communicate other students pre value—post value	0.254 – 1.983 (p < 0.05)	0.519 – 1.241 (p = 0.214)	0.000 – 0.618 (p = 0.537)	0.680 – 1.778 (p = 0.075)	-0.0345 – 0.179 (p = 0.858)
Interview the patient by myself pre value—post value	0.212 – 1.117 (p = 0.264)	-0.593 – 2.774 (p < 0.01)	0.189 – 0.522 (p = 0.602)	0.960 – 2.480 (p < 0.05)	0.345 – 0.854 (p = 0.393)
Develop a better care plan alone pre value—post value	0.145 – 0.841 (p = 0.400)	-0.407 – 1.853 (p = 0.064)	0.973 – 2.896 (p < 0.01)	-0.400 – 1.281 (p = 0.200)	0.071 – 0.289 (p = 0.773)

PHi, pharmacy student (inter-professional team); PHo, pharmacy student (pharmacy-only team); N, nutrition student (inter-professional team); PT, physical therapy student (inter-professional team); \*Wilcoxon Signed Ranked test

also exceeded their expectations of their ability to communicate with the patient. After participating in the assessment lab, pharmacy students working with nutrition and/or physical therapy students were more likely to indicate a preference for working with others when interviewing the patient. Nutrition students, on the other hand, indicated a greater preference for working alone when interviewing the patient. Following the lab, pharmacy students working with other pharmacy students indicated a preference for working alone when developing the care plan.

Care plan recommendations

No significant differences were found between team types (PH-N-PT; PH-PT; PH-only) as to their recommendations for calcium and vitamin D supplements, pharmacologic agent, or exercise (Table IV). Furthermore, all three team types appeared to effectively address these aspects of the care plan.

Significant differences were seen between team types and their recommendations for pain management, patient education, patient follow-up, global assessment of the care plan, and total score obtained for the plan. Pharmacy-only teams tended to score lower than the other team types (PH-N-PT and PH-PT) for pain management, patient education, and total score. Pharmacy-only teams also scored significantly lower than PH-N-PT teams for both patient follow-up and global assessment of the care plan.

Discussion

The purpose of this paper was to report on the relative quality of care plans based on team type, as well as student expectations and experiences working with the different collaborative models. Given the comprehensive nature of the task, it was not surprising to find the interprofessional teams (pharmacy-nutrition-physical therapy AND pharmacy-physical therapy) were able to produce more complete care plans. Interestingly, the pharmacy-only teams appeared to be least effective in non-discipline-specific areas such as patient education and patient follow-up. One can only speculate as to why this occurred. Possible explanations include insufficient emphasis on these activities within the pharmacy curriculum, or the ability of interprofessional teams to elicit better performances from individual members. In either case, the results suggest interprofessional teams are superior to intraprofessional teams when developing a care plan for this type of patient, at least as they relate to the inclusion of pharmacy students.

Those students reporting prior experience working with other health disciplines, interviewing a patient or developing a care plan had more positive pre-lab expectations (data not shown), particularly those

Table IV. Care plan recommendations: mean scores and confidence intervals by team type.

Evaluation criteria	Team type			Kruskal–Wallis (sig.)
	PH-N-PT <i>n</i> = 25 Mean (CI)	PH-PT <i>n</i> = 4 Mean (CI)	PH-only <i>n</i> = 20 Mean (CI)	
Calcium supplement	4.40 (4.09–4.71)	4.50 (3.58–5.42)	4.68 (4.46–4.89)	1.384 ( <i>p</i> = 0.501)
Pharmacologic agent	4.78 (4.51–5.05)	4.00 (2.16–5.84)	4.75 (4.49–5.01)	3.226 ( <i>p</i> = 0.199)
Pain management*	4.36 (3.96–4.76)	5.00 (5.00–5.00)	2.63 (2.19–3.06)	28.792 ( <i>p</i> < 0.001)
Exercise	4.40 (4.18–4.62)	4.25 (3.45–5.05)	3.85 (3.07–4.63)	0.420 ( <i>p</i> = 0.811)
Patient education*	3.54 (2.95–4.13)	3.63 (2.43–4.82)	1.38 (1.06–1.69)	22.548 ( <i>p</i> < 0.001)
Patient follow-up <sup>†</sup>	3.36 (2.77–3.95)	3.75 (2.95–4.55)	2.40 (2.02–2.78)	7.231 ( <i>p</i> < 0.05)
Global assessment of plan <sup>†</sup>	5.08 (4.53–5.63)	4.75 (3.95–5.55)	3.40 (2.88–3.92)	15.654 ( <i>p</i> < 0.001)
Total*	33.90 (31.88–35.92)	34.63 (32.25–37.00)	26.88 (25.16–38.59)	22.796 ( <i>p</i> < 0.001)

PH-N-PT, team consisting of one pharmacy, one nutrition, and one physical therapy student; PH-PT, team consisting of two pharmacy and one physical therapy student; PH-only, team consisting of two or three pharmacy students; \*Bonferroni test (*p* < 0.05)—PH-only significantly different from PH-N-PT and PH-PT; <sup>†</sup>Bonferroni test (*p* < 0.05)—PH-only significantly different from PH-N-PT.

relating to the student's perceived ability to participate, contribute and communicate effectively. Observed differences between student types with regard to pre-lab expectations may be attributable to the different levels of preparation and experience with these activities, and different levels of experience working with other disciplines, rather than the particular health discipline *per se*.

The assessment lab format was familiar to the pharmacy students as they had participated in a cardiac patient assessment lab with a different group of nutrition students in the previous term. In preparation for the lab, pharmacy students received the 'usual' didactic lecture on osteoporosis and were given access to the current clinical practice guidelines. The academic preparation of the physical therapy students was similar to the pharmacy students; a lecture and access to the guidelines. Although the format of the interprofessional assessment lab was unfamiliar to them, the physical therapy students had previously completed a five week clinical internship that included some experience taking patient histories and developing care plans. The nutrition students, on the other hand, had little or no experience with patient interviews, developing care plans, or working with students from another health discipline, and substantial class time was dedicated to preparing them for the osteoporosis assessment lab.

Differences between the pre- and post-lab questionnaires suggest nutrition and physical therapy students made the greatest changes in assessing their own abilities, while pharmacy students were more likely to change their attitudes toward working with others. Increased support among PHi-pharmacy students for working with the students of other health professions suggested a positive experience that exceeded their expectations. Conversely, the reported decrease in support for group work among pharmacy-only team members may reflect the challenges of working as a member of a team without the benefit

of being able to draw on a broader range of discipline-specific expertise.

Reduced support among nutrition students for a group approach to patient interviewing may reflect their relative inexperience with this type of activity compared to the pharmacy and physical therapy students. In light of their gained experience with, and greater understanding of the benefits of a team-based approach, these students may be more supportive in subsequent interprofessional situations, and better able to participate and contribute to patient care.

The assessment lab illustrated some of the problems that can occur with an interprofessional training experience, even when administrative and logistical barriers have been overcome. Differences between the three health disciplines in terms of classroom instruction, clinical training, experience with interviewing and assessing patients, and the types of assessment tools used by each profession represented sources of frustration and concern for some students. Not providing the opportunity for all students to participate in an interprofessional team exercise was also identified as an issue, particularly among those pharmacy students not assigned to work with students from the other two health professions.

#### Limitations

Since the assessment lab was conducted over a three-day period, communication between students about the lab could not be prevented. This may have allowed some students to be better prepared for the patient interview and to be more familiar with the structure of the exercise. The extent to which this may have influenced student evaluation of the process is unknown. In addition, different discipline-specific approaches were used to prepare students for the lab. As a result, students from the three health disciplines may have had very different expectations of the lab and this could have affected their evaluation of it.

### Conclusion

Pharmacy students working in teams with other health disciplines produce more complete patient care plans than pharmacy-only teams. Assessment lab activities also appear to increase student support for inter-professional teams and appreciation for the contributions made by other health care professions. The ability to work collaboratively is an essential skill within the evolving health care environment. By providing undergraduate health care students with more opportunities to work with students from other health professions, their support for interprofessional activities, as well as their ability to work collaboratively may be enhanced.

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### Appendix 1: Pre-lab and post-lab survey items

#### Pre-lab items

1. In the upcoming osteoporosis lab I am confident that I will be able to participate in a meaningful way in the patient interview portion of the lab.
2. In the upcoming osteoporosis lab I am confident in my ability to contribute to developing an appropriate patient care plan
3. I am confident that I will be able to communicate effectively with the standardized patient.
4. I am confident that I will be able to communicate effectively with the other students in my group.
5. I believe I could do a better job of gathering information if I were able to interview the patient by myself rather than as a member of a small group.
6. I believe I could develop a better care plan if I were able to work alone rather than as a member of a small group.

#### Post-lab items

1. In the osteoporosis lab I was able to participate in a meaningful way in the patient interview portion of the lab.
2. In the osteoporosis lab I was able to contribute to developing an appropriate patient care plan.
3. I was able to communicate effectively with the standardized patient.
4. I was able to communicate effectively with the other students in my group.
5. I believe I could do a better job of gathering information if I were able to interview the patient by myself rather than as a member of a small group.
6. I believe I could develop a better care plan if I were able to work alone rather than as a member of a small group.