

# Effects of Student Physical Therapists on Clinical Instructor Productivity Across Settings in an Academic Medical Center

Tonya L. Apke, Matthew Whalen, John Buford

**Background.** Clinical education is an integral component of physical therapy education. Both benefits and barriers exist in clinical education, but 1 commonly stated barrier includes the perception that students have a negative impact on clinical instructor productivity.

**Objective.** The purposes of this study were to evaluate the productivity of physical therapist clinical instructors in an academic medical center before, during, and after clinical education experiences, determine if there are differences in productivity during clinical education experiences across settings, and compare clinical instructor productivity with that of therapists who did not have a student during the same time frames.

**Design.** A retrospective design examined productivity across 3 years in acute care, inpatient rehabilitation, outpatient orthopedics, and outpatient neurology. Mean daily productivity was computed, normalized to an 8-hour day, and averaged for each week of the year. Data were analyzed using a repeated-measures ANOVA. Post-hoc comparisons were made within each setting to compare therapists with a student to those without. The Bonferonni-correction was used to control for multiple comparisons.

**Results.** Clinical instructor productivity was significantly increased in outpatient orthopedics and inpatient rehabilitation, and approached significance in outpatient neurology, but was not significant in acute care. The presence of a student made clinical instructors more productive but had no effect on the productivity of other therapists in that setting during the same time frame.

**Limitations.** We studied only 1 academic medical center and could not account for clinical instructor factors such as years of experience or student factors such as year in their program.

**Conclusions.** Our results indicate that having a student increases productivity of therapists in various settings. Future studies should examine the impact of clinical instructor experience and student characteristics and should expand to other settings.

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Clinical education is an essential component of the education of physical therapists and nearly all other health professions. On average, 29% of the doctorate of physical therapy curriculum in the United States is devoted to full-time clinical education experiences (CEE).<sup>1</sup> For the purposes of this study, the definition of CEE from The American Council of Academic Physical Therapy will be used. A CEE is defined as a “formal supervised experiential learning, focused on development and application of patient/client-centered skills and professional behaviors. It is designed so that students gain substantial, relevant clinical experience and skills, engage in contemporary practice, and demonstrate competence before beginning independent practice.”<sup>2</sup>

Physical therapy educational programs face several obstacles related to clinical education. Since 2000, there has been a rise in the number of physical therapist educational programs in the United States, even in the recent past from 230 in 2011 to 242 in 2017, with 30 more in development.<sup>1</sup> In addition to more programs, larger class sizes among existing programs have been the trend. In 2015, there were 9453 students who graduated from physical therapist programs.<sup>1</sup> By 2019, it is projected that this number will rise to 10,721, a 13% increase<sup>1</sup>, whereas the US population is projected to grow by about 8% during the same time frame ([www.census.gov](http://www.census.gov)).<sup>1</sup> With this pace of growth in physical therapist educational programs, placement of students for full-time CEEs will continue to be a challenge facing all programs.

Clinical education is a time-intensive process, with 1 study citing that for a single educational institute several thousands of hours were spent training physical therapy students in a single year.<sup>3</sup> The capacity for clinical education placements of students by existing physical therapy programs is largely unknown. Howman et al<sup>4</sup> gathered data from a regional clinical education consortium in Ohio and Kentucky and suggested that the demand for clinical placements, particularly in inpatient settings, is greater than the supply offered by clinical education sites. Although the number of graduates is increasing, there is no evidence that the capacity for clinical education sites is rising. Perceived barriers, including time constraints, may lead to a lack of willingness of staff to serve as a clinical instructor.<sup>5</sup>

Another issue affecting clinical education is the lack of consensus on which ratio of student to clinical instructor works best. Pabian et al<sup>6</sup> found that clinical instructor productivity for physical therapy students in the acute care (AC) setting was higher with the 2:1 model than for the 1:1 model. Lekkas et al<sup>7</sup> in 2007 performed a systematic review of both undergraduate and entry-level CEEs in a variety of allied health disciplines, examining a broad array of outcomes including clinical performance of the student, clinical instructor productivity, and stakeholder percep-

tions. They concluded that there was no “gold standard” student to clinical instructor ratio that functioned best.

Few studies have examined the effects of students on the clinical instructors and clinic during CEEs. Among these, both benefits and barriers were discussed.<sup>4,5,8-10</sup> The most commonly reported benefits of clinical education include recruitment of future employees, improved patient satisfaction, increased clinic productivity, keeping updated on practice development and recent evidence, opportunities for professional growth, development of the profession, and personal gratification as a result of teaching and mentoring a student.<sup>5,8,10</sup> Frequent barriers to CEEs include the perception of difficulty in maintaining required productivity standards, lack of support from clinic administrators, inadequate staffing, space constraints, and less time for practice management duties.<sup>5,8-11</sup>

The perceived negative impact of students on productivity has been a pervasive sentiment that makes placement of students difficult for programs across the country. Contrary to this perception, studies over the last 3 decades consistently conclude that students have a positive effect on the physical therapy department productivity in the AC setting.<sup>12-17</sup> Recently, Pivko et al<sup>18</sup> examined productivity of student physical therapists on clinical instructors in a variety of physical therapy settings using self-reported productivity logs from their first and final CEEs. Clinical settings included were AC, outpatient, acute rehab, and mixed/specialty care. For CEEs lasting 6 weeks or longer than 8 weeks, there were no significant differences between the first 2 baseline weeks compared with weeks 1 and the final week of the CEE. For 8-week CEEs, week 6 did not differ from the baseline, but productivity in week 6 was significantly higher than the baseline, as measured by an increased number of patients treated. As noted previously, Pabian et al<sup>6</sup> analyzed productivity for a collaborative clinical education model vs traditional one-to-one supervision through a 3-year, retrospective analysis in AC. They found significant increases in productivity when taking on 1 student and a much higher increase when supervising 2 students together compared with when no students were in the clinic.

Studies outside of physical therapy have also examined the impact of students on staff productivity. Rogers et al<sup>19</sup> examined clinical instructor productivity during a CEE in dietetics/nutrition and occupational therapy (OT) in their large health system. They concluded that the mean time spent with patients was significantly increased and the number of treatment sessions increased at the beginning of the CEE, although not significantly; notably, there was no significant decrease. Ozell et al<sup>20</sup> conducted a study examining which factors could be most predictive of productivity in occupational therapists during level II field work experiences from a single, large health care entity, which employed occupational therapists in the inpatient, outpatient, and pediatric settings. Their results indicated

**Table 1.**  
Numbers of Physical Therapists and Students for Analysis During the 3-Year Time Frame<sup>a</sup>

Setting	No. of Physical Therapists		No. of Students	No. of Universities
	Total	Clinical Instructors		
Acute care	43	21	42	14
Inpatient rehabilitation	17	13	33	13
Outpatient neuro	20	8	21	7
Outpatient ortho	134	38	52	17
Total	214	80 <sup>b</sup>	148	26 <sup>c</sup>

<sup>a</sup>CEE = clinical education experience.

<sup>b</sup>Some of the physical therapists served as clinical instructors for multiple CEEs during the study time frame.

<sup>c</sup>Some of the universities placed students in more than 1 setting.

that clinician productivity before receiving a student was the strongest indicator of how productive that clinical instructor would be when a student was present. They concluded that actual productivity with all clinical instructors with a student was no worse than without a student. Additional studies of OT students showed no detrimental impact on clinical instructor productivity during fieldwork; however, their differing study designs, variable definitions of productivity, and relatively small sample sizes make drawing definite conclusions difficult.<sup>21,22</sup> Medicine and dentistry have also concluded that interns do not negatively impact the productivity of the health care facility.<sup>23,24</sup>

Although the evidence suggests a consistent trend that student physical therapists do not negatively impact productivity and may actually increase productivity, many of the studies are dated, making them difficult to apply to the contemporary clinical environment that includes vastly different regulations, supervision requirements, and payment models. Few studies included settings outside of AC.

Therefore, the purpose of this study was to: (1) evaluate the productivity of physical therapist clinical instructors across both inpatient and outpatient settings in an academic medical center before, during, and after clinical experiences; (2) determine if there are differences in productivity during CEEs across settings; and (3) compare clinical instructor productivity during CEEs to that of therapists who did not have a student during the same time frames.

## Methods

### Data Collection

This study was approved by The Institutional Review Board of The Ohio State University before initial data collection. Retrospective physical therapist productivity data were collected over a 3-year period from each department of our academic medical center, which included AC, inpatient neurologic rehabilitation (IPR), outpatient neurologic rehab (OPN), and outpatient orthopedic rehab (OPO). Each of these departments

routinely recorded each clinician's hours worked per day and the number of Current Procedural Terminology codes billed. Productivity was calculated by the number of units of Current Procedural Terminology codes billed divided by the number of hours worked per day. This was normalized to an 8-hour day.

Next, we gathered a list of student CEEs from the Site Coordinator of Clinical Education from each department, which included start and end dates for each CEE, student name, and university affiliation. Due to incomplete data available from the site coordinators, students' demographic data (eg, the level of clinical and the number of previous CEEs) and clinical instructor years of experience, number of previous students, and whether they had taken the APTA Clinical Instructor Credentialing Program were not included in our analysis. The CEEs ranged from 4 weeks to 24 weeks in duration. A total of 148 students completed CEEs from 26 different clinical instructors universities during the time frame of our study. The names of the clinicians and the students were de-identified prior to analysis. The numbers of therapists, clinical instructors, universities, and students in each setting are represented in Table 1.

### Data Analysis and Statistics

The data were analyzed with the Statistical Package for the Social Sciences (SPSS Version 25.0) (IBM, Armonk, NY, USA). For each clinician, we calculated the average daily productivity, normalized to an 8-hour day, for each week of the year. This produced 1 entry per week for each clinician. Also for each week, for those clinicians who were clinical instructors, the presence of a student was noted along with the week of the student's experience. The 4 weeks prior to the student beginning were considered the pre-student period (before), and the 4 weeks afterwards were the post-student period (after), regardless of the length of the clinical experience. We chose 4 weeks because this was the duration of the shortest clinical experiences and long enough to represent the most recent baseline. In addition, though productivity

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**Table 2.**  
Weeks Studied for 3-Year Time Frame in Each Setting

Setting	Therapist Weeks Studied by Time Frame (Sun–Sat, Normalized to an 8-hour Day)			
	Total	Before	During	After
Acute care	3847	155	345	163
Inpatient rehabilitation	2121	116	299	110
Outpatient neuro	1439	170	106	19
Outpatient ortho	13,583	258	435	162

**Table 3.**  
Sample of Data for Analysis<sup>a</sup>

Setting	Dyad	Actual Student-Clinical Instructor Dyad			Other Physical Therapists (No. Student)		
		Before	During	After	Before	During	After
OPO	PT5_StudentE	27.19	28.78	28.09	24.60	24.06	23.76
OPO	PT6_StudentF	24.31	32.78	29.51	25.31	24.53	25.18
IPR	PT7_StudentG	20.98	23.25	18.86	22.01	21.33	19.77
IPR	PT8_StudentH	24.33	28.70	22.23	22.28	22.59	22.28
OPN	PT3_StudentC	22.37	24.38	21.76	24.10	22.52	23.55
OPN	PT4_StudentD	24.48	31.40	29.01	24.58	23.86	24.53
AC	PT1_StudentA	14.60	13.51	15.20	13.47	14.09	14.38
AC	PT2_StudentB	14.38	12.76	12.70	14.30	13.88	14.02

<sup>a</sup>For each dyad (clinical instructor-student pair), the productivity was averaged for the 4 weeks before the CEE (before), for the time of the CEE (during), and the 4 weeks after the CEE (after). For those exact same weeks, the average weekly productivity of all other physical therapists (who were without a student during any given week) was averaged for the same weeks, before, during, and after the CEE.

is captured daily, therapists in our system are evaluated based on monthly productivity totals, so this was a natural duration. Lopopolo<sup>15</sup> and Pivko et al<sup>18</sup> both described utilizing a baseline of 1 week, but we chose 4 weeks to account for any unusual activities during that 1 week and to allow adequate time to return to baseline productivity. In cases where 2 therapists split a student, their productivity was split into the averages for the hours they had the student vs those when they did not. We did not have any 2:1 CEEs, with 2 students assigned to 1 clinical instructor, during this study. For each therapist-student dyad, the time frame of that clinical experience was used to calculate the productivity of other therapists in that setting who did not have a student for the same weeks before, during, and after the CEE.

The total number of weeks studied for each of these time frames and settings is presented in Table 2. The mean productivity for each of these time frames and settings was entered into the ANOVA. Table 3 represents the data structure used. For example, if a physical therapist had a student on a CEE in March and April, the data for “actual dyad” in Table 3 would be that clinical instructor’s productivity for February in “before,” March and April for “during,” and May for “after.” The data for “other physical therapists” in that setting would also come from February

for “before,” only including data for weeks in February when any given therapist did not have a student and likewise for during and after for the “other physical therapists.” A repeated-measures ANOVA was used with mean productivity as the dependent variable and time frame (before, during, after) as the repeated measure. Setting (AC, IPR, OPN, OPO) and whether the therapist had a student (clinical instructor vs other physical therapists) were fixed factors. The Type III Sum of Squares was used for this mixed model.

For post hoc analyses, the Bonferroni correction was used. The intended alpha level was  $P \leq .05$ . In addition to the main analysis (1 test), a post-hoc analysis was run for each of the 4 settings (4 tests). Tests were also conducted for each time point (before, during, after) to compare the productivity of the clinical instructor with other therapists in that setting (4 settings  $\times$  3 time points = 12 tests). Thus, 17 tests were conducted (1 + 4 + 12), which necessitated adjustment of the required significance level to  $P \leq .003$  (0.05/17). Based on significant results in Mauchly’s test of Sphericity, the Greenhouse-Geiser correction was used for estimates of  $P$  levels in the post-hoc tests.

## Results

There was a significant main effect of setting

**Table 4.**  
Means and Standard Deviations of Productivity by Setting

Period	Clinical Instructors				Other Physical Therapists <sup>a</sup>			
	OPO	IPR	OPN	AC	OPO	IPR	OPN	AC
Before	25.8±4.3	21.9±1.3	23.3±2.5	15.9±3.6	25.1±0.8	22.0±0.6	22.1±1.3	15.9±2.8
During	27.5±3.8	23.9±1.9	24.9±3.5	16.3±4.0	24.8±0.8	21.9±0.9	22.4±0.8	16.0±2.9
After	25.9±3.1	20.7±2.7	24.3±3.0	16.0±3.6	24.7±0.8	21.5±1.1	22.4±1.1	16.1±2.9

<sup>a</sup>Physical therapists without a student, in the same setting as the clinical instructor, matched to the same weeks when the clinical instructor had a student.

( $F_{3,278} = 271.5, P \leq .001$ ). Post-hoc comparisons indicated that mean productivity for therapists was significantly different for most settings, with OPO highest, followed by OPN, IPR, and AC. These differences were significant at  $P < .001$ , except IPR vs OPN, which did not meet the adjusted criteria ( $P = .042$ ). Comparing overall productivity of therapists who were with a student with those who were without across all settings, productivity was higher for the clinical instructors ( $F_{1,278} = 11.9, P = .001$ ). There was a significant main effect of the time frame (ie, before, during, after) for clinical instructors ( $F_{2,270} = 19.5, P < .001$ ) but not for other therapists ( $F_{2,270} = 0.70, P = .50$ ). There was a significant interaction between time frame and setting for clinical instructors ( $F_{6,270} = 3.48, P = .002$ ) but not for other therapists ( $F_{6,270} = 2.17, P = .047$ ). Due to the significant differences among settings, further post-hoc comparisons were restricted to differences across the 3 time frames for clinical instructors and other therapists within each setting; no post-hoc comparisons across settings were conducted.

Means and standard deviations for productivity by setting for clinical instructors and other therapists are presented in Table 4. For the outpatient orthopedic setting, clinical instructors were significantly more productive while with a student than the month before ( $P = .003$ ) or after ( $P = .001$ ) the CEE (Fig. 1A, solid line). The productivity of the clinical instructors in OPO was not significantly different for the month before and after the student ( $P = .940$ ). For other therapists in the OPO setting, the time frame had no effect on productivity (Fig. 1A, dotted line). During the CEE, clinical instructors in OPO were more productive than other therapists who did not have a student ( $P < .001$ ), but the clinical instructors did not have different productivity than physical therapists without a student in the month before ( $P = .140$ ) or after ( $P = .013$ ) the CEE.

For the inpatient rehab setting, clinical instructors (Fig. 1B, solid line) were also significantly more productive while with a student than the month before ( $P < .001$ ) or after ( $P < .001$ ), but productivity for the months before and after the student were not significantly different from each other ( $P = .023$ ). For other therapists in the IPR setting, the time frame had no effect ( $P = .042$ ) on productivity (Fig. 1B, dotted line). During the CEE,

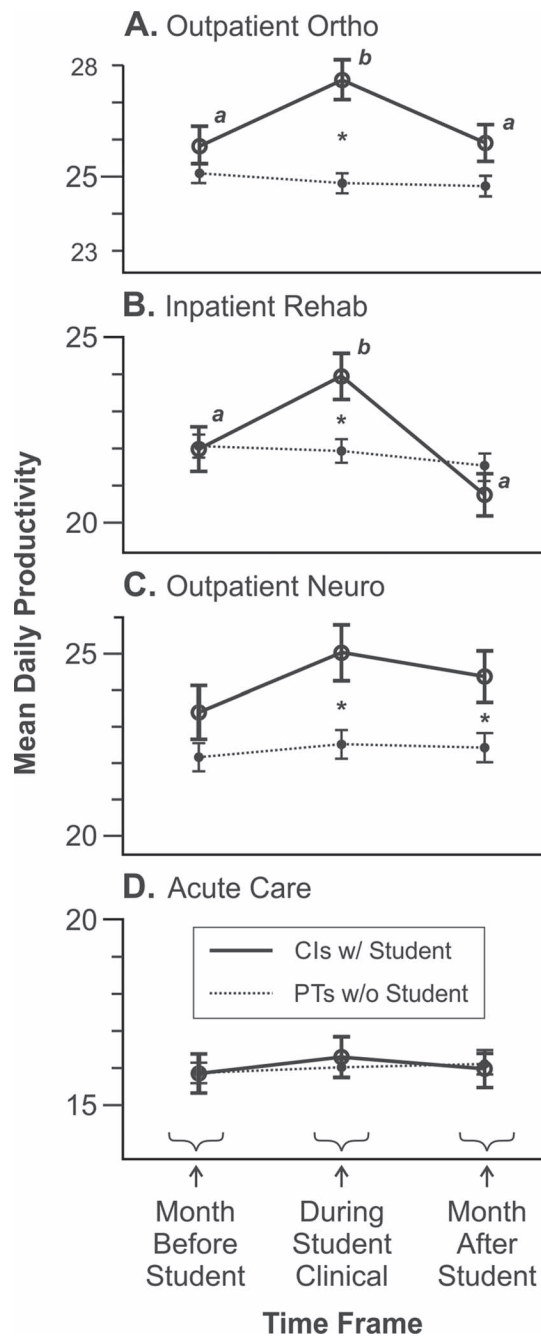
clinical instructors in IPR were more productive than other therapists who did not have a student ( $P < .001$ ), but the clinical instructors did not have different productivity than other therapists in the month before ( $P = .775$ ) or after ( $P = .127$ ) the CEE.

For the outpatient neuro setting, clinical instructors (Fig. 1C, solid line) appeared to be more productive while with a student, but this did not meet the adjusted significance level required for the month before ( $P = .022$ ) or after ( $P = .237$ ). As for the other settings, productivity for the clinical instructors did not differ for month before versus after the CEE ( $P = .169$ ). It should be noted that the OPN setting had the smallest number of CEEs ( $n = 21$ ), which might have contributed to this failure to reach significance. For other therapists in the OPN setting, the time frame had no effect ( $P = .420$ ) on productivity (Fig. 1B, dotted line). During the CEE, clinical instructors in OPN who had a student were more productive than other therapists during the CEE ( $P < .001$ ) and for the month afterwards ( $P = .002$ ) but not in the month before ( $P = .030$ ).

For the acute care setting (Fig. 1D), there was no difference based on the time frame for clinical instructors ( $P = .408$ ) or for therapists without a student ( $P = .483$ ) nor was there any difference in the productivity of the AC clinical instructors compared with AC therapists without a student ( $P = .880$ ).

## Discussion

Although a perception that students might reduce productivity has been a common reason that clinical sites have been hesitant to take students for clinical experiences, our results indicate that in an academic medical center, across various settings, productivity of the clinical instructor is not negatively impacted and, in most cases, is positively affected by a student physical therapist. These findings are in agreement with recent studies in physical therapy<sup>6,18</sup> as well as those in other health care professions.<sup>19–24</sup> An important feature of the present study is the retrospective design. The clinical instructors were not aware that their productivity was being examined for this purpose, and therefore no bias occurred from that knowledge (ie, there was no “Hawthorne effect”). Productivity requirements differed across each setting but were consistent within each setting.



**Figure 1.** Effects of having a student physical therapist on clinician productivity by setting. Error bars represent 1 standard error of the mean. Solid lines represent data for clinical instructors during the month before the student, while the student was present, and during the month after the student. Dotted lines indicate data for therapists in that setting who did not have a student for the same time frames. For the clinical instructors, significant differences in the post-hoc analysis are indicated by small letters; symbols that share a letter are not significantly different. The asterisks indicate differences between the clinical instructors and other physical therapists in that setting for that time frame.

Our data show that, for the system as a whole, the presence of a student made therapists who were clinical instructors more productive while the student was present but had no effect on productivity of other therapists in that setting. The increased productivity of the therapist with a student reached significance in the OPO and IPR settings and approached significance in the OPN setting. In no case was there a significant difference in the productivity of therapists who were about to have a student from their counterparts in that setting during the month before the student arrived. However, during the period of the CEE, therapists with a student were more productive than their counterparts who did not have a student in each setting except acute care. Clinical instructors remained more productive than their counterparts during the month after the student in the OPN setting but not for the other settings.

The acute care setting was different than the others in many regards. Students had no impact on the productivity of the therapists, and there was never a difference in the productivity of therapists who were clinical instructors compared with their counterparts who were without a student. Although the profile of the plot for acute care, with a peak in the middle (Fig. 1D), resembles those above, there was no significant difference. The lack of an effect of the student in the acute care setting may be due to the higher requirement for assistance of patients in our acute care facility; our hospital is a tertiary and quaternary care center. For complex cases such as this, the clinical instructor must be readily available to support the student.

Our study shows that for this academic medical center, students had no negative effect on productivity in any setting. Even in cases where there was no significant effect of the student, the actual productivity number was always highest for clinical instructors who had a student. The increased productivity of therapists who were clinical instructors was never significant in the month before the student arrived. It was only evident while the student was present. This indicates that increased productivity during the student CEE was likely due to the student, not in differences between therapists who were and were not clinical instructors. Likewise, increased productivity of the clinical instructor did not come at the expense of other therapists in the clinic; the clinical instructor did not increase his or her caseload causing other therapists to have fewer patients. Rather, when significant differences were present, the clinical instructor was more productive than he or she would have been otherwise and more productive than the other therapists in that setting during the same time period. There was not a decrease in the productivity of the other therapists while the student was present. This demonstrates that, overall, when a significant difference was present, students increased the productivity for the setting as a whole.

In the OPN setting, the number of overall experiences at the medical center studied was small, so these findings

must be considered with caution. Productivity was improved in this setting during the student clinical experiences but not significantly. To our knowledge, no other studies have investigated the effects of students on productivity in the OPN setting. Based on the trend seen in this data, we would expect that, with a larger number of CEEs, we would have seen a significant effect of the student in our OPN setting analogous to what we observed in the OPO and IPR settings. In the acute care setting, in contrast, we doubt significance would have been reached no matter how many CEEs were in this study. We did observe that clinical instructors with a student in the OPN setting were more productive than their counterparts during the CEE and, somewhat surprisingly, even in the month after the student. None of the other settings demonstrated this after-effect. Perhaps this is an indication of the duration of an episode of care. In the AC and IPR settings, patient lengths of stay are quite limited, and the caseload probably includes mostly different patients the month after the student. In OPO, the caseload is quite dynamic. Perhaps in OPN, where therapists tend to follow patients over longer time frames, an increased caseload might be developed during the student clinical, and it could take some time for the clinical instructor to return to a typical caseload.

Additional explanations for differences in productivity and the effects of students across settings may include the varied supervision and billing practices between inpatient and outpatient settings, differences in ability to schedule more than 1 patient at a time, the complexity of the patients, and the need for more than 1 person for safety and assistance. In addition, some of the therapists in the AC setting cover several floors of the hospital, so maintaining appropriate supervision levels of the students may have precluded them from treating concurrent patients and thus improving their productivity.

### Limitations

One clear limitation of this study is that we only studied productivity at 1 academic medical center with 4 distinct settings. Our medical center is not directly affiliated with a skilled nursing facility, pediatrics, or home health, so those settings were not included. In addition, our numbers for OPN were relatively small, so generalizations from this setting should be made with caution. Academic medical centers are somewhat unique in their high emphasis on research and teaching along with clinical service, and this may have impacted the results. In addition, there were only 1:1 models of clinical education employed in our academic medical center, so we could not study any other model.

The productivity reporting was done in a slightly different format for each of the settings, but in all cases therapists self-reported this number. As a cross check, the aggregated data for each setting as a whole is routinely compared by management to the sum of units reports by

the individuals, so large errors can be detected and corrected. Examining the billing department records could have provided additional information to confirm the accuracy of self-reporting.

Finally, demographic data on the clinical instructors and students were not consistently available for all CEEs in this retrospective study. For the clinical instructors, we would like to have known which clinical instructors were APTA credentialed and how many students the clinical instructor had previously trained. For the students, we would like to have known what year they were in their program and how many previous clinicals they had. Consideration and analysis of these characteristics could have better framed the results and provided further information helpful to clinical sites and academic programs.

### Recommendations for Future Study

Conducting a similar study as a multi-site analysis across multiple academic medical centers could be useful to improve generalizability. Expanding the settings to include skilled nursing facilities, hospitals other than academic medical centers, pediatric facilities, and private practices would also be of value. A qualitative analysis of the perceived effects on productivity compared with the actual numbers could reveal why there is a perception of lower productivity during student clinical experiences even though the data show no effect or an increase. Additional studies on the benefits and barriers of having student physical therapists would be useful.

Future studies should also include more detailed clinical instructor data to determine the impact of clinical instructor characteristics on productivity, such as years of clinical and clinical instructor experience as well as clinical instructor credentialing status. Additionally, tracking the level of the student and the impact it has on clinical instructor productivity would add to the current evidence and could lead to development of strategies to educate students at all levels of their education without negatively impacting the business of clinical practice.

### Conclusion

As we continue to strive for evidence to guide clinical education, our findings indicate that productivity is either improved or unaffected by the presence of a student physical therapist in all settings throughout 1 academic medical center. This increased productivity does not come at the expense of reduced productivity for therapists who did not have a student. Overall, there appears to be a system-wide net gain in productivity associated with the presence of students during a CEE. Our results are consistent with recent as well as older studies indicating that student physical therapists increase clinician productivity; however, those studies focused primarily on the AC setting. We also included IPR, OPO, and OPN, and found that differences exist between each of these

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practice settings. The most significant increases in clinical instructor productivity occurred in OPO and IPR, with a trend towards increased productivity in OPN. AC was essentially unaffected by the student. We should utilize these findings to refute the idea that CEEs have a cost of decreased productivity to the department. A concerted effort to communicate these results to our clinical partners is needed to help diminish concerns with productivity and to increase clinical education opportunities for our students, thereby securing the future of our profession for the benefit of society.

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Concept/idea/research design: T.L. Apke, M. Whalen, J. Buford

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### Ethics Approval

This study was approved by the Institutional Review Board of the Ohio State University before initial data collection.

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### Disclosure

The authors completed the ICMJE Form for Disclosure of Potential Conflicts of Interest and reported no conflicts of interest.

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