

doi: 10.4085/1062-6050-0561.24

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Title: Service Utilization and Value at an Athletic Training Student Run Clinic for University Employees and Students

Author:

Cynthia J. Wright, PhD, ATC
Professor of Health Science & Athletic Training
Whitworth University
cwright@whitworth.edu

Corresponding Author:

Cynthia J. Wright
Department of Health Science
Whitworth University
300 W. Hawthorne Rd
Spokane, WA 99251
Phone: (509) 777-3244
Email: cwright@whitworth.edu

Acknowledgements:

Thank you to Whitworth's MSAT students and supervising faculty for their day-to-day role in clinic services.

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Service Utilization and Value at an Athletic Training Student Run Clinic for University Employees and Students

Abstract

Context: Student-run health clinics (SRHC) are commonly utilized to provide clinical experiences to students in healthcare education programs as well as healthcare services to a target community. Recent reports on athletic training SRHCs (AT-SRHCs) with a client population of university students, employees and/or community members have reported positive patient outcomes and high patient satisfaction, however there is limited data about the treated conditions, services and value provided by AT-SRHC. **Objective:** To track utilization of athletic training services at a free AT-SRHC. **Design:** Retrospective chart review from September 2022-May 2024. **Setting:** University-based AT-SRHC. **Patients:** 97 patients (52 males, 44 females, 1 not documented; age 32.6 ± 13.7 years, range: 18-65 years old; 50 employees, 47 students). **Main Outcome Measures:** Data were extracted from an electronic medical record and scheduling software. Variables extracted included patient demographics, appointment numbers, mechanism of injury, injured body part, days since injury, injury diagnosis, injury severity, and common procedural terminology (CPT) codes. Data were analyzed descriptively. **Results:** Sixty-four percent (226/352) of available appointment sessions were reserved. The 3 most commonly injured body areas were the knee ($n=26$, 23.9%), shoulder ($n=23$, 21.1%), and thigh ($n=13$, 11.9%). The 3 most common diagnoses were sprains/strains ($n=51$, 46.8%), overuse conditions (e.g. epicondylitis, impingement, tendonitis; $n=18$, 16.5%), and nonspecific joint pain ($n=22$, 20.2%). The 3 most common CPT codes were for therapeutic exercise ($n=136$), athletic training evaluation ($n=98$), and manual therapy ($n=78$). Estimates for the total value of services range from \$6,901 to \$13,498 (\$39.89-78.03 per session). **Conclusions:** Services at an AT-SRHC were

utilized by a small portion of the campus population during its first 2 years of operation. Data provides preliminary insight into AT-SRHC service utilization and value. Additional organizations may benefit from developing an AT-SRHC to provide access to affordable care and student clinical experiences.

Key Words: reimbursement, student run health clinic, athletic training clinic, common procedural terminology

Abstract Word Count: 293

Body of Manuscript Word Count: 2402

Key Points:

- Athletic training student run health clinics (AT-SRHC) are a viable model to provide AT services.
- The AT-SRHC treated a diverse range of musculoskeletal conditions in university students and employees.
- Estimates of the value of services provided ranged from \$39.89 to 78.03 per session.

Student-run health clinics (SRHC) are commonly utilized to provide clinical experiences to students in healthcare education programs, while simultaneously meeting a community health need (often for underserved populations at no cost).^{1,2} In the SRHC model, students provide patient care under the supervision of a licensed healthcare professional. Literature on SRHCs provides evidence for positive patient outcomes,^{1,3} patient satisfaction,^{2,4} decreased healthcare system costs,⁵ and increased student perceived readiness for clinical rotations.⁶

SRHCs are most frequently run by student in medicine, pharmacy and nursing; and most commonly treat chronic conditions such as diabetes or hypertension.¹ However recent reports have highlighted the potential benefits of SRHC which provide athletic training services to patients with musculoskeletal conditions.^{4,7} These studies report improvements in patient reported outcomes (PROs) such as pain and function^{4,7} and high levels of patient satisfaction.⁴

Athletic training services at many universities have traditionally only been available to university student-athletes, however, athletic training SRHC (AT-SRHC) generally serve the broader population of students, university faculty and staff, and/or community members.^{4,7} To date there is limited discipline-specific evidence regarding the demand for and provision of athletic training services in this population, although musculoskeletal conditions pose a significant health burden in the general population, and constitute approximately 25% of primary care clinic visits.⁸

The current athletic training research agenda recognizes the need to emphasize healthcare economics (including value of services) and health information technology (including point-of-care data).⁹ AT-SRHC are well situated to advance this agenda by using electronic medical record (EMR) review to generate clinically meaningful evidence.¹⁰ Therefore the purpose of this study was to track utilization of athletic training services at an free university-based AT-SRHC.

Of particular interest were appointment utilization rates, types of conditions treated, and economic estimates of the value of care provided.

Methods

Procedures

The study was approved by the University's Institutional Review Board. Study dates were defined as the first two years of clinic operation: 9/13/22-12/8/22 (fall semester 1), 2/7/23-5/4/23 (spring semester 1), 9/12/23-12/5/23 (fall semester 2), and 2/6/24-4/30/24 (spring semester 2). The University had an approximate enrollment of 2,350 full-time equivalent students and approximately 550 full-time equivalent employees across this period.

De-identified data were extracted from the EMR (Core-AT, Athletic Training Practice Based Research Network) and scheduling software (Microsoft Bookings) by the primary investigator. Variables extracted from the EMR included patient demographics, mechanism of injury, activity at the time of injury, injured body part and laterality, days since injury, injury diagnosis (utilizing International Classification of Disease [ICD]-10 codes), injury severity, and common procedural terminology (CPT) codes. Variables extracted from the scheduling software were the number of appointment slots available, and the number of appointments reserved. Extracted data were analyzed descriptively utilizing both Microsoft Excel (Office 365 Version 16, Redmond WA) and IBM SPSS Statistics (Version 28.0, Chicago, IL) software.

Data for three variables were extracted from the EMR then categorically coded for analysis. First, the activity at time of injury was extracted from the free text "mechanism of injury" field within the EMR, and then coded into 7 general categories for analysis (Table 1). Injury diagnoses were coded categorically into 5 general categories (Table 1). Lastly, the

number of days since injury was coded into 3 clinical categories: acute (≤ 14 days), subacute (15 days to 60 days), and chronic (> 60 days). To protect patient confidentiality, if less than 5 observations existed for any injury descriptor in Table 1 (e.g. only 1 thumb injury, or only 2 dislocations) observations were combined into a subgroup labeled “other”.

The Center for Medicare and Medicaid Services (CMS) physician fee schedule 2024B was utilized to assign dollar values to CPT codes.¹¹ This schedule was utilized as it a national governmental standard, publicly accessible, and many private insurance companies utilize the CMS schedule when setting their own allowable services and prices. The national payment amount at the non-facility price was utilized. CPT codes can be updated annually, and we discovered two CPT code options within the EMR dropdown menu were outdated. For those two CPT codes, we included the documented CPT code (old) and the current equivalent CPT codes (new).

Athletic trainers are not recognized as providers by CMS, thus CPT codes for athletic training evaluations exist (97169, 97170, and 97171) but are not reimbursable.^{12,13} For these three codes only, an estimate of the reimbursable value from a single state fee schedule was utilized.¹⁴ The state fee schedule listed the reimbursement rate for athletic training evaluation codes (97169 = \$67.32; 97170 = \$118.32).¹⁴ In comparison, the CMS physician fee schedule¹¹ for physical therapy evaluations ranging from low to high complexity (97161-97163) are priced at \$100.20 and occupational therapy evaluations ranging from low to high complexity (97165-97167) are priced at \$101.19.¹¹ Based on this comparison data, we opted to utilize the more modest reimbursement rate from the state fee schedule (\$67.32) as the value estimate for athletic training evaluation CPT codes in this study.

Clinic Setting

The SRHC (known as the XX clinic) is a free, educational clinic open to all students, faculty and staff of XX University. As an educational facility, the XX clinic serves as a clinical site for Master of Science in Athletic Training (MSAT) students. The mission of the clinic is to create clinical experience opportunities for MSAT students and serve the university community by offering high quality athletic training services.

The XX clinic is open 2 days a week for 1.5 hours a day. Each day it offers two new patient appointments (45min), and two return patient appointments (30-45min). Patients self-schedule appointments via an online reservation system (Microsoft Bookings). On a typical day the clinic is staffed by 2 MSAT students and 1 athletic training faculty supervisor who was state licensed and Board of Certification (BOC) certified. Similar to past reports the clinic supervision model is one of supervised autonomy,^{4,7} with students performing intake and evaluation tasks, then presenting their findings and desired treatment plan to the supervising athletic trainer for approval prior to implementation. A wide range of treatment tools and techniques such as manual therapy, therapeutic modalities, taping, and exercise are available to prescribe. However due to limited operational hours, the clinic typically prioritizes creating a home exercise plan and educating patients about self-care and proper therapeutic exercise technique.

Expenses to operate the XX clinic are intentionally kept minimal. Both the scheduling software and EMR are available free of charge to the clinic. Microsoft Bookings is part of the university software package. Core-AT EMR is offered free-of-charge by the Athletic Training Practice Based Research Network. Expendable supply use and printing costs are not tracked separately within the MSAT budget but are estimated to be less than \$100 annually. The largest clinic expense is for supervisory personnel. Students are supervised by a faculty member who is

a state-licensed BOC certified athletic trainer. Each semester the faculty supervisor receives load credit equivalent to a 1 credit course, for a total of 2 credits annually or 10% (0.1) of a full time equivalent (FTE). This FTE was assigned based on an estimated workload of 4 hours per week.

Results

Patient Demographics

A total of 97 patients (52 males, 44 females, 1 not documented; age 32.6 ± 13.7 years, range: 18-65 years old) were served during the 2-year study period. As several patients returned for care for an additional unique musculoskeletal condition, 109 unique injuries or conditions are included in the current chart review. The patient population was approximately equally split between university employees ($n=50$, 51.5%) and students ($n=47$, 48.5%).

Appointment Availability and Utilization

The reservation rate of available appointments is presented in Table 2. The average condition was treated across 1.8 ± 1.2 sessions (range: 1-7). Across the 109 unique injuries there were 197 documented sessions (119 for employees, 78 for students; 109 new patient appointments, 88 return visits). Forty-six percent (50/109) of new injuries or conditions returned for at least one follow-up appointment.

Characteristics of Musculoskeletal Conditions Treated

Characteristics of the conditions treated are presented in Table 1. The median time since injury was 53 days (range: 1-3670 days). The top 5 diagnostic codes were (1) S13.4XXA - Sprain/Strain Neck ($n=13$, 11.9%), (2) M25.569 - Knee Pain ($n=10$, 9.2%), (3) M25.519 - Shoulder Pain ($n=9$, 8.3%), (4) S73.109A - Sprain/strain Thigh/Hip/Groin ($n=8$, 7.3%), and (5)

S83.90XA - Sprain/Strain, unspecified, distal end, Thigh (n=6, 5.5%). All other diagnostic codes had ≤ 5 observations each.

Economic Value Estimates

CPT codes were documented in the EMR for 89.9% (98/109) of new injury evaluations and 85.2% (75/88) return visits. Data were missing in 10.1% (11/109) of new injury evaluations and 14.8% (13/88) return visits. The CPT codes assigned to intake and return sessions are document in Table 3. The three most common CPT codes were for therapeutic exercise (97110), athletic training evaluation (97005), and manual therapy (97140). The total value of treatments provided according to the CMS Physician Fee Schedule was \$6,901.06 (average \$39.89 per session). If CPT codes for athletic training evaluation (e.g. 97169-97171) were eligible for reimbursement, the additional value of athletic training evaluations performed was \$6,597.36 (\$67.32 each for 98 evaluations). The total combined value of services including evaluation and treatment was \$13,498.42 (average \$78.03 per session).

Discussion

The purpose of this study was to track utilization of athletic training services at a free university-based AT-SRHC. Of particular interest were appointment utilization rates, types of conditions treated, and economic estimates of the value of care provided. Overall, this SRHC provided AT services to 109 unique musculoskeletal conditions in 97 patients over its first 2 years of operation. Appointment reservations increased 11% from the first to second year of operations, likely due to increased awareness of this new campus resource.

Compared to past reports on AT-SRHC, our patient population was similar in age and overall injury profile.^{4,7} Curran et al.⁴ reported that their 4 most common body areas treated

were knee (18.8%), low back or pelvis (17.5%), ankle or foot (15.2%), followed by shoulder (12.6%). In contrast our top 4 were knee (23.9%), shoulder (21.2%), thigh (11.9%), followed by the neck (9.2%). The slight differences may have been due to natural variation, or perhaps differences in methodology as Curran et al.⁴ reported outcomes for a subset of patients rather than their entire population. The most common conditions treated for both studies were sprains and strains (46.8% in the current study versus 34.8%), and unspecified joint or musculoskeletal pain (20.2% in the current study versus 20.1%).⁴ Average number of visits per condition (1.8±1.2) was lower in the current study than previously reported in comparable AT-SRHC (e.g. 4.7±1.8⁷). However the averages reported in prior studies are not comparable as their aim was to report patient outcomes, thus they excluded any patient that did not return for multiple sessions.^{4,7} As would be expected for the type of clinic, our patients were largely low acuity (67.9% classified as grade 1 or mild) and the most common causes of injury were fitness activities and sport (55%).

Economic Value Estimates

The XX clinic is a free clinic, it neither bills insurance for services nor charges fees for services. Our data show the estimated value of services, either including reimbursement for athletic training evaluation codes (\$13,498) or excluding reimbursement for athletic training evaluation codes (\$6,901). However, there could be alternative methods to calculate value. For example, our university has recently moved to a self-funded medical plan. A self-funded medical plan (also referred to as self-insured) is a health plan strategy where an employer pays the employee's health claims directly to health providers, rather than paying monthly premiums to a health insurance company to cover those claims. This can save the employer money if direct costs are less than premiums costs (which are based on risk estimates). When self-funded every

visit made by an employee to an external therapy clinic is a direct cost to the university. If AT-SRHC utilization decreases employee utilization of external therapy services, the university will see a reduction in self-funded medical plan expenses. For example, over the study period the XX clinic completed 119 sessions for 51 employees. If the most likely alternative to the AT-SRHC would be a physical therapy billed at \$150 per session, the medical plan expense reduction to the university would be \$17,850. However, this value does not account for the expense to run the clinic. To determine return on investment, the benefits (e.g. medical plan expense reduction, value of student clinical opportunities) should be divided by the expense to operate the clinic (e.g. FTE for supervision, supplies). In addition to medical plan expense reduction, benefits of a free onsite medical services for employees include decreased sick-leave and avoiding lost productivity, as employees can receive treatment during the normal course of their workday with minimal interruption.¹⁵

Student Clinical Experience and Accreditation Standards

This AT-SRHC was initially developed to serve multiple aims, including to aid in compliance with accreditation standards for the MSAT program. The Commission on Accreditation of Athletic Training Education (CAATE) 2020 Standards include a requirement that during athletic training clinical experiences students gain experience working with patients or clients across the lifespan (e.g. pediatric, adult, elderly) and those engaged in non-sport activities (Standard 17).¹⁶ As traditional athletic training clinical experiences with high school, collegiate or professional athletics typically exclude these populations, utilizing the XX clinic as a student clinical site provided an important opportunity to provide high-quality learning experiences that met the requirements within Standard 17. Past research has shown that SRHCs

increase student perceptions of readiness for future clinical rotations and ultimately autonomous clinical practice.⁶

Limitations

The current study analyzes data from an AT-SRHC in its first 2 years of operations. The relatively low number of patients served could be influenced by the limited hours of clinic operation and/or limited awareness of this new campus resource. Additionally, as our dataset was small, it was underpowered to investigate patient outcomes. Therefore we were unfortunately unable to report patient outcomes alongside the current data on clinic utilization and value estimates.

Our methods for calculating economic value have limitations. First, CPT codes were missing from 10-15% of records, primarily due to inadequate training when first implementing a new EMR. Additional training and policies were implemented after the first year to improve documentation. The missing data may result in underestimating the value of services provided. Second, we estimated the value based on the documented CPT code, which assumes that documentation was appropriate and complied with any relevant medical billing standards. However, we are not experts in medical billing policies and practices, and it is possible errors were made in CPT code assignment or documentation. Thirdly, we estimated the value of athletic training evaluation codes (97169-97171) from a state fee schedule¹⁴ due to the absence of a nationwide estimate; the actual value will vary depending on the source of third party reimbursement (e.g. CMS versus state insurance versus private insurance).

Conclusion

Although SRHC are a well-established model within other healthcare professions,^{1-3,5,6} only recently have AT-SRHCs been reported within the literature.^{4,7} The current retrospective

244 chart review provides evidence supporting AT-SRHC utilization, patient population and services,
245 as well as economic value estimates. Future research should investigate the cost-effectiveness of
246 AT-SRHC services, as well as sustainable funding models for organizations interested in
247 developing an AT-SRHC.

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Online First

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Table 1. Characteristics of Conditions Treated

Characteristic	N	%
Mechanism of injury		
Non-contact	50	45.9
Insidious onset (unknown)	39	35.8
Fall	10	9.2
Contact	5	4.6
Twisting	5	4.6
Activity at time of injury		
Fitness/Workout activity	31	28.4
Sport activity	29	26.6
Insidious (unknown)	22	20.2
Activity of daily living	8	7.3
Post-operative	6	5.5
Work activity	6	5.5
Other	7	6.4
Time elapsed since injury		
Acute (0-14 days)	21	19.3
Subacute (15-60 days)	35	32.1
Chronic (>60 days)	53	48.6
Body laterality		
Right	55	50.5
Left	34	31.2
Bilateral	20	18.3
Body area		
Knee	26	23.9
Shoulder	23	21.1
Thigh	13	11.9
Neck	10	9.2
Back	9	8.3
Hip	8	7.3
Ankle	7	6.4
Other	13	11.9
Severity		
Mild (grade 1)	74	67.9
Moderate (grade 2) or Severe (grade 3) ^a	35	32.1
Diagnostic category		
Sprain or strain	51	46.8
Joint pain (not otherwise specified)	22	20.2
Overuse (e.g. -itis)	18	16.5
Meniscal tear	5	4.6
Other	13	11.9

^a Moderate and severe categories were combined to protect confidentiality as there were <5 severe injuries

Table 2. Appointment Availability and Utilization

Date	New patient appointments			Return patient appointments		
	Reserved	Available	%	Reserved	Available	%
Year 1	44	84	52.4	54	84	64.3
Year 2	63	92	68.5	65	92	70.7
Total	107	176	60.8	119	176	67.6

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Table 3. Current Procedural Terminology (CPT) Codes Assigned to Intake and Return Sessions

CPT code	Description	Intake session	All return sessions	Price each ^a	Total value
97005 (old ^b)	Athletic training evaluation	98	0	0.00	0.00
97169 (new)	Athletic training evaluation, low complexity, 20min OR				
97170 ^c (new)	Athletic training evaluation, moderate complexity, 30min				
97010	Application of a modality to 1 or more areas; hot or cold packs	11	4	0.00	0.00
97014 (old ^b)	Electrical stimulation (unattended) (to one or more areas)	3	2	14.31	71.55
97032 (new)	Application of a modality to 1 or more areas; electrical stimulation (manual), each 15 minutes				
97035	Application of a modality to 1 or more areas; ultrasound, each 15 minutes	5	2	13.98	97.86
97110	Therapeutic procedure, 1 or more areas, each 15 minutes; Therapeutic exercise to develop strength and endurance, range of motion and flexibility	85	51	29.25	3978.00
97112	Neuromuscular Re-education of movement, balance, coordination, kinesthetic sense, posture, and/or proprioception for sitting and/or standing activities (one or more areas, each 15 minutes)	0	1	33.62	33.62
97116	Therapeutic procedure, 1 or more areas, each 15 minutes; gait training (includes stair climbing)	1	1	29.29	58.58
97124	Therapeutic procedure, 1 or more areas, each 15 minutes; Massage, including effleurage, petrissage, and/or tapotement (stroking, compression, percussion)	4	3	30.29	212.03
97140	Manual therapy techniques (eg, mobilization/ manipulation, manual lymphatic drainage, manual traction), 1 or more regions, each 15 minutes	35	43	26.96	2102.88
97530	Therapeutic activities, direct (on-on-one) patient contact (use of dynamic activities to improve functional performance), each 15 minutes	1	2	36.62	109.86
29240	Strapping; Shoulder	1	2	29.63	88.89
29530	Strapping; Knee	2	1	29.29	87.87
29540	Strapping; Ankle and/or foot	1	1	29.96	59.92

^a Center for Medicare and Medicaid Physician Fee Schedule 2024B national non-facility price

^b The EMR utilized outdated CPT codes for 2 services provided. For those two services both the documented code (old) and current equivalent code (new) are listed.

^c The code 97171 (athletic training evaluation, high complexity, 45min) is omitted as it would exceed the allotted time.