Journal of Student-Run Clinics
Descriptive Report

Clinical Documentation Quality and Adherence to Preventive Care Guidelines in a Student-Run Free Clinic

A Retrospective Chart Audit

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Published: December 5, 2025

Abstract

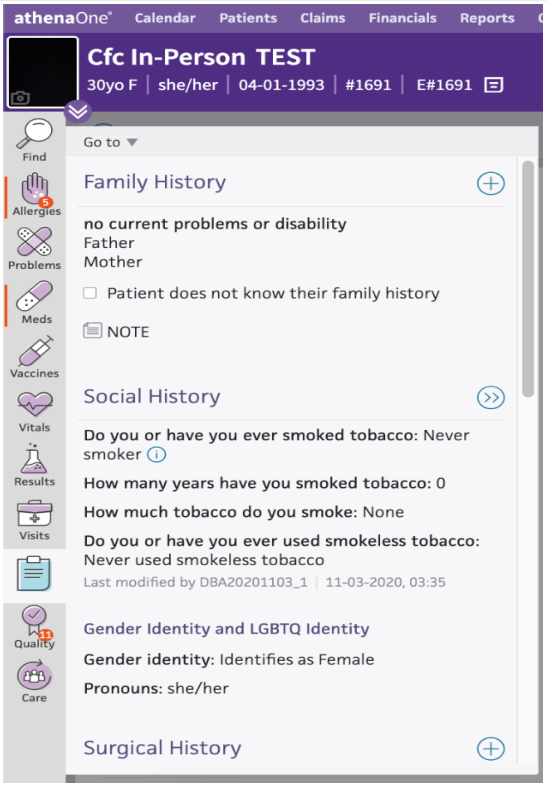
The Columbus Free Clinic (CFC) is the largest interprofessional student-run free clinic in Ohio that provides medical and social services to uninsured and underinsured individuals. In recent years, CFC's care model has gradually shifted away from serving as an acute care resource and towards a longitudinal provider role for uninsured and underinsured residents in the greater Columbus area. Limited data on the quality of our patient charts and limited ability to utilize data to inform longitudinal programs and chronic care treatment led us to evaluate documentation quality in a sample of our patient charts with the aim of improving the quality of care in our clinic. We assessed documentation of vital signs, social history, family history, past medical history, obstetric history, and preventive screenings. We randomly selected 10% of patient charts. As of June 2023, our clinic had 4971 patient records; therefore, our sample size was 497 charts. Substantial gaps in reporting patient social history, family history, and past medical history were noted, as well as gaps in reporting patient cancer screenings. We describe our chart audit process and chart review materials here with the aim of providing other student-run free clinics with a model to assess the quality of their patient charts and improve the quality of their clinical documentation, thereby improving overall patient care. The results of this chart audit have promoted the development of new volunteer training initiatives, new volunteer recruitment and the creation of chart quality and research committees, which will allow us to improve the quality of CFC patient charts and continuity and quality of patient care.

Introduction

The Columbus Free Clinic (CFC) is the largest interprofessional student-run free clinic in Ohio that provides medical and social services to uninsured and underinsured individuals. Since CFC began using the AthenaHealth (athenaOne Version 25.11, athenahealth, Inc., Watertown, MA) electronic health record (EHR) in 2019, it has seen close to 5,000 patients for a total of more than 11,000 encounters. Over 90% of encounters were primary care visits, with specialty care, lab appointments, medication pickup, and social work consultations comprising the remainder of encounters.

In recent years, CFC's care model has gradually shifted away from serving as an acute care resource and towards a longitudinal provider role for the community.[1] Chronic care programs such as the diabetes and hypertension education and monitoring programs have been successfully implemented.[2] A panel of the clinic's most medically complex patients are assigned to fourth-year medical students who function as their primary care provider, allowing for greater continuity of care. However, constant turnover of patients and volunteers in the CFC general clinic has presented a barrier to continuity of care and adherence to preventive care guidelines. Quality of clinical documentation is an additional barrier to high-quality care, as student volunteers in our clinic are predominantly first-

Figure 1. View of history tab in AthenaHealth



Patient history tab from a test patient chart in AthenaHealth (athenaOne Version 25.11, athenahealth, Inc., Watertown, MA). Cfc: Columbus Free Clinic; LGBTQ: Lesbian, Gay, Bisexual, Transgender or Queer

year medical students who lack experience in obtaining comprehensive medical history and writing detailed medical notes.

To address our clinic's lack of data on the quality of patient charts and limited ability to utilize data to inform longitudinal programs and chronic care treatment, we conducted a chart audit assessing documentation quality in a sample of our patient charts. The data obtained from this audit has aided the design of initiatives to improve our clinic's quality of care.

Audit Methods

We conducted a retrospective chart audit to assess CFC's (1) patient chart quality, (2) chronic care and screening adherence, and (3) use of structured data entry in our clinic's EHR, AthenaHealth. Historically, all components of the patient history and exam have been written in a free-text format in Athena using a pre-templated dot phrase shortcut as a guide. Entering history and physical information in Athena's tab function allows for patient characteristics to be identified and queried through EHR reports, allowing for easier data analysis (Figure 1).

First, we looked for vitals signs expected to be measured at every patient visit (height, weight, and blood pressure). These three measures are necessary to calculate a patient's body mass index (BMI) and atherosclerotic cardiovascular disease (ASCVD) risk score, which is essential for determining statin recommendations for cardiovascular health in patients between the age 40-75.[3] Additionally, patients with high blood pressure can be referred to CFC's hypertension longitudinal clinic. We also searched for evidence of recommended depression screening in patients[4].

Next, we evaluated patient history characteristics, beginning with gender identity to identify patients for our Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexual, Two Spirit (LGBTQIA2+)-

Table 1. Guidelines for patient screening

Type of Screening	Screening Population	Frequency
ASCVD	All patients age 40-75	Yearly
Diabetes	All patients age 35-70 with BMI > 25	Yearly
Diabetic Eye/Foot Exam	All Diabetic Patients	Yearly
Lipid Panel	Men age > 35 Women age > 40	Yearly
Colorectal Cancer	All patients age 45-70	Every 10 years
Lung Cancer	All patients age 50-80 with >20 pack-year smoking history	Yearly
Prostate Cancer*	All patients age 55-69	Periodic
Abdominal Aortic Aneurysm	Men age 65-75 who have ever smoked	One-time
Breast cancer	Women age 40-74	Every 2 years
Cervical Cancer	Women age 21-65	Every 3 years without HPV co-testing or every 5 years with HPV co-testing

Qualifications for patient screenings, as outlined by United States Preventive Services Task Force guidelines. [3-10]
**Prostate cancer screening is a soft recommendation and is up to the discretion of patients.*
ASCVD: Atherosclerotic Cardiovascular Disease
HPV: Human Papillomavirus

focused Rainbow clinic. We searched for patient smoking use and pack-year history, which is useful for risk-stratification, lung cancer screenings, and abdominal aortic aneurysm (AAA) screenings.[5,6] Additional history assessed included alcohol use, diet, exercise, transportation difficulty, housing status, and ability to care for oneself (including hearing and vision).

For chronic care screening and tests, we searched for Hemoglobin A1c tests, Coronavirus Disease 2019 (COVID-19) vaccination, and screenings for AAA and cancers of the colorectum, lung, prostate, breast, and cervix for patients who should receive those tests, per United States Preventive Services Task Force (USPSTF) guidelines (Table 1).[7,8,9] Additionally, as the USPSTF is currently analyzing effectiveness of screening for chronic kidney disease (CKD), we included related screenings (estimated glomerular filtration rate [eGFR], microalbumin/creatinine ratio).[10] Finally, we assessed completion of the obstetrics/gynecology (OB/GYN) tab.[11,12]

For the non-tab portion of this audit, we examined the longitudinal retention of our patients through frequency of visits utilizing two measures: 1) an appointment in the past year and 2) three appointments in the past three years. We also evaluated the written portion of each patient chart (Table 2). When a new patient schedules an appointment at CFC, a patient chart is created prior to their arrival. As of June 2023, our clinic had 4971 patient charts. For this audit, 10% of patient charts

Table 2. Criteria for written chart completion

Written Chart Component	Description
History of Present Illness (HPI)	Patient data is filled out using dot phrases
Review of Systems (ROS)	Patient data is filled out using dot phrases
Physical Exam (PE)	Patient data is filled out using dot phrases
Assessment and Plan (A&P)	Detailed information on diagnosis and treatment plan
Rationale	Explanation of A&P (ex. reason for ordering laboratory tests, etc.)

Evaluation criteria for assessment of written chart categories.
Dot phrase: a template that is used for the completion of medical charts. A unique template is provided for each body system.

(497 charts) were reviewed by the authors. Discrepancies during evaluation were resolved through discussion.

Results

Patient Chart Completion and Vital Signs

Of the 497 charts reviewed, 324 (65%) had an appointment in their chart while 173 (35%) were blank due to unattended appointments. Of all patient charts, 75% of patients had their height, weight and blood pressure measured. The presence of a depression screening (e.g. Patient Health Questionnaire-2 [PHQ2], Patient Health Questionnaire-9 [PHQ9], Geriatric Depression Scale [GDS]) was completed for 19% of patients (Table 3).

Patient History

The first history metric examined was reporting of patient gender identity, pronouns, and sex-

Table 3. Vitals and history records

Variable	Completed, N = 324 (%)	Not Completed, N (%)
Vital Signs		
Height	243 (75)	81 (25)
Weight	246 (76)	78 (24)
Blood Pressure	243 (75)	81 (25)
Depression Screening	61 (19)	263 (81)
Social History		
Gender Identity	55 (17)	269 (83)
Pronouns	72 (22)	252 (78)
Sexual Orientation	48 (15)	276 (85)
Tobacco Use? (Yes/No)	31/84 (10/26)	209 (64)
Calculated Pack Years	3 (10)	28 (90)
Alcohol Use? (Yes/No)	10/28 (3/9)	286 (88)
Calculated Drinks per week	3 (30)	7 (70)
Sexually Active (Yes/No)	5/4 (2/2)	315 (96)
Future Pregnancy Plans (Yes/No)	0/4 (0/1)	320 (99)
Interest in Contraception Discussion (Yes/No)	0/4 (0/1)	320 (99)
Current Diet Regimen	11 (3)	313 (97)
Current Exercise Regimen	13 (4)	311 (96)
Housing Status	0 (0)	324 (100)
Transportation Difficulties (Yes/No)	0/10 (0/3)	314 (97)
Ability to Care for Themselves (Yes/No)	16/1 (5/<1)	307 (95)
Difficulty with Sight (Yes/No)	1/13 (<1/4)	310 (96)
Difficulty with Hearing (Yes/No)	0/13 (0/4)	311 (96)
Family History		
How many generations captured (3/2/1)	6/12/30 (2/4/9)	276 (85)
Patient History		
Previous Medical History	54 (17)	270 (83)
Previous Surgical History	30 (9)	294 (91)
Medication List	248 (77)	76 (23)

Completion of social, family, and medical history across evaluated patient charts.

ual orientation (17%, 22%, and 15% complete respectively). Smoking history and pack-years are separate tabs in Athena (36% and 10% complete respectively), as well as alcohol use and calculated drinks per week (12% and 30% complete respectively). Next, we looked at sexual activity, future pregnancy plans, and interest in contraception (4%, 1%, and 1% complete respectively), followed by diet and exercise regimens (3% and 4% complete respectively). Lastly, we looked at select indicators for social determinants of health: housing, transportation, ability to care for oneself, visual difficulty, and hearing difficulty (0%, 3%, 5%, 4%, and 4% complete respectively). We counted how many generations of family history were recorded in patient charts, with only 17% having any generations recorded, despite the option to select "no relevant family history" in the patient chart for those who do not have/do not know of any family members with health conditions.

Finally, we assessed whether the patient's list of medications and previous medical and surgical history were recorded in their chart (77%, 17%, and 9% complete respectively). For patients who have no relevant past medical history, there is a place in those sections to either select "no previous history" (surgical history, medication list) or select no for irrelevant medical conditions (previous medical history) (Table 3). If a chart had no information inputted and did not select the option for nonsignificant previous history, then it was considered not complete.

Chronic Care Screenings and Tests

We first examined patient retention. From 324 patients with records, roughly 42% had a CFC appointment within the last year. Only 24 patients (7.4%) had a yearly appointment for the past 3 consecutive years. Next, we evaluated patient charts for different chronic care screenings and testing. COVID-19 vaccination status was not recorded in 94% of patient charts. Unfortunately, 0% of patients had an ASCVD risk score in their chart. Lipid panels were ordered for only 41% of qualifying patients. No charts reviewed from CFC's diabetic population had a record of yearly eye or foot exams. Forty percent and 10% of CFC patients have been tested for eGFR and Albumin/Creatinine ratio tests respectively (Table 4).

Table 4. Longitudinal retention, tests, and screenings

Variable	Qualifying Patients, N=324	Completed, N (%)	Not Completed, N (%)
1 clinic visit in past 12 months	324	135 (42)	189 (58)
3 clinic visits in past 3 years	324	24 (7)	300 (93)
Coronavirus disease 2019 Vaccine	324	18 (6)	306 (94)
ASCVD Risk Score	179	0 (0)	179 (100)
Hemoglobin A1c	168	76 (45)	92 (55)
Last Lipid Panel	186	77 (41)	109 (59)
Last Diabetic Eye Exam	47	0 (0)	47 (100)
Last Diabetic Foot Exam	47	0 (0)	47 (100)
eGFR Calculation	324	129 (40)	195 (60)
Albumin/Creatinine Ratio	324	33 (10)	291 (90)
Last Colorectal Cancer Screening	155	4 (3)	151 (97)
Last Lung Cancer Screening	1 (90 unsure*)	1 (100)	0 (0)
Last Prostate Cancer Screening	51	0 (0)	51 (100)
Last Abdominal Aortic Aneurysm Screening	0 (25 unsure*)	0 (0)	0 (0)

Completion of longitudinal retention, tests, and screenings across evaluated patient charts. The determination of qualifying patients for these screenings is based on the guidelines outlined in Table 1.
ASCVD: Atherosclerotic Cardiovascular Disease
eGFR: Estimated Glomerular Filtration Rate
**Unsure refers to any patients that did not qualify for screenings, due to missing patient data.*

Patient records for screening adherence were also evaluated. Any patients that did not qualify for screenings due to missing patient data were labeled as "unsure". Due to many patients missing smoking "pack year" data, we could only confirm one patient who qualified for lung cancer screening, and this patient's screening was up-to-date. Of 155 patients, only four patients (3%) completed a colorectal cancer screening. Lastly, we evaluated patients compliant with prostate cancer and AAA screening. Unfortunately, 0% of qualifying patients had a record of either screening.

OB/GYN Care

Next, we wanted to measure how well we were tracking and maintaining GYN-related care. Out of all patients in the appropriate age range, we are tracking less than 10% of metrics for GYN history (age at first menstrual period, regular menstrual cycle, use of hormone therapy (HRT), menopause), pertinent history (last menstrual period, history of abnormal Pap smear, history of sexually transmitted infection (STI), human papillomavirus (HPV) vaccine, obstetric history), and USPSTF-recommended screenings (last mammogram or Pap smear) (Table 5).

Quality of Written Chart

For each patient, we read the most recent appointment record in the patient's profile. Valid appointment types included both in-person and telehealth new appointments and follow-up appointments. Of 324 patient charts reviewed, 97% of patient charts had a well-described HPI using the criteria outlined in the rubric (Table 2). For the review of systems (ROS) and physical examination (PE), we looked for ROS/PE records that covered the body systems pertaining to the patient's condition and a holistic examination for new patients or follow-ups. From this criteria, 54% and 52% of patient charts fulfilled ROS and PE criteria respectively. Ninety-nine percent of patient charts had an assessment and plan (A&P), with 41% of patient charts having a satisfactory rationale. In total, 17% of charts met all 5 evaluated criteria (Table 6).

Discussion

The results of this chart audit highlighted a number of ways in which clinical documentation is in need of improvement. As vital signs are essential for assessing hypertension and BMI for potential cardiovascular risk/screenings in older populations, a vitals completion rate of 75% of patients is concerning. As our population is at greater risk of mental health conditions, the completion rate of 19%

Table 5. Obstetric/Gynecological care

Variable	Qualifying Patients, N=180	Completed, N (%)	Not Completed, N (%)
Last Menstrual Period	180	15 (8)	165 (92)
Age at First Menstrual Period	180	9 (5)	172 (95)
Regular Menstrual Cycles (Yes/No)	174	6/2 (3/1)	166 (96)
Last Mammogram	104	5 (5)	99 (95)
Abnormal Pap Smear (Yes/No)	180	0/1 (0/<1)	179 (100)
Last Pap Smear	176	6 (3)	170 (97)
History of STI (Yes/No)	180	2/6 (1/3)	172 (96)
Use Hormone RT (Yes/No)	180	0 (0)	180 (100)
Received HPV Vaccine (Yes/No)	180	0 (0)	180 (100)
Menopause (Yes/No)	168	2 (1)	166 (99)
Obstetrics History	180	11 (6)	169 (94)

Completion of Obstetric/Gynecological-related history across evaluated patient charts.
STI: Sexually-Transmitted Infection; HRT: Hormone Replacement Therapy; HPV: Human Papillomavirus

Table 6. Quality of written chart

Variable	Completed, N (%)	Not Completed, N (%)
History of Present Illness	315 (97)	9 (3)
Review of Systems	176 (54)	148 (46)
Physical Exam	169 (52)	155 (48)
Assessment and Plan	320 (99)	4 (1)
Rationale for Plan	134 (41)	190 (59)
All Five	56 (17)	268 (83)

Completion of written chart categories across evaluated patient charts.

for the PHQ2, PHQ9, and GDS highlights a necessary area for intervention. Low reporting rates of patient gender identity, pronouns, and sexual orientation may present a barrier to ensuring that patients feel respected and comfortable at CFC, along with identifying potential patients interested in our LGBTQIA2+-focused specialty clinic[13].

In terms of social history, low rates of recording for smoking history, alcohol use, diet, and exercise regimen make potential outreach campaigns for nutrition education, smoking cessation, and alcohol cessation difficult as well as creating a barrier to identifying patient risk factors for chronic disease, such as lung cancer or liver disease. Social determinants of health such as housing, transportation, ability to care for oneself, sight difficulty, and hearing difficulty were also infrequently recorded, which makes it difficult to coordinate outreach for appropriate social services, connect patients with partner organizations, and provide holistic care.

Lack of data for various chronic care screenings, vaccines and testing, as recommended by the USPSTF, hinder outreach efforts to provide these services. For example, it is difficult to identify patients who are not vaccinated against COVID-19, as vaccination status was recorded in less than 10% of patient charts. Lack of ASCVD risk scores, inconsistent lipid screening, and lack of adherence to diabetes chronic care guidelines put patients at risk for further disease complications. Very few patients had recorded cancer screenings, despite the large number of patients who would qualify for these screenings at our clinic. These services are available at our clinic, therefore improved data quality will be essential to ensure that they are provided to all eligible patients.

For GYN history, we are tracking less than 10% of metrics (age at first menstrual period, regular menstrual cycle, use of HRT, menopause), pertinent history (last menstrual period, history of abnormal pap smear, history of STI, HPV vaccine, obstetric history, sexual activity, pregnancy plans, and interest in contraception), and USPSTF-recommended screenings (last mammogram or Pap smear). This makes sexual health education campaigns, contraception campaigns, and breast and cervical cancer screening campaigns even more difficult.

There are 173 patients with no information in their charts. This indicates a patient population in our EHR who were scheduled for an appointment but did not attend. Out of the available patients who have visited our clinic, less than half have visited in the past year with even less visiting having three consecutive yearly appointments. This indicates that many CFC patients are lost to follow-up.

Due to the success of the previous initiatives with implementing a history of present illness (HPI) dot phrase, nearly all patient charts had a well-described HPI using the criteria outlined in the rubric, however only half of patient charts had adequate ROS and PE sections. While nearly all patient charts had an A&P, only 41% had an adequate rationale, highlighting a need to place additional emphasis on recording clinical reasoning for student volunteers. As the majority of our volunteers are preclinical medical students, lack of medical knowledge and clinical experience are likely major drivers of the chart quality. Additionally, the free clinic setting is an educational environment with a high patient volume. Both the students writing clinical notes and providers reviewing notes face time and resource limitations, further barriers to chart quality at our clinic.

This study follows previous retrospective chart reviews analyzing clinic performance with chronic care guidelines.[14,15] A high-quality patient chart is essential for a number of reasons. Nearly every patient at CFC is seen by a different provider at every visit, highlighting the necessity for high-quality documentation for continuity of care of our patients. Additionally, patients are frequently referred to the university hospital and outside organizations for specialty care. Maintaining a high-quality medical record is essential for outside providers to be able to effectively care for CFC patients.

Limitations

We recognize that clinical operations for every student-run free clinic are highly variable and that our proposed solutions in the next section may not be generalizable to other clinics. However, our aim in publishing our protocol for this audit is to provide other clinics with the protocol to conduct similar audits and assess the quality of their patient charts.

Future Directions

First, we must improve our ability to record medical information and patient history in Athena tabs and the written segments of the chart, particularly for telehealth appointments, starting by re-training student volunteers on how to use Athena. For example, volunteers are not using the ROS template despite its availability in Athena, leading to only 54% of patient charts having completed ROS. Furthermore, lack of volunteer understanding of why completing the dot phrases and encounter templates is important may lead to less motivation to complete them fully and effectively. CFC is building a weekly chart audit system with standardized feedback to students to provide regular evaluation and explanations of the importance of complete documentation. In addition to re-training student volunteers, adding additional checkpoints for chart quality before student volunteers leave the clinic may be helpful to implement. While providers do review clinical notes before signing orders and signing the encounter, this often occurs after the patient has left the clinic, creating an additional barrier in the event of missing information.

We will improve chronic care and follow-up appointments, as our aim is to operate as a primary care clinic instead of solely an acute medical center. As patient communities rely on us for care, we should increase our focus on longitudinal health and resources. We are trialing scheduling through Athena to improve long-term patient communication and appointments, while decreasing administrative burden. Additional committees will be made within our clinic to help manage follow-up appointments, testing, and screenings amongst our patient population. We plan to recruit additional undergraduate volunteers to improve data collection and analysis to guide future quality improvement initiatives. As our data improves with these and other solutions, we will gain greater insight into the needs and overall health of our patient population. Additionally, we are exploring collaborations with medical students experienced in software development and machine learning. A regulated and HIPAA-compliant program can aid medical student volunteers with patient interviewing and disease workup along with swiftly collecting and analyzing patient data.

Conclusion

The goal of our chart audit was to assess the quality of CFC's charts, care for chronic conditions, and screenings to aid in our efforts to provide high quality care to our patients. Substantial gaps in reporting patient social history, family history, and past medical history were noted, as well as gaps in reporting patient cancer screenings. We hope that the description of our chart process and chart review materials in this report will allow other student-run free clinics to assess the quality of their patient charts and therefore improve the quality of their clinical documentation. Through new volunteer training initiatives, new volunteer recruitment and the creation of chart quality and research

committees, we aim to improve the quality of CFC patient charts and continuity and quality of patient care.

Disclosures

The authors have no conflicts of interest to disclose.

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