Implementation of emergency department–initiated buprenorphine for opioid use disorder in a rural southern state

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Abstract

\textbf{Aim:} The National Institute on Drug Abuse (NIDA) Clinical Trials Network (CTN), an entity aimed at bridging researchers and community-based substance abuse treatment providers to develop new treatment approaches, has taken an interest in the dissemination of findings from a randomized clinical trial by D’Onofrio demonstrating that initiating buprenorphine in the emergency department (ED) enhances linkage to treatment [JAMA 2015; 313 (16): 1636–1644]. In the Southern Consortium Node of the CTN, the authors have taken an implementation science approach to expand on the D’Onofrio study by implementing an ED-based buprenorphine initiation program in three diverse South Carolina EDs utilizing a predominantly peer recovery coach model. The aim of this pilot program was to foundationally integrate universal screening,
brief interventions and referral to treatment (SBIRT) in hospital EDs to identify patients with at-risk substance use. Through brief interventions, patient navigators assessed readiness to change and motivation for treatment of patients. Patients willing to engage in treatment were referred to appropriate community resources. Patients identified to have opioid use disorder (OUD) and willing to engage in treatment were eligible for ED-initiated buprenorphine and peer recovery coaches assisted in arranging next day follow up with a community treatment program or other local provider for ongoing treatment.

**Method:** Hospital partner sites included a large academic medical center, a large private hospital, and a small community hospital. Prior to implementing this quality improvement initiative, the authors completed an ED workflow analysis at each site, developed internal planning committees including identification of a “hospital champion,” facilitated electronic health record modifications, educated more than 200 ED nurses and providers, and identified a network of local community “fast-track” providers able to accept patients for next-day appointments.

**Results:** Within 14 months, all three sites were fully operationalized and project staff in 3 ED sites screened 6523 patients for substance misuse with 33.0% screened positive for at-risk substance use. Positive screening results were as follows by substance: 907 alcohol, 100 cocaine, 40 methamphetamine, 7 amphetamines, 96 marijuana, 12 benzodiazepines, 3 Ecstasy/MDMA/Molly, 10 other/unknown substance, 274 heroin, 90 prescription opioids, 32 other/unknown opioid, 254 undetermined polysubstance use without opioids, and 331 polysubstance use with opioids. Of the 727 positive screened patients for non-medical opioid use, 70.0% were determined potentially eligible to receive buprenorphine initiation. Two-hundred thirty-one patients were initiated with one dose of 8 mg sublingual buprenorphine or 8-2 mg sublingual buprenorphine/ naloxone; 76.6% of those initiated arrived to next-day appointments for continued medications for opioid use disorder (MOUD); and 59.9% of those patients were retained in treatment at 30 days. Of referred patients, payor at time of ED visit were as follows: 71.1% uninsured, 21.4% state Medicaid, 1.6% Medicare, and 5.9% private health insurance.

**Conclusion:** With adequate resources and institutional support, implementation of evidence-based quality improvement initiatives focused on OUDs are feasible and enhance linkage to evidence-based treatment in a rural Southern state. Lessons learned from this implementation study can be used to guide future CTN studies focused on ED settings.

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**Keywords**

Emergency department–initiated; buprenorphine; MOUD and ED; ED buprenorphine; ED MOUD; ED MAT; Emergency department MAT; Emergency department MOUD; Emergency department SBIRT; SBIRT; ED SBIRT; SBIRT implementation; ED MAT implementation; ED MOUD implementation; SBIRT buprenorphine; MOUD; MAT
1. Introduction

At the frontline of the opioid crisis in the United States are emergency departments (EDs) that see hundreds of thousands of patients with opioid use disorder (OUD) per year (Centers for Disease Control and Prevention, 2010; Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality, 2013; Weiner et al., 2017). Until recently, the standard of care for treating patients with OUD in the ED has been a referral to outpatient addiction treatment. However, in 2015, a landmark study which has since influenced multiple ongoing National Institute on Drug Abuse Clinical Trials Network (CTN) studies demonstrated that starting buprenorphine, one of three medications FDA-approved for the treatment of OUD, was associated with significant improvements in OUD outcomes, including decreased opioid use and heightened treatment engagement rates (D’Onofrio et al., 2015). Specifically, 78% of patients in the buprenorphine group compared with 37% in the referral group were engaged in treatment at 30 days post-initiation \( p < .001 \) and the number of days of illicit opioid use per week was 5.4 days in the referral group vs 2.3 days in the buprenorphine group \( p < .001; \) D’Onofrio et al., 2015).

Despite evidence demonstrating benefits of ED-buprenorphine initiation for OUD, many barriers still exist in implementing such programs, including issues around funding, staffing, training, treatment philosophy, culture change, limited referral sites for continued care of patients, and federal regulations surrounding buprenorphine prescribing (D’Onofrio, McCormack, & Hawk, 2018; Jones, Campopiano, Baldwin, & McCance-Katz, 2015). Given that ED-based buprenorphine initiation programs are relatively new, very little research has focused on feasible and effective implementation of these programs. While not a CTN-funded study, this paper provides an overview of a pilot implementation program, leveraging strong statewide connections with providers created through the Southern Consortium Node of the CTN, to establish three ED programs in South Carolina, aimed at (1) identifying patients at risk for OUD utilizing universal screening, brief intervention and referral to treatment (SBIRT) performed by patient navigators; (2) initiating buprenorphine for appropriate patients with OUD; and (3) ensuring appropriate and timely follow-up care, facilitated by patient navigators. Specifically, the paper outlines (1) the implementation process, which followed Chamberlain’s Stages of Implementation completion (Chamberlain, Brown, & Saldana, 2011) with consultation services from the Mosaic Group, utilized in three ED programs in South Carolina to overcome barriers to operationalization and implementation of buprenorphine initiation for OUD in ED settings, (2) initial outcomes from the new programs, and (3) lessons learned and recommendations for next steps to support nationwide implementation of ED-initiated buprenorphine.

2. Methods

This pilot implementation program followed Chamberlain’s Stages of Implementation completion (Chamberlain et al., 2011), which included pre-implementation (e.g., engagement, consideration of feasibility, and readiness planning) and implementation (e.g., staff hired and trained, adherence monitoring processes in place, services begun, and ongoing services and feedback). Implementation consultation services were provided by Mosaic Group.
2.1. Pre-implementation

Pre-implementation activities included engagement, consideration of feasibility, and readiness planning.

2.1.1. Engagement—The primary engagement activity included site selection, in which the team evaluated results from a community needs assessment conducted as part of a related project (see Moreland et al., 2020 for details), as well as state-level data on OUD, overdose rates, and treatment availability. Given the 20-year relationship among CTN investigators, SUD community treatment programs (CTPs), and the drug and alcohol single state authority, 100% of CTPs in the state participated in the survey. These data helped to identify areas of highest need for ED-initiated buprenorphine. Final site selection was determined in conjunction with the drug and alcohol single state authority and approved by the state funding agency, South Carolina Department of Health and Human Services (A201813113A, A201913377A). Sites included the Medical University of South Carolina (MUSC), Tidelands Waccamaw Community Hospital, and Grand Strand Medical Center. None of these sites was previously involved in the 2015 landmark study (D’Onofrio et al., 2015).

The first ED-based buprenorphine initiation program in South Carolina started at MUSC in December 2017. MUSC is an academic medical center and has been the Regional Research and Training Center of the Southern Consortium Node of the CTN for almost 20 years. MUSC treats approximately 60,000 ED patients per year. A screening, brief intervention, and referral to treatment (SBIRT) program through federal grant funding was already in place when the ED buprenorphine program was implemented. Through the CTN, the authors have longstanding relationships with many outpatient referral sites, also called “fast-track” sites, who agreed to work with us to offer next-day care, including office-based treatment programs (MUSC’s Center for Drug and Alcohol Program [CDAP] clinic and MUSC’s Women’s Reproductive Behavioral Health Program) and an opioid treatment program (Charleston Center, a partially state-funded, county run opioid treatment program). All three referral sites were located within a half-mile of the MUSC ED. Tidelands Waccamaw Community Hospital began offering ED-based buprenorphine initiation in early March 2018. This is a non-academic community hospital site, seeing approximately 30,000 ED patients per year. “Fast-track” sites for Tidelands Waccamaw Community Hospital include office-based treatment programs: a partially state-funded, non-profit drug and alcohol treatment agency approximately thirty miles away from the hospital, one primary care office approximately eight miles from the hospital and one pain management office approximately twenty miles from the hospital that provided buprenorphine. Grand Strand Medical Center, a private teaching hospital, began offering ED-initiated buprenorphine in March 2018 as well, and utilized the same referral sites as Tidelands Waccamaw Community Hospital; the partially state-funded, non-profit drug and alcohol treatment agency approximately thirty miles away from this hospital, one primary care office approximately thirty miles from the hospital and one pain management office approximately one mile from the hospital. Grand Strand Medical Center sees approximately 80,000 ED patients per year.
2.1.2. **Consideration of feasibility**—This engagement activity was conducted in partnership and collaboration with leadership at each of the participating hospitals. Several initial planning meetings took place both via telephone and in person, to discuss pre-implementation planning and feasibility.

2.1.3. **Readiness planning**—Readiness planning included review of funding, plan for hiring and training staff and supervision, discussion of recruitment, and finalization of the implementation plan. First, funding for the implementation of these ED-initiated buprenorphine programs came from the Department of Health and Human Services in the state of South Carolina with a first-year budget of $1.5 million directed to MUSC in partnership with South Carolina’s single state agency, the Department of Alcohol and Other Drug Abuse Services. The private consulting firm, Mosaic Group based out of Baltimore, Maryland, was hired to assist in development, planning, and program roll-out for three sites. Next, an ED workflow analysis and assessment of the current electronic health record (EHR) substance use screening process was conducted and any needed EMR modifications were made prior to starting the program. Specifically, evidenced-based substance use screening questions (e.g. NIDA *QuickScreen*) were added into nursing triage at most sites, order sets were created for sublingual buprenorphine and naloxone kits, and a Clinical Opiate Withdrawal Scale (COWS) calculator or flowsheet was added into appropriate nursing and physician profiles in the EMR.

Given our experience in implementing research in community treatment settings through the CTN, the authors recognized that closely examining fast-track site needs was essential pre-implementation. To accomplish this, the team met with fast-track sites to determine the specific needs at each site to be able to provide next-day continuing care for ED patients who had been initiated on buprenorphine. Select fast-track sites received grant funding from the state to support the potential increase of uninsured ED patients seeking care in the ED through this program. The necessary information for the next-day continuation of treatment included: the ED provider note with documentation of diagnosis of OUD, time of single dose of buprenorphine administered, urine drug screen results, and demographic information.

2.2. **Implementation**

Following the model used in CTN studies, implementation activities included hiring and training staff, putting monitoring processes in place, beginning services, and ongoing services and feedback.

2.2.1. **Staff hiring and training**—The patient navigator staff came from a variety of backgrounds dependent on the site involved, but all were hired and supervised by the local public drug and alcohol treatment program with input from the implementation team. MUSC and Grand Strand Medical Center sites already had navigators hired prior to the buprenorphine program starting from the preexisting federal SBIRT grant program. At the third site, patient navigators were hired for the role. All but one project staff were in recovery from differing substance use disorders (SUD) with at least three years of sustained recovery and all were required to have at least a GED. Given the varied backgrounds of the
patient navigator staff, training and clinical supervision was essential to the programs’ success. Forty hours of live education was provided to staff with curriculum provided primarily by the Mosaic Group and supported by MUSC academic staff. Training modules included the role of the patient navigator, ethical responsibilities, professional boundaries, mentoring and educating using positive communication, SBIRT process, stages of change, brief interventional, motivational interviewing, SUDs, identifying community resources, medications for opioid use disorder (MOUD), and naloxone kit education and documentation. Ongoing supervision varied by site but generally included onsite observation and feedback of staff interactions with patients, and staff meetings and telephonic availability of supervision during program hours.

Training was provided to ED nurses at the program sites. Training included an overview of SBIRT, buprenorphine pharmacology and dosing, calculation of a COWS and its importance in buprenorphine initiation, and the process of naloxone kit dispensing and education. Physicians, advanced practice providers, social workers, and case managers were also provided live education on ED-based buprenorphine initiation protocol at all three sites. This training included evidence supporting the practice, buprenorphine pharmacology and dosing, the COWS, naloxone kit distribution and education, and follow-up. Regulations regarding buprenorphine administration and prescription were also reviewed. Training was provided in various formats conducive to the sites including at monthly staff meetings, grand rounds, and pre-shift huddles.

2.2.2. Monitoring—The next stage in implementation included putting a monitoring process in place. First, communicating patient information between hospitals and outpatient treatment centers was critical, especially between out-of-system providers. The team worked with the legal, compliance, and forms committees at all sites to ensure an appropriate release of information was available and signed by all participants. Release of information forms met the regulatory requirements of 42 Code of Federal Regulations Part 2, commonly referred to as “Part 2”. This federal confidentially law protects the privacy of patients with a SUD by prohibiting unauthorized disclosures of patient records other than in very limited circumstances. Second, outpatient treatment sites provided feedback on referred patients through monthly reporting regarding engagement in treatment at next-day and thirty-day visits. Outpatient treatment sites also provided information on whether patients were continued on buprenorphine or switched to other MOUD.

2.2.3. Beginning of services—At all three sites, specialized staff, called patient navigators, worked directly in the ED with patients and clinical staff to complete SBIRT: screening, brief intervention, and referral to treatment. Working hours of patient navigators varied from site to site and staffing levels. When patient navigator staff were unavailable, follow up to SBIRTs were at the discretion and availability of the ED site provider and nurse caring for the patient. Universal screening for SUDs (including alcohol, opioids, and illicit drugs) was added into nursing triage for all patients presenting to the ED when not already in existence. Preferred screening tools included the two NIDA quick screen questions related to prescription and non-prescription drug use and the AUDIT-C. Patient navigators were allowed electronic health record access to observe these responses, in addition to the chief
complaint for visit so that they could target and prioritize their interventions. Additionally, ED clinical staff was encouraged to alert the patient navigator staff if they felt a patient was appropriate for an intervention. In some sites, due to preexisting federal grant requirements, additional screening using an Alcohol Use Disorders Identification Test (AUDIT) and/or Drug Abuse Screening Test (DAST-10) by patient navigator or nursing staff was performed. If patients were identified as having at-risk or risky substance use defined by a positive answer to the NIDA quick screen drug screening questions, a score of eight or greater on the AUDIT-C/AUDIT, or a score of two or greater on the DAST-10, then a brief intervention, using techniques of motivational interviewing, was performed to assess readiness to change and encourage patients to reduce or quit use and engage in treatment for all substances. If appropriate, patients were also offered a referral to treatment.

For patients identified with OUD, patients were further screened to assess eligibility for buprenorphine initiation during their ED visit. If a patient was identified as an interested candidate for buprenorphine, the patient navigator discussed the patient’s potential candidacy with the ED provider and nurse. Exclusion criteria included admission to the hospital, residence outside of the tri-county area, and/or COWS <8. If appropriate, the nurse assessed a COWS and if >8, the ED provider assessed the patient to confirm diagnosis of OUD and the patient was given a single dose of 8 mg of sublingual buprenorphine or buprenorphine/naloxone. At some sites, based on local fast-track site preference, a urine drug screen was also ordered and completed. The navigator arranged for follow up within 24 h for further buprenorphine dosing. Additionally, any patient identified with OUD, exclusive of buprenorphine dosing, was offered an intranasal naloxone kit and education prior to discharge.

Hospital pharmacies were involved throughout the process to minimize any delays in getting buprenorphine when ordered from the ED and naloxone kits could be distributed directly to ED patients prior to discharge. When necessary, the Pharmacy and Therapeutics committee approved the protocol to allow the administration of one dose of buprenorphine while the patient was in the ED. This dosing strategy is permissible under the Title 21 Code of Federal Regulations, Part 1306.07(b), commonly referred to as the “three-day rule” or “72-h rule”, which allows a provider that is not registered in a narcotic treatment program and has not received a waiver through the Drug and Alcohol Treatment Act of 2000 (DATA 2000), to administer, but not prescribe, narcotic medications for the purpose of treating acute withdrawal symptoms for up to 72 h while arranging referral to treatment (Emergency Narcotic Addiction Treatment, n.d).

2.2.4. Ongoing services and feedback—The ED-initiated MOUD program is ongoing at the three participating sites. The team is constantly collecting feedback from the participating EDs and outpatient treatment programs on a monthly basis and adapting aspects of the program to improve service delivery and program effectiveness. Patient navigator staff may telephonically follow up with patients upon ED discharge as agreed upon by the patient and patient navigator.
3. Results

Initial outcomes from the ED-initiated MOUD programs have been promising, and closely mirror what was reported from D’Onofrio and colleagues (D’Onofrio et al., 2015). The data reported below include patients at MUSC December 2017-March 2019, and Tidelands Waccamaw Community Hospital and Grand Strand Medical Center from March 2018-March 2019.

3.1. Patient self-reported substance use

As seen in Table 1, patients reported using a range of substances, with alcohol being the highest prevalence and polysubstance use with opioids being second. Numbers for each site can be found in Table 1.

3.2. Buprenorphine-initiated patients and outcomes

Table 2 indicates that 241 of the patients eligible for buprenorphine received buprenorphine in the ED. Once receiving buprenorphine, 78% (187) of patients arrived at the follow-up fast-track appointment the next day and 59% (111) of those patients remained in treatment 30 days later. Table 2 also describes total naloxone kits distributed (209). There were no prescheduled or intended number of kits to be distributed. Numbers for each site can be found in Table 2. This information was collected on a monthly basis from outpatient treatment programs.

3.3. Payors for buprenorphine-initiation

As seen in Table 3, the majority of patients were uninsured (71.1%), followed by being covered by Medicaid (21.4%), private health insurance (5.9%), or Medicare (1.6%). Percentages for each site can be found in Table 3.

4. Discussion

This paper is one of the first to describe implementation of ED-initiated MOUD programs in multiple sites throughout a state, including a non-academic site. Throughout the implementation, the authors relied on longstanding relationships developed through 20 years of work with CTPs and state agencies and the CTN. Results add to the literature by outlining the pre-implementation and implementation processes, informed by their CTN implementation experience, as well as initial outcomes from the program. Specifically, the authors found that, in addition to alcohol, a significant portion of the patients reported polysubstance use with opioids. This indicates that the program is reaching the intended population, which includes patients with significant need for MOUD.

This study demonstrates very promising evidence for the feasibility and effectiveness of the ED-initiated MOUD program in South Carolina. The efficacy of MOUD has already been extensively demonstrated. MOUD has been shown to reduce opioid use, infectious disease transmission, criminal behavior, risk of overdose, and mortality (National Institute on Drug Abuse, 2016). Given the wealth of literature supporting MOUD, prior studies focusing on the efficacy of ED-initiated MOUD have focused on rate of follow up with referral sites and...
retention in treatment rates as markers of program success (D’Onofrio et al., 2015, 2017). In this study, approximately half of eligible patients were initiated on buprenorphine in the ED. Further, results showed the effectiveness of remaining in treatment once initiated, more than three quarters of patients attended their fast-track appointment and more than half of patients remained in treatment 30 days later. This showed the high impact of ED-initiated MOUD, given the high rates of continued engagement in treatment following initiation.

4.1. Lessons learned

4.1.1. Leadership involvement—The authors found that early buy-in from the top leaders in the hospital system (CEO and/or CMO) was a critical success factor during the implementation and post-implementation processes. Many hospital committees and various disciplines and departments need to be engaged to make these programs successful. Having the verbal commitment of senior hospital leadership as an initial first step in site implementation ensured expeditious integration and propelled positive culture change across the three sites.

4.1.2. Communication with community providers—Maintaining a close working relationship and open lines of communication between community fast-track providers and program staff from the outset, and continued on an as-needed basis, was essential. Without follow up, these programs could not exist. So that patients could continue in treatment after hospital discharge, outpatient treatment providers needed to receive necessary information, clearly communicated, about requirements for buprenorphine maintenance.

4.1.3. Early and frequent feedback to ED staff regarding program’s outcomes—In emergency medicine, it is common to observe a disproportionate percentage of general treatment failure in populations served. When patients are referred and engaged in outpatient substance use treatment, they are less likely to be seen again in the ED setting for an opioid-related issue. Providing ED staff with frequent feedback regarding the positive outcomes of the program, especially early on in the process, helped to dissolve cognitive biases and reinforced the importance and impact of treating addiction. Feedback to ED staff occurred primarily through email and presentations to the group. Information disseminated included number of patients initiated, the percentage who attended the fast-track follow up, and the percentage retained in treatment at 30 days. Additionally, at one of the sites, the number of ED visits and admissions post-initiation were reported, and de-identified thank you letters about the program from patients and families were provided. The idea of providing feedback to ED staff stemmed from concerns voiced by providers prior to program implementation and the information issued was focused to address those specific worries. This feedback was not assessed as part of the implementation process, but anecdotally was very successful in reassuring ED staff, debunking myths and stigma of addiction, and gathering further support for the program.

4.1.4. Electronic health record integration—For consistent and uniform screening of substance use in ED patients, the authors found it critical to embed validated screening tools in the triage assessment process. EHR integration also ensured regulatory compliance and allowed for program data capture and sustainability.
4.1.5. **Patient navigator supervision**—The authors found that two major factors in the successful implementation of our model was using patient navigators, preferably in recovery from SUD, and ensuring the provision of strong, consistent onsite supervision by experienced clinicians. The supervisor not only ensured fidelity of the navigator intervention, but also was able to reinforce selfcare for those in recovery from an SUD. The supervisor served as a liaison among the navigators, community treatment providers, and hospital staff, as needed.

4.2. **Conclusions**

ED-based buprenorphine initiation programs in South Carolina have shown considerable success. The authors reviewed the significant barriers to starting an ED-based buprenorphine initiation program, how sites addressed those barriers, and successful implementation strategies at our three sites. As the authors continue to start new programs across the state, they will continue to build on what they have learned. With adequate resources and institutional support, implementation of evidence-based quality improvement initiatives focused on SUDs are feasible and can improve patient care in a rural southern state. Lessons learned from this implementation study can be used to guide future National Drug Abuse Treatment Clinical Trials Network (CTN) implementation and/or research studies focused on ED settings.

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Table 1

Patient self-reported substance use.

| Substance                          | MUSC | Grand Strand | Waccamaw | Total (%) |
|-----------------------------------|------|--------------|----------|-----------|
| Alcohol                           | 200  | 394          | 366      | 960 (42.3) |
| Cocaine                           | 60   | 26           | 18       | 104 (4.6)  |
| Methamphetamine                   | 11   | 28           | 5        | 44 (1.9)   |
| Amphetamines                      | 1    | 3            | 4        | 8 (0.4)    |
| Marijuana                          | 56   | 13           | 28       | 97 (4.3)   |
| Benzodiazepines                   | 10   | 2            | 3        | 15 (0.7)   |
| Ecstasy/MDMA/Molly                | 0    | 3            | 2        | 5 (0.2)    |
| Heroin                            | 54   | 130          | 108      | 292 (12.9) |
| Prescription opioids              | 35   | 29           | 29       | 93 (4.1)   |
| Other/unknown opioid              | 26   | 5            | 2        | 33 (1.5)   |
| Polysubstance use without opioids | 79   | 108          | 80       | 267 (11.8) |
| Polysubstance use with opioids    | 89   | 134          | 121      | 344 (14.9) |
| Other/unknown substance           | 3    | 3            | 2        | 8 (0.4)    |
| Total (%)                         | 624 (27.5) | 878 (38.7) | 768 (33.8) | 2270       |
Table 2

Buprenorphine-initiated patients and outcomes.

|                                  | MUSC | Grand strand | Waccamaw | Total |
|----------------------------------|------|--------------|----------|-------|
| Number eligible for buprenorphine| 125  | 206          | 204      | 535   |
| Number who received buprenorphine in the ED | 61   | 95           | 85       | 241   |
| Number of patients who followed up at fast-track appointment | 49   | 75           | 63       | 187   |
| Number of patients retained in treatment at 30 days            | 34   | 48           | 29       | 111   |
| Number of naloxone kits distributed                              | 88   | 70           | 51       | 209   |
Table 3
Payors for buprenorphine initiation by site.

|                      | MUSC | Grand strand | Waccamaw | Total |
|----------------------|------|--------------|----------|-------|
| Uninsured            | 49.0%| 81.3%        | 76.2%    | 71.1% |
| Medicaid             | 32.7%| 16.0%        | 19.0%    | 21.4% |
| Private Health Insurance | 14.3%| 1.3%        | 4.8%     | 5.9%  |
| Medicare             | 4.1% | 1.3%        | 0.0%     | 1.6%  |