



Original Contribution

Improving specialty care follow-up after an ED visit using a unique referral system^{☆,☆☆,☆☆,★}

Frank C. Messina, MD^{a,*}, Michele A. McDaniel, MD^a, Adam C. Trammel, MD^b, Denise R. Ervin, MBA^a, Mary Ann Kozak, DrPH^a, Christopher S. Weaver, MD, MBA^a

^a Department of Emergency Medicine, Indiana University School of Medicine, Indianapolis, IN 46202

^b Saint Francis Hospital, Indianapolis, IN

ARTICLE INFO

Article history:

Received 1 April 2013

Received in revised form 25 July 2013

Accepted 3 August 2013

ABSTRACT

Objective: Many patients discharged from the emergency department (ED) require urgent follow-up with specialty providers. We hypothesized that a unique specialty referral mechanism that minimized barriers would increase follow-up compliance over reported and historical benchmarks.

Methods: Retrospective review of all patients requiring urgent (within 1 month) specialty referrals in 2010 from a safety net hospital ED to dermatology, otolaryngology, neurology, neurosurgery, ophthalmology, urology, plastic surgery, general surgery, or vascular surgery clinics. After specialist input, all patients received a specific follow-up appointment before ED discharge via a specific scheduling service. Necessity for payment at the follow-up visit was waived.

Results: Of the 1174 receiving referrals, 85.6% of patients scheduled an appointment and 80.1% kept that appointment. After logistic regression analysis, the factors that remained significantly associated ($P < .05$) with appointment-keeping compliance were the specialty clinic type (dermatology, 61.5%, to ophthalmology, 98.0%), insurance status (other payer, 87.5%; commercial, 82.8%; Medicaid, 77.9%; Medicare, 85.7%; charity care program, 88.1%; self-pay, 73.0%), age (<18 years, 80.1%; 18–34 years, 75.0%; 35–49 years, 79.2%; 50–64 years, 85.9%; >64 years, 93.9%), and mean length of time between ED visit and clinic appointment (kept, 10.5 days; not kept, 14.3 days).

The specialty clinic (neurology, 72.8%, to vascular surgery, 100%; $P < .001$) was significantly associated with the likelihood of patients to complete the appointment-making process. Race/Ethnicity was not associated with either scheduling or keeping an appointment.

Conclusion: A referral process that minimizes barriers can achieve an 80% follow-up compliance rate. Age, insurance, specialty type, and time to appointment are associated with noncompliance.

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1. Introduction

Specialty care referral is often unavailable to emergency department (ED) patients, especially in safety net hospitals, although patients could benefit from specialty care follow-up [1,2]. Although the Patient Protection and Affordable Care Act [3] and professional associations advocate a medical home for all patients [4,5], many safety net hospital patients do not have a primary care provider (PCP) to coordinate care and make referrals [6]. For this reason, patients requiring specialty care services are often overlooked and end up

without treatment options until their health advances to an acute stage, placing the patient at risk for ineffective and costly treatment. Referring a patient for follow-up with a PCP, even if one were available, does not provide specialized testing, equipment, or procedures only available via specialty services. Therefore, many ED patients require specialty care referral at the time of their ED visit.

Our study included a broad range of specialists available for ED follow-up care, whereas prior ED follow-up studies typically involve referral to a PCP or primary care clinic to address a specific health condition such as asthma or chest pain. Emergency department referral to follow-up care has generally poor compliance. Prior studies have incorporated some of the following factors that increased the likelihood of keeping an appointment: scheduling a specific appointment date and time before leaving the ED [7–18], removing financial barriers such as payment requirements [13,15,19–22], ED providers perceiving the follow-up as medically necessary [23], and involving follow-up care providers in the referral process [11,22]. Addressing just 1 or 2 of these factors alone during the ED visit has only resulted in a follow-up rate ranging from 14% to 65% [7–11,24–28].

[☆] This study was internally funded by the Department of Emergency Medicine, Indiana University School of Medicine, Indianapolis, IN.

^{☆☆} Poster Presentations: American College of Emergency Physicians Research Forum, Denver, CO, October 2012; Indiana Chapter of the American College of Emergency Physicians Annual Meeting, Indianapolis, IN, May 2012.

[★] At the time of the study, Adam C. Trammel was affiliated with Indiana University School of Medicine, Department of Emergency Medicine, Indianapolis, IN.

* Corresponding author. Tel.: +1 317 630 7276.

E-mail address: fmessina@iupui.edu (F.C. Messina).

Incorporating all of the above factors associated with ED follow-up to improve appointment compliance has not been successfully accomplished to date. We sought to address ED follow-up barriers simultaneously by developing a specific referral mechanism for patients requiring urgent specialty care follow-up (within 1 month of their ED index visit). Our intervention is unique because the following factors are addressed simultaneously: (1) patients schedule their own specialty care follow-up appointment date and time before leaving the ED; (2) the ED provider determines the need for an urgent follow-up and confirms follow-up urgency in conjunction with a specialist; (3) the specialty service provides point of care input; and (4) payment is not required at the time of the follow-up visit. We also devised the system so that the ED provider's time and effort are minimal.

The goal of the investigation was to introduce an intervention addressing factors shown to increase compliance with referrals from a safety net hospital ED to specialty services. We hypothesized that patients using our unique referral system would have a better appointment-keeping rate than the historical 62% rate of the general population at our hospital scheduled to those services and than the current literature benchmark rate of 65%.

2. Methods

2.1. Study design and setting

We conducted a retrospective review of urgent ED specialty care referrals. The study was conducted at Wishard Hospital, a level I trauma center with approximately 90 000 annual ED patient visits. Wishard is a safety net hospital located in downtown Indianapolis, IN, that hosts an emergency medicine residency program. Wishard Hospital uses a charity care program of care management to provide high-quality, seamless medical care to low-income and uninsured residents of Indianapolis. All Marion County (Indianapolis) residents who fall at or below 200% of the Federal poverty level and do not qualify for any other assistance program are eligible. The program allows for access to care with minimal or no patient financial responsibility. The Indiana University Institutional Review Board approved the study.

2.2. Selection of participants

We included all patients receiving an urgent ED specialty care referral, as accessed through the electronic medical record (EMR), to dermatology, otolaryngology, neurology, neurosurgery, ophthalmology, urology, plastic surgery, general surgery, or vascular surgery clinics at Wishard between January 1, 2010, and December 31, 2010.

2.3. Intervention

Beginning in November 2009, providers began using the new unique mechanism for any ED patient requiring urgent specialty care referral to these services. First, the ED provider evaluated and treated the emergent needs of the patient and made the clinical judgment that the patient needed urgent specialty care follow-up within a day to within 1 month. The provider then spoke briefly on the telephone with the specialty care on-call physician, available 24 hours every day, to ensure agreement with the referral and to obtain specific instructions such as a particular clinic session the patient should attend or the need for prespecialty clinic testing. Before ED discharge, the provider discussed the referral process with the patient and entered a specific request into the EMR, which indicated the requested time frame for follow-up and any special instructions requested by the specialty physician. An ED nurse then directed the patient to a telephone dedicated to the ED referral system. This system was only used for patients referred urgently from the ED and not from

other clinics, from any inpatients or from anyone outside the Wishard hospital system. When the patient picked up the telephone, it automatically connected him/her to a scheduler who was available 24 hours every day and who had access to the EMR referral and a slate of appointment slots dedicated to ED urgent referrals. The patient then chose and received a written record of the specific follow-up date and time. The follow-up mechanism waived the necessity for payment at the urgent ED follow-up visit.

2.4. Measurements

A trained abstractor who was unaware of the study hypothesis gathered patient data from the EMR and hospital administrative and financial databases for predetermined data fields including consult type, sex, age, race/ethnicity, type of insurance, and whether the appointment was kept. All information concerning individual patients remained anonymous and confidential. One patient had missing data and was excluded from the analysis. Total appointments scheduled and aggregate appointment-keeping rates for all patients scheduled to the various Wishard specialty clinics (from any other source including nonurgent ED referrals, inpatient wards, and patient self-referrals) were obtained for calendar year 2010 to use as an historical comparison.

Although urgent was initially defined as a specialty care follow-up appointment to occur within 30 days of the index ED visit, 7.3% of appointments were rescheduled by the patient and occurred beyond 30 days. Therefore, compliant patients were redefined as those completing a specialty care visit appointment within 90 days to ensure capture of all urgent specialty care follow-up appointments generated by the index ED visit. A noncompliant patient was one who did not keep his/her specialty care follow-up appointment.

2.5. Outcomes

The primary study outcomes were the proportion of referred patients scheduling an urgent specialty care follow-up appointment and the proportion of those patients keeping the follow-up appointment. Secondary outcomes included the effects of specialty appointment type, sex, race/ethnicity, insurance status, age, and time from ED visit to follow-up appointment on the likelihood of having an urgent appointment scheduled and on the compliance of the patient with keeping that appointment.

2.6. Analysis

We evaluated demographic and visit characteristics of patients scheduling appointments and keeping follow-up appointments. We compared those who were compliant and noncompliant using a χ^2 analysis, which we also used to compare appointment-keeping rates of those with and without an ED urgent specialty referral. We used the Wilcoxon rank sum test to compare the time to specialty care appointment among compliant and noncompliant patients. A logistic regression was fit to consider the association of demographic and visit characteristics with specialty care follow-up compliance, controlling for all other factors. All analyses were performed using SAS version 9.3 (SAS Institute, Cary, NC).

3. Results

Emergency department providers requested a total of 1174 urgent specialty care referrals during the study period. One patient had missing data and was excluded from the analysis. Table 1 presents the demographics of those receiving ED urgent specialty referrals and of all unique patients (so that repeat visitors are counted only once) seen in the Wishard ED in 2010.

Table 1
Demographics of patients referred for ED urgent specialty care follow-up and of total 2010 unique ED patients

	Study population (N = 1174)		ED population (unique patients; N = 53 244)	
	n	%	n	%
Sex				
Female	418	35.6	26 223	49.2
Male	756	64.4	27 021	50.8
Age (y)				
<18	43	3.7	3564	7.3
18-34	441	37.6	19 218	36.7
35-49	386	32.9	15 789	29.8
50-64	233	19.8	10 991	20.0
65+	71	6.0	3440	6.1
Unknown	-	-	242	0.5
Race/Ethnicity				
African American	465	39.6	21 162	43.5
Hispanic	142	12.1	2177	4.1
Other	27	2.3	1176	2.2
White	540	46.0	21 539	40.4
Unknown	-	-	5195	9.7
Insurance status				
Charity care program	329	28.0	15 544	29.2
Commercial	81	6.9	4488	8.5
Medicaid	124	10.6	8636	16.2
Medicare	99	8.4	5162	9.7
Self-pay	508	43.3	17 636	33.1
Other payer	33	2.8	1341	2.5

Table 2 presents specialty clinic referral type, sex, age, race/ethnicity, and insurance status of patients scheduling and keeping an ED urgent specialty care follow-up appointment. Of those patients receiving an ED urgent specialty care referral, 85.6% scheduled a

follow-up appointment. Of those who scheduled an appointment, 80.1% kept their specialty clinic appointment. We found that the specialty clinic referral type, sex, age, insurance status, and the mean length of time between ED visit and clinic appointment were all significantly associated with compliance ($P < .05$ for differences amongst the variables within the demographic characteristic).

Completing the appointment scheduling process was significantly associated with specialty (range of 72.8% [neurology] to 100% [vascular surgery], $P < .001$), as well as insurance status (range of 72.7% [other payer] to 91.9% [Medicare], $P = .013$).

The type of specialty clinic determined the likelihood of keeping the follow-up appointment (range of 61.5% [dermatology] to 98.0% [ophthalmology], $P < .001$). The patient's age was also associated with keeping an appointment (range of 75% [18-34 years] to 93.9% [≥ 65 years], $P < .001$). Other factors significantly associated with keeping an appointment were sex (female, 83.8%, and male, 77.9%; $P = .026$) and insurance type (charity care program, 88.1%; other payer, 87.5%; Medicare, 85.7%; commercial, 82.8%; Medicaid, 77.9%; self-pay, 73.0%; $P < .001$).

Table 3 compares the total numbers of appointments and the appointment-keeping rates of patients scheduled to the clinics through the ED urgent referral process and of all other patients scheduled to those clinics, from all sources including nonurgent ED referrals, in 2010. Only unique patients were included in the total 2010 statistics to avoid overcounting those with repeat visits. Patients with urgent ED referrals had significantly increased appointment-keeping rates for 5 of the 9 clinics and for all clinics combined.

Patients who got appointments sooner after the ED index visit were more likely to keep their appointment (Table 4). The mean time to the specialty care follow-up appointment for patients who kept their appointment was 10.5 days compared with 14.3 days for those who did not keep their appointment ($P < .001$).

Table 2
Number of ED urgent referrals, appointments, scheduled (%), and appointments kept (%)

	No. referred for specialty follow-up	No. of appointments scheduled	No. of appointments scheduled ÷ no. of referred	No. of appointments kept	No. of appointments kept ÷ no. of appointments scheduled
n (%)	1174	1005	85.6%	805	80.1%
Referral type			$P < .001$		$P < .001$
Dermatology	42	39	92.9%	24	61.5%
Otolaryngology	168	148	88.1%	118	79.7%
General surgery	99	87	87.9%	62	71.3%
Neurology	191	139	72.8%	111	79.9%
Neurosurgery	66	54	81.8%	43	79.6%
Ophthalmology	122	98	80.3%	96	98.0%
Plastic surgery	279	247	88.5%	187	75.7%
Urology	196	182	92.9%	156	85.2%
Vascular surgery	11	11	100.0%	8	72.7%
Sex			$P = .369$		$P = .026$
Female	418	363	86.8%	304	83.8%
Male	756	642	84.9%	501	77.9%
Age (y)			$P = .180$		$P = .001$
<18	43	36	83.0%	28	80.0%
18-34	441	368	83.4%	276	75.0%
35-49	386	337	87.3%	267	79.2%
50-64	233	199	85.4%	172	85.9%
65+	71	66	93.0%	62	93.9%
Race/Ethnicity			$P = .115$		$P = .910$
African American	465	402	86.4%	319	79.1%
Hispanic	142	129	90.8%	105	81.4%
Other	27	24	88.9%	20	83.3%
White	540	450	83.3%	361	80.2%
Insurance			$P = .013$		$P < .001$
Charity care program	329	293	89.1%	259	88.1%
Commercial	81	64	79.0%	53	82.8%
Medicaid	124	104	83.9%	81	77.9%
Medicare	99	91	91.9%	78	85.7%
Self-pay	508	429	84.5%	313	73.0%
Other payer	33	24	72.7%	21	87.5%

Table 3
Specialty care clinic attendance: with referral system and overall 2010

	Specialty care clinic with urgent ED referral			Overall 2010 specialty care clinic			P*
	No. of appointments scheduled	No. of appointments kept	No. of appointments kept ÷ no. of appointments scheduled (%)	No. of appointments scheduled	No. of appointments kept	No. of appointments kept ÷ no. of appointments scheduled (%)	
Dermatology	39	24	61.5	14 529	7991	55.0	.412
Otolaryngology	148	118	79.7	7857	4714	60.0	<.001
General Surgery	87	62	71.3	13 033	9834	75.5	.366
Neurology	139	111	79.9	5328	3037	57.0	<.001
Neurosurgery	54	43	79.6	1689	1436	85.0	.277
Ophthalmology	98	96	98.0	20 069	11 640	58.0	<.001
Plastic Surgery	247	187	75.7	3097	2013	65.0	.001
Urology	182	156	85.7	6093	3656	60.0	<.001
Vascular Surgery	11	8	72.7	1244	909	73.1	.980
Total	1005	805	80.1	72 939	45 230	62.0	<.001

* P value (χ^2) of comparison of appointment-keeping rates between those with urgent ED referral and overall.

When all factors were fit in a logistic regression model, all variables except sex and race/ethnicity remained significantly associated with keeping an appointment (Table 5).

4. Discussion

We implemented a unique specialty care referral mechanism in an urban, Midwest ED, which, as hypothesized, increased appointment-keeping compliance over reported and historical benchmarks. The mechanism, which we still use, was developed in concert with, and agreed to by, emergency medicine and specialty care physicians, promoting timely follow-up of patients after an ED visit. We used all of the following factors to make the process easier and more comprehensive for our patients: (1) real-time appointment making by patients so that they may choose a time most convenient to them and have a confirmed appointment before leaving the ED, (2) ED provider determination of urgency, (3) input from the specialist involved, (4) capture of the referral in the EMR, and (5) waiver of payment at the time of specialty clinic appointment.

We found that 85% of patients who were referred through the mechanism scheduled appointments. Those who were given a referral might not have scheduled an appointment for several reasons, which we did not track: the nurse did not direct the patient to the appointment scheduler available by telephone; the patient declined to complete the scheduling telephone call; or the patient departed before his/her ED discharge process, which included scheduling follow-up, was begun. It is unlikely that nurses failed to direct the patient through the process because they were already quite familiar with it: they had been using the specific ED urgent specialty referral process for more than 1 month before our first data collection date and they had also been using a very similar mechanism of urgent

referral to primary care clinics (necessitating direction to the same scheduler telephone) for more than 5 years.

We found that 80% of the patients who received an appointment were compliant with keeping that appointment, more than in any other similar US ED. Vinson and Patel [12], using a system that scheduled appointments for patients before they left the ED, reported a 67% to 79% compliance rate for primary and specialty care, but this occurred in 1 health maintenance organization in which 98% of the patients already had a PCP, unlike those in most safety net EDs. More similar to our follow-up mechanism was one instituted by Murray and LeBlanc [15]. When patients received written confirmation of a specific appointment before leaving the ED and did not have to pay for the follow-up clinic visit, 81% of patients kept appointments. The authors suggested that their unusually high compliance rate was

Table 5

Logistic regression results for association between demographic factors and keeping an appointment with specialty care clinics

	OR	95% CI	P
Specialty clinic			<.001
Dermatology	0.27	0.12-0.61	
Otolaryngology	0.75	0.41-1.38	
General surgery	0.43	0.22-0.83	
Neurology	0.81	0.43-1.52	
Neurosurgery	0.77	0.34-1.75	
Ophthalmology	8.58	1.95-37.65	
Plastic	0.67	0.39-1.15	
Vascular surgery	0.20	0.05-0.92	
Urology (reference)	1.00		
Sex			.106
Female	1.36	0.94-1.96	
Male (reference)	1.00		
Race			.554
Black	0.80	0.56-1.15	
Hispanic	1.08	0.63-1.84	
Other	1.21	0.36-4.04	
White (reference)	1.00		
Insurance			.001
Commercial	1.81	0.66-4.95	
Medicaid	1.46	0.59-3.66	
Self-pay	1.06	0.47-2.36	
Other payer	3.06	0.71-13.12	
Charity care program	2.74	1.18-6.35	
Medicare (reference)	1.00		
Age (y)			.006
<18 (reference)	1.00		
18-34	0.72	0.28-1.84	
35-49	0.85	0.33-2.21	
50-64	1.45	0.52-4.06	
65+	6.01	1.25-28.78	
Appointment time	0.98	0.97-0.99	.003

OR, odds ratio; CI, confidence interval.

Table 4
Association between keeping appointment and mean time from ED visit to appointment

Appointments scheduled (n = 1005)	Appointments kept, mean time in days (SD)	Appointments not kept, mean time in days (SD)	P
Overall	10.5 (11.7)	14.3 (15.4)	<.0001
Dermatology (n = 39)	8.1 (14.2)	20.1 (23.5)	.010
Otolaryngology (n = 148)	8.9 (10.6)	8.3 (6.7)	.396
General surgery (n = 87)	11.3 (11.7)	17.1 (19.8)	.414
Neurology (n = 139)	18.5 (12.6)	18.6 (13.4)	.910
Neurosurgery (n = 54)	16.0 (17.2)	24.8 (21.2)	.042
Ophthalmology (n = 98)	5.0 (8.1)	4.5 (0.7)	.400
Plastic surgery (n = 247)	7.7 (6.0)	9.1 (7.7)	.231
Urology (n = 182)	11.2 (13.3)	19.9 (19.4)	.004
Vascular surgery (n = 11)	9.2 (7.7)	5.0 (1.7)	.536

partly because this study took place in Canada, where no patients needed to pay for their follow-up visit, as opposed to the United States. We believe that with our varied, inner-city population and mix of payer sources, our study provides a situation more like that of other large, urban EDs throughout the United States and our referral mechanism could be reproduced in such US systems.

Although our mechanism may be considered too resource intensive or cost prohibitive by some, others have demonstrated that similarly resource-intensive programs, implemented before ED or hospital discharge, can decrease overall costs or costly downstream health care use [29–32]. Our own anecdotal experience and one of the reasons for implementing the program was that we found patients discharged from our ED with instructions to see a specialist but who could not access specialty care, because of no availability or an inability to provide payment, were returning to our ED anyway where they would receive the care, often after serious morbidity had already occurred and usually when it was less effective and more inconvenient for the patient, the specialist, and the ED.

The ED urgent referral system had the greatest impact on those specialties with the historically poorest appointment-keeping rates: otolaryngology, neurology, ophthalmology, plastic surgery, and urology. Neurosurgery and general surgery clinics had historically relatively high appointment-keeping rates to start, which were affected less. We feel that the dermatology appointment-keeping rate had a clinically significant increase, although the relatively small numbers for this clinic failed to reach statistical significance.

The preponderance of men in our study population is mostly accounted for by their relative prevalence in 3 clinics expected to see more men. Men had 102 more urology referrals, 123 more plastic surgery referrals, and 19 more general surgery referrals than did woman. Most urology patients are traditionally men. Men experience traumatic injuries at a rate far greater than women and, in our level 1 trauma center, general surgeons follow up patients with serious traumatic injuries and the plastic surgeons follow up most of those with burns and hand trauma.

The difference in compliance among the specialty clinics is likely multifactorial. Patients are less likely to keep follow-up appointments when they perceive their illness as self-limiting or less severe [14,16,22,25,33,34]. In our study, this is likely the case for patients referred to dermatology (having the lowest compliance rate of 61.5%) compared with those referred to ophthalmology (98.0%), urology (85.2%), neurology (79.9%), and neurosurgery (79.6%). Although each clinic dedicated an agreed-upon number of appointment slots for patients referred through the ED specialty care follow-up mechanism, availability varied within the 30-day window such that the lag time between the ED index visit and follow-up appointment varied. As Magnusson et al [11] also found, patients with longer lag times were significantly less likely to keep their appointments.

Both the age and the insurance status of the patient were significantly associated with keeping the follow-up appointment. As previous studies have found [11,16], compliance was better in those 50 to 64 years of age (85.9%) and in those 65 years and older (93.9%). Also similar to other studies [11,34,35], we found that self-pay and Medicaid patients were less likely to keep scheduled appointments (73.0% and 77.9%, respectively) compared with those having commercial insurance or Medicare (82.8% and 85.7%, respectively). Patients enrolled in our charity care program were most likely to keep their follow-up appointment (88.1%). Although patients did not need to have a copay to be seen at the follow-up visit, they still might have been concerned about downstream medical costs associated with the condition prompting the visit. Those in the charity care program and with Medicare or commercial insurance were the least likely to be personally responsible for their medical costs than those self-pay (uninsured) patients or those with less robust insurance coverage such as Medicaid.

Women and men were equally likely to schedule an appointment. Similar to Magnusson et al [11], we found, after logistic regression analysis, that women and men were also equally likely to keep appointments. Although some studies have identified differences in access, quality, and outcome based on patient race/ethnicity [10,36,37], our study did not reflect a significant difference. Patients were equally likely to schedule an appointment regardless of race/ethnicity (white, 83.3% - Hispanic, 90.8%). Keeping an appointment was also similar between racial/ethnic groups (African American, 79.1% - Hispanic, 81.4%).

5. Limitations

Our study has several limitations. First, it is retrospective. However, we do not think that there was systematic bias in data collection because the data abstractor was blinded to the study hypothesis and the EMRs were supplemented and cross-referenced to hospital administrative and financial databases for accuracy. Also, only 1 individual conducted the data abstraction. Although this alleviates concerns of interobserver variability, it is possible that the abstractor made errors in data collection. This study was only conducted at 1 site with specialty care referrals to specialty clinics within the same hospital system. However, our population and operations are similar to other safety net hospital systems, and we think that our results could be replicated in other large, urban safety net hospitals in the United States. These hospitals would need to create 24-hour appointment system access, dedicated appointment slots, 24-hour access to consultants, and/or the ability to waive payment at the follow-up appointment, if these resources did not already exist. Another limitation is that we did not track the reasons for patient noncompliance with follow-up, although this did not impact the study findings. Finally, it is possible that there was variability between the way individual ED providers communicated with patients regarding the purpose or process of scheduling and keeping the specialty care follow-up appointment, although it is unlikely that this created a systematic bias in the results.

6. Conclusions

In summary, we achieved an 80% compliance rate in keeping follow-up appointments in a safety net hospital population by implementing a unique system in which patients needing an urgent specialty care referral received real-time specialty care input, an appointment date and time before leaving the ED, and a cost waiver. This is well above the reported benchmark of 65% in other similar US EDs and the hospital's historical appointment-keeping rates for patients in these specialty clinics. Future research should address patient demographics and insurance status as well as the timeliness of follow-up appointment compliance. Specifically, it may be possible to improve compliance by targeting variables we found to be associated with poor compliance: certain specialty types, patients who are 18 to 49 years of age, patients with Medicaid insurance or who are self-pay, and patients with longer wait times between the ED visit and the follow-up appointment. Widespread generalizability awaits reproduction of our results using an analogous mechanism in other similar and dissimilar EDs and their specialty care clinics.

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