

Physician's changes in management of return visits to the Emergency Department

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Abstract

Return visits to the Emergency Department (ED) are estimated between 2-3.1%, which impacts ED care costs and wait times. Adverse events for unscheduled return visits (URVs) have been reported to be as high as 30%. The objective of this study was to characterize the attitudes and management of Emergency Medicine (EM) physicians regarding patients presenting with the same chief complaint to the ED for an URV. An online survey questionnaire was developed and sent to 160 accredited EM Graduate Medical Education programs in the United States. The questionnaire consisted of case vignettes wherein providers were asked to submit what orders they would place for each scenario. The mean numbers of tests and treatments were compared from initial visit to repeat visit with same chief complaint. Physicians also provided feedback regarding their management of URVs. There were estimated 6988 eligible participants with 397 responses (response rate 5.7%). There was a statistical significance ($P < 0.001$) in provider management of URVs with pediatric fever, but there was no statistical significance for management of the other chief complaints. There were 77% of physicians that felt an increased work up is warranted for URVs. The results of this study indicate that majority of EM residents and staff working in training programs feel that they should approach the management of URV patients with a more extensive workup despite no clinical change. These findings suggest that further analysis should be performed regarding provider management of URVs and the associated health-care costs.

Introduction

The purpose of this study was to evaluate whether Emergency Medicine (EM) physicians' attitudes and management change solely based on the fact that a patient is returning to the Emergency Department (ED) with the same chief complaint but no con-

cerning clinical change between visits. We question whether patients are undergoing unnecessary laboratory studies, radiological studies or being prescribed more medications solely based on the fact that are returning to the ED with the same chief complaint, otherwise known as a *bounceback* or an unscheduled return visit (URV).

Of the articles published, many referenced that the most common chief complaints for patients returning to the ED include illness/fever, abdominal pain, shortness of breath, headache and vaginal bleeding.^{1,2} While some research found that ED crowding and staff experience are not predictors of return visits,² other articles specifically stated that return visits are related to staff experience and may have been prevented with better management or patient education. Most EDs have incorporated a five-level triage system or acuity scale in order to estimate the patient's level of urgency to determine the time to be seen by a provider; however these systems do not take into consideration if a patient is an URV.³ Approximately 2-3.1% of ED visits are URVs and of those patients, there has been a moderate association of adverse events (30%), usually in patients >65 years old or patients with comorbidities.^{2,3} Adverse events were considered hospitalization on repeat visit or death within 8 days of initial visit.³

One study performed in Thailand in 2011 found that a total of 307 (0.92%) patients returned visit to the ED within 48 hours during a one year period had chief complaints dyspnea (75 cases or 24.4%), abdominal pain (53 cases or 17.3%) and bleeding per vagina (28 cases or 9.1%).⁴ Another study in Taiwan in 2010 reported 1899 patients returning to the ED within 72 hours of their initial visit during a one year period and of those patients, illness accounted for 80.9% with abdominal pain being the most common chief complaint.⁵ While one study defined URV as a repeat visit within 8 days, most defined URVs as being seen again within 72 h.

Our goal was to determine if EM physicians changed their management on repeat visit for bouncebacks with same chief complaint and no change in clinical. A secondary goal was to determine what reasons physicians felt that they did not need to change management or why they should change their management for URVs.

We hypothesized that there would be a statistically significant change in the EM physician management and attitudes of those patients in the ED on initial encounter *vs* the repeat encounter for the same chief complaint despite no clinical change in the patient.

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Key words: Emergency medicine; Unscheduled return visit; Bounceback; Physician's attitudes; Provider management.

Contributions: AL, conception and design of study, data analysis and interpretation, drafting of manuscript and revisions of manuscript; RC, conception and design of study, data collection and analysis, final approval of manuscript; MR, data analysis, revising of the manuscript for intellectual content, final approval of manuscript

Conflicts of interest: the authors declare no potential conflict of interest.

Funding: no funding was provided and this study has not been presented at any conferences.

Received for publication: 20 October 2015.

Revision received: 18 April 2016.

Accepted for publication: 19 April 2016.

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Emergency Care Journal 2016; 12:5594

doi:10.4081/ecj.2016.5594

Materials and Methods

This was a survey designed to estimate the number of diagnostic tests requested and treatment given on initial and return visits for patients presenting to the ED with chief complaints of headache, pediatric abdominal pain, back pain, and pediatric fever within EM teaching hospitals (Appendix 1). The variables are diagnostic tests and treatments as measured by survey results. Results are reported as the estimate of a binomial probability and a margin of error. The margin of error was calculated from the Wald equation. The worst case is a probability of 0.50 (50%). With 384 subjects, the margin of error is 5%. Survey items that differed by more than the margin of error between initial and return scenarios within the same chief complaint were considered statistically significant.

In order to create the survey, we completed a review of the American College of Emergency Physicians (ACEP) Clinical Guidelines for appendicitis, pediatrics with fever, and headache.^{2,3} Survey questions were created based on the chief complaints found to be most common for return visits to the ED

found in the literature search. The patients presented in the clinical scenarios were all non-toxic, appearing with no concerning signs on history or exam that would warrant a significant workup, as per the current guidelines. The physicians participating in this anonymous voluntary online survey were presented with a total of 8 clinical scenarios. They were also presented with questions at the end of the survey regarding their demographics and their opinions regarding the management of URVs.

For the headache scenario, the patients were aged 30-35 with benign history, vitals and physical examination and no red flags for emergent conditions. The back pain patients were in mid-40s with no red flags on history or physical exam to suggest emergent conditions. The abdominal pain scenario included a male pediatric patient with diffuse abdominal pain and 2 episodes of non-bloody, non-bilious vomiting, normal bowel movements, normal vitals and benign exam with the second scenario being a pediatric male patient returning to the ED with abdominal pain after being seen 2 days prior with the same clinical history as the prior patient including non-bloody, non-bilious vomiting and normal bowel movements. The initial pediatric fever patient scenarios was an infant male with no past medical history and immunizations up to date with one day of fever and physical exam with a non-toxic appearing child and no focal exam findings. The clinical scenario for the repeat pediatric fever patient was an infant male with no past medical history and immunizations up to date with three days of fever and a non-toxic appearing child with no focal findings on examination. Repeat visits for the above clinical scenarios with chief complaint of headache, back pain, pediatric abdominal pain and pediatric fever had no change in his-

tory, vitals, or exam and returned to the ED within 72 hours.

The survey was generated using SurveyMonkey™, which allowed for randomization of the above 8 clinical questions. After completion of those 8 questions, physicians were asked to respond why they felt they should or should not change their clinical management for URVs and were asked to provide demographic data about themselves including level of practice, age and sex. The questions were reviewed by six EM staff physicians and residents and were approved by the IRB prior to sending out the survey. Using FREIDA Online Database via the American Medical Association (AMA), a search for EM programs accredited in the United States within Graduate Medical Education (GME) provided a total of 160 programs. EM GME Program Directors and their assistants were contacted via email with a link to access the anonymous online survey generated from SurveyMonkey™. The program directors and their assistants were asked to forward the survey to EM staff and residents within their program and were given one month to respond. Data was collected in 2012, when the total number of EM residents in US GME programs was 5388. It is unknown how many staff are working within each program and were given the opportunity to participate in the study, however the authors assumed that there were 10 staff per program provided with the online survey, meaning the total possible number of participants was 6988. The total number of providers who received the emailed survey may be considerably less if the program directors and their assistants did not forward the email within their respective programs.

The total number of tests and treatments that would be ordered by EM providers [at

postgraduate year 1, 2, 3/4 (PGY1, PGY2, PGY3/4) and staff level] on initial visit and repeat visit with the same chief complaint were analyzed via two factor ANOVA with repeated measures of one factor. Post hoc analysis was performed to make pairwise comparisons based on the estimated marginal means to determine if there were clinically significant number of treatments that would be ordered based on practice level.

Subsequent subgroup analysis was performed to determine if physicians changed their clinical management from initial to repeat visit by indicating that they would be ordering more or less tests and treatments despite answering *no* (need to change their clinical practice). A two-factor ANOVA on the number of tests and treatments by visit and response was performed for this analysis.

Results

The total number of respondents with complete surveys was 397 (84 PGY1, 74 PGY2, 88 PGY3 and/or PGY4, and 151 staff physicians). With the assumption of 6988 total possible participants, the response rate is calculated at 5.7%; however, it is not possible to truly calculate the number of participants that received the survey.

There was no statistical significance in the total mean number of tests and treatments that would be ordered for headache patients on initial and repeat visits ($P > 0.05$). There was a significant difference in the mean number of tests and treatments that would be ordered within level of training (Table 1).

There was no significant difference between the mean number of tests and treat-

Table 1. Pairwise comparison of the number of tests and treatments ordered by level of practice for headache management based on estimated marginal means of initial and repeat visits.

Level of training		Mean difference (I-J)	SE	Significance ^o	95% CI	
					Lower bound	Upper bound
PGY1	PGY2	.251	.210	1.000	-.307	.809
	PGY3/4	.241	.201	1.000	-.293	.774
	Staff	.755*	.180	.000	.279	1.231
PGY2	PGY1	-.251	.210	1.000	-.809	.307
	PGY3/4	-.011	.208	1.000	-.562	.541
	Staff	.504*	.187	.044	.008	1.001
PGY3/4	PGY1	-.241	.201	1.000	-.774	.293
	PGY2	.011	.208	1.000	-.541	.562
	Staff	.515*	.177	.023	.046	.984
Staff	PGY1	-.755*	.180	.000	-1.231	-.279
	PGY2	-.504*	.187	.044	-1.001	-.008
	PGY3/4	-.515*	.177	.023	-.984	-.046

SE, standard error; CI, confidence interval; PGY1, postgraduate year 1; PGY2, postgraduate year 2; PGY3/4, postgraduate year 3/4. ^oAdjustment for multiple comparisons: Bonferroni; *the mean difference is significant at the .05 level.

ments that would be ordered on initial and repeat visit for musculoskeletal back pain or pediatric abdominal pain ($P>0.05$). Post hoc analysis also revealed there was no statistically significant difference amongst treatments that would be ordered for musculoskeletal back pain or pediatric abdominal pain amongst the different levels of training.

There was a statistically significant difference in the mean number of treatments and tests that would be ordered on initial and repeat visits for pediatric fever ($P<0.001$). There was also a statistically significant difference between practice groups ($P<0.001$), illustrated in Table 2 with pairwise comparisons on post hoc analysis.

There were 307 physicians (77%) who responded that they should change their management for patients on repeat visit for the same chief complaint. There were a total of 90 physicians that felt there was no need to change their clinical practice for *bounceback* patients on repeat visits with no clinical change in the patient's status between visits. Of those 90 physicians, there were 9 female staff physicians, 36 male staff physicians, 5 female PGY3/4s, 15 male PGY3/4s, 7 female PGY2s, 3 male PGY2s, 5 female interns and 10 male interns. Of the 307 physicians who responded that treatment should change, 34% were staff physicians, 23% were PGY3/4s, 21% were PGY2s and 22% were PGY1s.

A subgroup analysis was performed to determine if those physicians who responded *yes they would change their management for URVs* actually did indicate that they would order more tests or treatments on repeat visit. This analysis was also completed to determine if those physicians who responded *no they would not change their management for URVs* actually chose to order the same or less tests and treatments on repeat visit.

For the management of headache, pediatric abdominal pain and pediatric fever, the mean number of tests and treatments increased on repeat visit ($P\leq 0.001$) for the group of physicians who stated that *yes they should change management for repeat visits* and for the group of physicians who stated that *no they should not change management for repeat visits*. For the management of back pain, there was a significant difference for both groups of physicians with regards to the mean number of tests and/or treatments that would be ordered on the second visit ($P\leq 0.001$), where both groups ordered *fewer* tests on the second visit. While there was statistical significance for both groups in management of all the chief complaints present, the mean difference of tests and/or treatments between visits was less than 1 on all chief complaints.

Discussion

In a study of 931 URV patients in the US in 2008, 41% of those patients had no change in their diagnosis on their second visit, but 25% were judged to have missed diagnoses on initial visit, with most of those being related to abdominal pathologies.³ Considering that 2-3% of the patients seen in the ED are URVs, it is important to have an understanding of the physicians' attitudes towards these patients and whether or not management should be escalated as a result of the patient being a bounceback.

In this survey, a total of 77% of EM physicians or residents in training feel that it is necessary to change treatment of patients on return visits. The vast majority of these physicians commented that repeat visits are oppor-

tunities to re-evaluate something that may have been overlooked by the previous provider and many argue that bouncebacks are higher risk patients and the fact that they are returning to the ED is a red flag. One staff physician remarked: *A wise mentor once told me: Welcome patients who return as they are possibly giving you a second chance to catch something you missed the first time.* Residents (PGY1-PGY4) had a 66% consensus that patients returning to the ED for a second visit require more attention, treatment and workup than on their previous visit. Staff physicians were more likely not to change their management on a repeat visit.

Several of the physicians who stated that there is no need to change treatment or increase the work up for these patients on repeat visit argue that bouncebacks are often the result of the initial medical team failing to meet the patient's or family's needs, wherein there may have been a lack of communication or improper patient education. Patient education and reassurance may be the only things that the patient and their family require, especially if there has been no change in the clinical situation.

While qualifying physician attitudes with regards to bounceback patients is important, this survey also attempted to quantify the number and types of additional tests and/or medications that Emergency Medicine physicians would order on repeat visits with the same chief complaint. The survey addressed 4 chief complaints common to the ED: headache, back pain, pediatric abdominal pain and pediatric fever. ACEP clinical policies (CP) exist for the management of headache, suspected appendicitis and pediatric fever.⁶⁻⁸

The ACEP CP for management of the acute headache has a Level B recommendation to obtain neuroimaging if a patient has a

Table 2. Pairwise comparison of the number of tests and treatments ordered by level of practice for pediatric fever management based on estimated marginal means of initial and repeat visits

Level of training		Mean difference (I-J)	SE	Significance ^o	95% CI	
					Lower bound	Upper bound
PGY1	PGY2	.131	.236	1.000	-.495	.757
	PGY3/4	.649*	.226	.026	.050	1.248
	Staff	.876*	.202	.000	.341	1.410
PGY2	PGY1	-.131	.236	1.000	-.757	.495
	PGY3/4	.518	.234	.163	-.101	1.137
	Staff	.745*	.210	.003	.187	1.302
PGY3/4	PGY1	-.649*	.226	.026	-1.248	-.050
	PGY2	-.518	.234	.163	-1.137	.101
	Staff	.227	.199	1.000	-.300	.753
Staff	PGY1	-.876*	.202	.000	-1.410	-.341
	PGY2	-.745*	.210	.003	-1.302	-.187
	PGY3/4	-.227	.199	1.000	-.753	.300

SE, standard error; CI, confidence interval; PGY1, postgraduate year 1; PGY2, postgraduate year 2; PGY3/4, postgraduate year 3/4. ^oAdjustment for multiple comparisons: Bonferroni; *the mean difference is significant at the .05 level.

headache with neurological findings, a new-onset severe headache, or patients that are human immunodeficiency virus (HIV) positive. Level C recommendations are to obtain imaging on patients over the age of 50 with a new type of headache.⁶ There are Level C recommendations stating that patients with evidence of increased intracranial pressure should undergo neuroimaging followed by the possible need to perform a lumbar puncture, and lumbar puncture can be performed for an acute headache in the absence of clinical signs of increased intracranial pressure. The patients presented in the headache clinical scenarios in the survey did not meet any of the criteria to suspect meningitis or subarachnoid hemorrhage and did not have abnormal neurological exams or HIV; therefore, they would not warrant neuroimaging nor lumbar puncture per the CP. The results of the survey indicated that there was no statistical significance between the mean number of tests or treatments that physicians would order on initial *vs* second visit; however, there was a significant difference in the number of treatments or tests that physicians would order within level of practice, with staff physicians indicating that fewer orders would be needed for the patients with low risk headaches.

Lower back pain is the fifth most common reason for visits to physicians in the US, and while there is no ACEP CP, the American College of Physicians clinical guidelines regarding treatment and diagnosis of lower back pain have a strong recommendation that clinicians should not routinely obtain imaging or other diagnostic tests in patients with non-specific back pain. Risk factors for serious disease with regards to back pain include age >60, fever, constitutional symptoms, trauma, history of cancer, chronic steroid use, IV drug use, recent instrumentation or bacteremia or night pain.⁹ The patients presenting in the clinical scenarios both had non-specific back pain for initial and repeat visit with no clinical change from first to second visit. Neither patient had disabling pain or red flags requiring further imaging or laboratory tests. Arguably, on a repeat visit, a patient may warrant different or strong pharmacological agents to assist with their symptoms. Interestingly, the results of the survey indicated that the group of physicians who stated that they would not change their clinical practice based on URV and the group of physicians who stated that they would change their clinical management for URVs both showed that they would order less tests or treatments for the patients returning to the ED with nonspecific back pain. There was no statistical difference in the mean number of orders physicians would place from initial to repeat visit nor was there a statistical difference in the number of

treatments or tests that would be ordered amongst physicians at different levels of practice.

The ACEP CP for management of patients with suspected appendicitis states that there are level B recommendations to use clinical signs and symptoms to risk-stratify patients to guide further testing and management.⁷ The pediatric patients with abdominal pain and vomiting on initial and repeat visit had Alvarado scores for acute appendicitis of 1, meaning that appendicitis is unlikely; therefore, imaging should not be pursued and arguably laboratory tests would be unnecessary for either of these patients. The results of the survey indicated that there was no statistical significance in the number of tests or treatments that would be ordered by providers on initial *vs* repeat visit and management did not differ independent of practice level.

The ACEP CP for children younger than three years old presenting with fever to the ED recognizes that fever is among the most common chief complaints in this age group and the challenge of EM physicians is to differentiate life-threatening causes of fever from normal physiological response to common illnesses. There is a Level A recommendation to presume that an infant between 1-28 days with fever has a serious bacterial infection and should be managed as such. There is also a Level A recommendation that response to antipyretics does not change the likelihood of a child having a serious bacterial infection. There is a Level B recommendation to obtain a chest radiograph in children less than 3 months with evidence of an upper respiratory infection. Level C recommendations are to consider obtaining a chest radiograph in patients older than 3 months with temperatures $\geq 39^{\circ}\text{C}/102.2^{\circ}\text{F}$ and a white blood cell count $>20,000/\text{mm}^3$. There is Level A recommendations to consider urinary tract infection in patients under 1 year old without a source of fever and Level B recommendations that females aged 1-2 years old should be suspected to possibly have a urinary tract infection if no other source is identified.⁸ The patients presented in the clinical scenarios for pediatric fever were infants, non-toxic appearing and no focal findings on exam. Therefore, both patients would not warrant significant workups or treatments and could be discharged with return precautions and antipyretics alone. The results of the survey for the pediatric fever scenarios showed that there was a statistically significant difference in the mean number of treatments and tests that would be ordered on initial *vs* repeat visits and there was also a statistically significant difference between practice groups. This may indicate that physicians are more likely to increase a workup or treatment regimen on febrile pediatric patients with URVs, despite

the current ACEP guidelines indicating that no further evaluation or treatment is required given the clinical scenarios presented.

The subgroup analysis of physicians who indicated that *yes they would or should change their clinical management of URVs vs* those physicians who stated that *no they would not change their clinical management of URVs* did indicate a statistical significance in the mean number of tests that physicians would order. However, the statistical significance for each chief complaint within the subgroups showed only a mean difference of less than one treatment or test that would be ordered, so this is unlikely to be clinically significant.

There are several limitations to this study. First, ED provider samples assembled for this study may be biased in that those who were willing to complete the survey may have different attitudes regarding management of URV patients than those who declined. Given that this was an anonymous survey emailed to a total of 160 EM GME programs within the US, it is difficult to determine the total number of participants given that the distribution of the survey required the program directors and/or assistants to forward the survey to the providers within their programs. Last, this study quantified the total number of tests and/or treatments by the total number of theoretical orders the physician completing the survey would have requested given the clinical scenario. A more appropriate analysis may have been performed using the total cost of the specific orders and compare cost of treatments amongst the different levels of practice and comparing the initial visit to the repeat visit costs of treatments.

Conclusions

The results of this study indicate that majority of EM residents and staff working in United States GME programs feel that they should approach the management of URV patients with a more extensive workup solely based on the fact that they are returning for a second visit even if there has been no change in the patient's clinical course except for time. Physicians could work to focus more on what goals the patient or patient's family are needing that require them to return to the ED for a second visit rather than placing unnecessary orders. If physicians treated URV patients the same as their initial visit rather than increasing the number of treatments or tests ordered on URVs, the cost of healthcare and patient's waiting time could decrease significantly. This suggests the need for further data collection regarding provider management of bouncebacks.

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