

# Changes in the rate and types of patients seen in the Emergency Department 2011 -2016 by Nurse Practitioners

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## Abstract

### Objective

The purpose of this study is to examine if there was an increase in the rate of use of nurse practitioners (NP) in the ED from 2011-2016 after the Affordable Care Act (ACA) was implemented.

### Methods

Data from the National Hospital Ambulatory Medical Care Survey was used.

### Results

There has been an increase in the rate of patients seen by nurse practitioners in the ED from 3.6% to 10%. The increases were seen in mental health diagnosis, headaches and migraines.

### Conclusions

The study illustrates that NP use is expanding and increasing in the ED. The type and number of patients they treat has expanded and changed. This indicates a need for more extensive training in those areas such as mental health as NP treat more patients with these complaints.

## Introduction

It was thought that the implementation of the Affordable Care Act (ACA) would mean patients with insurance and access to primary care providers would use the Emergency Department (ED) less. Instead, there has been a steady increase in patients seeking care in the ED [1-5]. Despite a 1% increase in medical school enrollment, there is still predicted to be a shortage of physician in the coming years [4-5]. However, the number of nurse practitioners and physician assistants being trained in the United States is increasing at a rate of 5 to 6% a year [6-10]. Thus, in order to meet the increased need in the ED, there has been a push for the expanded use of mid-level health providers such as nurse practitioners (NP) [4-5]. The expanded use of these mid levels could help address the dual issues of increased patient volume and decreased physicians.

These mid-levels can address the healthcare needs of the estimated 60 to 80 % of patients who present to the ED with non-urgent or minor medical problems [8-12]. The use of NP in the ED has shown to have an increase in quality, cost savings,

reduced wait times and improved patient satisfaction [13-24]. Additionally, now that NP has prescribing rights in all 50 states they can work independently in numerous ED settings.

However, several studies prior to the implementation of the ACA, showed a limited number of NP working in the ED setting. In looking at studies, using the National Hospital Ambulatory Medical Care Survey (NHAMCS) prior to the ACA in 2010, out of 17,151 visits only 462 (2.7%) showed the nurse practitioner as the sole provider of care [17]. The majority of those visits (78%) occurred in urban centers within nonprofit hospital ED. Most of those patients treated by nurse practitioners were triage level 4 or 5 (65%) [17]. They found that the most common illnesses treated by NP visits with care provided by NPs were orthopedic injury-related. The most common mechanism of injury was falls. They did see a range of illnesses including otitis media, ENT, UTI, and pain related [17].

Other studies found that when NP were used in the ED, they ordered a range of laboratory and imaging tests such as CBC blood panels, urinalysis and x-rays and CT scans [18]. These tests ordered and medication prescribed were consistent with the type of illness seen within the acuity level [16-18]. These findings were similar to what other research had found [15-19]. As was seen prior to the implementation of the ACA, NPs provided the majority of care within not-for-profit hospitals operating in metropolitan and urban settings. NPs typically provided care for lessor acuity visits such as acute common illnesses and injuries within the scope of practice of training for the modern advanced practice nurse [14, 19]. Training for NP is often focused on primary care with the majority of NP having a certification in family primary care. The most common practice setting for these NPs is private group practice [1, 2, 8, 14].

If, however, there has been a change and a difference in what NP treat in an ED setting that might indicate the need for more and or different training [6, 19, 22].

## Methods

This study used data for the years of 2011 to 2016, from the National Hospital Ambulatory Medical Care Survey (NHAMCS) [25]. This time period was used, as it was when the ACA was fully implemented across the U.S., with the expansion of Medicaid in 2013. Data beyond 2016 was not used as 2016 is the most current data available.

The NHAMCS is data based on a national sample of visits to EDs of general and short-stay hospitals. The survey is designed to evaluate the use of ambulatory care services in hospital emergency departments [25]. The data are based on a national probability sample (i.e. all 50 states and the District of Columbia) of visits to emergency departments in non-institutional general and short-stay hospitals, exclusive of Federal, military, or Veterans Administration facilities [25]. The NHAMCS survey uses a four-stage probability sampling design; consisting of (a) geographically defined areas, (b) the hospitals within these areas, (c) the inclusion of all EDs within selected hospitals, and (d) finally the patient visits. Patient records were randomly sampled from patient visits during a randomly assigned 4-week reporting period. Data elements included in the survey were demographics, payment source, patients' complaints, diagnoses, diagnostic/screening services, vital signs, procedures, pharmacological therapy, disposition, types of providers seen, causes of injury, and hospital characteristics such as geographic region [25].

Data was only used where the patient records indicated the NP was the sole provider.

Data from the 2011-2016 NHAMCS survey were analyzed using the IBM Statistical Package for the Social Sciences (SPSS), version 25. Frequencies and percent change were used to determine if any changes in numbers of patients, types of illness, level of ED urgency, and types of medication prescribed.

## Results

There was an increase in the overall rate of ED visits per 100,000. It reached a 10-year high in 2015 overall and specifically for patients aged 45-64. There has been an increase in the number of patients seen by nurse practitioners in the ED since 2011-2016. From 2011 at a rate per 100,000, NPs saw just 3.6%. By 2016, there was an increase in the rate to 10% seen by NPs. The triage level of presenting illness seen by NP did not change. The majority of triage levels seen by NP were still within the urgent to emergent categories. However, there was a change in percentages of rates of patients seen within certain categories. One of the largest increases was seen in the area of mental health diagnosis. In 2011 NP saw those with the diagnosis of anxiety at 9% and depression at 6%. See table 1.

In 2016 those with anxiety increased to 11% and depression to 8%. The other diagnosis that saw an increase for NP was in headaches at 6% and migraines at 7% in 2011 to headaches at 12% and migraines at 10% in 2016. There was less than one percent increase in the number and types of laboratory tests and radiology they ordered. There was an increase of medication

given in the ED from 5% in 2011 to 10% in 2016. There was also a 3% increase in the drugs prescribed for use if patients were discharged. However, there was little to no difference in the types of medicines they prescribed with NSAIDs, antibiotics and pain/analgesics being the top drugs given.

**Table 1:** Top increases in type of presenting illness treated by Nurse Practitioners in the ED 2011-2016.

Presenting Illness	2011	2016	% Change
Anxiety	9%	12%	3%
Depression	6%	8%	2%
Headaches	6%	12%	6%
Migraines	7%	10%	3%

## Discussion

This study found an increase in the rate of patients being seen by NP in the ED after the ACA was implemented. The number of patients seen in the ED has increased overall and the use of mid levels overall has increased [25]. This indicates there is an ongoing need for an expansion of NP who is trained to work in the ED setting.

The study overall found there was little to no change in the urgency level of patients seen, by NP. The NP saw mostly non-urgent or emergent patients. Thus NP, despite seeing an increase in the total rate of patients seen within the past five years still mainly treat the 60 to 80 percent of ED patients with non-urgent or non-life threatening medical and mental problems. This confirms what other studies have found when they have examined the NP role and diagnosis seen in the ED [1-3, 17-23]. The NP is still most likely to work in an urban nonprofit hospital ED. These studies results do indicate there was a change in the rate of patient NP seems with specific illnesses. This increase was seen in the area of specific mental illness of anxiety and depression, as well as headaches and migraines. These diagnoses were the areas that saw 2 to 5% increase within five years. The continued increase, specifically within patients presenting with mental illness, might indicate a more extensive training will be needed for NP within the ED as Keough et al. indicated in their study [22].

## Limitations

This study used secondary data within the specific dates available. It might not have been able to fully capture the ongoing dynamics of how ACA is impacting MH and patients in general coming to the ED.

The data was collected per region versus per states, so it is more difficult to see if some states such as those without ACA expansion are having an overall impact on numbers seen by nurse practitioners. Additionally, each state may have differing regulations with regards to what type of patient's nurse practitioners can see and how they are reimbursed. This could

have impacted overall numbers and types of patients seen within specific states which this data may or may not have captured.

## Conclusions

There has been an increase in the rate of patients seen by nurse practitioners after the implementation of the ACA within the ED. The findings illustrate an expansion of the use of NP in the ED setting. This increase has been in specific physical and mental health illnesses, such as migraines and depression and anxiety. This might indicate that a more extensive training in those areas, specifically mental health is needed as NP treat more patients with these complaints.

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