Joint Chairmen's Report on Emergency Department Overcrowding

December 2017

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EXECUTIVE SUMMARY

The 2017 Joint Chairmen's Report directed the Maryland Institute for EMS Systems (MIEMSS) to work with the Health Services Cost Review Commission (HSCRC) to evaluate the impact of hospital overcrowding on EMS response times and Maryland's patient population and to develop a plan to address the overcrowding issue. As discussed herein, the Report includes the following information:

- Excessive ED wait times and ambulance diversion from one hospital to another has been a long-standing challenge for the Maryland health care system and is a multifaceted problem that will require comprehensive system adjustments.

- ED overcrowding has been exacerbated by the following factors:

    - An increase in behavioral health patients treated at EDs, including overdose patients
    - Continuing staff shortages affecting hospital EDs
    - Increased patient care requirements in emergency departments
    - Increasing numbers of EMS transports in some EMS jurisdictions coupled with limited options for alternative modes of treatment
    - A misalignment of hospital reimbursement and EMS reimbursement policies

- Efforts undertaken to date, including utilization of Ambulance Yellow Alerts, have not resolved the problem and do not address underlying factors.

- The HSCRC has identified two strategies to incentivize hospitals to continue to improve ED efficiency and patient throughput: 1) adding an ED performance measure in the Quality-based Reimbursement program; and 2) requesting hospital efficiency improvement action plans from hospitals that have poor ED performance measures coupled with reduced patient days.

- MIEMSS and EMS jurisdictions will continue to develop new models of EMS care delivery and assess their utility in reducing ambulance transport of low acuity patients to hospital EDs.

- MIEMSS will work with the HSCRC to incorporate/engage EMS for participation in new care delivery programs under the State's Enhanced Total Cost of Care All-Payer Model, including the possibility of shared savings. MIEMSS will work with the Maryland Department of Health to identify potential opportunities for changes in the Medicaid program to reimburse EMS for new models of service delivery.

- MIEMSS will assess and determine whether the use of Yellow Alerts should be discontinued.

- MIEMSS will work with EMS jurisdictions to identify a reasonable standard time for ambulance off-load (the time between the arrival of an ambulance-transported patient and the time that the patient is moved off the EMS stretcher).

INTRODUCTION & POLICY CONTEXT FOR THE STUDY

The 2017 Joint Chairmen's Report contained the following language:

> **Evaluating the Impact of Emergency Department Overcrowding:** emergency department (ED) overcrowding increased significantly in fiscal 2016. This has a direct impact on emergency medical services (EMS) availability and response times, as well as patient care. Data is not currently available to evaluate the specific impact overcrowding has on Maryland patients. The budget committees direct the Maryland Institute for Emergency Medical Services Systems (MIEMSS) to work with the Health Services Cost Review Commission (HSCRC) to evaluate the impact of hospital overcrowding on EMS response times and Maryland's patient population and to develop a plan to address the overcrowding issue. The report is due to the budget committees no later than December 15, 2017.

In response to this request, MIEMSS and the HSCRC developed the report over the course of seven (7) meetings held during 2017. As part of this effort, MIEMSS and the HSCRC also solicited input from the Maryland Hospital Association, emergency physicians practicing in Maryland emergency departments, and representatives from EMS public safety jurisdictions.

Hospital ED overcrowding occurs when the identified need for emergency services outstrips available hospital resources such that there are more ED patients than there are beds available in either the ED or on an inpatient unit. Potential reasons that patients may have a prolonged stay in the ED include that additional observation may be needed to determine whether an inpatient admission is warranted. Additionally, if admitted, the inpatient unit where the patient is scheduled to be transferred may not have space or staffed beds available, known as hospital through-put. Ambulance diversion is linked to ED overcrowding and often serves as a proxy for ED overcrowding.

Excessive ED wait times and patient diversion from one hospital to another has been a long-standing challenge for the Maryland health care system and is a multifaceted problem that will require comprehensive system adjustments. ED overcrowding raises significant concerns about hospitals' ability to routinely accommodate patients needing urgent medical care, as well as critically ill patients, and to respond effectively during a mass casualty incident or epidemic. The limited ability of hospitals to receive emergency patient transports seriously concerns hospitals, healthcare providers, EMS providers, and Maryland health regulatory agencies.

In 2002, the Maryland Health Care Commission (MHCC) and the HSCRC jointly issued a report that reviewed state and national trends in ED utilization, identified factors influencing ED utilization, and included recommendations to help address ED overcrowding.[1] Baltimore City convened a Task Force on Emergency Department Crowding in 2006 that brought together the City's hospitals, Health Department and Fire Department to review available evidence and make recommendations to reduce ED crowding.[2] In 2007, the MHCC issued an update to its 2002 report that provided information on innovations that had occurred since the original report and identified new recommendations that identified nine (9) strategies to address crowding that focused on input/demand for ED services and on ED throughput.[3]

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[1] Maryland Health Care Commission and Health Services Cost Review Commission. Trends in Maryland Hospital Emergency Department Utilization: An Analysis of Issues and Recommended Strategies to Address Crowding. April 2002.

[2] Baltimore City Task Force on Emergency Department Crowding: Findings and Recommendations. June 2006.

[3] Maryland Health Care Commission. Use of Maryland Hospital Emergency Departments: An Update and Recommended Strategies to Address Crowding. January 1, 2007.

Additional challenges have emerged in the intervening decade that have complicated and made more complex the strategies to deal with ED overcrowding. These include the following:

Increase in behavioral health patients seeking treatment in EDs

The Maryland Hospital Association's (MHA) analysis of available data indicates that the number of ED visits by individuals with behavior health diagnoses rose by 18% between 2013 and 2015[4]. These patients can present major challenges and may require isolated space and ongoing supervision for protracted periods while ED personnel pursue placement and therapy. Patients who are violent present the potential of disrupting ED operations or harming staff or other patients. Behavioral health patients seen in the ED who require admission often wait in EDs for an available inpatient bed, either at the treating ED facility or another facility. Several state facilities have closed while others primarily serve patients in the court system, and available acute care hospital inpatient psychiatric bed capacity has declined. The current opioid crisis, with increasing numbers of patients being transported to the ED has further complicated the situation, as EDs are called upon to provide not only immediate treatment, but also to provide other necessary screenings, and arrange for referrals and follow-up treatment post ED discharge. Patients with dual diagnoses of substance dependency and psychiatric disease present further challenges to placement and treatment.

Misaligned Reimbursement Policies

Reimbursement policies for hospitals and Emergency Medical Services (EMS) are misaligned with hospital reimbursement initiatives. Although many hospital ED patients are self-transported walk-in patients, a significant number of true emergency patients are transported to EDs by Emergency Medical Services (EMS). Because EMS is viewed as a transportation benefit, EMS is not reimbursed unless a transport actually occurs. Medicare limits EMS reimbursement to patient transports to and from: 1) hospitals; 2) patient homes; 3) critical access hospitals; 4) dialysis facilities for End-Stage Renal Disease patients; 5) skilled nursing facilities; and 6) physician's offices, but even then only when the ambulance is en-route to a Medicare-covered destination, the patient is in dire need of professional attention, and the ambulance continues to the covered destination immediately thereafter. As a practical matter, public safety EMS, which responds to 9-1-1 calls, generally is limited in terms of transport destination to hospital emergency departments, while commercial services, which do not respond to 9-1-1 calls, transport patients to destinations that include patient homes, dialysis facilities and skilled nursing facilities. Other payers, e.g., Medicaid and private insurers, similarly tie reimbursement to the requirement that the patient must be transported to the identified destinations. This model makes EMS reimbursement dependent upon transport of patients to hospital emergency departments – a high cost environment for delivery of health care services. There is no ability for EMS to be reimbursed for providing services for low-acuity patients at the patient's home or obtaining services for patients in other less costly environments.

In contrast, a goal of current hospital reimbursement policies is to reduce the 30-day hospital re-admission rate, reduce unnecessary utilization and limit the per capita growth in healthcare spending by providing care in the most appropriate setting. The ED is a high cost setting that also serves as a gateway for patient admissions and re-admissions. Many hospitals are focusing on community partnerships so that non-urgent patients can obtain needed services in other, less-costly environments.

[4] Maryland Hospital Association. Emergency Department Diversions, Wait Times: Understanding the Causes. 2016-2017.

Increased patient care requirements in EDs

Hospital efforts to reduce re-admissions include a focus on patients who are high utilizers of ED services and, therefore, likely candidates for re-admission. Hospitals have implemented initiatives, e.g., care management / care coordination plans, which identify high utilizers of the ED, provide information on the patient's history and prior results from tests and work-ups and recommend courses of action. ED staff efforts are focused on providing the immediate and necessary patient care in the ED (as opposed to admitting the patient to receive such care) and also on identifying and linking patients to needed follow-up care from other healthcare resources in the community, e.g., primary care physician, health clinic, so that a future re-admission may be avoided. Thus, the ED staff performs multiple roles including patient treatment provider and patient transition facilitator in the health care system, increasing ED workload.

Currently, emergency physicians are reimbursed on a fee-for-service basis, meaning that the amount of financial compensation increases as they see more patients in the ED. For emergency physicians, an efficiently run ED means moving those patients that need admission out of the ED and into an appropriate inpatient bed in another unit of the hospital to allow for more patients to be seen and managed in the ED. In contrast, under the global budget system, hospitals work to determine whether an inpatient admission is needed or if the patient can be appropriately discharged and treated in a lower cost setting. The hospitals' motivation centers on having the emergency physician/ emergency department comprehensively evaluate, diagnosis, and discharge patients that do not require an inpatient admission. The clear conflict between the emergency physician and hospital incentives generates mixed messages to patients and staff and contributes to the longer ED wait times and hospital throughput inefficiency.

Increasing numbers of EMS patients seeking treatment at EDs

Some EMS jurisdictions in Maryland are grappling with an increasing volume of 9-1-1 calls for EMS services. For example, between FY2015 and FY2016, EMS transports in Baltimore City increased by nearly 5,918 patients, and the City saw an additional 2,972 patient transports between FY2016 and FY2017. Total EMS transports for Baltimore City were at an all-time high in FY 2017 of 100,984. Because of the strictures of reimbursement policies, nearly all of these patients are transported to hospital emergency departments, with the exception of patient refusals. An increase in EMS calls has also been reported in Montgomery County and Prince George's County.

At the same time, there are many patients who call 9-1-1 and are transported by EMS to hospital emergency departments have conditions that could be treated in a health care environment other than a hospital emergency department. Statewide EMS data indicates that a significant number of EMS patients are classified as "Priority 3." Priority 3 patients are those whom EMS has determined have "non-emergent conditions, requiring medical attention, but not on an emergency basis"[5]. Priority 3 Medical patients, as well as Priority 4 Medical and

[5] Priority 1 — Critically ill or injured person requiring immediate attention; unstable patients with life-threatening injury or illness. Priority 2 — Less serious condition yet potentially life-threatening injury or illness, requiring emergency medical attention but not immediately endangering the patient's life. Priority 3 — Non-emergent condition, requiring medical attention but not on an emergency basis. Priority 4 — Does not require medical attention. Source: Maryland Medical protocols for EMS providers, page 31 II. GENERAL PATIENT CARE (GPC) -> D. INITIAL ASSESSMENT -> 7. Assign Clinical Priority -> (a) through (d).

Injury patients, i.e., those who do not require medical attention, appear to be potential candidates for treatment in an environment other than the ED.

FY 2017	Priority 1	Priority 2	**Priority 3**	**Priority 4**
Medical	21,822	170,723	**306,959**	**14,189**
Injury	3,285	26,516	89,519	**2,318**

Source: eMEDS Data

Staff shortages

Hospitals report an ongoing shortage of registered nurses across the state that contributes to reduced inpatient capacity and ED overcrowding. The availability of inpatients beds can be decreased if nurses are unavailable to staff those beds. Alternatively, ED nurses can be pulled into the hospital to staff inpatient beds, decreasing the number of available personnel to treat ED patients.

ED OVERCROWDING RESEARCH

There is a substantial volume of research that indicates that ED overcrowding is driven by the boarding of admitted patients in the ED, suggesting that ED overcrowding is a result of hospital-wide overcrowding[6, 7, 8]. The ED depends upon resources being available throughout the rest of the hospital. The number of available staffed hospital beds, especially critical care and specialty beds, the level of surgical activity, the average patient length of stay, nursing staffing levels, and the capabilities and capacity of diagnostic services (e.g., labs and radiology) all impact the ED. As a result, hospital operations are an important key to resolving ED overcrowding and ambulance diversions. Improved hospital through-put, i.e., the movement of patients through hospital admission, treatment and discharge, has been cited as a significant factor in reducing ED crowding and alerts. [9 10 11]

There is also substantial research that ED overcrowding can have significant, detrimental impact on patients. Complication rates of ED patients with acute coronary syndrome were found to be significantly increased during periods of ED overcrowding in terms of increases in incidence of death, cardiac arrest, heart failure, late detection of myocardial infarction, arrhythmias, stroke or hypertension[12]. A study of 90,000 patients admitted through a suburban, university-based academic ED

See https://www.miemss.org/home/Portals/0/Docs/Guidelines_Protocols/2017-MD-Medical-Protocols-WEB.pdf?ver=2017-04-04-143321-600.

[6] Salway RJ, Valenzuela R, Schoenberger JM, et al: Emergency Department Overcrowding: Evidence-Based Answers to Frequently Answered Questions: Rev Med. Clin. Condes 2017; 28(2) 213-219.

[7] Institute of Medicine of the National Academies. The Future of Emergency Care: Hospital-Based Emergency Care at the Breaking Point. The National Academies Press, Washington, DC. 2007.

[8] GAO. (Government Accountability Office). 2003. Hospital Emergency Departments: Crowded Conditions Vary Among Hospitals and Communities. Washington, DC.

[9] Rathlev NK, Chessare j, Olshaker J, et al. Time series analysis of variables associated iwht daily mean emergency department length of stay. Ann Emerg Med 49 (3), 2007, 265-71.

[10] Powell ES, Khare RK, Venkatesh AK et al. The Relationship between inpatient discharge timing and emergency department boarding. J Emerg Med 42 (2), 2012, 186-196.

[11] Chang AM, Cohen DJ, Lin A, et al. Hospital Strategies for Reducing emergency Department Crowding: A Mixed-Methods Study. Ann Emerg Med, 2017, In press.

[12] Pines JM, Pollack CV, Diercks DB et al. The Association Between emergency Department Overcrowding and Adverse

over a 35-month period showed that increased ED boarding time was associated with increased mortality, increased ICU admissions, and increased hospital lengths of stay[13]. Periods of high ED overcrowding have also been shown to be associated with increased hospital length of stay and costs for admitted patients.[14] Another review of nearly 700,000 ED patient records in Quebec concluded that a 10% increase in ED occupancy was associated with a 3% increase in mortality and hospital readmission at a return visit[15]. Another article published the results of a literature review that concluded that ED crowding was associated with negative effects on mortality, time to treatment, quality of care, and patient satisfaction[16]. Several studies have documented that the total length of hospital inpatient stay is increased by as much as a full day longer for patients who were boarded in the ED, as opposed to those with similar illnesses who were promptly placed in inpatient units.[17] Increased medical errors, reduced quality of care, and increases in medication errors have all been shown to be associated with ED overcrowding.[18] [19] [20] ED Overcrowding also causes ambulance diversion.

Maryland – Past & Current Data

According to the Department of Legislative Services, since 2010, the percentage of uninsured Marylanders has declined from 11.3% to 6.6%. The largest gains in coverage have occurred through the expansion of Medicaid, with nearly 281,000 additional individuals qualifying for Medicaid coverage as of October 2016. Additionally, more than 136,000 individuals have received coverage through the State's Health Benefit Exchange. Preliminary data indicates that access to health care has improved in Maryland with the expansion of coverage. Furthermore, hospital uncompensated care has declined, moderating growth in hospital rates.

Despite an expansion in the Medicaid population and a reduction in the number of uninsured individuals since the passage of the Affordable Care Act in 2010, hospital volumes have decreased in the Emergency Department. As shown below, the trend for both inpatient visits (individuals that come to the Emergency Department and were ultimately admitted to an inpatient bed) and outpatient visits (individuals that received services in the Emergency Department, but were ultimately not admitted to the hospital) show a decline in the total volume between calendar year (CY) 2013 and 2016.

HSCRC data shows that inpatient visits (inpatients who are admitted from the ED) have declined by 9.9 percent from CY 2013 to CY 2016. See Figure 1 below.

Cardiovascular Outcomes in Patients with Chest Pain. Acad Em Med 16 (7), July 2009, 617-625.

[13] Singer AJ, Thode HC, Viccellio P, & Pines, JM. The Association Btween Legnth of Emergency Department Board and Mortality. Acad Em Med 18 (12), December 2011, 1324-1329.

[14] Sun BC, Hsia RY, Weiss RE, et al. Effects of Emergency Department Crowding on Admitted Patients. Ann Emerg Med 61 (6) June 2016, 605-611, e6.

[15] McCusker J, Vadeboncoeur A, Levesque JF, et al. Increases in emergency department occupancy are associated with adverse 30-day outcomes. Acad Emerg Med 21 (10), October 2014, 1092.

[16] Salway RJ, Valenzuela R, Shoenberger JM et al. EmergencyDepartment (ED) Overcrowding: Evidence-Based Answers to Frequently Asked Questions. Rev Med Clin Condes, 28 (2), 213-219, 2017.

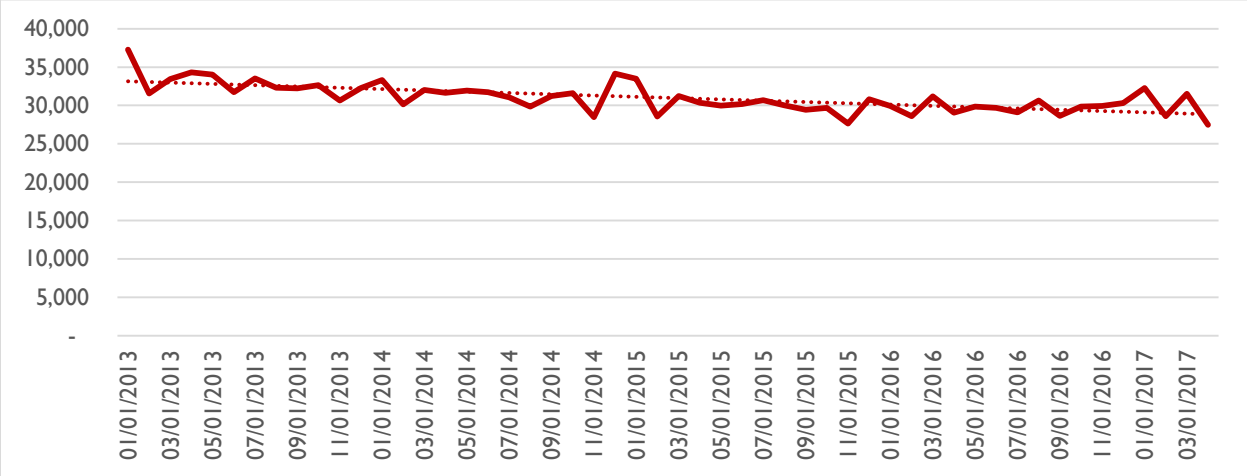
[17] Liew D, Liew D, Kennedy MP. Emergency Department length of stay independently predicts excess patient length of stay. Med J Aust 179 (10), 2003, 524-526.

[18] Weissman JS, Rothschild jr, Bendavid E, et al. Hospital workload and adverse events. Med Care 45 (5), 2007, 448-455.

[19] Cowan RM, Trzeciak S. Clinical review: emergency department overcrowding and the potential impact on the critically ill. Crit Care 9 (3), 2005, 291-295.

[20] Kulstad EB, Sikka R, Sweis RT. Overcrowding is associated with an increased frequency of medication errors. Am j Emerg med 28 (3), 2010, 304-309.

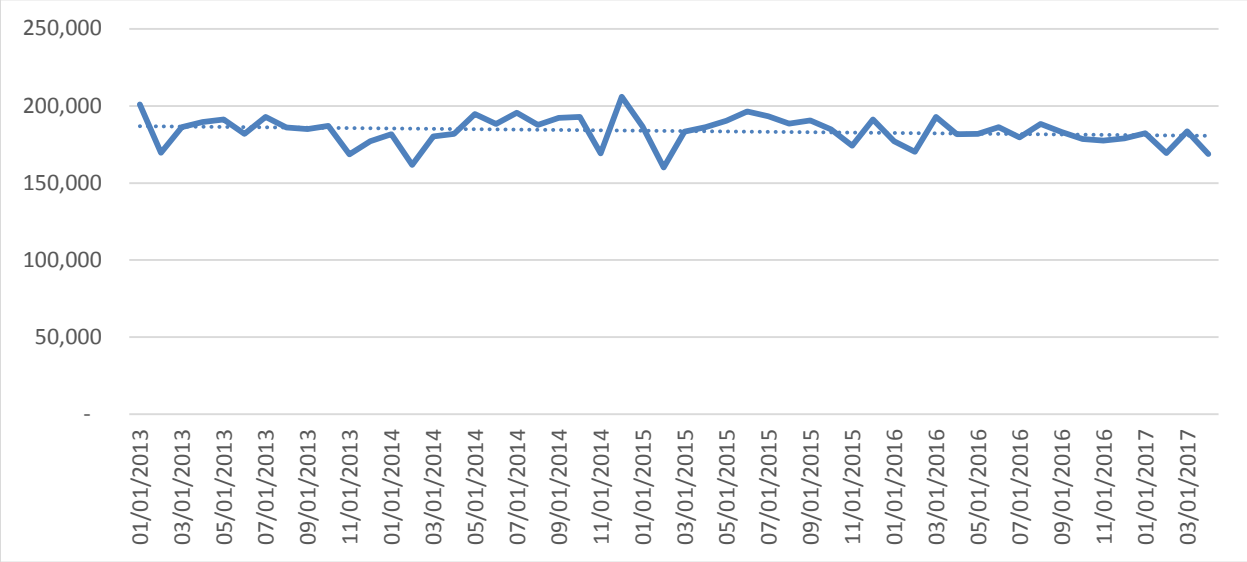
Figure 1. Hospital Inpatient Visits (inpatients who were admitted from the ED - Jan 2013 to Mar 2017)



Source: HSCRC data January 2013 to March 2017

Similarly, outpatient visits have declined 1.8 percent between CY 2013 and CY 2016. See Figure 2 below.

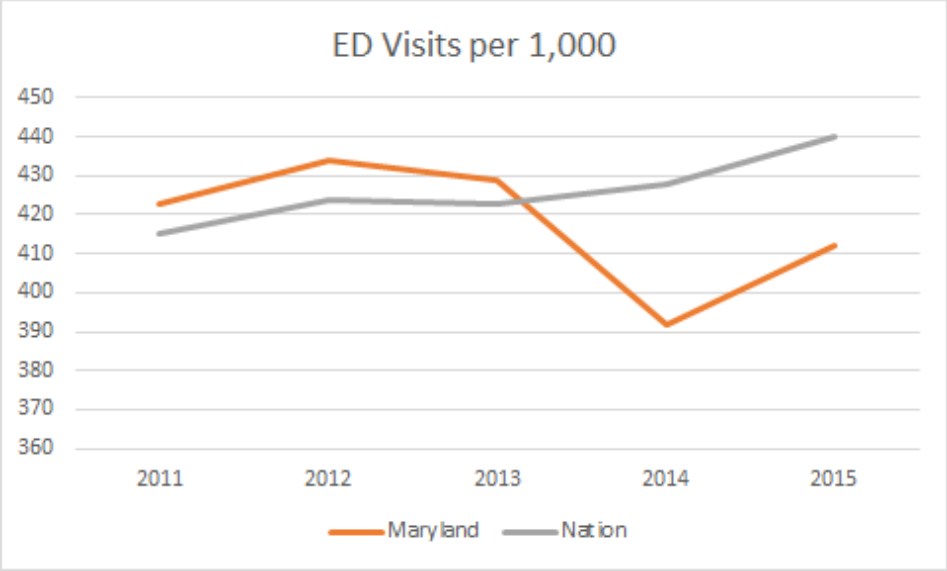
Figure 2. Maryland Hospital Outpatient Visits (ED patients not admitted - Jan 2013 – Mar 2017)



Source: HSCRC data January 2013 to March 2017

Although the State does not have access to the same level of data on inpatient and outpatient ED visits to compare nationally, the Kaiser Family Foundation has compiled data on hospital Emergency Room visits that shows Maryland ED visits are lower than the national average. Figure 3 below shows that Maryland has been able to reduce the rate of ED visits since the start of the All-Payer Model. According to KFF, the data compiled is limited to community hospitals only and excludes federal hospitals, long term care hospitals, psychiatric hospitals, institutions for the intellectually disabled, and alcoholism and other chemical dependency hospitals.

Figure 3. Hospital Emergency Room Visits per 1,000 population



Source: Kaiser Family Foundation, 2015

To get a sense for the types of cases presenting to the ED in Maryland, Table 1 below shows the top 10 primary diagnoses of Emergency Department visits in CY 2016 statewide.

Table 1. Maryland Hospital ED Top 10 Diagnosis Categories (2016)

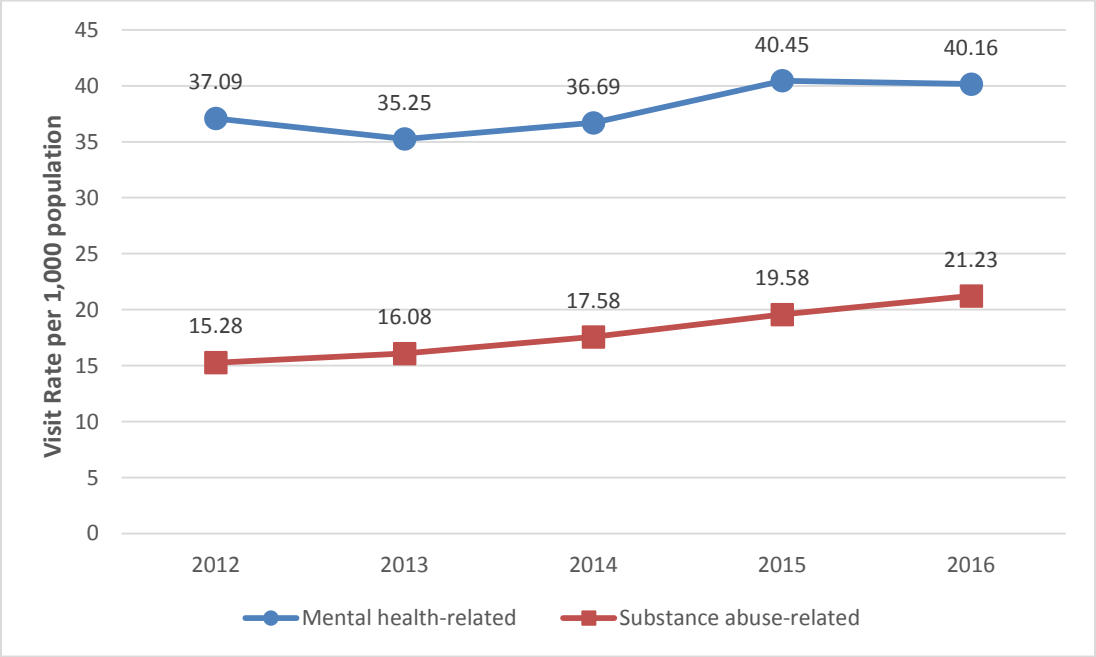
1	CHEST PAIN UNSPECIFIED	57,646	2.74%
2	OTHER CHEST PAIN	45,172	2.15%
3	ACUTE UP RESPIRATORY INF	41,067	1.95%
4	UNSPECIFIED ABDOMINAL PA	37,404	1.78%
5	HEADACHE	32,953	1.57%
6	UTI SITE NOT SPECIFIED	31,489	1.50%
7	LOW BACK PAIN	24,436	1.16%
8	SYNCOPE AND COLLAPSE	24,259	1.15%
9	VIRAL INFECTION UNSPECIF	21,753	1.03%
10	UNS ASTHMA W/ACUTE EXACE	21,719	1.03%

Source: HSCRC Data, 2016

Behavioral health plays a role in emergency department volume as well. The chart below shows an increase in both mental health and substance-abuse related visits to the Emergency Department. While behavioral health diagnoses are not included in the top 10 primary diagnoses resulting in ED visits, the

number of patients presenting to the ED with a behavioral health need has steadily increased over the last few years. Figure 4 below shows the number of mental health and substance abuse related ED visits statewide between CY 2012 and 2016.

Figure 4. Mental Health & Substance Abuse-related ED Visits (2012-2016)



Source: HSCRC Data, 2012-2016

ED Wait Times

Despite the decrease in volume, Maryland hospitals continue to experience a varying degree of inefficiency associated with patients entering the hospital through the Emergency Department, as measured by wait times and ambulance diversion (yellow alert hours). Hospitals have made some progress in reducing the number of yellow alert hours, as discussed below. Emergency Department patient throughput initiatives at hospitals are attempting to improve patient wait times, quality, and patient satisfaction.

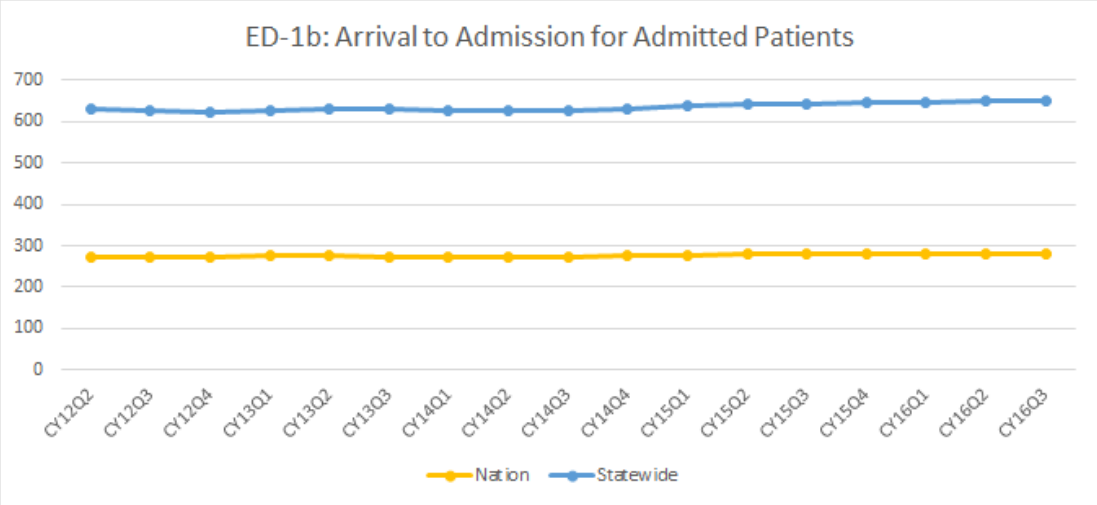
CMS collects inpatient and outpatient quality reporting measures across the hospital system. The Emergency Department measures that were studied for this report include:

- ED_1b: Median Time from ED Arrival to ED Departure for Admitted ED Patients*
- ED_2b: Admit Decision Time to ED Departure Time for Admitted Patients*
- OP_18b: Median Time from ED Arrival to ED Departure for Discharged ED Patients*

Note: Asterisk (*) indicates that these measures are endorsed by the National Quality Forum.

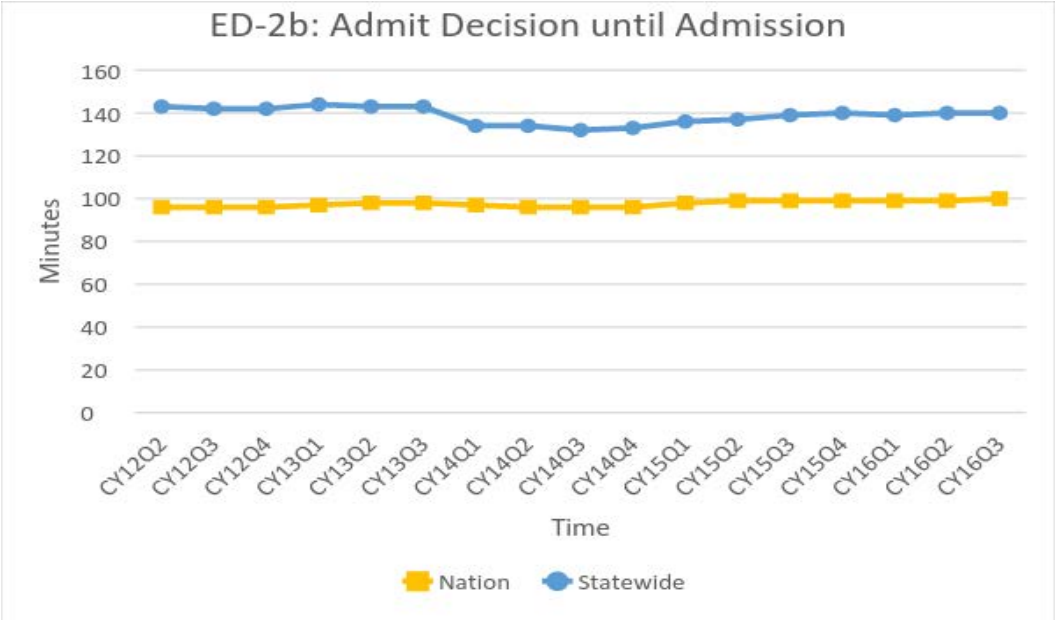
Maryland hospitals perform far worse than the national average on both ED measures; a problem that has existed for Maryland for a number of years prior to the ACA or the All-Payer Model.

Figure 5. Time from ED Arrival to Inpatient Admission for Admitted Patients– Maryland vs. National



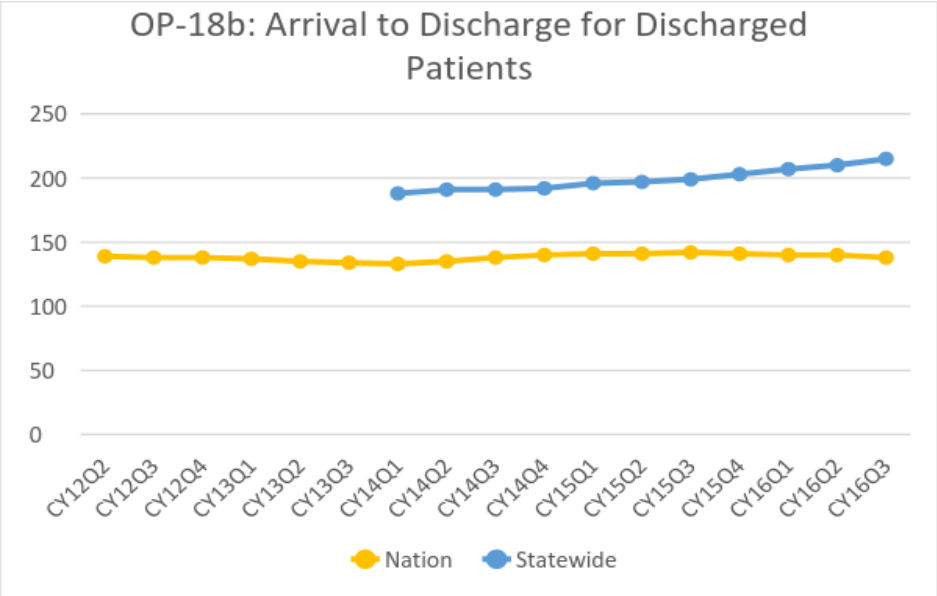
Source: CMS Hospital Compare Data

Figure 6. Time from ED Decision to Admit to Inpatient Admission – Maryland vs. National



Source: CMS Hospital Compare Data

Figure 7. Time from ED Arrival to ED Discharge – Maryland vs. National



Source: CMS Hospital Compare Data

Alerts / Ambulance Diversion

Another measure of ED inefficiency is the number of times a hospital temporarily requests a diversion of patients in need of urgent medical care. Ambulance diversion is linked to ED overcrowding and often serves as a proxy for ED overcrowding. A "Yellow Alert" diversion is initiated because the ED is experiencing a temporary overwhelming overload such that priority II and III patients may not be managed safely[21]. Priority I patients require immediate attention or are unstable with life-threatening injury or illness are never subject to Yellow Alert diversion. Prior to diverting pediatric patients, medical consultation is advised for pediatric patient transports when EDs are on yellow alert. As shown below, the number of yellow and red alert hours has fluctuated between CY 2002 and 2016[22]. However, there has been an increasing trend since CY 2013 in the use of Yellow Alert hours. Hospitals have been working to decrease the use of Yellow and Red Alerts (when a hospital does not have any monitored beds), and the most recent quarterly trends reflect a decrease in the total number of alert hours. A decrease in alerts, however, does not necessarily indicate decreased ED overcrowding. There is no universally accepted indicator of when a hospital should go on diversionary status; as a result, hospitals make their own determines about whether and when to go on diversion. Further, some hospitals do not

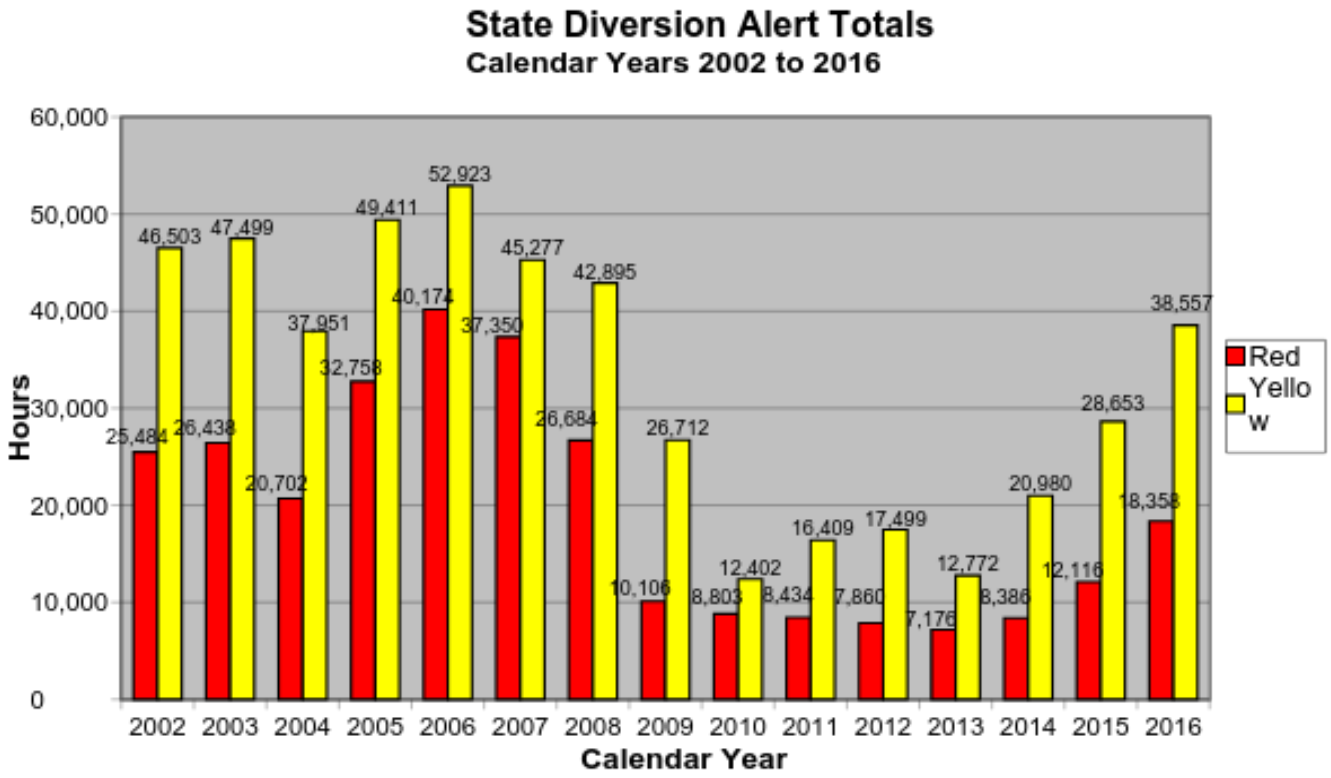
[21] Priority II patients are less serious, with potentially life-threatening conditions and require treatment, but are not immediately endangering the patient's life; Priority III patients have non-urgent conditions that require medical attention, but not on an immediate basis.

[22] Historically, alert utilization peaks during the Influenza and winter illness season and then comes down for the remainder of the year. The 2012-2013 flu season started early and was severe compared to the previous years. Vaccines in 2014-2015 were not as effective in previous years in controlling the spread of the viruses due to a mismatch in the strains experienced with those predicted and resulted in a "somewhat severe" season. The 2015-2016 was a moderate season, but the alert activity did spike higher than previous years during and immediately following the holidays. This seasonal influenza is not the only factor affecting diversion, as the activity throughout the year has drastically increased since 2013.

go on diversionary status at all, even when their EDs are overcrowded and unable to receive and treat patients in a timely manner.

Figure 4:

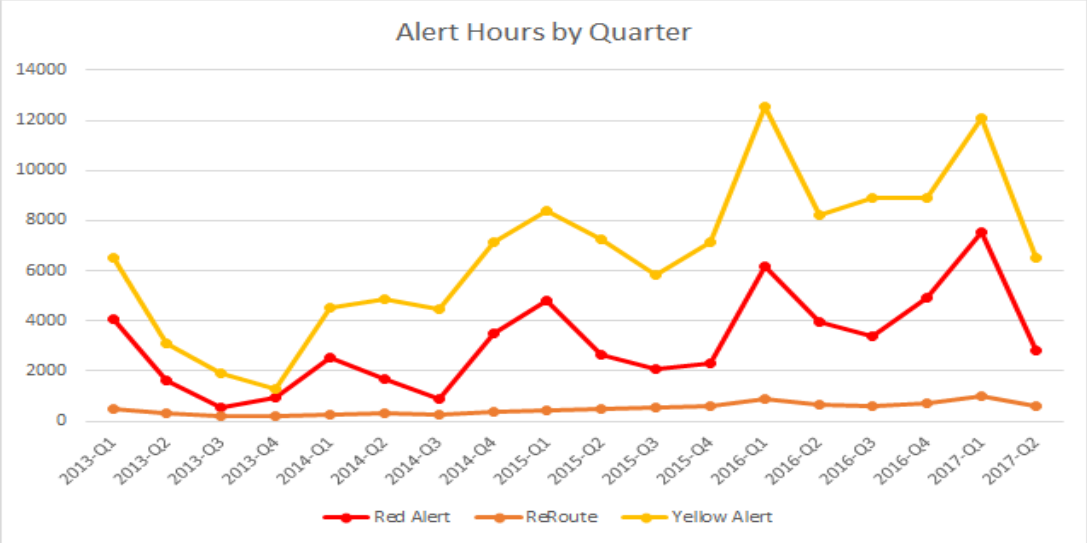
Figure 8. Statewide Yellow & Red Alerts (2002 – 2016)



Source: Department of Legislative Services, 2016

As noted above, there has been some improvement in the use of alert hours across Maryland in 2017. The graph below shows alert hours by type (yellow, red, and reroute) between CY 2013 and the second quarter of CY 2017. When comparing CY 2016 Q2 performance to CY 2017 Q2 performance, hospitals have shown a reduction in the number of yellow and red alert hours. Again, however, a reduction in alerts does not necessarily indicate a reduction in overcrowding.

Figure 9. Yellow & Red Alerts by Quarter (2013 – 2017)



Source: MIEMSS County/Hospital Alert Tracking System

Given the lack of uniformity in hospital use of alert status, it is not a reliable indicator of ED status, particularly for EMS units transporting patients. Hospitals that have not declared an alert may still be unable to timely receive patients, with the result that ambulances are unable to timely off-load their patients in the ED. These ambulances are essentially "held" at the hospital until such time as the hospital accepts the patient who can then be offloaded from the ambulance stretcher to a hospital bed. Because of this, an additional alert status, "re-route" was developed whereby EMS units may declare that a particular hospital ED is unable to accept ambulance-transported patients. Through re-route, EMS – not the hospital – diverts ambulances that otherwise would have gone to the overcrowded ED and send the ambulance instead to another hospital ED.

EMS REAL-TIME OPERATIONAL AND PERFORMANCE MONITORING

Some EMS jurisdictions have implemented systems that monitor certain performance measures and operational efficiencies, including how long their ambulances are being held in EDs. Prince George's County Fire/EMS Department (PGCF) has implemented FirstWatch, a web-based, real-time dashboard and data analysis software system that analyzes ambulance data in real-time and provides situational awareness regarding ambulance off-load wait times and ED overcrowding at the hospitals to which PGCF transports patients. PGCF monitors ED performance based upon how long a unit is at the hospital ED from EMS unit arrival until unit back-in-service time. The performance standard is based on a 30-minute turnaround time, a generally accepted national standard. The expectation is that the ambulance is able to offload the patient and complete the patient care report, and return to service within 30 minutes. PGCF reports that this standard is met approximately 32% of the time for their units. All hospitals in Prince George's County also have real-time access to the FirstWatch data for their individual hospitals and can assess their performance.

In addition, PGFC has developed strategies to help manage extensive ED delays. PGFC has periodic meetings with ED staff at to discuss issues. They also have a Limited EMS Resource Plan with two levels that is put into effect in times of stress.

- Level 1 goes into effect when 40% of all transport units are consumed. The EMS Supervisor is able to review the hospital information on FirstWatch and may direct ambulances to specific hospitals to minimize or avoid delay. Once at the ED, EMS providers complete a shortened patient care report (a full report to be completed at a later time) and offload the patient. While other units return to service, one ambulance unit may remain at the hospital in order to observe the (sometimes multiple) transported Basic Life Support patients waiting on stretchers for an ED bed.

- Level 2 goes into effect when 60% of all transport units are consumed. In addition to the actions taken in Level 1, when operations reach Level 2, the county's dispatch policy changes so that response to lower acuity calls can be held for up to 45 minutes in order to ensure that higher acuity calls receive a priority response. Units that are out of service for training or other reasons (other than mechanical) must return to provide service. EMS Supervisors and Battalion Chiefs will go to area hospitals to assess the delays on-sight, determine what actions are needed to clear the delay and discuss with hospital administration.

PGFC reports that the Limited EMS Resource Plan is used more and more frequently as ED overcrowding has increased, indicating that it is not unusual for PGFC to be in Limited EMS Resource Plan status twice a day for about 45 minutes – 1 hour at each occurrence. PGFC also reports that they do not encounter lengthy wait times at Inova Health System hospitals, in Northern Virginia, just across the state border. Inova Health Systems hospitals post their average ED wait times on an ongoing basis; times are "refreshed" every 30 minutes. See: https://www.inova.org/emergency-room-wait-times/

Baltimore City Fire Department (BCFD) reported that in 2004-2005, problems of ED overcrowding increased significantly, initially at hospitals near the City's periphery which also receive ambulance transports from surrounding jurisdictions. During that time, it was not uncommon for units to be backed-up at hospitals for 3 or more hours: BCFD units would be queued up to off-load patients at hospital EDs along with other jurisdictions that had transported patients to that hospital ED. In response, a process (Baltimore Medical Resource Center or "BMRC") was put in place whereby a BCFD communications person contacted City EMS units and those in surrounding jurisdictions for situational awareness, e.g., how many units were being held at specific hospitals so that the ambulance could avoid that hospital.

Other approaches that BCFD tried included sending Battalion Chiefs to EDs where ambulances were backed up for the purpose of monitoring BCFD personnel to ensure that they were moving as quickly as possible to offload patients, complete required paperwork and other tasks, and return to service. Additional personnel were called-in as needed, resulting in increased overtime costs, and surge ambulances could be put into service. After one year of intense efforts, BCFD's response times improved by only 12 seconds. BCFD also explored the possibility of BCFD and surrounding jurisdictions mutually sharing dispatch information so that each jurisdiction could have situational awareness of all the units transporting patients to Baltimore hospitals. As a technical matter, however, interface of the dispatch systems was not possible at that time. BCFD also explored obtaining access to cameras at each ED in the City to be able to visualize ambulance back-up at the ED, but that could not be accomplished due to security issues, availability of cameras and other factors.

In 2013, BCFD implemented a new approach using Medical Duty Officers (MDO). The MDO is a captain and licensed paramedic or nurse who is the liaison between BCFD and each hospital and functions much like an air traffic controller. An MDO maintains situational awareness and works with ED charge nurses at City hospitals to maintain real time situational awareness and bed availability for certain patient

complaints. The MDO has the ability to route ambulances to appropriate destinations. This approach resulted in decreased transfer times, improved treatment times, and improved EMS unit availability. For example, after implementation, ambulances were returning to service within 60 minutes 95% of the time and within 45 minutes 80-85% of the time even during flu season. The MDO program is expensive, however, with personnel costs to BCFD of about $300,000 annually.

Currently, BCFD is in the process of implementing FirstWatch and anticipates its full deployment within six (6) months. Implementation of FirstWatch will provide access to critical operational data in real-time, close monitoring of key measurements, and use of information to adjust unit deployment and other aspects of service operations. Montgomery County Fire & Rescue Services and Charles County Department of Emergency Services have also purchased FirstWatch.

Maryland's All-Payer Model

Background

For over 40 years, the federal government has "waived" federal Medicare rules for Maryland so that hospital payments may be set at the State level. Beginning January 1, 2014 through December 31, 2018, Maryland's federal "waiver" of Medicare rules was updated under the "All-Payer Medicare Model Contract." Whereas hospitals used to be reimbursed by all payers on a regulated, fee-for-service basis under the federal "waiver," hospitals are currently incentivized to improve quality of care while controlling per capita hospital growth. The new All-Payer Model requires hospitals to take responsibility for patients in their service area in order to improve health and reduce unnecessary utilization. Hospitals have partnered with community providers and implemented care coordination activities that aim to direct the patient to the most appropriate level of care. In some cases, this results in additional screening in the ED to determine the most appropriate level of treatment for the patient that increases ED wait times for patients.

In the first three and a half years since implementing the All-Payer Model, Maryland has met or exceeded the key Model tests for limiting hospital cost growth on an all-payer basis, providing savings to Medicare, and improving quality of care. Maryland has also proposed a Care Redesign Amendment to the All-Payer Model, in response to stakeholders' request for greater provider alignment and transformation tools.

Next Phase: Total Cost of Care Model Beginning January 2019

In early 2017, CMS and State officials, with input from Maryland health care leaders, began negotiations for a new "Maryland Total Cost of Care Model" that is set to begin January 2019. Maryland will be expected to progressively transform care delivery across the health care system, beyond hospitals, with the objective of improving health and quality of care. At the same time, State growth in Medicare spending must be maintained lower than the national growth rate.

The new Total Cost of Care Model will leverage the foundation already developed by Maryland for hospitals and build on the investments that hospitals make during 2014 through 2018. Maryland will continue to encourage provider- and payer-led development of Care Redesign programs to better meet the needs of patients, especially those with complex and chronic conditions. Maryland is also continuing efforts to implement a new Maryland Primary Care Program (MDPCP), which is intended to bring care coordination and support to approximately 400,000 Medicare beneficiaries and 2,000 providers. The State will commit its public health resources to support population health improvements that are aligned with Model goals and Marylanders' needs.

STRATEGIES TO ADDRESS ED OVERCROWDING

HSCRC

Through a focus on the goals of the All-Payer Model, the HSCRC is incentivizing improvements in readmissions, inpatient hospital-acquired conditions, and patient satisfaction of admitted patients, among other measures of hospital quality of care. As hospitals work to improve on these patient outcome measures, hospitals are implementing care redesign activities, including increased Care Management and Care Coordination services. Some of these services are provided in the Emergency Department (ED), which may impact ED wait times. Hospitals have expressed the view that some inefficiency under ED Wait Time measures may be the result of additional care coordination and care transition support, which is vital to the long-term success of the Maryland All-Payer Model.

The HSCRC has been exploring potential policies that will incentivize hospitals to continue to improve hospital efficiency and patient throughput. Two potential strategies have been identified: 1) adding an ED performance measure in the Quality-based Reimbursement program; or 2) requesting hospital efficiency improvement action plans from hospitals that have poor ED performance measures coupled with reduced patient days.

Performance Measures in the Quality-Based Reimbursement Program

The Maryland Health Services Cost Review Commission (HSCRC's or Commission's) quality-based measurement and payment initiatives are important policy tools for providing strong incentives for hospitals to improve their quality performance over time. These initiatives hold amounts of hospital revenue at-risk directly related to specified performance benchmarks.

The HSCRC operates several pay-for-performance programs related to hospital quality improvement and achievement; chiefly among these are the Readmissions Reduction Incentive Program (RRIP); the Maryland Hospital-Acquired Conditions Program (MHAC); and the Quality-Based Reimbursement program (QBR).

Maryland's Quality-Based Reimbursement (QBR) program employs measures that are similar to those in the federal Medicare Value-Based Purchasing (VBP) program. Because of its long-standing Medicare waiver for its all-payer hospital rate-setting system, the Centers for Medicare & Medicaid Services (CMS) has given Maryland various special considerations, including exemption from the federal Medicare VBP program. In its place, the HSCRC implements the Maryland-specific QBR program.

The Maryland QBR Program currently consists of 15 measures of inpatient hospital quality across 3 domains - Person and Community Engagement (encompassing 8 measures of Patient Satisfaction); Safety (encompassing 5 measures of hospital-acquired conditions, distinct from the PPCs, and 1 measure of early elective delivery); and Mortality (1 measure of in-hospital mortality).]

To update these programs each year, the HSCRC hosts regular meetings of the Performance Measurement Work Group. The Performance Measurement Work Group is comprised of various stakeholders, including hospitals, insurance providers, Medicaid, consumer advocates, subject-matter experts, and other Health Department staff. In building and updating pay for performance programs, the HSCRC Performance Measurement Work Group follows the following guiding principles:

- The measurements used for performance linked with payment must include all patients, regardless of payer.
- The measurements must be fair to hospitals.

- Annual targets must be established to reasonably support the overall goal of meeting or outperforming the national Medicare readmission rate by CY 2018.
- The measurements used should be mostly consistent with the CMS readmissions measure.
- The approach must include the ability to track progress.

HSCRC works to track and incentivize improvement on a number of hospital quality measures, and updates its core pay-for-performance programs each year. Each annual program update involves extensive stakeholder review, vetting, and modeling; draft proposals are then presented to the Commission and to the public for feedback; and final policies are approved by Commissioners in a formal vote.

Through the Performance Measurement Work Group, the HSCRC has provided modeling for the addition of two ED performance measures, the ED-1b and ED-2b measure, which measures the amount of time that elapses between arrival to admission, and between the decision to admit a patient and the actual admission, respectively. The process to add a measure to the QBR is intensive and requires significant modeling and vetting to ensure that the measures are accurate and can be fairly applied to all hospitals. At its December 2017 monthly meeting, the HSCRC voted to include the ED measures in the quality program for rate year 2020 for all hospitals, with the possibility of approving additional risk-adjustment methodology by June 2018.

Hospital Efficiency Improvement Action Plans

After a discussion of ED efficiency at the October 2017 HSCRC monthly meeting, Commissioners suggested that additional quantitative and qualitative data be collected from hospitals that are experiencing the worst ED wait times, through the solicitation of a Hospital Efficiency Improvement Action Plan. As of this publication, 13 hospitals were notified by the HSCRC to submit a Hospital Efficiency Improvement Action Plan based on their performance on ED wait time measures compared to the State average, high use of yellow alert/diversion, and have excess capacity. Those hospitals will submit an action plan to the HSCRC by January 2018 that that details the steps that will be taken to improve hospital throughput. This strategy will allow for a more comprehensive approach to correcting ED inefficiency.

MIEMSS

Yellow Alerts

MIEMSS will assess and determine whether the use of Yellow Alerts should be discontinued.

There are varying views on the utility of Yellow Alerts as a mechanism for monitoring and impacting ED overcrowding. Some Maryland hospitals believe the use of Yellow Alerts provides temporary relief from ED overcrowding by diverting patients to other hospitals and are supportive of continued use of the Alert system. Other hospitals limit the use of Alerts, and some hospitals, as a matter of policy, never go on Alert status. There is no uniform application of the Alerts among hospitals that use Alerts and no universally-accepted trigger for putting an ED on a Yellow Alert.

The inconsistent application among hospitals of Alert status is one reason that some EMS jurisdictions are unconvinced as to the utility of alerts. These jurisdictions point out that the use of Alerts provides no early indication that stress is developing in the ED and that by the time a hospital is overloaded and goes on Alert, it is too late to decompress quickly the overloaded ED. EMS is also faced with

inconsistent use of alerts among hospitals which is particularly problematic for ambulances with service areas that typically encompass more than one or two hospitals.

NEDOCS[23] is a 6-item scale that was developed to objectively assess the degree of overcrowding within an ED and provide a universal, uniform definition of when emergency department overcrowding occurs. NEDOCS is used in many hospitals in the U.S. Research into application of NEDOCS in high volume EDs, however, indicate that NEDOCS may overestimate ED overcrowding possibly due to different perceptions of ED overcrowding by health care providers working at different EDs[24].

MIEMSS attempted to conduct a pilot application of NEDOCS at several EDs in 2016. The pilot, which was to run for 90 days, was intended to examine correlations between rising NEDOCS scores and ambulance diversion. Actual hospital participation in the pilot was low and inconsistent; consequently, no conclusions could be drawn from the pilot.

Based on experiences in other states, there is increasing interest in discontinuing use of Yellow Alerts in Maryland. In 2009, the state of Massachusetts banned the use ambulance diversions. Hospitals were given six months 'notice to prepare and create strategies to mitigate overcrowding, e.g., hiring extra staff, increasing instances of inpatient bed rounding. After the ban, the length of time spent in the ED for admitted patients fell by 10.4 minutes at nine (9) hospitals in the Boston area, while ED patients who were subsequently discharged did not see any increase in time spent in the ED. Further, ambulance turnaround time fell by more than two minutes[25].

New Models of EMS Care Delivery [26]

MIEMSS and EMS jurisdictions will continue to develop new models of EMS care delivery and assess their utility in reducing ambulance transport of low acuity patients to hospital EDs. MIEMSS will work with the HSCRC to permit reimbursement for EMS participation in these programs.

> *Mobile Integrated Healthcare (MIH)* - MIH programs that have demonstrated the capability of linking patients to preventative health services, reducing 9-1-1 EMS call volumes, and improving the continuity of care from the hospital to the home in order to reduce complications for patients and avoid unnecessary hospital readmissions. MIH programs have been implemented and are operational in Queen Anne's County, Montgomery County, Prince George's County, and Charles County. Additional MIH programs are set to start in Salisbury-Wicomico County and in Frederick County. A key feature of each of these programs is connecting frequent users of the 9-1-1 EMS system who have non-emergency conditions, or multiple underlying medical conditions, with medical and/or social programs within their communities that can address the conditions that resulted in the patient's call to 9-1-1 for EMS. Maryland MIH programs are targeted to reducing the number of EMS transports of high utilizers of 9-1-1 EMS services who have chronic or low acuity conditions by partnering with other health care providers to conduct home visits to assess, treat and refer patients to needed services outside the emergency department environment.

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[23] Weiss SJ, Derlet R, Arndahl J, et al. Estimating the degree of emergency department overcrowding in academic medical centers: results of the National ED Overcrowding Study (NEDOCS). Acad Emerg Med 2004; 11:38-50.

[24] Wang H, Robinson RD, Bunch K, et al. The inaccuracy of determining overcrowding status by using the National ED Overcrowding Study Tool. Am J Emerg Med 32 (2014) 1230-1236.

[25] "Ambulance Diversion," Health Affairs Health Policy Brief, June 2, 2016. DOI: 10.1377/hpb20160602.353150.

[26] MIEMSS. Maryland Mobile Integrated Health Programs Involving EMS. Report in Response to the Joint Chairmen's Request. October 2017.

Alternative Destinations. Alternate Destination Programs transport 9-1-1- patients with low acuity conditions to an urgent care or similar care environment, instead of transporting low-acuity patients to a hospital emergency department. The Baltimore City Fire Department (BCFD) is implementing a pilot Alternative Destination Program (ADP) to provide services to patients in an urgent care environment instead of a hospital emergency department. The program is based on an internal Baltimore City analysis that showed that about one-third of the City's 9-1-1 calls were low-acuity incidents. As a result, BCFD developed its ADP program to encourage appropriate 9-1-1 use, optimize EMS resource utilization, and maintain appropriate patient care. At this time, there is no ability for BCFD to bill for patient transport to an urgent care facility.

The ADP program will assess the accuracy and safety of triaging patients identified by a nationally-recognized protocol that tailors EMS response to the potential severity of injury or illness based on the information provided to dispatch by the 9-1-1 caller.[27] Patients eligible for inclusion in the ADP program are those whose have been determined to be stable low-acuity patients.

Under the pilot program, in response to a 9-1-1 call for an apparent low-acuity patient located within identified geographic boundaries and available hours of the pilot, BCFD will dispatch the normal EMS resources to the patient, along with an Emergency Nurse Practitioner who will determine if the patient is, in fact, low-acuity and otherwise meets the pilot criteria. Such patients will be offered transportation to the University of Maryland Medical Center Urgent Care Center which is located across the street from the UMMS ED entrance. Patients who do not consent will be transported to the closest hospital emergency department.

A significant limitation to the development of these programs, however, is the lack of EMS reimbursement as traditional sources of reimbursement are not available to support EMS participation in these programs. Because EMS is viewed as a transportation benefit, EMS is not reimbursed unless a transport actually occurs. Medicare limits EMS reimbursement to patient **transports** to and from: 1) hospitals; 2) patient homes; 3) critical access hospitals; 4) dialysis facilities for End-Stage Renal Disease patients; 5) skilled nursing facilities; and 6) physician's offices, but even then only when the ambulance is en-route to a Medicare-covered destination, the patient is in dire need of professional attention, and the ambulance continues to the covered destination immediately thereafter. As a practical matter, public safety EMS jurisdictions, which respond to 9-1-1 calls, generally are limited in terms of transport destination to hospital emergency departments, while commercial services, which do not respond to 9-1-1 calls, transport patients to destinations that include patient homes, dialysis facilities and skilled nursing facilities. Other payers, e.g., Medicaid and private insurers, similarly tie reimbursement to the requirement that the patient must be transported to the identified destinations. This reimbursement model provides a financial incentive for EMS to transport all patients to hospital emergency departments which is a high cost environment, instead of either providing services for low-acuity patients at the patient's home and arranging for the patient to obtain other, needed services in a non-emergency (lower cost) setting.

Tying EMS reimbursement to patient transports severely limits the ability of EMS to implement, or even participate in, new models of care delivery, such as MIH and alternative destination programs. At the same time, these reimbursement policies also limit the transport destination options by requiring public

[27] The protocol was developed by the International Academies of Emergency Dispatch, a nonprofit standard-setting organization promoting safe and effective emergency dispatch services worldwide.

safety EMS services to transport 9-1-1 patients to hospital emergency departments which discourage the development of Alternative Destination Programs. A further complicating factor is that potential alternative destinations, and in particular, urgent care centers, are not regulated in Maryland in a manner that ensures that health care personnel staffing, equipment and services are standardized and uniformly available at urgent care centers throughout the state.

The potential impact of reimbursing EMS for managing certain identified 9-1-1 EMS calls in a manner other than by transporting the patient to a hospital could be significant. A 2013 study projected that if Medicare had the flexibility to reimburse EMS throughout the United States for certain 9-1-1 EMS calls in a manner other than requiring transport to a hospital emergency department, patient continuity of care could be improved and annual Medicare savings could range from $283 to $560 million.[28]

Changing Medicare and Medicaid reimbursement policies for EMS could have a transformational on the growth of MIH and other non-traditional EMS service delivery models. MIH programs report that the majority of their program participants are Medicare or Medicaid recipients[29].

The value of MIH Programs was identified and underscored by the Workgroup on Rural Health Care Delivery. In its final report, the Workgroup recommended enhancing or expanding MIH:

> "…Sending paid emergency medical technicians (EMTs), paramedics, mid-level healthcare professionals, or community health workers into the homes of patients can help with chronic disease management and education, as well as post-hospital discharge follow-up, to prevent hospital admissions or readmissions, and to improve patients' experience of care. These healthcare workers can help patients navigate to destinations such as primary care, urgent care, dental care, mental health care services, or substance abuse treatment centers, instead of emergency departments, thus avoiding costly, unnecessary hospital visits. While the workgroup members are very supportive of these programs, sustainable funding is a concern. At its last meeting, the Workgroup briefly discussed the need for EMS providers to be recognized as healthcare providers. Currently, EMS providers are reimbursed for the transportation, but not the healthcare services provided. If EMS providers could bill for health care services the sustainability concerns for MICH programs could be resolved…"[30]

Standard for Expected Ambulance Off-Load Time

Ambulance offload is the time between the arrival of an ambulance-transported patient and the time that the patient is moved off the EMS stretcher with transfer of care to ED staff. MIEMSS will work with EMS jurisdictions to identify a reasonable standard time for ambulance off-load.

Delays in ambulance off-load effectively keeps the ambulance out-of-service which can delay EMS responses to other emergency calls in their jurisdictions, decreasing advanced life support coverage that

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[28] Alpert A, Morganti KG, Margolis GS, Wasserman J, and Kellerman AL. Giving EMS Flexibility in Transporting Low-Acuity Patients Could Generate Substantial Medicare Savings. Health Affairs 32:12. December 2013.

[29] For example: (1) Queen Anne's County MICH Program reports 82% of its participants are Medicare beneficiaries and 5.6% are Medicaid beneficiaries; and (2) Prince George's County MIH Program reports 56% are Medicare patients and 19% are Medicaid patients. Baltimore City Fire Department's payer mix (for all transports) is 43% Medicaid and 32% Medicare (FY15 data).

[30] Report of the Workgroup on Rural Health Delivery to the Maryland Health Care Commission. "Transforming Maryland's Rural Healthcare System: A Regional Approach to Rural Healthcare Delivery." p. 17, 2017.

responds to cardiac arrests, trauma, and other critical cases. High ambulance off-load times also decrease EMS productivity as ambulance crews wait to hand-over patient care to hospital personnel and the financial and personnel costs of such delays are a burden to EMS programs. Delays in ambulance off-load also raise potential EMTALA concerns. EMTALA requires that a patient receive a medical screening examination upon arrival to determine if an emergency medical condition exists.

Other Statewide System Improvements

The report finds a number of factors outside of direct hospital or EMS control that exacerbate wait times for patients and contribute to ED overcrowding. Most notably, there has been an increase in behavioral health patients treated at EDs, including overdose patients, which can have a ripple effect throughout the hospital. As noted in the report, behavioral health patients can present major challenges and may require isolated space and ongoing supervision for protracted periods while ED personnel pursue placement and therapy. Hospitals report a challenge in finding appropriate community-based treatment for behavioral health patients, indicating the need to enhance the public and private behavioral health infrastructure in the State.

To alleviate overcrowding at Maryland Emergency Departments, there must be a comprehensive, multi-faceted solution that addresses the many points in the health care system that prohibit the delivery of appropriate care in the appropriate setting for patients. System improvements for pre-hospital transportation, hospital throughput efficiency, and services in the community all need to be incorporated into potential strategies to improve the delivery of care.

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