

Emergency Department Utilization by Californians with Sickle Cell Disease, 2005-2014

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October, 2016: DOI: 10.1016/j.annemergmed.2016.08.293

Presented orally at the American Society of Hematology Annual Meeting in San Diego, CA, December

Background: High utilization of emergency department (ED) services among those with sickle cell disease (SCD) compared to the general population and compared to those with other chronic diseases is well documented in the literature. Some reports note that high utilization is episodic. Most analyses address the problem as a consistent one within patients, rather than consistent over time across the patient population but sporadic for patients. Reducing the high rate of ED utilization among patients with SCD requires an understanding of temporal patterns of ED utilization, the consistency of ED utilization over time by patients and the proportion of the population affected at any given time.

Methods: CDC has developed the Sickle Cell Data Collection program (SCDC) to conduct state level surveillance in this disease, and to continue and improve upon work begun through the Registry and Surveillance System in Hemoglobinopathies (RuSH). Through SCDC, California has collected ED and hospitalization data for years 2005-2014 on 4,325 people with SCD. A period of high ED utilization among this cohort was defined as three or more ED encounters (either treat and release or admission to the hospital from the ED) for any diagnosis (not only SCD diagnoses) each fewer than 30 days from the prior visit. The start of an episode of high utilization is the date of the first ED encounter; the end is the date of the last eligible ED encounter. All cohort members were divided into categories of utilization using the proportion of time spent in periods of high utilization divided by the total time in cohort. Total time in cohort is defined as the length of time from the earliest appearance in the ED or hospital data 2005-2014 to the latest appearance. The five categories were defined as no episodes of high ED utilization, and approximate quartile groups for those with high ED utilization: 1.1 to 3.0%, 3.1-10.0%, 10.1% or greater. Age categories (pediatric is < 21 years, and adult is 21 years or older) are defined as patient age at close of study (end of 2014) or at death if prior. Patient ID beginning with P is a pediatric, A is adult in the figures.

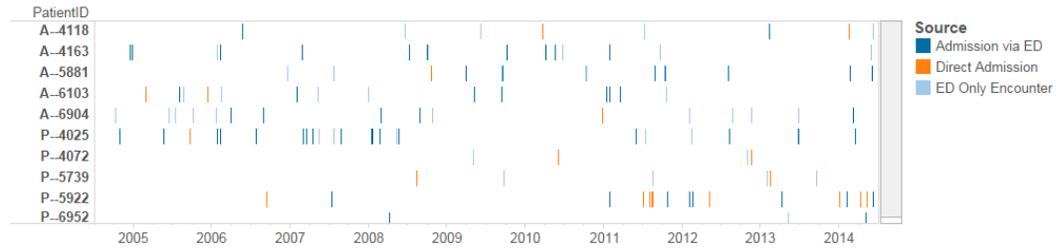
Results: There were 4,325 individuals with 27,694 person years in the cohort (mean 6.4 person years, median 7.6 person years). Sixty-three percent (n=2,715) of the cohort were aged 21 years and older. Forty-five percent, (n=1,955, 513 pediatric and 1,442 adults) had at least one episode of high utilization during the 10 year study for a total of 7,866 episodes of high utilization. Forty-three percent of patients with one or more high utilization episodes were male, and 63% were between the ages of 20 and 50. Nine percent of these high utilizing patients' total time in the cohort was made up of episodes of high utilization. The mean time span from start of episodes of high utilization to end of the episodes was 63.3 days, median 35 days; mean number of ED visits per episode was 9.0, median 4.0. Most episodes of high utilization were brief: 42.2% included just three visits, and 70.7% included five or fewer ED visits. Among these individuals with episodes of high utilization, the mean number of such episodes was 4.0 over the 10 years study period, and the median was 2.0. Most (76.4%) had five or fewer high utilization episodes, and 35.5% had just one (n = 693). Sample utilization patterns, including hospital admissions, are shown in Figure 1.

Conclusions: We demonstrate that among individuals with SCD seen in a population-based, statewide surveillance system, periods of high ED utilization are common, but most SCD patients have only a

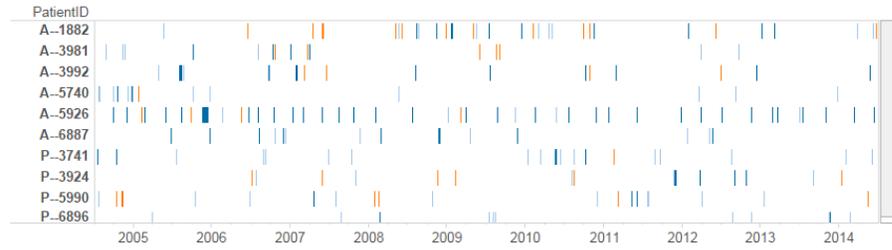
limited number of short episodes of such utilization. We found that high ED utilization is episodic rather than consistent within individuals, and that while the range of time spent in episodes of high utilization varies, few patients are high utilizers of ED services over a long period of time. Statewide surveillance that follows individual patients over time and in different hospital settings and includes ED utilization (including visits not coded as being related to SCD), provides high quality public health information to inform clinicians and healthcare systems in their development of efforts to reduce ED utilization among those living with SCD.

CA ED and Hospital Admission 2005-2014 among SCD Patients

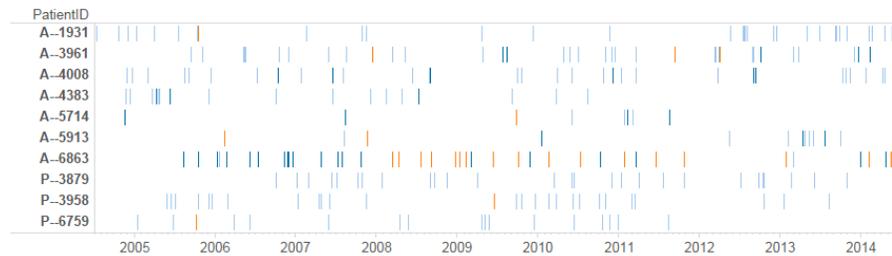
No Periods of High ED Utilization (Sample)



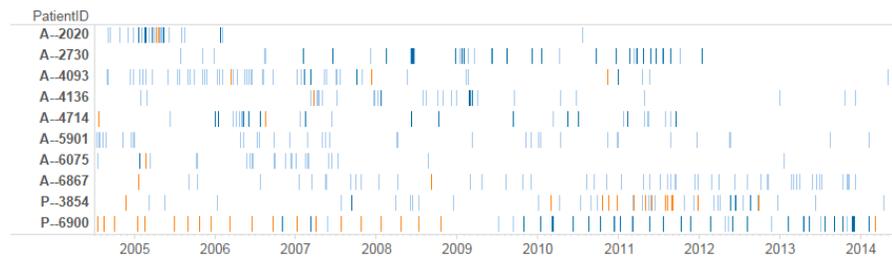
Up to 1% of Time in High Utilization



1 to 2.9% of Time in High Utilization



3 to 9.9% of Time in High Utilization



10% or More of Time in High Utilization

