

## Effectiveness of a dedicated day hospital for management of acute sickle cell pain

**Severe acute pain is common in sickle cell disease (SCD). Increasingly overburdened emergency departments are not the most appropriate setting in which to manage pain that requires close monitoring and careful opioid dose titration.<sup>1</sup> We report on the benefit of treating acute pain in SCD in a day hospital (DH).**

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The DH, a 2-bed monitored unit, was set up in July 2002 and operates between 8 am-5 pm, 5 days a week for the evaluation and treatment of acute uncomplicated SCD pain. Admission to the DH is controlled by a nurse practitioner (NP) who independently manages the patients. A hematologist is available for consultation. Patients are evaluated for pain control every half hour and IV opioids titrated to pain relief accordingly in a step-wise fashion. Records of SCD patients with the following ICD9 codes of 282.42, 282.62, 282.64 and 282.69 (corresponding to uncomplicated acute painful episodes) who attended the outpatient SCD clinic or the emergency department (ED) were reviewed for the period between January 2000 and December 2003. Admissions and discharges related to ED and DH visits were calculated from the records. Our study was approved by the Institutional Review Board at our institution. A baseline admission rate of 58.65% was calculated for ED visits prior to the establishment of the DH. Inpatient admission rates from the ED and DH admission were 57.6% and 5% respectively (Table 1). Mean hospital cost for all patients seen in the DH vs ED was \$1,609 vs \$2,689 ( $p$  value <0.0001). The mean length of stay (LOS) was 5.7 days vs 3.6 days ( $p$ <0.02) in the DH vs ED.

The management of SCD is well described.<sup>2-6</sup> Wright *et al.*<sup>7</sup> and Benjamin and co-workers in a large metropolitan hospital have reported on the establishment of a DH. They showed a reduction in ED use, hospital admissions, hospital LOS and a reduction in total hospital health-care costs in their patient populations (a \$1.7 million dollar saving with the establishment of a DH over a five-year period).<sup>8</sup> Rapid alleviation of pain should be a prime goal in the management of pain in patients with SCD because the frequency of painful episodes is associated with earlier death.<sup>9</sup>

While 94% of our subjects reported pain relief after 4 hours of continuous pain management and IV hydration, 6% of patients were admitted to the hospital for unresolved pain. Patients were likely to be admitted into hospital if pain control could not be achieved within 4 hours of presentation to the DH. We Most healthcare facilities use the same for diagnosis and procedures. Therefore, cost represents an easy comparison between healthcare facilities.<sup>10</sup> Overall, for all patients, the hospital cost was much lower in the DH compared to the ED \$2,689.07 vs \$1,609.52 ( $p$ -value <0.0001). This is a saving of \$1,080 for each patient seen in the DH instead of the ED. Over a number of years several millions of dollars are saved. Approximately 95% of subjects who used the DH for acute painful episode were discharged home, compared to 43% in the ED (Table 1). This could be due to the low patient to nurse ratio in the DH and the availability of dedicated medical personnel who quickly identified and alleviated the patient's pain so hospital admission was not required. This would be impossible in the ED because of the complexity of cases and

**Table 1.** Admission rate: DH vs ED (2000-2003).

	Admits (%)	$p$ value	Odds ratio
Day Visits = 274	14 (5)	$p$ <0.0001	0.0476 (95% CI: 0.0271-0.0833)
ED Visits = 612	325 (57.6)		

patient load. Gender was not shown to affect hospitalization rates. Our data took into account outcomes of ED visits during periods when the DH was not open. This showed more subjects were discharged home reflecting an increase in discharge rate above the baseline in the ED (patients were too few for statistical analysis). Since patients were admitted to a dedicated SCD service this may explain why no difference was observed in LOS. This is in contrast to the Benjamin study where patients were admitted to either a SCD or general medicine service. The calculated cost does not include the additional direct and indirect cost of maintaining the ED or the DH with regards to the number of FTE (much higher in the ED vs DH). To summarize, when patients with SCD form a clinically significant number of all hospital admissions, a DH is a useful approach to manage their uncomplicated acute pain.

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