Study suggests sick children should be tranferred to specialty hospitals sooner

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Critically ill children admitted to the pediatric intensive care units of regional medical centers from smaller hospitals are sicker than those admitted directly from those centers' own emergency rooms, a study by pediatric critical care physicians at UC Davis Children's Hospital has found.

The study, published online in the April 2008 issue of the journal *Pediatrics*, suggests the need for better coordination between smaller hospitals and regional medical centers, including greater use of telemedicine to provide emergency and critical care consultation on when to transfer sick children to larger hospitals.

"Kids who get transferred require more days of kidney dialysis, more days of mechanical ventilation to support their lung function and more medication to help them maintain their blood pressure and heart function" than children admitted directly from medical center emergency rooms, said study lead author Christopher Gregory, an assistant professor of pediatric critical care medicine at UC Davis Children's Hospital.

The broadly based study examined over 13,000 admissions of patients 18 years old and younger to pediatric intensive care units (PICUs) between January 2001 and January 2006. The admission information was derived from a national database of PICU admissions from community hospitals to 20 regional academic medical centers throughout the nation.

Children who were admitted to regional medical centers from community hospitals were sicker, requiring an average of eight days of hospitalization in PICUs compared to only 6.7 days for patients admitted from within the medical centers. In addition, 45 percent of children transferred from community hospitals needed mechanical ventilation to help them breathe compared to only 28.5 percent of the children admitted from medical centers' emergency departments. And children transferred from outside hospitals needed medication to control their blood pressure and support their heart function 7 percent of the time while children admitted to PICUs from their own medical centers' emergency departments needed similar medication only 5 percent of the time.

Because children are generally healthy, the largest percentage of patients in the study were treated for traumatic injuries — 18 percent — and for pneumonia — 16 percent. Ten percent of PICU admissions were for seizures, about 7 percent were for asthma and 6 percent were for diabetic shock. Other reasons for admission included serious infections (sepsis), heart disease, cancer, suicide attempts and shock.

Gregory said that determining why children transferred to regional medical centers from smaller hospitals need longer hospital stays and more intervention will require additional study.

"These differences could be secondary to an underestimation of the severity of illness or inadequate treatment of critically ill children at remote hospitals before transfer to tertiary (medical center) facilities or to physiologic deterioration of patients before or during transport," the study says.

"Maybe it's because these children are initially presenting at a hospital where they aren't familiar with treating very sick kids and they're getting worse while they're there. Maybe it's the process of being transported

that is creating the discrepancy. Another possibility is that the parents of kids who don't live close to a tertiary care center wait to take their child to the hospital because it's too far away," Gregory said.

The study notes that the "use of telemedicine technology to provide emergency and critical care consultation to remote hospitals and the availability of specialized pediatric transport services have been demonstrated to be both feasible and to improve outcomes" in previous studies.

"The use of telemedicine allows the pediatric specialists from the regional children's hospitals to help in the evaluation, treatment and planning for when, or if, critically ill children should be transported to regional medical centers," said study senior author James Marcin, a professor of pediatric critical care medicine and director of the UC Davis Children's Hospital Telemedicine Program.

"The take-away message from this study is that there are sick kids presenting at community hospitals and we at regional medical centers need to do as much outreach as we can with these hospitals to improve their comfort levels with working with us to help them decide when to send us their patients," Gregory said.

Source: University of California - Davis