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# When paediatric patients are critically ill

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EDITORIAL

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**Some sick children need closer monitoring than can be provided in a paediatric ward. For many, a paediatric high dependency unit may represent a more appropriate level of care.**

In this edition of the Journal of the Norwegian Medical Association, Dahle-Andersen et al. report on the experiences from the first five years of the paediatric high dependency unit (PHDU) at Haukeland University Hospital [\(1\)](#). The unit treats children aged 0–18 years with paediatric medical conditions requiring a high level of care. Similar units are planned for other paediatric wards, and it is therefore of great interest that the results and experiences from this unit are now being published.

All paediatric wards admit children who are acutely, seriously ill or whose condition deteriorates during their stay in hospital. Many will, for a period, need closer monitoring than is normally provided on general wards. Dedicated high dependency units have long been available for adult patients, but there is a need for a structured and quality-assured provision of high dependency care for children.

In 2016, the Norwegian Society of Paediatricians set up an interdisciplinary working group which was tasked with drawing up recommendations for high dependency care for paediatric hospital patients. In this context, a *high dependency unit* is defined as a unit providing a higher level of monitoring and treatment than that provided in a general ward, but not as advanced as in an

intensive care unit. The *Norwegian standard for paediatric high dependency care* from 2018 describes the framework for operation, competence and equipment (2). The document also indicates that the provision of paediatric high dependency care must be adapted to hospital size and other local conditions. A review in 2020 showed that 9 out of 20 paediatric departments in Norway had established a PHDU in their own department, while a further 7 departments were planning such a unit.

The study by Dahle-Andersen et al. showed that the children admitted to the PHDU were often very young. The median age was 1.5 years, and 45 % of the patients were under the age of one. Respiratory problems were the most common reason for admission to the PHDU (40 %), and 30 % received non-invasive ventilation support. These experiences are largely consistent with findings from PHDUs in other countries (3). Other key patient groups in the study were children with sepsis (15 %) and diabetic ketoacidosis (8 %). Almost half of the children who were admitted to the PHDU were transferred directly from the emergency department, and the length of stay in the unit was short (median 23 hours).

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In the absence of intermediate paediatric care units in paediatric departments in Norway, it can be assumed that the threshold for the admission of children to intensive care units has been lower than for adults. The establishment of quality-assured high dependency care in the paediatric departments will therefore, ideally, enable a more appropriate distribution of patients and utilisation of intensive care capacity. It is therefore worth reflecting on why there was no reduction in the number of paediatric admissions to the intensive care unit after the opening of the PHDU at Haukeland University Hospital. The authors point to increasing morbidity in the hospital population as a potential explanation for this. Raising the age limit for admission to the paediatric ward in the same period from 16 to 18 may also have played a role (1).

The study from Bergen indicates that the new PHDU has had an impact on the level of care provided for certain patient groups. After the unit opened, the proportion of children with diabetic ketoacidosis who were transferred to the intensive care unit decreased, and children who were transferred to the intensive care unit due to respiratory failure were more likely to receive ventilator treatment, which may indicate higher morbidity. Other paediatric departments with their own PHDU report similar experiences.

In many paediatric wards, the establishment of a high dependency unit has enabled the use of non-invasive ventilation support with CPAP. Being treated in a paediatric ward rather than having to be transferred to an intensive care unit can have major benefits for young children with respiratory diseases caused by infection and for children with chronic lung disease. This is particularly the case in hospitals without a paediatric intensive care unit. The physical

surroundings within a general intensive care unit are not always suitable for children. Nor is there any provision for parents to stay with their child round the clock. Intensive care unit staff, who mainly treat adults, may feel insecure about treating young children (4). They have less knowledge about diseases that are typical for this patient group, e.g. bronchiolitis. The risk of medicine dosage errors is higher, and medical equipment in an intensive care unit may not be suitable for the age group.

By virtue of its regional functions, the Department of Paediatric and Adolescent Medicine at Haukeland University Hospital treats a large number of children with complicated and serious medical conditions. Nevertheless, this study highlights one of the main challenges with the provision of paediatric high dependency care in Norway, namely the low volume of paediatric patients in need of this level of care. The number of admissions to the PHDU at Haukeland University Hospital rose throughout the study period, but even the year with the highest occupancy rate (2021) had an average of fewer than 0.7 admissions per day. Combined with the short lengths of stay and the considerable seasonal variations, this makes operational and staff planning difficult. Maintaining the necessary expertise among doctors and nurses on a 24-hour basis is a challenge due to the wide range of ages and diagnoses within the paediatric wards as well as the low patient volume. Clinical skills are best maintained by using them, and small units are highly vulnerable in this respect. Most paediatric departments in Norway will have a lower occupancy rate than the paediatric department at Haukeland University Hospital. Careful planning and continued interdisciplinary collaboration are needed if the quality of the service provision for the sickest children is to be on a par with that for adults.

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