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Admission, discharge and return transfer process

for paediatric intensive care units

October 2022

NSW GOVERNMENT

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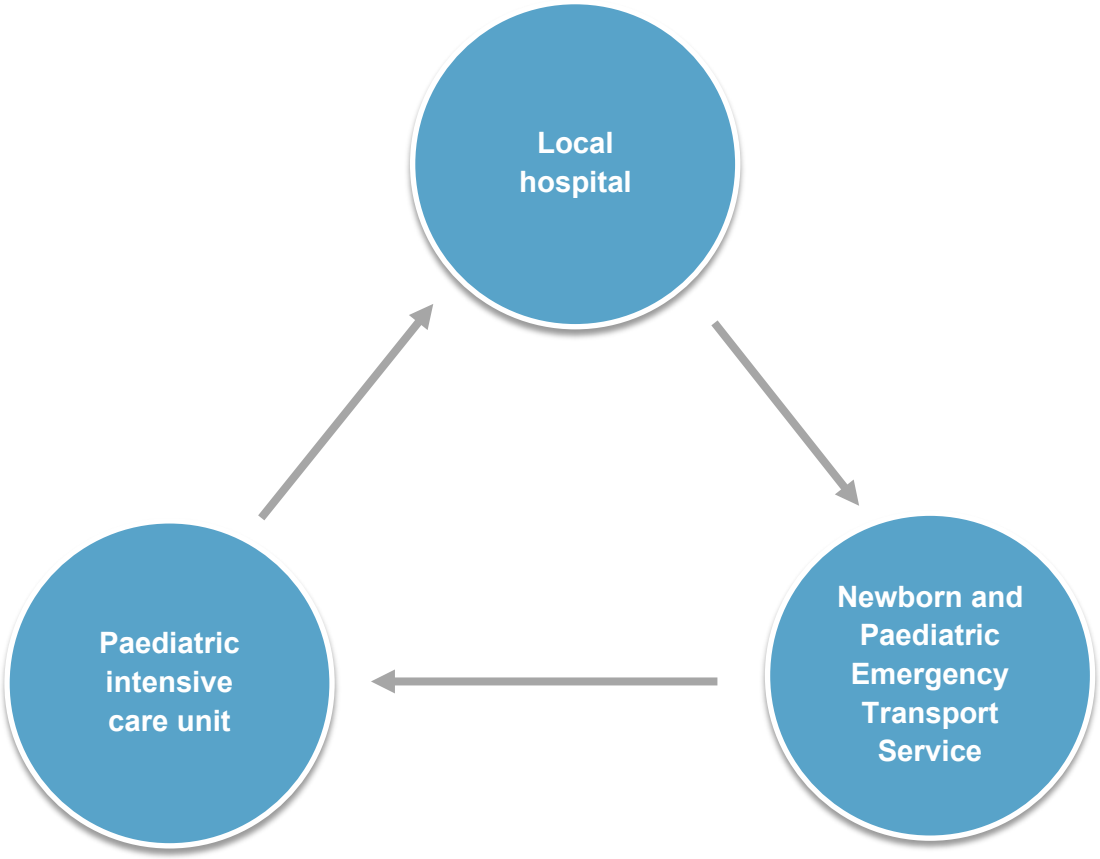
Contents

Executive summary

The purpose of this document is to describe the role of the paediatric intensive care unit (PICU) in supporting the principle that children receive the right care at the right place and at the right time as close to home as possible.

This includes return transfer to the hospital of origin or transfer of care closer to home, when medically appropriate. Transfers of care closer to home will be planned in collaboration with the child's family and local clinical teams. The transfers will generally be undertaken by the Newborn and Paediatric Emergency Transport Service (NETS).



Introduction and background

In 2019, the NSW Ministry of Health released the *Neonatal and Paediatric Intensive Care Services Consultation Report and Recommendations*.[1] The report makes 14 recommendations to support the planning and provision of neonatal intensive care unit (NICU) and paediatric intensive care unit (PICU) services in NSW.

Clinical care pathways and protocols are frequently different across different sites, potentially leading to clinical variation.[2] To address this, several models of care were implemented in some areas, based on:

- best practice
- innovation
- evidence.

These include close observation units, step-down opportunities from the intensive care unit to the paediatric ward and models to support smaller organisations to flex up and provide care to sicker children.[2]

Paediatric intensive care services in NSW provide expert advice and manage children with critical illnesses or injuries. In NSW there are three level six PICUs. The Children's Hospital at Westmead has 22 funded ICU beds plus four close observation beds. The Sydney Children's Hospital has 17 funded ICU beds and the John Hunter Children's Hospital has five funded ICU beds.

Children are referred from wards, operating theatres and emergency departments within hospitals and across the state. They are referred by teams for intensive care following planned surgery and procedures.

Care is led by the duty paediatric intensive care specialist and managed by a team of nursing, medical, allied health and support staff. The PICUs generally admit children under 16 years of age. Children with chronic and complex conditions who have not completed transition to adult health services may be admitted up to 18 years of age.

Method

To inform the development of this guide, a scan of current literature showed only international resources that did not align with NSW or Australian processes. The search for literature to inform this document was initially a bibliography citation search conducted using keywords: "paediatric intensive care (PICU)", "admission to PICU", "discharge from PICU", "transfer of care" and "back transfer".

Following this, a structured search of databases was conducted and a search of international paediatric intensive care unit websites for procedures and policies. There were no specific clinical incidents reported in relation to admission or discharge to PICUs. However, there were clinical incidents reported in relation to:

- communication
- transfer of care
- transport.

A working group was established from the Agency of Clinical Innovation (ACI) Intensive Care NSW (ICNSW), Paediatric Intensive Care Advisory Group. This group contained clinicians with PICU, NETS and paediatric experience in rural, regional and metro areas. It also included executives. The group consulted with Sydney Children's Hospitals Network clinical governance unit and the NSW chief paediatrician on the development of the document. A repository of current admission and discharge procedures and operating business rules was gathered from all PICUs, paediatric units and NETS to supplement NSW Ministry of Health policies and directives. Clinicians were consulted on their current admission and discharge practices. The review of these documents and current practices informed the development of this guide.

Admission to paediatric intensive care unit

Admission to PICU is based on:

- a child's specific condition
- a child needing a higher level of medical and nursing care than can be delivered at the referring site
- a child's condition deteriorating and requiring paediatric intensive care.

Clinicians can use virtual care to seek early support and advice from local and regional services, where appropriate. When needed, specialised statewide services, such as NETS or a retrieval service and PICUs, can be contacted. They can provide definitive care and potential transfer in collaboration with the PICU admitting officer. The admitting officer will make the clinical decision on whether to admit the child to PICU as one possible outcome. Or they may decide that the child is able to be managed at the referring hospital with support and advice from the PICU. If the plan is to transfer a child to another facility within the local health district but the child begins to deteriorate, advice can also be sought from NETS.

During the admission process it is crucial that the child's family is involved, and adequate accommodation is provided for them to remain with their child. To facilitate this, referral to a social worker will be needed to assist with accommodation and other needs of the family while they are away from home.

The criteria for admission to PICU is based on the following principles.

1. Safely match the child's condition to the most appropriate PICU.
2. Provide care as close to home as possible.
3. Consider local capacity.

Appendix 1 provides an outline of some of the clinical conditions that may require referral to a PICU or are ideally managed in an intensive care environment.

Process

When a child or neonate requires transfer, NETS and retrieval services use the statewide bed availability platform as a matrix to view available PICU beds in the state. In collaboration with the receiving site, NETS or the retrieval service will decide on the most appropriate PICU bed based on:

- location
- capability
- capacity, including the need for cross border transfer.

When planning to transfer a child to a different facility within the same local health district, consideration must be given for the potential for the child to deteriorate. Early signs of deterioration must be recognised and early involvement with NETS initiated.

Clinical advice may be sought from the PICU if the child's condition is not acutely deteriorating, or the child is known to the PICU. This advice may support the local hospital and clinicians to manage the child in a safe and supported environment. Planned admissions requiring paediatric intensive care after scheduled procedures will be booked into the most appropriate PICU by the specialist team managing the child and their condition.

Local hospital

If the child is deteriorating the medical team will contact NETS for referral or their local PICU for advice and support.

NETS

If the child requires transfer, NETS will use the bed availability platform to view available PICU beds in the state.

NETS will transfer the child to the most appropriate PICU, depending on the child's condition and admission criteria.

PICU

Once the child is admitted to the PICU, the discharge process back to their local facility will begin.

Return transfer

When the child has recovered from their illness, the return transfer back to their local facility will take place.

Before transfer the treating clinicians must ensure the child is able to be managed in the local facility and any follow-up care pathways are in place.

Discharge from paediatric intensive care unit

To support continuity of care and efficient use of resources, discharge planning is commenced from the time of admission to PICU. Discharge will generally be to the paediatric ward and once clinically appropriate the child may be discharged to their referring hospital closer to home. This will depend on the medical decision and collaboration between the intensivist, the child's paediatrician or specialist and the family.

Children admitted to a PICU have daily formal reviews by members of the multidisciplinary team. This is crucial for care planning and to review their current condition and treatment. The formal reviews identify when intensive monitoring, observation and treatment are no longer needed for the child and their condition has improved. These are the criteria on which the intensivist will decide that the child is ready for discharge from PICU.

Continual communication with families regarding the child's clinical status and progression should occur throughout the child's stay in PICU. Virtual transfer of care and communication can support and prepare the receiving hospital and family for the pending discharge and transfer of the child to a hospital closer to home.

Return transfer of care back to the referring hospital

When a child is ready to be discharged from PICU, the discharge planning process should maintain the principle that the destination should be the right place for the child's care and be as close to their home as possible. Discharge planning needs to be done in partnership (or consultation) with treating clinicians from both hospitals, as well as family members, to determine the most appropriate pathway for the child.

This may be for the child to remain in the current hospital paediatric ward and be discharged home from there. Or it could be that after some time in the paediatric ward, the child transfers back to the referring hospital close to home until they have recovered enough to go home. There are benefits of a return transfer to a local facility. These include the opportunity for the patient and their family to link in with community services closer to home and arrange follow up with a local paediatrician or general practitioner.

Decisions to transfer a child back to a hospital close to home require consideration of the following.

- The availability of appropriate staffing and resources to provide the necessary care for the child.
- The ongoing level of care and service delivery required for the child.
- The ongoing medical care and assessment of the child.
- That there are effective communication channels between the Intensivist, paediatricians, nursing teams, allied health clinicians, sub-speciality teams and parents and carers.
- The use of virtual care to undertake a multidisciplinary handover and facilitate transition for the child and their family.
- A completed discharge summary is available to all clinicians involved in care, including NETS and the base hospital referring consultant. The discharge summary should include any tertiary follow up that may be required.

- The availability of a bed at the referring hospital.
- The availability of appropriate transport to transfer the child back to the referring hospital.

The parent or guardian must continue to be informed about transfer arrangements, particularly if there is a change to departure time.[3] All relevant documentation and links to appropriate imaging of the child's history, treatment and management plan must be forwarded to the referring hospital consultant and medical team to assist staff in the care of the child.

Governance

Governance processes should be in place at all hospitals throughout the child's journey and must include the following.

- Staff are trained with the skills to identify the deteriorating child and initiate early referral to NETS for support and potential retrieval.
- The provision of an escalation care pathway for acute deterioration of the child's condition at referring hospitals with clear roles, responsibilities and contact numbers available to the staff.
- Each site has a clear referral process to a tertiary PICU through collaboration with NETS and retrieval services.
- There must be a medical officer in charge of the child's care at each stage of the child's journey.
- The local medical team will be responsible for the child's care until they leave the referring hospital. Care will then be taken over by NETS in collaboration with the PICU intensivist.
- Once the child has left the referring hospital, NETS or the retrieval services are responsible for the child until they are admitted to the receiving hospital.
- Communication channels, either virtual or by telephone, must be available to clinicians to contact NETS and retrieval services, or the receiving hospital, to support the care of the child.
- If virtual care is used for the admission or discharge process, appropriate, functional modalities and specialised systems need to be available for clinicians to use at both the referring and receiving sites. Staff should also be trained and educated about these.

While the child is being cared for in the PICU, all decisions on care and treatment are made by the intensivist who is on call. Where appropriate, some decisions on the child's treatment will be made in collaboration with the child's multidisciplinary team. Consistent, accurate information must be provided to the family regarding the child's condition, progress and discharge planning.

Appendix 1: Conditions that may be managed within a PICU

Respiratory

- Threatened airway or respiratory distress with the need for invasive or non-invasive ventilation
- Patients who have recurrent apnoea
- Supplemental oxygen requirement exceeding 6L min to maintain saturation >94%
- Half hourly or continuous inhaled or nebulised medications
- Recurrent adrenaline nebuliser to manage croup or any other airway obstruction

Circulation

- Shock of any aetiology requiring more than 40mL/kg of fluid resuscitation or inotropic support or a persistent blood lactate >2mmol/L
- Post-cardiopulmonary resuscitation
- Any arrhythmias with haemodynamic compromise
- Congenital heart disease or heart failure with unstable cardiorespiratory status
- Hypertensive emergency (severe increased blood pressure with end-organ dysfunction)
- Severe anaphylaxis requiring repeated adrenaline

Neurological

- Seizures unresponsive to initial therapy and requiring a continuous infusion of anticonvulsive agent
- Acutely and severely altered sensorium where neurologic deterioration or depression is likely or coma
- Progressive neuromuscular dysfunction requiring cardiovascular monitoring and/or respiratory support
- Acute inflammation or infections of the spinal cord, meninges or brain with metabolic and hormonal abnormalities or the possibility of increased intracranial pressure
- Suspected increased intracranial pressure from any cause (altered sensorium with hypertension and/or bradycardia)

Endocrine or metabolic

- Life threatening or unstable endocrine or metabolic disease
- Severe diabetic ketoacidosis
- Severe electrolyte abnormalities
- Suspected inborn errors of metabolism with hyperammonaemia or potential for acute deterioration

Haematology or oncology

- Plasmapheresis or leukapheresis with unstable clinical condition
- Severe coagulopathy with compromise
- Severe anaemia with haemodynamic and/or respiratory compromise
- Acute severe tumour lysis syndrome
- Life-threatening haemorrhage
- Masses compressing or threatening to compress vital vessels, organs or airway

Renal

- Acute renal failure with electrolyte or acid-base abnormality or with fluid overload
- Acute rhabdomyolysis with renal insufficiency or electrolyte disturbance
- Hypertension requiring frequent intermittent intravenous or orally administered medication or with evidence of encephalopathy

Surgical

- General surgery with haemodynamic or respiratory instability
- Cardiothoracic surgery (only performed within a tertiary children's hospital)
- Neurosurgery with neurological compromise requiring a high level of monitoring
- Ear nose and throat surgery with airway compromise
- Any surgery for multi-trauma
- Orthopaedic and spinal surgery with risk of neurological or circulatory compromise
- Unexpected intra-operative complications requiring close observation

Multisystem

- Toxic ingestions and drug overdoses with potential acute decompensation of major organ systems
- Electrical injuries with ongoing compromise
- Drowning with ongoing compromise
- Respiratory or cardiorespiratory compromise requiring urgent consideration for extracorporeal support

Gastrointestinal

- Severe non-acute bleeding leading to haemodynamic or respiratory compromise
- Emergency endoscopy for removal of foreign bodies and any battery, magnet or caustic ingestion
- Acute hepatic failure

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Glossary

ICNSW	Intensive Care NSW
NETS	Newborn and Paediatric Emergency Transport Service
NICU	Neonatal Intensive Care Unit
PICU	Paediatric Intensive Care Unit
Virtual care	Technology used for virtual communication

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