



**Scottish Patient Safety Paediatric Programme  
Critical Care Workstream  
Driver Diagram and Change Package**



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A driver diagram is used to conceptualise an issue and to determine its system components which will then create a pathway to achieve the goal.

Outcome	Primary Drivers (Primary Drivers are system components which will contribute to moving the primary outcome)	Secondary Drivers (Secondary drivers are elements of the associated primary driver. They contain change concepts that can be used to create projects that will affect the primary driver)
<p><b>Improve paediatric care outcomes (Reduce mortality, infections and other adverse events)</b></p>	<p>Appropriate, timely and reliable evidence-based critical care therapies.</p>	<p>Reduce complications from ventilators.</p> <p>Reduce complications from central venous catheters.</p> <p>Prevent healthcare associated infections and cross contamination.</p> <p>Sepsis recognition and treatment.</p>
	<p>Child and family centred-care</p>	<p>Child/family involvement in daily goal setting.</p> <p>Open communication between team, child and family.</p> <p>Joint end of life care planning.</p> <p>Child/young person's physical and environmental comfort.</p>
	<p>Effective and collaborative multidisciplinary teams.</p>	<p>Reliable care planning, communication and collaboration of a multidisciplinary team.</p>
	<p>Infrastructure and culture that promotes safety and quality.</p>	<p>Optimal flow of children and young people through critical care wards.</p> <p>Infrastructure and leadership to deliver consistent and reliable, evidence based care.</p> <p>Timely, regular feedback to clinicians of quality and safety performance measures.</p> <p>Staff with improvement skills.</p>



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<p><b>Secondary Drivers</b></p>	<p><b>Change concepts and ideas for PDSA testing</b>  <b>‘Bolded’</b> items are required elements of SPSP</p>
<p>Reduce complications from ventilators.</p>	<p>Consider non-invasive ventilation and avoid intubation in appropriate cases  <b>Use paediatric ventilator-acquired pneumonia (VAP) prevention bundle:</b></p> <ul style="list-style-type: none"> <li>• bed elevation -30-45 degrees; (neonates 15-30 degrees);</li> <li>• daily sedation vacations;</li> <li>• sedation to be reviewed - daily assessment of weaning/readiness to extubate;</li> <li>• peptic ulcer prophylaxis;</li> <li>• deep vein thrombosis prophylaxis (unless contraindicated), for age-appropriate children.</li> <li>• comprehensive mouth care.</li> </ul> <p>DVT prophylaxis protocol          Develop sedation protocol          Develop weaning protocol          Develop ALI/ARDS protocol          Develop oral care protocol and aspiration precautions          Develop mobility protocol</p>
<p>Reduce complications from central venous catheters (CVC).</p>	<p>Consider appropriate device – catheter type, number of lumens, length of therapy  <b>Use CVC insertion bundle (see documentation for further details):</b></p> <ul style="list-style-type: none"> <li>• hand hygiene;</li> <li>• transparent semi-permeable dressings (use gauze only with bleeding/oozing);</li> <li>• maximum barrier protection /aseptic non-touch technique;</li> <li>• skin preparation - 2% chlorhexidine (unless contraindicated).</li> </ul> <p>Reduce variability in insertion process.          Insertion checklist and documentation.          Develop CVC carts for insertion process.          Catheter insertion training for all providers.          Share insertion protocols with Accident &amp; Emergency and theatres.</p> <p><b>Use CVC maintenance bundle:</b></p> <ul style="list-style-type: none"> <li>• daily assessment and documentation of line necessity;</li> <li>• hand hygiene prior to line maintenance and access;</li> <li>• date time of dressing applied and change at 7 days;</li> <li>• replace dressing if damp, loose, visibly soiled;</li> <li>• 2% chlorhexidin (unless contraindicated) for cleaning site during dressing changes;</li> </ul>

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	<ul style="list-style-type: none"> <li>• catheter/hub/cap/tubing care.</li> </ul> <p>Use line carts and dressing change kits to standardise processes.          Develop cap change kit.          Review catheter necessity during multi-disciplinary rounds.          Catheter maintenance training for all.          Minimise catheter manipulations.          Share maintenance protocols with oncology and paediatric wards.</p>
Prevent healthcare associated infections and cross contamination.	<p><b>Peripheral vascular catheter (PVC) insertion bundle</b></p> <ul style="list-style-type: none"> <li>• hand hygiene;</li> <li>• non-sterile gloves / aseptic non-touch technique;</li> <li>• transparent semi-permeable dressings;</li> <li>• skin preparation - 2% chlorhexidine (unless contraindicated).</li> </ul> <p>Develop PVC insertion kit.</p> <p><b>Peripheral vascular catheter (PVC) maintenance bundle:</b></p> <ul style="list-style-type: none"> <li>• perform hand hygiene before and after all PVC procedures.</li> <li>• review in-situ PVCs - are they still required?</li> <li>• remove PVCs where there is extravasation or inflammation;</li> <li>• check PVC dressings are intact; change dressing every 7 days or if dirty or loose;</li> <li>• consider removal of PVCs in situ longer than 72 hours.</li> </ul> <p>Identify patients with active surveillance cultures (ASC):</p> <ul style="list-style-type: none"> <li>• Identify patients to be cultured;</li> <li>• Create reliable process to obtain and process cultures;</li> <li>• Create reliable and timely processes for notification of culture;</li> <li>• Create a protocol for management of colonised patients.</li> <li>• Monitor and provide feedback on ASC testing and patient management procedures.</li> <li>• Flag colonised patients.</li> </ul> <p>Use contact precautions and dedicated equipment for colonised / infected children / young people</p> <ul style="list-style-type: none"> <li>• Ensure staff knowledge re contact precautions (current staff, new employees and rotating staff).</li> <li>• Place infected and colonised patients on contact precautions, as per CDC/HICPAC or other guidelines.</li> <li>• Place patients in single rooms if possible.</li> <li>• If necessary, cohort patients.</li> <li>• If single rooms or cohorting is not possible, create a “security zone” around the bedspace (e.g., red tape on</li> </ul>

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the floor).

- If patient must be transported, alert receiving area/ward/service.
- Monitor and provide feedback.

Use appropriate room cleaning and disinfection

- Educate staff on cleaning and disinfection procedures and assess competence.
- Wear appropriate attire (gown, gloves) when cleaning.
- Make it easy to distinguish disinfected equipment from contaminated equipment.
- Disinfect reusable equipment.
- Put environmental services personnel on the improvement team.
- Prioritise room cleaning and disinfection by focusing on frequently touched surfaces e.g. bedrails, doorknobs, bathroom fixtures, etc.
- Create a checklist for room cleaning.
- Monitor and provide feedback.

Use dedicated equipment for colonised/infected children/young people

- Educate staff on appropriate management of equipment.
- Ensure availability of required supplies.
- Monitor and provide feedback on availability and compliance with use.

**Establish reliable hand hygiene practices:**

- ensure staff knowledge about infection, transmission principles, hand hygiene, and hand washing technique;
- make hand washing facilities, soap, alcohol and gloves available at the point of care;
- monitor and provide feedback of infection data and hand hygiene compliance to clinicians;
- create a culture that supports reliable hand hygiene.

**Optimise antimicrobial prescribing:**

- Use protocols and auto-stop points for antibiotics.
- Establish formulary restriction.
- Establish clinical practice guidelines with standardised order sets.
- Standard order sets contain pre-approved indications (best if part of computerised physician order entry).
- Pharmacy substitution/switch; protocol-driven IV/PO switch.
- Provide unit specific/provider utilisation feedback.
- Therapeutic de-escalation.

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	<ul style="list-style-type: none"> <li>• Computer-assisted antibiotic management.</li> <li>• Antibiotic cycling.</li> <li>• Monitor and feedback on exception reporting.</li> </ul> <p>Use decolonisation to decrease burden of organisms</p>
Sepsis recognition and treatment.	
Child/family involvement in daily goal setting.	<p>Include family in multi-disciplinary rounds.</p> <p><b>Include child, young person or family in daily goal setting.</b></p>
Open communication between team, child and family.	<p>Establish processes to promote open communication among caregivers and family:</p> <ul style="list-style-type: none"> <li>• Institute open visitation for families in PICUs/HDUs.</li> <li>• Request families' support care by asking questions, checking HOB.</li> <li>• Use grease boards to enhance communication between team and families.</li> <li>• Use voicemail systems for family communication.</li> <li>• Educate family about risk of self-extubation when ventilated.</li> </ul>
Joint end of life care planning	<p>Establish reliable processes to clarify care wishes and provide end of life care planning:</p> <ul style="list-style-type: none"> <li>• schedule routine family meetings to discuss care wishes;</li> <li>• establish and publicise end of life care team;</li> <li>• establish triggers for automatic consultation to end of life care team.</li> </ul>
Child/young person's physical and environmental comfort.	<p>Involve child, young person or parent in care planning.</p>
Reliable care planning, communication and collaboration of a multidisciplinary team.	<p><b>Establish Daily Goals</b></p> <ul style="list-style-type: none"> <li>• Establish appropriate, explicit daily goals for patients</li> <li>• Use daily goal sheet to document and communicate</li> <li>• Assess patients' progress in meeting daily goals</li> </ul> <p><b>Institute multi-disciplinary rounds</b></p> <ul style="list-style-type: none"> <li>• include paediatricians, nurses, end of life care, pharmacy, physiotherapy, nutrition, case managers, social work, chaplaincy, family members and other key care team members in rounds;</li> <li>• use discipline-specific rounding and prep sheets to prompt clinicians on key items to address during rounds.</li> </ul> <p>Institute unit based safety briefings</p>



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	<ul style="list-style-type: none"> <li>Focus on patients with increased risk for self-extubation and injury, for example, sedation interruption, head trauma and weaning.</li> </ul> <p>Use simulation of low frequency, high-risk events and re-enactments to maintain competency and enhance system capability.</p> <p>Standardise clinical communications – escalations and handovers</p> <ul style="list-style-type: none"> <li>Use SBAR format: Situation, Background, Assessment, Recommendation.</li> <li>Use standard handover templates.</li> </ul> <p>Conduct formal team training programme.</p> <p>Staff with improvement skills:</p> <ul style="list-style-type: none"> <li>SPSPP workstream huddles.</li> <li>Use measures to view outcomes over time.</li> <li>Publish timely feedback on progress towards critical care aims.</li> </ul>
Optimal flow of children and young people through critical care wards.	Structured communication techniques for admission and discharge handovers.
Infrastructure and leadership to deliver consistent and reliable, evidence based care.	Assign leadership for critical care workstream.
Timely, regular feedback to clinicians of quality and safety performance measures.	Timely, regular feedback to clinicians of quality and safety performance measures: <ul style="list-style-type: none"> <li>paediatric critical care learning from paediatric mortality &amp; trigger tool reviews.</li> </ul>
Timely, regular feedback to clinicians of quality and safety performance measures.	<b>Feedback from paediatric trigger tool</b> Feedback from mortality reviews
Staff with improvement skills.	SPSPP workstream huddles Use measures to view outcomes over time. Publish timely feedback on progress towards critical care aims.

