Intervention The main instigated changes involved creating uniform circulation trolleys containing all the required equipment for paediatric cannulation and giving a bolus of rescue fluid. The bay had 3 grab trolleys and all were identical. To aid restocking, a label was placed below each piece of equipment to state what should be there and photographic checklists were created. The same principle was used for the airway trolley which, while being organised for weight, had an identical layout in each drawer and the same labelling system and checklist.
Study design This was an observational study based on the time taken for SHO's to find emergency equipment pre and post changes.
Strategy for change The changes were implemented by a Paediatric SHO and F1 who redesigned, labelled and restocked the trolleys. This was organised prior to the new rotational doctors starting who were then inducted around the department by one of the study organisers.
Measurement of improvement We timed SHO's finding equipment pre and post changes.
Results

Abstract G553(P) Table 1 Time taken for SHO's to find equipment pre and post changes

	SHO 1 (pre changes)	SHO 2 (post changes)
Airway test	2 mins 34 s	1 min 49 s
Circulation test	6 min 31 s (incomplete)	1 min 7 s

Prior to the changes SHO 1 took a protracted amount of time to find a paediatric non-rebreath mask and during the circulation speed test searched multiple drawers, could only find half a culture kit and used the last bag of 10% dextrose in the paediatric resuscitation bay. After our implementation, SHO 2 found all of the airway adjuncts in the airway trolley and only required one grab trolley to successfully collate all the circulation equipment with a decrease in time.
Effects of changes Although two SHO's were used, both were of a similar grade and had had a similar amount of exposure and experience within the resuscitation bay. Simple measures, requiring no additional equipment or money, were taken to standardise the area. Substantial improvements in time were noted in both tests. Nursing staff and doctors reported finding the area easier to use, more logical and clearer to restock.
Lessons learnt Simple changes can make a demonstrable difference and improve patient safety.
Message for others We showed with no money or extra resources you can ensure a safer environment for patients by ensuring uniformity and clear labelling.

G554(P) IMPLEMENTATION OF AN INTEGRATED INPATIENT PAEDIATRIC MORTALITY REDUCTION INTERVENTION

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Background Based at a University teaching hospital in Northern Ethiopia, the author was placed through Voluntary Services Oversea's (VSO) as a Paediatric Senior. The department witnesses a high Paediatric mortality rate amongst inpatients (30%, non-neonatal). Ward level care is largely provided by junior doctors (Interns). A gap in knowledge and skills of up-to-date resuscitation practices was identified in this group.
Project design The project included an intervention to improve Intern knowledge and skills. The intervention comprised development of a resuscitation protocol package with suitable training. A baseline audit of all Paediatric admissions (excluding neonates) over a three month period provided mortality data including specifics of disease category. This highlighted the conditions with highest rates of mortality at our hospital: severe acute malnutrition, coma, meningitis, congestive heart failure (CHF), hypovolaemic shock and meningitis. The Paediatric senior faculty developed five, locally appropriate, protocols to address the acute management of these conditions plus added three complementary protocols based on those promoted by the Emergency Triage, Assessment and Treatment (ETAT), WHO. The final protocol package included: respiratory distress, hypovolaemic shock, septic shock, coma, CHF, airway emergencies, seizure and cardio-pulmonary resuscitation (CPR). The nuances of acute malnutrition were addressed in each protocol. The package provided readily available, locally appropriate guidelines to provide evidence based information for Interns.

The protocol package was implemented with a training programme of all Interns rotating through the Paediatric department during the study period (n = 21, September 6th to December 9th 2011). A full day simulation based training course was developed to introduce the concept and use of the protocol package plus development of key resuscitation skills: bag mask ventilation, CPR plus intra-osseous needle placement. Simulation based scenarios were developed to build on theoretical knowledge provided in short didactic lectures and allow practice of skills.
Results 474 patients were admitted in the baseline group and 432 following the intervention. No change was observed for overall mortality (crude OR=0.72, 95% CI 0.40–1.29, p = 0.265). No change was observed in first-24-hour mortality (crude OR 0.97, 95% CI 0.37–2.55, p = 0.959).

Total examination scores improved from median 32.6 to 73.5% ($p < 0.001$), with improvements observed for all tested skills. Median scores improved from 11.1 to 77.8% on bag mask ventilation, from 11.1 to 88.9% on CPR, from 40.0 to 100% on intraosseous needle placement, and from 21.7 to 87.0% in aggregate for all observed procedural skills ($p < 0.001$ for all parameters).
Evaluation Two aspects were evaluated to aid measurement of success. An audit of inpatient admissions was carried out pre and post Intern training. Data was collected from the ward log book and entered into an Excel spreadsheet. The primary and secondary outcomes included crude mortality plus mortality within the first 24 h and were expressed as a percentage of admissions. Odds ratios for these outcomes were calculated using univariable logistic regression.

Evaluation of Intern knowledge and skills took place pre- and post-training to assess the impact of the simulation based program. Testing took place in multiple choice format with videos of critically ill children to focus on pattern recognition and triage skills plus a theory paper to assess problem-solving in emergency situations. Procedural skills were tested by direct observation. Trainees were asked to demonstrate skills covered in the course while project coordinators applied a standardised, checklist-based marking tool to evaluate their performance. Median trainee examination scores were calculated as percentage answered correctly and pre- and post-training results were compared by Wilcoxon matched-pairs signed ranks test.
Conclusions Combining care standardisation, management protocols, and simulation-based training did not red uce mortality among non-neonatal Paediatric inpatients in this study.

Simulation-based training improved short-term test performance among Ethiopian medical trainees.

G555(P) QUALITY IMPROVEMENT IN ENDOTRACHEAL INTUBATION IN A PAEDIATRIC EMERGENCY DEPARTMENT: CHECKLIST DEVELOPMENT AND IMPLEMENTATION USING SIMULATION AND ACTION CARDS

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Background Endotracheal intubation in paediatric emergency medicine is a relatively infrequent event with a significant complication rate. Strong evidence exists for the use of checklists around emergency intubations to improve safety.

This QI project took place in a dedicated Children's Emergency Department (CED), seeing 33 000 presentations a year. Our institution takes part in the National Emergency Airway Registry for Children (NEAR4KIDS), an international, multicentre advanced airway registry and quality improvement initiative. Measures such as number of attempts to successful advanced airway placement, saturation changes during RSI and tracheal intubation-associated adverse events are being used to regularly evaluate airway management within each participating institution. Out-of-theatre endotracheal intubation data has been captured since March 2013. Previously, we successfully increased inconsistent end-tidal CO2 use to almost 100% after a quality improvement push based on NEAR4KIDS data. No intubation checklist was used at our institution until December 2014, when an Emergency Intubation Checklist was implemented in our Paediatric Intensive Care Unit (PICU) and CED. It was deemed important to create a hospital-wide checklist. This would promote team coherence for CED emergency intubations, when often both PICU and CED staff are involved. PICU sees around 150 intubations annually; CED intubates around 25 children a year. The team members' familiarity with advanced airway management is therefore potentially very different.

Method We decided on a step-wise, simulation-based checklist development and implementation. Step 1 involved identifying key checklist elements, using other intubation checklists and expert opinions from within our institution and externally. Step 2 involved developing a checklist of essential actions and tasks based on the roles of the airway team members. Step 3 involved running low-fidelity simulated scenarios using the checklist with the CED Nurse Educators. Step 4 consisted of medium-fidelity simulation training for CED junior doctors. We amended the checklist based on feedback given by the Nurse Educators and CED doctors. Step 3 and 4 elucidated the need for a tool to speed up and aid preparation for intubation prior to completing the checklist. A solution was found in creating role-specific action cards for airway team members: event manager, airway doctor, airway assistant, medication nurse, circulation nurse. These are laminated A5 size cards, stating a role and its actions required to prepare for intubation. Step 5 involved introduction of the intubation quality improvement package to all CED staff, using a variety of simulated scenarios aimed at each level of nursing and medical staff involved in advanced airway management. The final step is assessment of the QI tool's effect on patient care, with adaptations actioned as needed.

Results Introduction of this quality improvement package has been well received. Team member feedback (both nursing and medical) was uniformly positive. The cards aided role allocation, allowed speedier preparation for intubation and promoted role flexibility. The effects on patient outcome are measured as part of the Near 4 kids airway collaboration. We anticipate being able to report some simulation based results over the next 3 months.

Conclusion A shared checklist for PICU and ED appears to be helpful. Involvement of all levels of medical and nursing staff in the development of this quality improvement tool ensured buy-in. Simulation-based introduction of an intubation checklist in a low-volume setting such as a paediatric emergency department allows timely implementation. Action cards are an excellent way to teach and reinforce checklist-related roles. Effect on patient outcomes will be reported in the near future.

G556(P) IS MEAN BLOOD SUGAR MONITORING WITH SMART METRE A BETTER INDICATOR OF CONTROL THAN HBA1C IN PAEDIATRIC DIABETES?

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Context Kettering General Hospital, Distric Hospital, United Kingdom. Number of paediatric patients with type 1 diabetes - 140.

Multidisciplinary Team: Paediatric Diabetes Specialist Consultant, paediatric registrars, diabetic nurses, dietician.

Problem For paediatric diabetes patients, effective glucose control with less variability is always challenging. Inadequate control can lead to recurrent hospital admissions affecting patient's quality of life.

Assessment of problem and analysis of its causes MDT identified following potential causes for inadequate control.

1. Clinic HbA1C is performed 4 times a year to monitor glycaemic control but it may not truly reflect day to day control of patient's blood sugar levels at home which can be significantly up and down.
2. Maintaining a hand written sugar diary can be difficult for patients with compliance issues.
3. Interpretation of an inadequately filled paper diary can be challenging for doctors as well as patients as it does not give an idea of trends of sugar levels and therefore does not reflect glycaemic control and variability.
4. Patients can also experience difficulties in calculating right dose of insulin at home.

Intervention Patients were provided SMART metres after an education about their use.

They were taken through a process of on-going learning to review and analyse the SMART metre downloads and make appropriate changes to their insulin needs to prevent high and low sugars.

The MDT had an oversight of the process to actively facilitate the learning to decrease admissions aiming for diabetes home care.

In 3 monthly clinics near patient HbA1c testing as well as SMART metre downloads were used to analyse patient compliance and treatment results

Study design Prospective data collection during clinics from January to June 2014.