

Think ECG, not just the rhythm

Boby Rupa Sarder 1¹, Anjali Shah 2², Anna McCorquodale 3³
Princess Alexandra Hospital NHS net

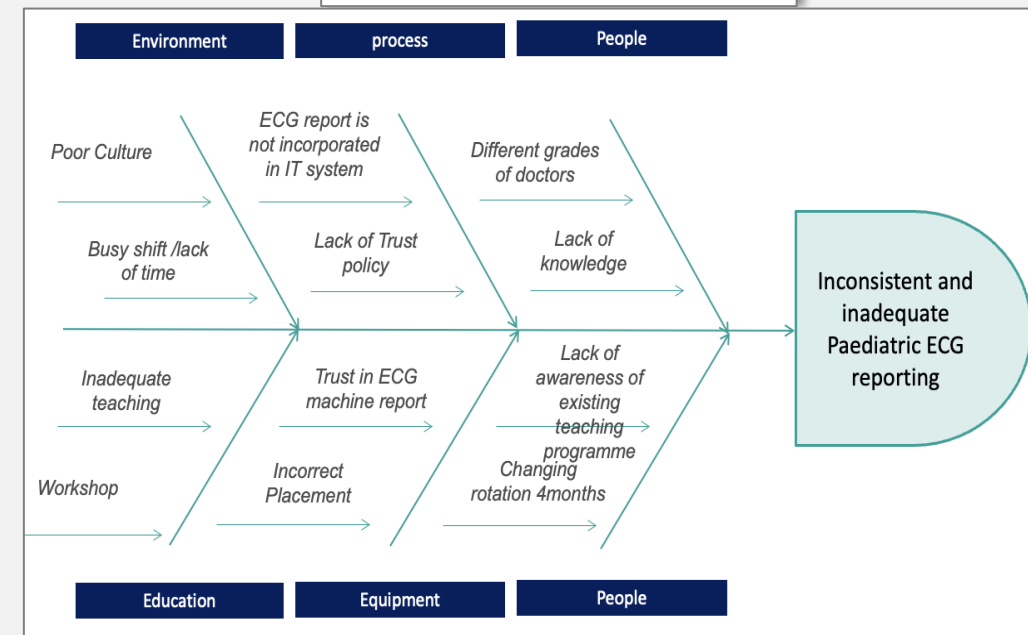
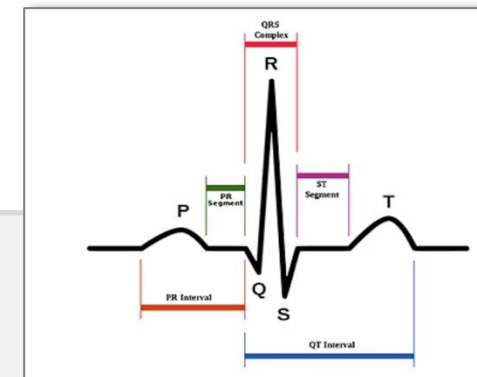
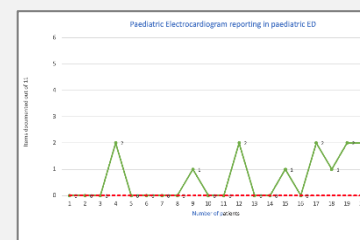
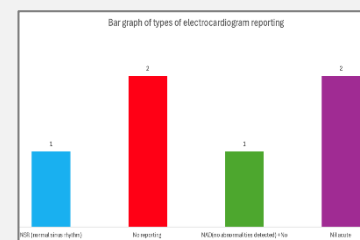
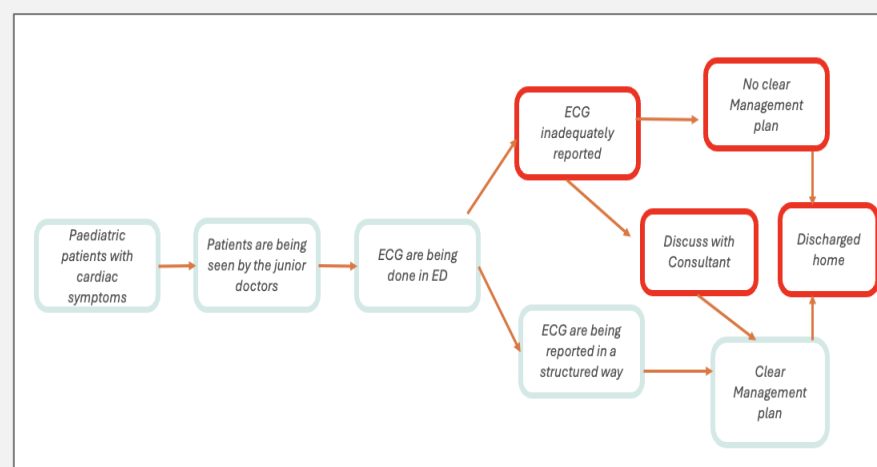
PROBLEM

Inconsistent and inadequate reporting of Paediatric ECGs risks us missing ECG abnormalities with risk of sudden cardiac death. It also delays in providing correct diagnosis and management for children.

BACKGROUND

ECG reporting in our Emergency Department is inadequate and inconsistent, and patients are being discharged. Not having structured reporting increases the risk of missing abnormalities in ECG, which might lead to sudden cardiac death.

DIAGNOSTICS



AIM

Analysis and detailed interpretation of ECGs are done for 6 out of 10 children in our ED and clearly documented to inform the next stage of care by 15th August 2024 (current performance 0 out of 10).

MEASURE

Is the proforma correctly filled in?
How many items are being filled out of 11 (rate, rhythm, axis, P wave morphology, PR interval, delta wave, QRS duration, QRS amplitude, QTc, ST segment, T wave morphology)?

Inclusions

All the ECGs are being done in children <16 years of age in the Paediatric Emergency Department.

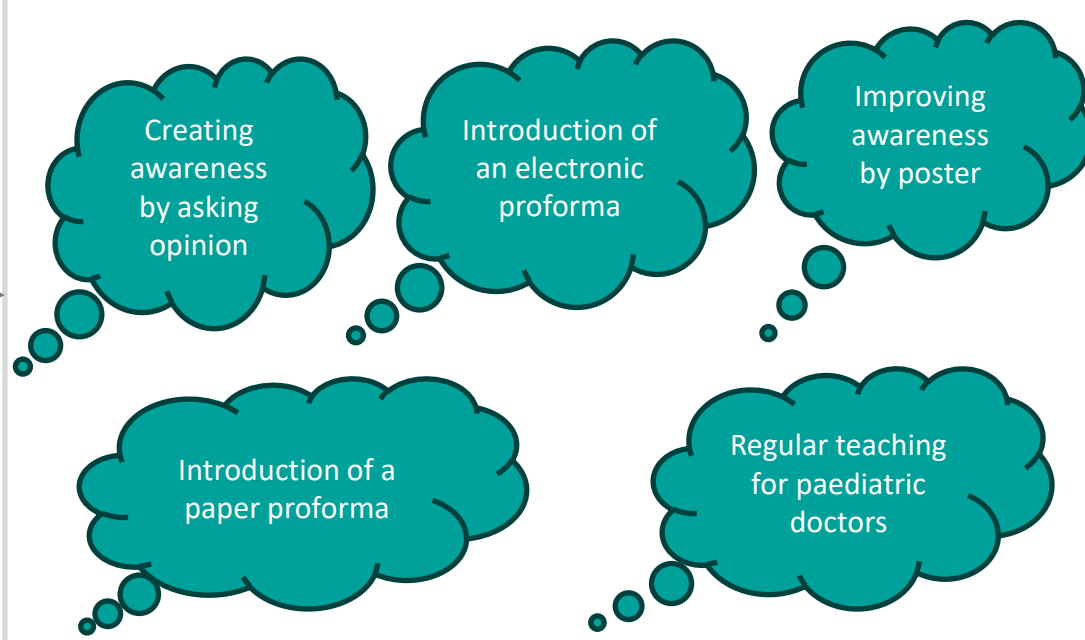
Exclusions

Children in other areas (ward, NICU, urgent treatment centre).
Young people 16 years and over.

Sampling method and frequency

Review of Electronic notes on a weekly basis that are used in the Paediatric Emergency Department.

CHANGE IDEAS



PDSAs

PDSA Test #	PLAN	Do	STUDY	ACT
1	Create awareness by asking a) Do they think inconsistent and incomplete electrocardiograms (ECG) are a problem? b) What do they think about the potential causes? c) Will it be a good idea to introduce a paper proforma?	Spoke to 10 colleagues.	Colleagues agreed that this is a significant problem, discussed potential causes, and, most importantly informed that there is requirement for teaching on this topic. They felt it will be good to use a proforma.	Identify what colleagues think are necessary items on ECG reporting proforma.

PDSA Test	Plan	Do	Study	Act
2.1	Identify necessary items on electrocardiogram (ECG) proforma.	Dot voting of necessary items(10) on Electrocardiogram (ECG) reporting proforma.	6 out of 9 agreed with all items. 3 out of 9 felt that not all the items are necessary as ED is a busy environment and needs to keep things to a minimum.	Discuss with the supervising consultant if a few items can be reduced from the proforma.

PDSA Test	Plan	Do	Study	Act
2.2	Discuss with the supervising consultant regarding a) The number of items that must be recorded b) Supporting document when using the electrocardiogram proforma	I have written a) A proforma based on the dot voting and b) Supporting information as a guide when using the electrocardiogram proforma	1) Two more items were added, and one was deleted from the electrocardiogram reporting proforma. Total items are now 11. 2) Some items on the supporting document require clarification.	Electrocardiogram reporting proforma and supporting document when using the proforma were amended.
2.3	Develop a supporting document as guide when using the electrocardiogram proforma.	Developed supporting information as a guide when using electrocardiogram proforma.	Consultant advised to provide clarification on some items on the supporting document.	Amended supporting document.
2.4	Discuss with supervising consultant all above and the number of items that must be reported.	Discussed with consultant.	Advised to add heart rate chart and abnormal example of electrocardiogram axis.	Added information, sent email and has been approved by consultant.

PDSA test	Plan	Do	Study	Act
3.1	Provide education sessions on ECG reporting to the emergency doctors	Discussed with supervising consultant and college tutor how to organise	Advised to email specific consultant responsible for emergency department teaching.	Email the ED consultant responsible for teaching to request a slot in the teaching rota.
3.2	Explore other avenues of teaching	I discussed with advanced emergency nurse practitioner who does regular teaching with emergency doctors	She is happy to share the proforma in her teaching session in the emergency department	Finalise the proforma and email to the nurse practitioner

Paediatric ECG reporting proforma
Attach with the ECG Trace

Patient Name :
DOB :
Hosp/NHS number:

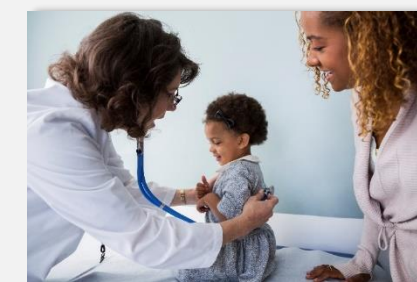
Indication for ECG	Date	Time	Comment (normal/abnormal)
Rate	beats / min		
Rhythm	sinus / non-sinus		
Axis (range)	degrees		
P wave morphology			
PR interval	ms		
Delta wave	Yes / No		
QRS duration	ms		
QRS amplitude (VL/V5)	mm		
QTc	ms		
ST segment	Isolated / elevated / depressed		
T wave morphology			

Conclusion
Normal ☐
Borderline ☐
Abnormal ☐

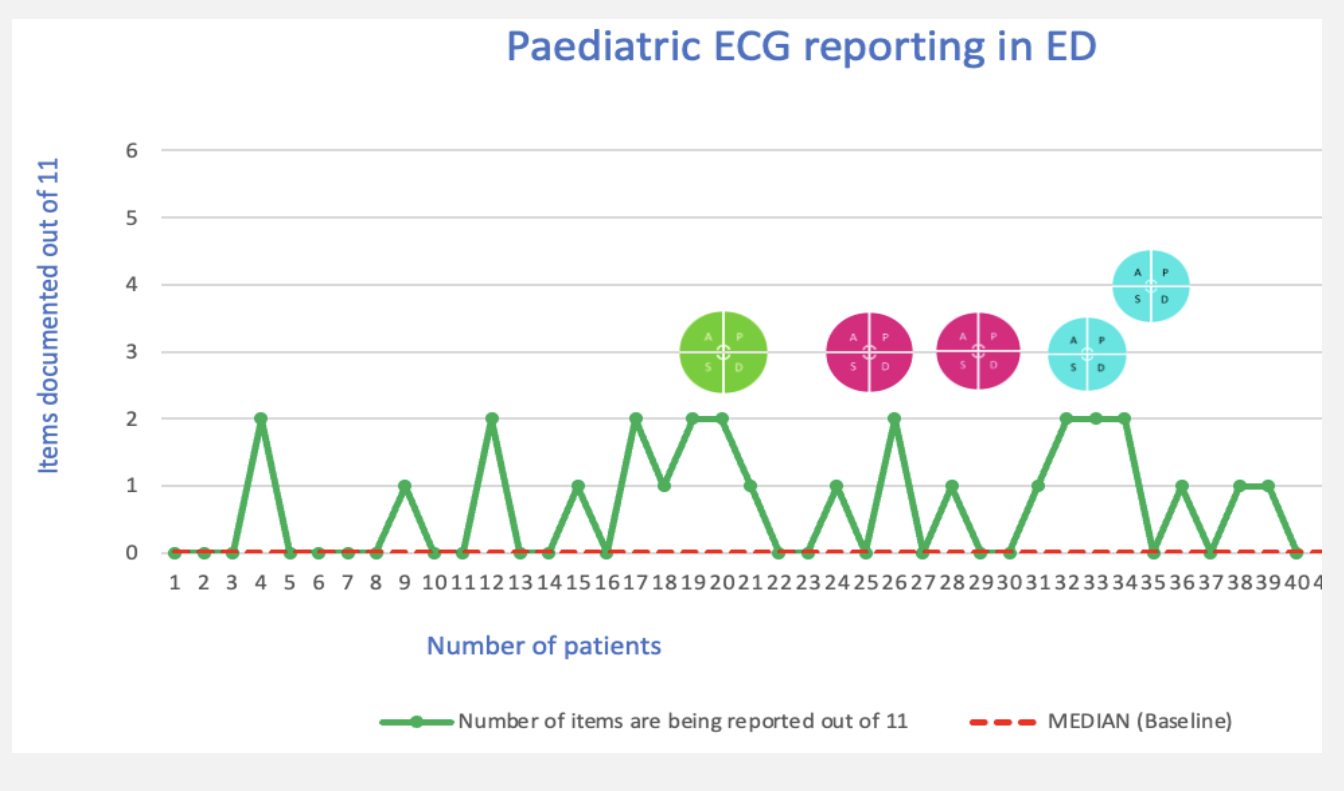
Borderline/Abnormal ECG must be reviewed by a Senior Clinician. Tertiary Cardiac advice where needed is from Paediatric Cardiology Registrar at the Royal Brompton Hospital.

Plan/Follow up

Completed by (Doctors name) _____ Consultant covering ED: _____
Grade _____ Signature _____



RUN CHART



CONCLUSION & LEARNING

- Though I did not achieve my aim, by creating awareness and discussion with colleagues, I was able to increase the number of items recorded marginally. However, my data shows that clear documentation of interpretation is still falling a long way short of my aim.
- The change idea of using proforma faced resistance from the stakeholders, and it took time to involve them and get their agreement.
- It is important to keep my change ideas simple and aim to see a small improvement at a time. Though I had not managed to incorporate the proforma for ECG reporting, creating an awareness and education helped.
- Collecting data weekly is important to see which change idea is working.
- QI is an ongoing process, and I intend to provide education and encouragement/involve other colleagues in taking this forward.

REFLECTIONS

- Every small step counts towards quality improvement - PDSA cycles can be very small and helps guide us on what change ideas work and what to adapt.
- Bringing about change takes time - This course taught me the importance of defining the problem clearly, exploring change ideas and consider other options if a specific idea doesn't work

