



SusQI Project Report

Project Title: Reducing Unnecessary Cannulation in the Emergency Department.	Date of Report: Project completed in 2018 as part of the Royal Devon and Exeter Green Team Competition.
Team Members: <ul style="list-style-type: none">• Cassie Worth - Emergency Medicine Consultant• Suzie Faulkner - Matron• George Page -	

Background:
Before this project was carried out, inserting a cannula for a patient arriving in the emergency department (ED) was considered 'routine' care. As part of the cannulation policy, all cannulae were fitted with a Bionector for infection control purposes. Staff noticed when reviewing patients that many cannulae were not used, or used inappropriately (e.g., intravenous fluids or drugs used when the patient was able to drink and take oral medications). It was suspected that practice of inserting a cannula 'routinely' led to significant waste in terms of equipment required and intravenous fluids and medicines. This process was also ineffective use of clinician time and unnecessarily uncomfortable for patients.

Specific Aims: To reduce unnecessary cannulation in the emergency department (ED).
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Methods: The team completed a process map to better understand the patient pathway and at what specific points in the pathway an unnecessary cannulation may occur (Appendix 1). The team then planned an audit to test the hypothesis that a significant number of cannulations were unnecessary. A data

proforma was developed and provided to staff at thrice daily handovers and was also available on equipment trolleys where cannula insertion kits were kept. ED consultants raised awareness of the audit at the thrice-daily team handovers. A poster campaign was also developed, with posters displayed around the ED and on equipment trolleys. A collection tray for completed proformas was placed in ED.

For 1 week, doctors and nurses inserting cannulae completed a data proforma recording

- patient's reasons for admission
- intended indication for insertion
- number of attempts at insertion (i.e. number of cannulae used)
- if a Bionector was used
- whether the cannula was used in ED and if so, what the cannula was used for.

The audit also identified that, where cannulae were likely to be short term, such as in theatres or the resus section of ED then Bionectors were not mandated, but in the main ED, where cannulae were also often required short term, Bionectors were mandated.

Change implemented:

- The audit results were presented informally at handovers and formally via a presentation.
- A revised cannulation policy for the ED was developed and agreed with the infection control team. This policy stated if a cannula is likely to be required short term only, a Bionector does not need to be used.
- Education was carried out encouraging staff to think before you cannulate, including education on correct use of cannulae and raising awareness of the revised policy. After the education campaign, the consultants stopped mentioning the audit and changes at handovers.

Measurements:

The initial audit revealed that of the 143 cannulas inserted (that were recorded), 44% were not used in ED, and of these, 112 were fitted with a Bionector, 43% of which were not used.

A 1 week audit was repeated 1 month after the education campaign to assess if the education campaign had been effective and if reduction in unnecessary cannulation had been embedded.

Environmental: To identify CO₂e savings from reduced use/procurement of the cannula and Bionectors, the financial cost and emissions factor for medical/surgical equipment¹ was used.

At each cannulation the following kit is required: alcohol wipe, disposable tourniquet, cannula, cannula dressing, gauze, blood bottle adapter, 10ml saline ampoule, 10ml syringe, Bionector and packaging. The weight of the above items was used to identify amount of waste generated, totaling 62g per insertion. The carbon emission factor for incineration of clinical waste² was used to identify waste savings in CO₂e.

Financial: Costs for items required and clinical waste stream were obtained via the Trust procurement and estates teams.

Social: Social benefits were observed informally via discussions with staff.

Results:

Clinical outcomes:

- The total number of patients cannulated reduced by 59% (143 to 58)
- The number of patients who had an unnecessary cannula inserted was reduced by 70% (64 to 19)
- The number of patients fitted with a Bionector reduced by 79%
- As more than 1 attempt at insertion was made for some patients, there was total reduction of 105 cannula and 98 Bionectors per week.

The reduction in cannulation has clinical and health benefits for patients by:

- reducing pain and discomfort for no therapeutic benefit
- reducing physical restriction: having a cannula in situ can be physically awkward for a patient when washing, toileting and intravenous interventions impede mobility.
- encouraging use of the oral route for fluids and medications which is better for health than intravenous fluids.
- Reducing risk of cannulae site infections

Environmental sustainability:

A summary of results from 1 week is shown in the table below.

CO2e	Initial audit	Post change audit	Saving
From cannula	98.51 kgCO2e	40.40 kgCO2e	58.11kgCO2e
From Bionector	144.56 kgCO2e	41.15 kgCO2e	103.41kgCO2e
Total	243.07 kgCO2e	80.55 kgCO2e	161.52kgCO2e

The reduction in 105 cannula and 97 Bionectors per week is a 66% reduction, equating to 161.52 kgCO2e saved per week. Of this saving; 56.7kgCO2e was due to reduction in use/procurement of cannula, 103.13kgCO2e was attributed to reduced use/procurement of Bionector. Waste disposal of cannula contributed 1.41kgCO2e and of Bionectors contributed 0.27kgCO2e.

Projected across a year, this is a total saving of **8,399kgCO2e**.

Social sustainability:

A reduction in cannulae insertions led to a substantial amount of staff time gained as staff did not need to gather equipment, wash hands and insert the cannula. Using oral, rather than intravenous fluids and medications also potentially has time savings for staff.

Dr Cassie Worth, Emergency Medicine Consultant, said;

"The project has brought about real cultural and behavioural changes in the department.

Now that we have participated in the Green Ward Competition many clinicians are approaching me with ideas for other sustainability projects. We have a long list!"

Economic sustainability:

Including purchasing and waste disposal, £535 is saved per week, equating to £27,830 over one year.

Barriers encountered / Limitations of the work

- It was observed by the lead consultant on this project, that carrying out the initial phase of the audit with an awareness from the wider team resulted in clinicians thinking more carefully about their cannulation practice. This likely led to a reduction in unnecessary cannulation during the initial audit phase, so the savings may be even greater than identified.
- The overall number of patients admitted to ED during the pre and post audit was not collected for comparison.
- Data was not collected on whether cannulae were used to take blood. If a cannula was not used, then the use of usual blood-taking kits should be taken into account in both CO₂e and financial calculations.
- Patient perspectives on the experience of cannulation were not collected.

Conclusions:

Through this project a reduction of 66% of unnecessary cannulations were achieved. There is potential to further increase both the carbon and financial savings in ED by reducing this percentage even further.

This project is applicable to many clinical areas and has been selected for the concept to be spread to other areas of the hospital.

References:

1. Emissions factor for medical/surgical equipment (0.23 kgCO₂e/£) obtained from the Sustainable Development Unit 2018/19 database.
2. Emissions factor for waste incineration (220 kgCO₂e/tonne) obtained from *Sustainability Reporting Template 2018/19 (Sustainable Development Unit)*.

*Please note the Sustainable Development Unit (now the Greener NHS Team) emissions factors used are now out of date. Please refer to updated factors for new projects.

Appendix 1: Process Map

