



# Final Project Submission Form

**Health Service:**

RWH

**Department:**

Ultrasound Services

**Title of project:**

Reducing plastic speculums for gynaecological ultrasound procedures

**Introduction**

*Provide a short introduction about yourself, your project, and why you were inspired to create sustainable environmental change in your department.*

I work three sessions a week as a Consultant Sonologist in the Women's Ultrasound Services.

When I was a fellow, we used metal speculums as the default option for all gynaecological procedures and I completed my training in November 2020.

I noticed in late 2021, that plastic speculums had appeared on the procedural trolley. Unsure when and why they were first introduced, I asked the Nurse in-charge if we could move back to metal speculums as the default to reduce plastic waste.

The rationale is based on a life-cycle analysis of disposable vaginal specula compared with reusable alternatives showed that single-use plastic speculums are associated with increased greenhouse gas emissions with no significant difference in clinical utility (Donahue LM, Hilton S, Bell SG, et al. A comparative carbon footprint analysis of disposable and reusable vaginal specula. Am J Obstet Gynecol 2020;223:225.e1-7. <https://doi.org/10.1016/j.ajog.2020.02.007>).

**What was the problem you tackled?**

Reduce the use of single-use vaginal speculum for ultrasound based gynaecological procedures by obtaining nursing and medical staff support to reserve the use of plastic speculums only when the reusable speculum is not suitable due to its size or patient preference.

**What was your SMART Goal?**

Reduce the number of plastic speculums used for gynaecological ultrasound procedures by 50% by November 2024 to reduce the carbon pollution associated with single-use instruments.

**What system factors contributed to the problem?**

- 1) Health services in general moving to disposable single-use instruments.
- 2) Introduction of plastic speculums occurred in our department without end-user consultation.
- 3) Introduction of plastic speculums occurred without consideration of environmental cost

**Who were the key stakeholders?**

Nursing staff who set up the procedural trolleys and medical staff (ultrasound & general radiology fellows).

**What was the intervention?**



## Environmental Sustainability Competition 2024-2025



Provide the reusable stainless-steel speculum as the default for all gynaecological ultrasound procedures. Plastic speculums are available on a case-by-case basis.

**What impacts/outcomes were measured? How did you measure them?**

- Number of plastic speculums avoided
- Retrospective audit of plastic speculums purchased by Ultrasound Services

**What challenges did you face? What enablers facilitated the change? What were the learning points?**

- Enabler: unit/staff all supported reducing plastic waste; clinicians generally preferred stainless- steel speculum for their strength/size/use of use; during COVID when supply chain issues arose, having in-house equipment available meant we did not run out of stainless-steel speculums
- It's good to question the change from reusable equipment to disposable equipment and find out that actually reusable equipment could be the preferred option
- Challenge: perceived patient preference for plastic speculum, some doctors prefer the plastic speculum. Overcome this by having plastic ones still being available on request

**What are the next steps with this project?**

- Promote this practice to the Emergency dept which is the only department in the hospital that has transitioned to plastic speculums for all patients/examinations

**Points will be awarded in the following categories:**

**Environmental sustainability: What were the carbon savings from your project? (Please include your raw data and calculations)**

Calculations based on a base case of 20 examinations.

Ref: Donahue LM, Hilton S, Bell SG, et al. A comparative carbon footprint analysis of disposable and reusable vaginal specula. Am J Obstet Gynecol 2020;223:225.e1-7.  
<https://doi.org/10.1016/j.ajog.2020.02.007>

- Life cycle analysis takes into account production phase, transportation, use phase/disposal

	Kg CO <sub>2</sub> e for each examination:
Acrylic	0.877
Steel grade 316 (chosen the steel grade associated with the higher CO <sub>2</sub> e as Sterile Processing Services was unsure which type we used)	0.3255
Estimated 255 gynaecological procedures performed in US services over the 3yrs. Acrylic specs used for 47 cases; steel used for 208 cases	Intervention over 3yrs: Reusable spec use + acrylic spec use= = 208 x 0.3255 + 47 x 0.877



## Environmental Sustainability Competition 2024-2025



	<p>= 67.704 + 41.219 = 108.923kg = total co2e with intervention</p> <p>Without intervention:</p> <p>255 x 0.877 = 223.635kg= total co2e without intervention</p> <p>KgCO2e saved: 223.635 – 108.923 = 114.712 kg= carbon saving over 3 years</p> <p>CO2 of driving - 146g/km is the data from the most recent Aus study = 785.7 km driven</p> <p>The carbon savings will increase as the Vic government fulfils its pledge to supply public hospitals with renewable electricity by ?end of 2025.</p>
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- The last purchase of acrylic speculums for US services was in Nov 2021; 1 box of 50 was purchased according to our procurement record. As of 1<sup>st</sup> Dec 2024, 3 plastic specs remained. I assumed that there was a full box of 50 single-use speculums at the time of practice change.
- Intervention commenced approximately 1/11/2021 (last purchase of plastic specs occurred in Nov 21).
- Using ViewPoint PACS, I retrieved records of saline and tubal procedures performed, a total of 34 saline infusions + 215 tubal patency tests + estimated 6 HSGs (performed by general radiology, exact numbers unknown due to different PACS used by general radiology, estimated by nursing staff to be approx. 2/yr): total of 255 gynae procedures
- Audit of impact undertaken at 1/12/2024.
- Assuming 3yrs of practice change with 255 procedures performed but only 47 speculums were used during this time. This means a plastic speculum was used only 18.4% of the time.
- I assumed that when the plastic speculum was chosen, it was done at the outset due to clinician preference or less frequently patient preference rather than after unsuccessful use of a metal speculum. This is the experience reported by nursing staff eg. Some doctors preferred the plastic speculum

**Environmental sustainability: What were the waste reductions? (If possible, please specify what waste stream – reduced clinical waste by diverting to recycling, reduced clinical waste by using reusable equipment etc.)**

Avoided clinical waste generation (used plastic speculum would have been disposed of as clinical waste due to the high frequency of blood contamination after cervical canulation)  
 = 255 x 88.28g (weight per plastic speculum)  
 = 22.5kg clinical waste avoided over the 3yrs

**Clinical outcomes: How did your project improve patient care? (include outcome data)**

No difference in clinical outcome.

**Financial sustainability: Have there been any financial savings? (please include your calculations)**

YES



## Environmental Sustainability Competition 2024-2025



Metal speculums – already owned by the hospital and processed in-house by Sterile Processing Services staff. Assumed that no new speculums were purchased during this time.

Plastic speculums cost \$1.96 each.

Cost without intervention =  $255 \times \$1.96 = \$499.8$

Cost with intervention =  $255 \times 1.96 \times 0.184 = \$92.1$

Cost savings over 3yrs =  $499.8 - 92.1 = \$407.68$  assuming no cost of additional sterilisation/packaging needed by the Women's

Add on cost of clinical waste disposal avoided from intervention = \$ per kg x 22.5kg avoided

### **Social sustainability: How did your project socially benefit patients, staff, or wider community?**

Benefits staff: Plastic speculum - cumbersome to take out of plastic packaging; metal speculum comes with the steel re-useable kidney dish which can be used to hold the prep instead of an additional plastic galley pot. Thus saves time and effort in procedure set-up.

Benefits patient: does not compromise patient safety; the difference in patient comfort is likely to be negligible (i.e. whichever instrument allows the cervical cannulation to be achieved in the shortest time will deliver the least patient discomfort)

### **Generalisability: Could this project be replicated in other areas of the hospital?**

Yes, to the Women's Emergency dept, the only department that uses plastic speculums for most patients.

### **Please attach some photos of you and your team undertaking this project**



