A COLLABORATIVE APPROACH IN REDESIGNING SINGLE USE INTRA VITREAL INJECTION (IVT) SETS FOR ASIAN COHORT

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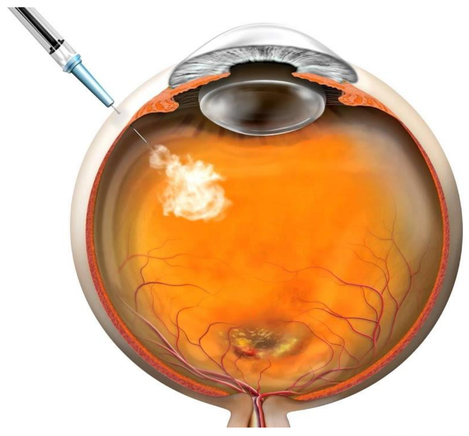
Introduction

Intravitreal Injection is one of the most common Ophthalmic procedures used to treat Age Macular Degeneration (AMD), Diabetic Retinopathy/ Maculopathy, Retinal Vein Occlusion (RVO).
It is a highly targeted drug therapy method that involves injecting Therapeutic Drugs into the vitreous cavity through pars plana under aseptic technique.



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Project Background

- SNEC performed about 16,000 Intravitreal Injections (IVT) annually.
- This breaks down to an average of 67 injections daily.
- Average turn around for each procedure is approximately 15 minutes.
- With the high volume and turn around, Staff Nurses spent a significant amount of time washing, packing and sending the sets for sterilization after each session. Man-hours & cost per case is shown in Table 1.
- The center maintains a total of 40 sets and turn around time to re-process these sets ready for the daily load must be sustained.

Table 1: Breakdown On Average Time Spent To Re-process Sets Daily

Time Required For Washing, Drying and Packing per set of IVT instruments	5 minutes
No of Reusable Sets used per day	67 sets
Total Time required to process instruments daily	5.6hr
Total Time required to process instruments per annum	1344hr
Labour Cost for SN per hour	$30
Cost Savings per annum	$40,320

IVT Set Requirements

1) The Instruments within each set are specifically designed to cater to suit the Asian Eyes (Figure 1).
2) The disposable set must be cost efficient and environmentally friendly.

Figure 1: Tight Conjunctiva Exposure On Most Asian Eyes **Figure 1**

- Most commercially available disposable instruments are bulky leaving little space to access the correct plane for our Asian population.
- One of the biggest challenges was to find the correct specifications for Eyelid Speculum and Indenter Marker (Figure 2) to cater to Asian Eyes.

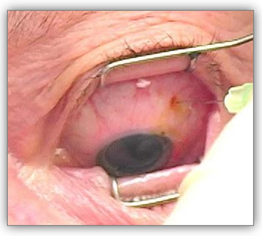

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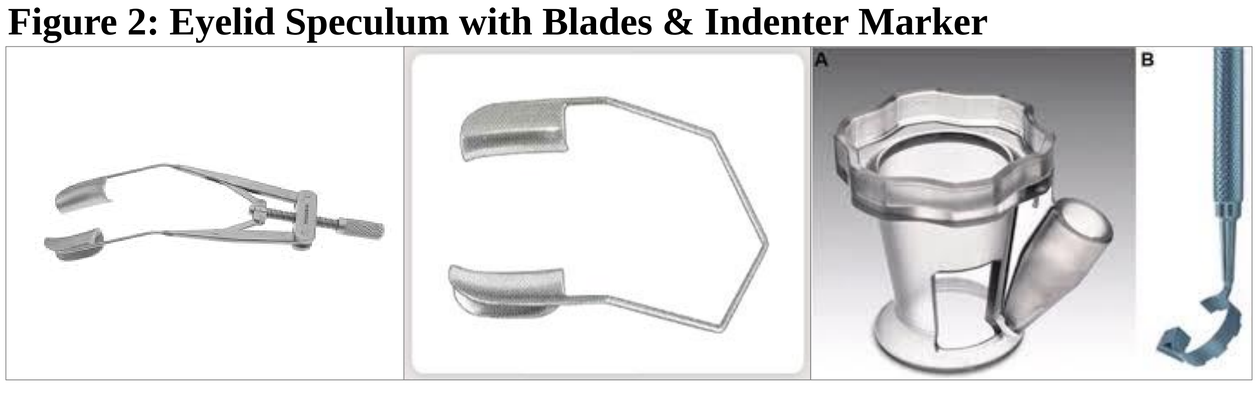
Figure 2: Eyelid Speculum with Blades & Indenter Marker



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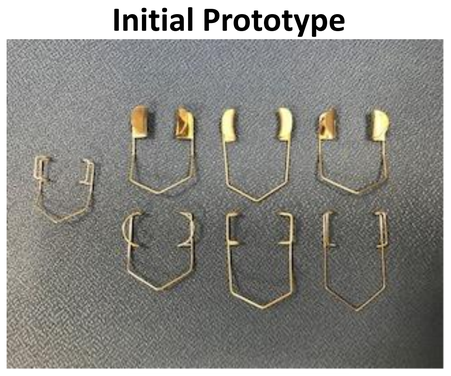
Objective

- Streamline IVT process by having disposable IVT sets to cut down instrument process time that includes washing, packing and sterilization to meet the daily high volume workload.
- To assess potential cost reduction in the IVT process.

Methodology

- We decided to design our own complete disposable IVT set.
- First we engaged and worked closely with Procurement Department to call for an Invitation To Quote (ITQ) to allow us to shortlist suitable companies that would customize our sets.
- Several rounds of customization and testing (Figure 3) were conducted before the final configuration and cost per set was accepted based on long term commitment (Figure 4).

Figure 3
Initial Prototype



Eyelid Speculum

Figure 4
Final Design of Disposable IVT Set

Fine Wired Eyelid Speculum

Indenter Marker

- Cost savings in Healthcare is critical. Table 2 shows cost savings of $1.78 ($6.48 - $4.70 = $1.78) per case which translated to $28,480 ($1.78 x 16,000 = $28,480) annual savings.
- Time saved from handling the reusable sets can be channeled to perform more IVT procedures and provide better quality patient care.

Table 2: Cost Comparison and Savings Between 2 practices

Cost Incurred Per Case	Previous Practice Per Case	Current Practice Per Case
Man-hours for Staff Nurses to Perform Washing, Packing & Sending to OT for Sterilization	$2.52	NIL
Autoclaving Cost for Eye Speculums & Eye Callipers	$0.76	NIL
Cost of Maintaining the Instruments	$0.30	NIL
Sterile Pack with Consumables	$2.90 (Consumables only)	$4.70 (inclusive of Instruments)
Total Cost Per Case	$6.48	$4.70

Conclusion

- Collaboration in designing a customized single used IVT set has increased efficiency to cope with our high volume workload with a significant cost savings on man-hours, investments and repair of instruments.
- With time saved, nurses no longer need to stay back late to wash and re-process the instruments. Survey has also shown the extremely high satisfaction rate among nurses.
- The single used IVT set also offers a much safer alternative to prevent infection and promote patient safety.