

VALUE-BASED HEALTHCARE CONFERENCE 2024

22-23 AUGUST 2024



Changi
General Hospital
SingHealth

CAN DISPOSABLE NASOPHARYNGOSCOPES SUBSTITUTE FOR REUSABLE NASOPHARYNGOSCOPES IN CLINICAL CARE? A RAPID HEALTH TECHNOLOGY ASSESSMENT

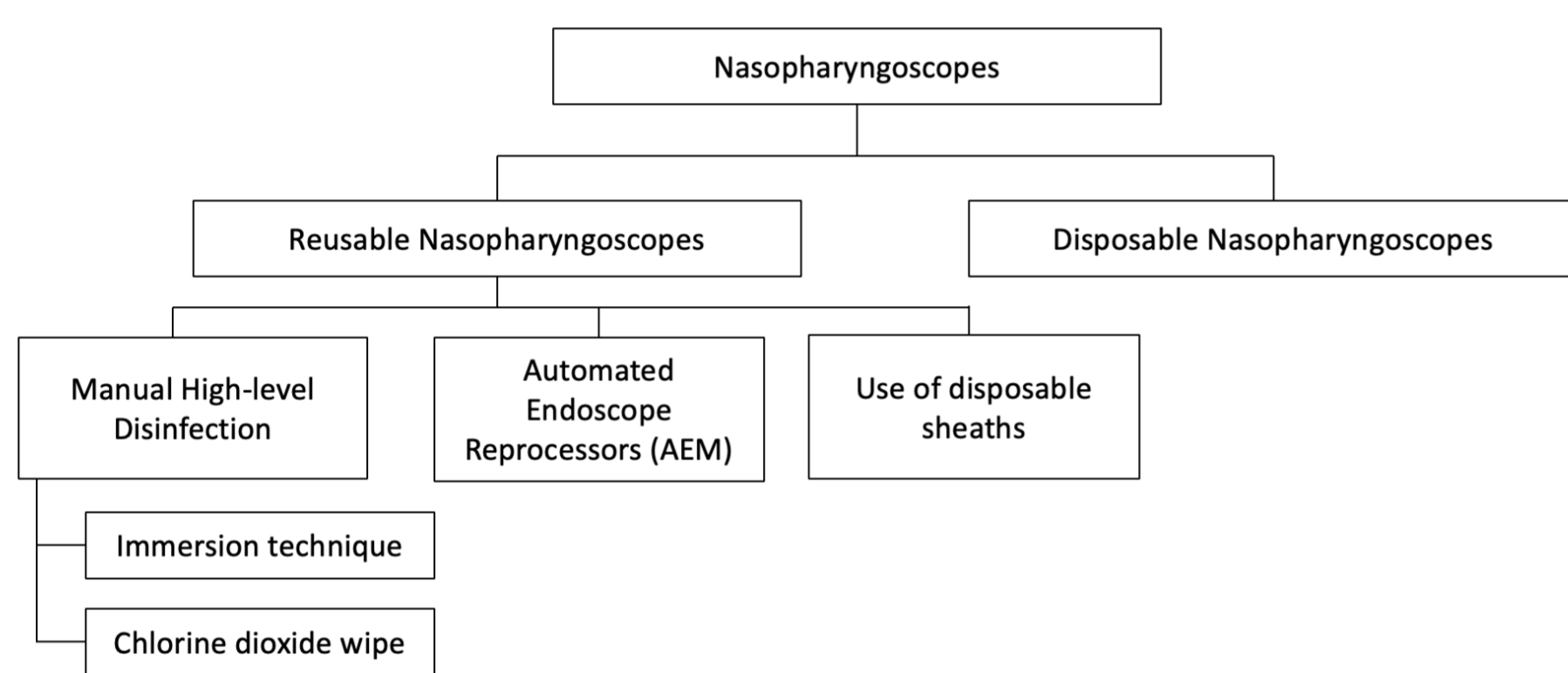
Tan Yin Zhien, Pwee Keng Ho
Health Services Research, Changi General Hospital, Singapore

Background

Nasopharyngoscopes, as with other rigid and flexible endoscopes used in otolaryngology are semi-critical items (i.e. devices that contact mucous membranes or non-intact skin). High-level disinfection (HLD) is required for disinfection of nasopharyngoscopes to destroy all vegetative microorganisms, mycobacteria, viruses, fungal spores, and some but not all bacterial endospores. The use of reusable nasopharyngoscopes brought about repair cost, manpower cost and maintenance cost associated with their reprocessing.

In recent years, disposable nasopharyngoscopes emerged as an alternative for clinicians to examine the upper airway. Immediately after use on a patient, the nasopharyngoscope would be disposed into a clinical waste bin, hence would be advantageous in preventing transmission of infectious agents between patients, as well as reducing costs associated with reprocessing. However, disposable nasopharyngoscopes came with a high per unit cost for use.

Figure 1: Overview of reprocessing techniques for nasopharyngoscopes



Methods

The research question for the rapid health technology assessment was: What is the clinical, technical and cost effectiveness, as well as environmental impact of using disposable nasopharyngoscopes for patients needing nasopharyngoscopy, compared with using reusable nasopharyngoscope?

Population	Patients needing nasopharyngoscopy
Intervention	Disposable nasopharyngoscopes
Comparator	Reusable nasopharyngoscope
Outcome	Clinical, technical and cost effectiveness, as well as environmental impact

The following databases were searched for systematic reviews, health technology assessment reports, and any other form of reviews:

- Pubmed
- Embase
- Cochrane Database of Systematic Reviews
- Epistemonikos database
- Cumulative Index to Nursing & Allied Health Literature (CINAHL)
- Scopus

Unstructured searches were also carried out on Google for systematic reviews, reviews, clinical practice guidelines and technical guidelines.

The general form of the search string used was:
nasopharyngoscopy AND (disposable OR single use)

As no systematic reviews or reviews are available from the initial search, relevant primary studies are included for review. Search results were reviewed and articles with relevant titles or abstracts shortlisted for retrieval of full text. The Critical Appraisal Skills Programme (CASP) appraisal tool for economic evaluation studies was used to critically appraise the included primary studies, as cost analyses were incorporated in each article. No critical appraisal instruments were used for technical or clinical practice guidelines. Findings were summarized in a narrative synthesis.

Results

There were no systematic reviews on the use of disposable nasopharyngoscopes, hence primary studies were reviewed. A total of four studies were included; all of them used Ambu aScope 4 RhinoLaryngo as disposable nasopharyngoscopes. The included studies were of good quality when appraised using CASP.

Three out of the four studies incorporated cross-sectional surveys of clinicians on their experience of using disposable nasopharyngoscopes, in addition to cost analysis. From the surveys, disposable nasopharyngoscopes were rated as good as, if not superior to reusable nasopharyngoscopes in terms of image quality, setup, convenience and transport of device. Environmental concern from the use of disposable nasopharyngoscopes was captured from qualitative feedback from one of the studies.

The included studies compared the cost per use or the incremental cost with the use of disposable nasopharyngoscopes, compared to reusable ones. Generally, the cost analyses concluded that disposable nasopharyngoscopes were good options in low volume setting, or when reusable nasopharyngoscopes were associated with high repair costs.

Table 1: Overview of the cost analyses conducted in the studies included in this rapid review.

Primary studies	Results of cost analysis
Mistry et al (2020)¹ (Hospital perspective)	In comparison to single-use / disposable rhinolaryngoscope, the incremental costs of reusable rhinolaryngoscope eyepieces and videoscopes were £30 and £11 respectively in the outpatient clinic (high-volume), and -£4 and -£73 in the acute surgical assessment unit (low volume).
Walczak et al (2021)² (Hospital perspective, low volume setting)	The per-use cost of the disposable nasopharyngoscopes (NPLs) for 1 year is \$172.82 and \$170.36 for 5 years. The cost per use for reusable NPLs was \$238.17 with 1-year life span, and cost per use for a life span of 5 years was \$197.88
Morgan et al (2022)³ (Health system perspective, high volume)	The cost per use was £66.61 for reusable devices versus £150.00 for disposable devices.
Jegatheeswaran et al (2023)⁴ (Hospital perspective, low volume setting)	The per-use cost for disposable fiberoptic nasendoscopes (FNEs) will be £112.69, £89.95 and £75.21 and £126.78, £85.68 and £69.90 for reusable FNEs at 1 year, 5 years and 10 years of use respectively.

Conclusion

In conclusion, based on the available primary studies from literature search, disposable nasopharyngoscope is a potential substitute for reusable nasopharyngoscopes in clinical settings. The available evidence on cost-effectiveness favoured use of disposable nasopharyngoscopes in a low volume setting, or when the repair of reusable nasopharyngoscopes were associated with high expenses. A centre-specific cost analysis would be beneficial to assess the cost associated with the adoption of disposable nasopharyngoscopes in institutions.

References

1. Mistry R, Russell RV, Walker N, Ofo E. The single-use rhinolaryngoscope: an evaluation and cost comparison. *J Laryngol Otol.* 2020;134(9):790-797. doi:10.1017/S0022215120001656
2. Walczak R, Arnold M, Grewal J, Yuan X, Suryadevara A, Marzouk H. Reusable vs disposable nasopharyngoscopes: Cost analysis and resident survey. *Laryngoscope Investig Oto.* 2021;6(1):88-93. doi:10.1002/lio2.500
3. Morgan O, Elsayed M, Ramakrishnan Y, McGlashan J, Whyne D, McCahon R. Cost-comparison study of reusable and disposable rhinolaryngoscopes in a large English teaching hospital. *J Laryngol Otol.* 2022;137(5):541-545. doi:10.1017/S0022215121004497
4. Jegatheeswaran L, Oungpasuk K, Choi B, et al. Disposable versus reusable fibre-optic nasendoscopes: a national survey of UK ENT surgical trainees and a single-centre cost-analysis. *J Laryngol Otol.* 2023;137(8):866-872. doi:10.1017/S0022215122002274