

# HEALTH ECONOMIC SAVINGS OF SINGLE USE FLEXIBLE ENDOSCOPES VS CURRENT RE-USABLE ENDOSCOPES AND DISPOSABLE SHEATH SYSTEMS

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**Introduction:** The transmission of endoscopy-associated infections is frequently linked to inadequate reprocessing. Regulatory organizations including FDA have published reprocessing guidelines resulting in an increase of associated time and costs. Flexible single use endoscopes represent the solution to complex re-processing procedures and also create significant cost savings to the health care system.

**Methods and Procedures:** Multi-society guidelines published in the US post 2015 for reprocessing endoscopes are analyzed and the cost of various materials is collected from vendors and published literature. A cost minimization model is designed taking into consideration different material and labor cost related to the endoscopic procedure. A sensitivity analysis on healthcare savings has been performed considering the number of procedures per re-usable endoscopic system and its average replacement time.

## Results:

**Table 1:** Health Economic Analysis of Single Use Flexible Endoscope vs Reusable Endoscope and Disposable Sheath System

Health Economic Analysis of Single Use Flexible Endoscope vs Reusable Endoscope and Disposable Sheath System		Reusable Flexible Endoscope		Disposable Sheath System		Single Use Flexible Endoscope
		Min	Max	Min	Max	
Cost of endoscopic system <i>Flexible Endoscope (Reusable), LCD Display, Video Processor, Monitor, Maintenance Unit, Water Leakage Tester, Contained Vented Enclosure, Endoscopy Cabinet, Transport and Storage System, Alcohol</i>	Lifetime	\$ 48,995.00	\$ 63,275.00	\$ 28,765.00	\$ 34,255.00	\$ 3,500.00
Average number of years for replacement of endoscopic system		3	3	3	3	3
Cost of endoscopic system / year	Yearly	\$ 16,331.67	\$ 21,091.67	\$ 9,588.33	\$ 11,418.33	\$ 1,166.67
Average number of procedures / endoscopic system	Yearly	350	350	350	350	350
Cost of endoscopic system / endoscopic procedure	Procedure	\$ 15.55	\$ 20.09	\$ 9.13	\$ 10.87	\$ 1.11
Cost of materials for reprocessing / endoscopic procedure	Procedure	\$ 98.50	\$ 251.97	\$ 98.50	\$ 251.97	
Cost of labor for reprocessing / endoscopic procedure	Procedure	\$ 92.99	\$ 92.99	\$ 92.99	\$ 92.99	
Cost of protective sheath barrier / endoscopic procedure	Procedure			\$ 44.00	\$ 50.00	
Cost of Single Use flexible endoscope / endoscopic procedure	Procedure					\$ 400.00
Cost of maintenance (650% over Lifetime)	Lifetime	\$ 367,462.50	\$ 474,562.50	\$ 215,737.50	\$ 256,912.50	\$ 26,250.00
Cost of maintenance / endoscopic procedure	Procedure	\$ 349.96	\$ 451.96	\$ 205.46	\$ 244.68	\$ 25.00
<b>Total Cost / endoscopic procedure</b>	Procedure	<b>\$ 557.01</b>	<b>\$ 817.01</b>	<b>\$ 450.09</b>	<b>\$ 650.51</b>	<b>\$ 426.11</b>
<b>Average Total Cost / endoscopic procedure</b>	Procedure	<b>\$ 687.01</b>		<b>\$ 550.30</b>		<b>\$ 426.11</b>

**Table 2:** Cost Savings of Single Use Flexible Endoscope vs Reusable Endoscope and Disposable Sheath System / Procedure

Cost Savings of Single Use Flexible Endoscope vs Reusable Endoscope / Procedure					Cost Savings of Single Use Flexible Endoscope vs Disposable Sheath System / Procedure				
		Average number of procedures / endoscopic system					Average number of procedures / endoscopic system		
		250	300	350			250	300	350
Average number of years for replacement of endoscopic system	2	\$ 710	\$ 570	\$ 470	Average number of years for replacement of endoscopic system	2	\$ 363	\$ 289	\$ 235
	3	\$ 418	\$ 326	\$ 261		3	\$ 208	\$ 159	\$ 124
	3.5	\$ 337	\$ 259	\$ 203		3.5	\$ 164	\$ 123	\$ 93

**Conclusion:**

Considering a replacement time of 3 years / endoscopic system and 350 procedures / endoscopic system per year, a single use flexible endoscope costs to hospital is \$426.11/ procedure in contrast to \$687.01/procedure for reusable endoscope and \$550.30/ procedure for disposable sheath system resulting in cost saving of \$261 and \$124 / procedure respectively. Our analysis indicates that even reducing number of procedures and increasing the replacement timeline of reusable endoscope, single use flexible endoscopes at \$400/ procedure are cost effective.

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