Establishing preconditions for effective duodenoscope reprocessing: an observational cohort study

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Ploeg et al, Impact of Duodenoscope Reprocessing Factors on Duodenoscope Contamination: A Retrospective Observational Study. Journal of Hospital Infection. 2024

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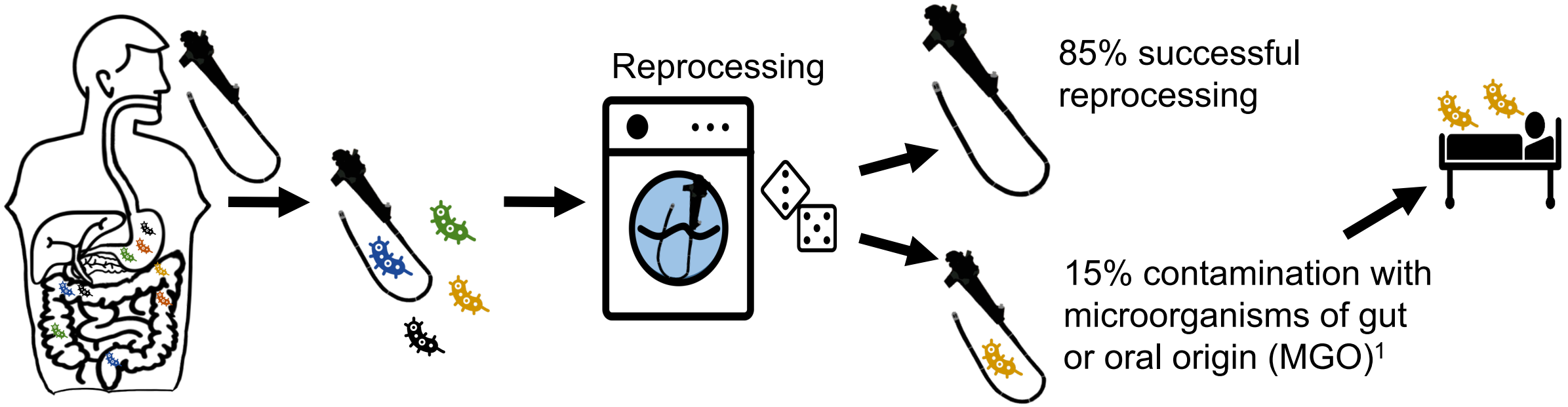
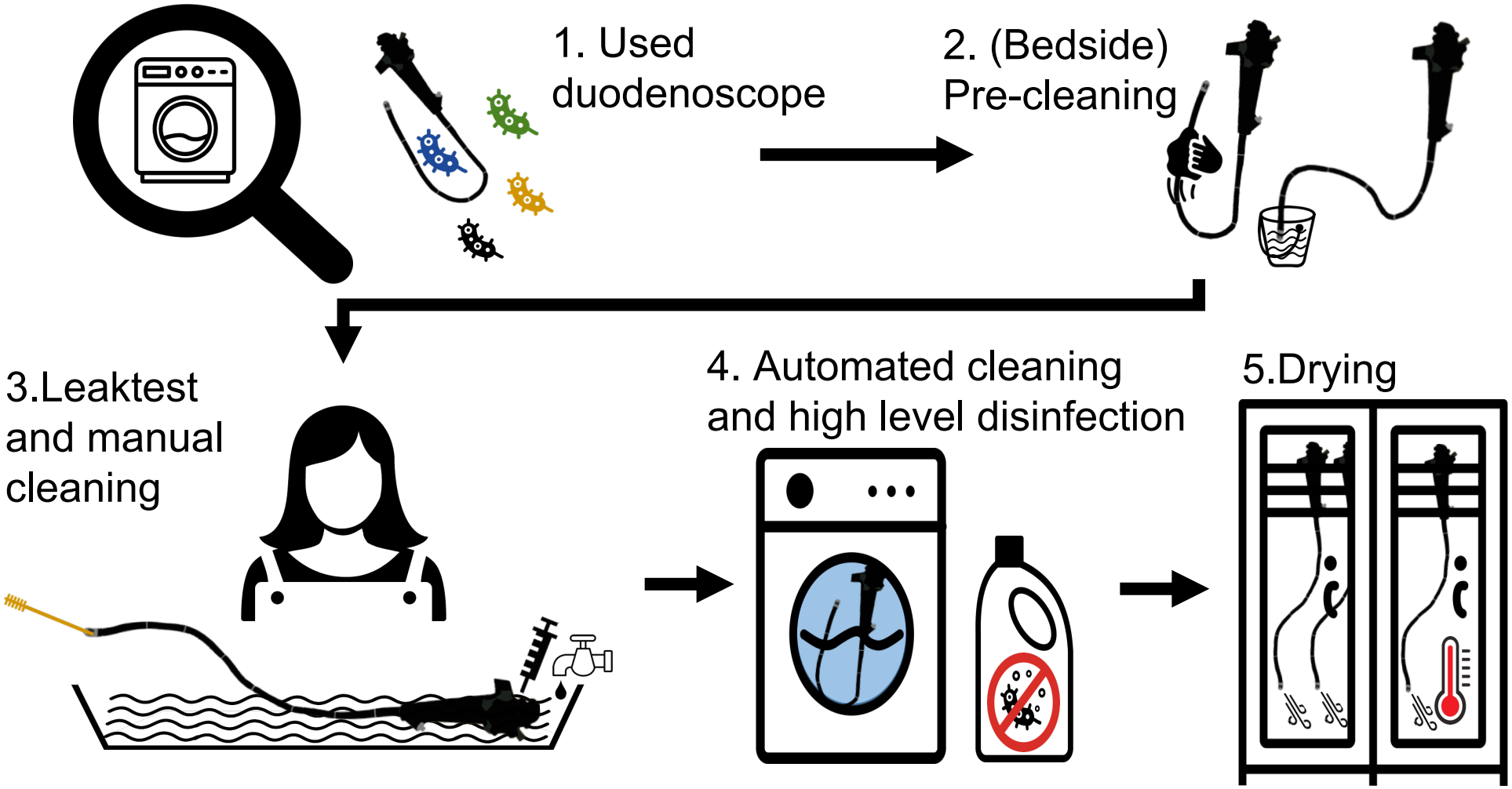
THE ISSUE



1. Rauwers et al, High prevalence rate of digestive tract bacteria in duodenoscopes: a nationwide study. Gut. 2018

CURRENT REPROCESSING



GUIDELINES

- Lack of uniformity
- Lack of sufficient evidence
- Essential risk factors remain unidentified
- Lack of information about individual competencies for reprocessing staff

NVMM

Samenwerkingsverband Richtlijnen Infectiepreventie

ESGE
European Society of Gastrointestinal Endoscopy

ASGE

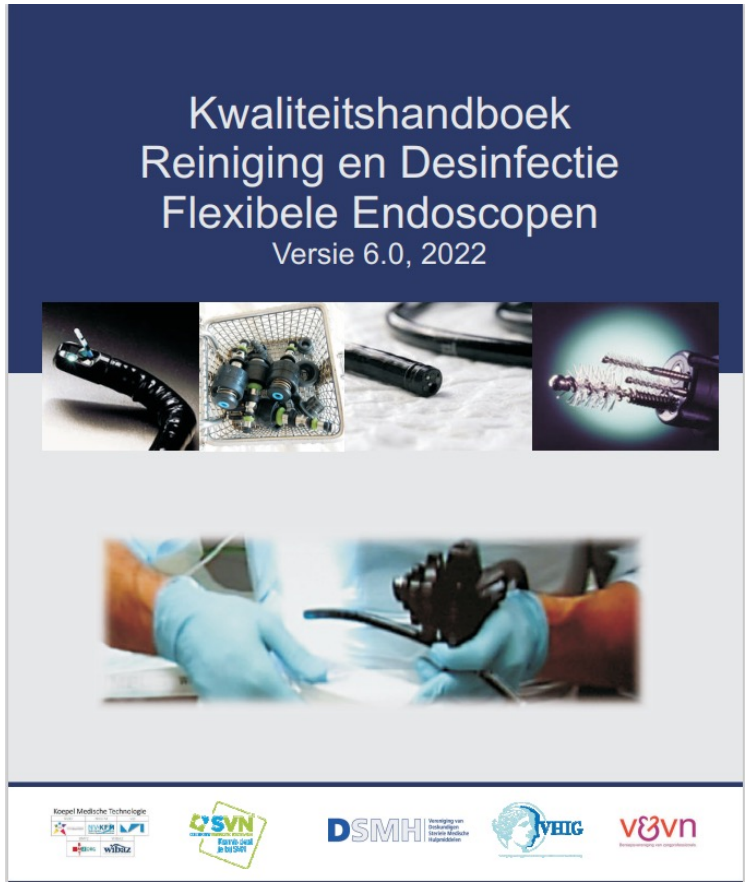
SGNA
Society of Gastroenterology Nurses and Associates, Inc.

CDC U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

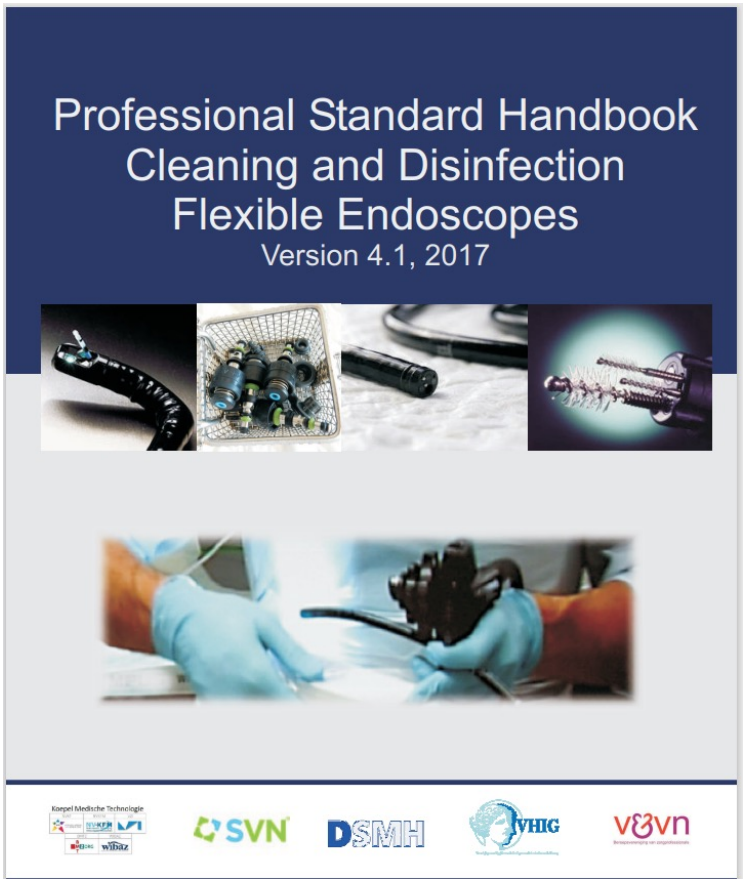
GLOBAL GUIDELINES WGO AND CASCADES
A Resource Sensitive Solution

1992 The Digestive Endoscopy Society of Taiwan (DEST)

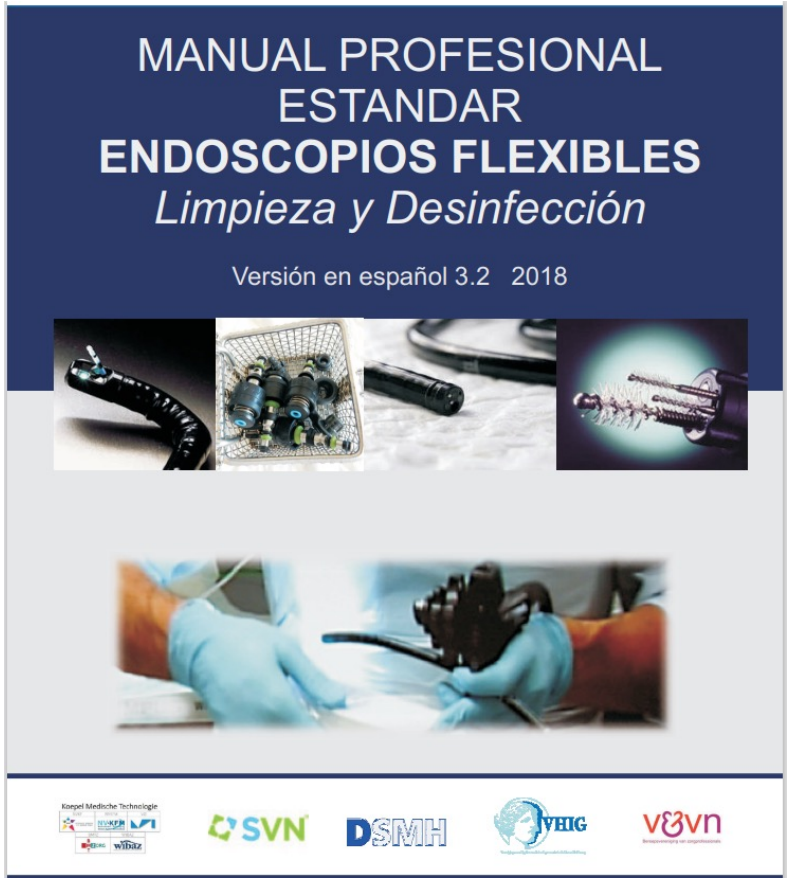
PROFESSIONAL STANDARD (SFERD)



SFERD Handboek 6.0 NL (infectiepreventieopleidingen.nl)



SFERD Handbook 4.1 ENG (infectiepreventieopleidingen.nl)



SFERD Handbook 3.2 ESP (infectiepreventieopleidingen.nl)

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METHODS

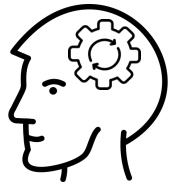
Duodenoscopes
- 8 duodenoscopes with disposable endcaps

Period
- February 2022 untill December 2023

Sampling
- Prior to ERCP-procedure
  - Swab distal tip
  - Flush-brush-flush sample of suction and biopsy channel (20 ml sterile water / single use endoscope pull through cleaning brush)
- Contamination = presence of microorganisms of gastrointestinal or oral origin (MGO) (including *Pseudomonas aeruginosa and Staphylococcus aureus*)

Data collection
- Data collection from electronic patient records on use and reprocessing of duodenoscopes and reprocessing staff

POTENTIAL RISK FACTORS

1. (Bedside) pre-cleaning —(>30 minutes)→ Manual cleaning[2]
2. ≤ 5 minutes manual cleaning
3.  Reprocessing employee <30 reprocessing cycles over study period

Drying/storage:

4. < 90 minutes (incomplete drying cycle)[3]
5. >7 days[2]

2. Beilenhoff et al, ESGE, Endoscopy; 2018
3. Instructions for use, drying cabinet

RESULTS

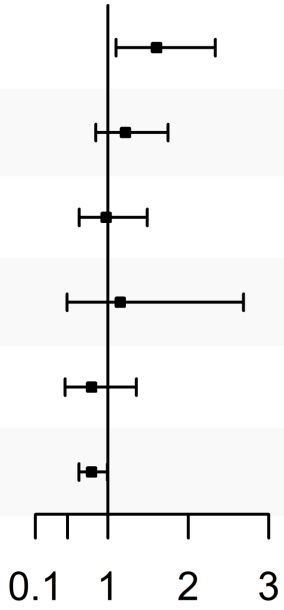
307 duodenoscope cultures

58 (18.9%) positive with MGO

Baseline characteristics reprocessing cycles, n=1296 (100%)	
Duodenoscope uses, n (%)	1150 (88.7%)
Delay >30 minutes before reprocessing, n (%)	502 (47.2%)
Manual cleaning ≤5 minutes, n (%)	212 (16.9%)
Reprocessing employee <30 reprocessing cycles, n (%)	308 (24.4%)
Drying time <90 minutes, n (%)	61 (4.8%)
Storage >7 days, n (%)	13 (1.0%)

MIXED-EFFECT MODEL

MGO	adjusted OR (95% CI)	P-value
Manual cleaning time 5 min. or less	1.61 (1.10 to 2.34)	0.01
Delay >30 min. before reprocessing	1.22 (0.85 to 1.75)	0.28
Reprocessor with <30 reprocessing cycles	0.98 (0.64 to 1.49)	0.93
Drying time <90 min.	1.15 (0.50 to 2.69)	0.74
Storage >7 days	0.80 (0.47 to 1.35)	0.40
Duodenoscope use	0.80 (0.64 to 0.995)	0.045

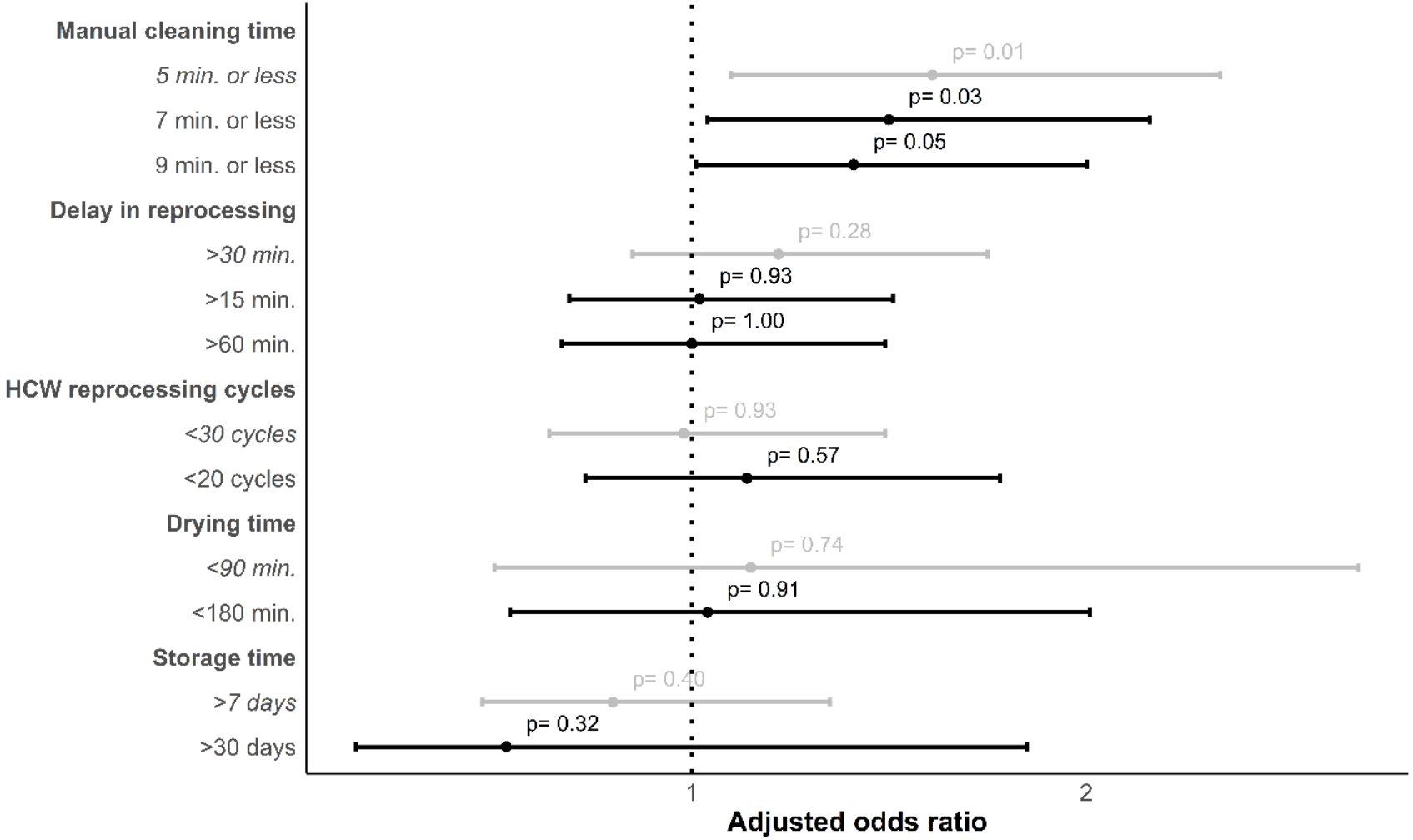


DOES FREQUENCY MATTER?

	HCW ≥30 cycles over study period	HCW <30 cycles over study period	p-value
Reprocessing cycles performed, n	955 (100%)	308 (100%)	
Reprocessing employees, n	6	35	
Reprocessing cycles performed per HWC, median [Q1, Q3]	62.50 [31.00, 237.00]	6.00 [4.00, 17.00]	0.001
Delay >30 minutes before reprocessing, n (%)	376 (45.5%)	126 (52.9%)	0.05
Manual cleaning ≤5 minutes, n (%)	130 (13.7%)	82 (26.9%)	<0.001

HCW: Health Care Worker

SENSITIVITY ANALYSIS



SUMMARY AND CONCLUSIONS

- **Duodenoscope contamination**
  - 18.9% contamination rate
  - Preventable healthcare-associated infections

- **Risk factors within reprocessing**
  - Manual cleaning ≤5 min.
  - Indirectly: Frequency of duodenoscope reprocessing by reprocessing staff

- **Reevaluation reprocessing protocols**
  - Minimum time manual cleaning
  - Reprocessing staff: minimum frequency of reprocessing?

- **Digital monitoring and alert systems beneficial?**

THANK YOU FOR YOUR ATTENTION

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