26TH WORLD STERILIZATION CONGRESS

4TH TO 6TH DECEMBER 2025

WELCOME CEREMONY,
3RD DECEMBER AT 18.00

HONG KONG
ASIAWORLD-EXPO
亞洲國際博覽館

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PROGRAM

BRING THE STERILIZATION SCIENCE TO THE NEXT LEVEL

將滅菌科學提升到新水平

B BRAUN
SHARING EXPERTISE

Visit us at BOOTH **D.01**

B. Braun Symposium

December 05, 2025
13:00 - 14:30, room 201C

Don't miss our symposium on the topic of

Interested in how to increase the efficiency in your CSSD?

Is your CSSD future ready - Process excellence & automation in CSSD
Massimo Fiamma, Director SASI Competence Center, Aesculap AG

Harmonized Asset Flow
Davide D'Aprile, Director SASI Business Management, Aesculap AG

Soft-to-Rigid transition at Ruijin Hospital: From a user experience and economic benefits perspective
Liming Qian – Vice Chairperson, Disinfection Supply Committee, Chinese Nursing Association

Aesculap AG | Am Aesculap Platz | 78532 Tuttlingen | Germany
Phone +49 7461 95-0 | www.bbraun.com

V-SGM25004

Honjo

A Comprehensive Guide to Explore THE 3-IN-1 INTELLIGENT CSSD at WFHSS 2025

01 Visit Honjo's Booth

Be in the Reality of 3-in-1 Intelligent CSSD

Hall2 G01, 1st Floor (Figure 1, A)

Throughout WFHSS 2025

Experience live demonstrations of AIPlatform | Robotics | DeepMirror
AIPlatform: Discover RoMAI, Honjo's cutting-edge intelligent operating system, driving seamless integration of data, automation, and workflow optimization in CSSD.
Robotics: See our versatile robots in action, handling tasks such as retrieval, transfer, packaging, pick-up and delivery in different settings, showcasing enhanced efficiency and precision.
DeepMirror: Experience real-time tracking of all robots' movements and statuses displayed on a 360-degree high-definition screen, blending live event environments with virtual data for full operational visibility.

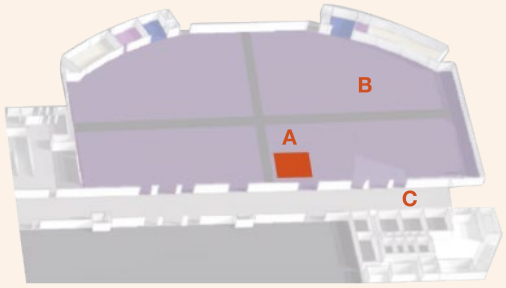


Figure 1: ASIAWORLD-EXPO 1st Floor

02 Listen to Honjo's Presentation

as part of the WFHSS 2025 Academic Program

CONFERENCE ARENA, 1st Floor (Figure 1, B)

16:45 – 17:15 (Thur., Dec. 4) – SESSION 4 – AUTOMATION AND AI
12:30 - 13:00 (Fri., Dec. 5) - POSTER AWARDS

SESSION 4 – AUTOMATION AND AI: *How We Built CSSDGPT: A Generative AI Assistant for Reprocessing Practitioners* — Yongpeng QIN, Founder of Honjo
POSTER AWARDS: *Effectiveness Verification and Optimization Path of CSSDGPT in the Sterile Processing Field* — Qi DING, Product Manager of CSSDGPT

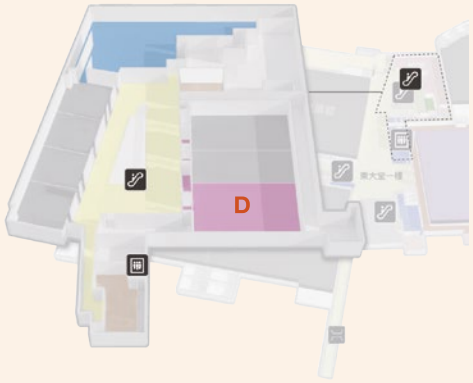


Figure 2: ASIAWORLD-EXPO 2nd Floor

03 Join Honjo's Symposium

Insights from Opinion Leaders, Application from Real-World CSSD Practice

Room 201C, 2nd Floor (Figure 2, D)

13:00 – 14:30 (Thur., Dec. 4)

Theme: Where Robotics meet AI
Beyond Tracking: *Building a Data-Driven Intelligent Decision-Making Platform* — Samuel LAW (HKSSMA)
Robotic Colleagues: *How Automation Reshapes Efficiency and Human Value in the CSSD* — Jin WANG (Beijing Anzhen Hospital)
From Manual to Intelligent: *Application and Practice of Robotic Packaging Technology* — Yunyu JIN (Jilin University First Hospital)
Meta CSSD: *Fine-Grained Operation and Simulation Optimization for the Entire Lifecycle* — Juan ZHU (Tongji Hospital, Huazhong University of Science and Technology)

04 Explore Honjo's Posters

Outcome of Honjo's Practical Experience and Collaboration with Real Hospitals

Poster Area, 1st Floor (Figure 1, C)

Throughout WFHSS 2025

Intelligent Robotics & Automation
Five studies by Eddie HE (GM, HonjoINFO), Lynn HE (GM, HonjoTECH), and Jing TANG (Technical Manager, HonjoMED), showcasing innovations in robotic recognition, sorting, packaging, and automated storage.
Human–Machine Interaction & Process Innovation
Two studies by Sofia CAO (Development Director, HonjoINFO) and Lynn HE, focusing on process improvement through voice-command interfaces and cooling device evaluation.
AI & Data-Driven Quality Management
Two studies by Qi DING, presenting applications of CSSDGPT in training, risk management, and quality improvement.

WEDNESDAY 3 DECEMBER
12月3日星期三

16.00 - 18.00	**OPENING OF THE REGISTRATION AND EXHIBITION /** 展览登记及开展
18.00 - 19.00	**WELCOME CEREMONY /** 歡迎儀式
19.00 - 20.30	**WELCOME RECEPTION IN THE EXHIBITION AREA /** 展览区欢迎招待会

THURSDAY 4 DECEMBER
12月4日星期四

08.00	**OPENING OF THE REGISTRATION AND EXHIBITION /** VISIT OF POSTERS AND EXHIBITION **展览登记及开展 /** 参观海报和展览

PLENARY ROOM - HALL 2 - ZONE C / 多功能会议室 – 2号展厅 – C区

08.30 - 09.00	**GOVERNMENT WELCOME AND KEYNOTE /** **政府歡迎辞** *Dr. Edmond SK Ma / Consultant & Acting Head of Infection Control Branch, Centre for Health Protection, Department of Health, Hong Kong Special Administrative Region* *Prof. Gangyi Peng / President of the Guangdong Nursing Association*
09.00 - 09.15	**CONGRESS INTRODUCTION / 大會介紹** *Speech by David Bellamy* / David Bellamy 的演講
09.15 - 10.30	**SESSION 1 - CHECKING AND PACKAGING** **第一部分 – 檢查和包裝** *Moderators - Karin BUNDGAARD & Teddy LEE* / 主持人 – Karin BUNDGAARD & 李俊堅
09.15 - 10.00	**CONFERENCE 1 / 會議 1** Performance test for sealing capability of rigid containers. 硬质容器密封性能试验 *Samuel Law (Hong Kong) / 罗达康 (香港)*
10.00 - 10.30	**CONFERENCE 2 / 會議 2** Ensuring Sterile Safety: A Study on Pouch Seal Integrity in Healthcare Facilities. 确保无菌安全：医疗机构包装袋密封完整性研究 *Dr Mary Ann Drosnock (USA) / Dr Mary Ann Drosnock (美国)*

10.30 - 11.30	**COFFEE BREAK & VISIT EXHIBITION / 茶歇和參觀展覽**	
	201 C	**201 A**
10.30 - 11.30	SHINVA **Intelligent Infection Control: Making disinfection and sterilization safer, smarter and more efficient** *Han Hui, Cheng Ping, Luo Dakang*	matachana **Driving CSSD Excellence: Production, Efficiency and Sustainability** *Elena Lorenzo*
PLENARY ROOM - HALL 2 - ZONE C / 功能会议室 – 2号展厅 – C区		
11.30 - 13.00	**SESSION 2 - STERILIZATION** **第二部分 – 灭菌** *Moderators - Cinthia Vera FUENTES & Julia Pui Ian LAM /* 主持人 – Cinthia Vera FUENTES & 林佩欣	
11.30 - 12.00	**CONFERENCE 3 / 会议 3** **Experimental and numerical determination of the steam amount inside long, fine cavities using absorption spectroscopy and computational fluid dynamics.** **使用吸收光谱和计算流体动力学对长而细的腔室内的蒸汽量进行实验和数值测定** *Simon Pletzer (Austria) / Simon Pletzer (澳大利亚)*	
12.00 - 12.30	**CONFERENCE 4 / 会议 4** **The effects of load weight on the physical parameters during low-temperature VHP sterilization processes.** **灭菌负载重量对低温过氧化氢灭菌过程中物理参数的影响** *Aiqin Chen (China) / 陈爱琴 (中国)*	
12.30 - 13.00	**CONFERENCE 5 / 会议 5** **Hong Kong Experience in Control of Wet Pack through Scientific Approach.** **香港通过科学方法控制湿包的经验** *Teddy Lee (Hong Kong) / 李俊坚 (香港)*	
13.00 - 14.30	**LUNCH - POSTERS AND EXHBITION / 午餐海報和展覽**	
	201 C	**201 B**	**201 A**
13.00 - 14.30	Honjo **Where Robots Meet AI... – A 3-in-1 Intelligent CSSD** *Raymond Lee*	STERIS **Automation in Action: Elevating Productivity with Robotics, Data and Artificial Intelligence** *Marjorie Wall, Richard Bancroft, Sarah Brown*	ASP Advanced Sterilization Products **Pioneering Excellence in Endoscope Reprocessing** *Victoria McCreanor, Patricia Ching, Ivan Salgo*

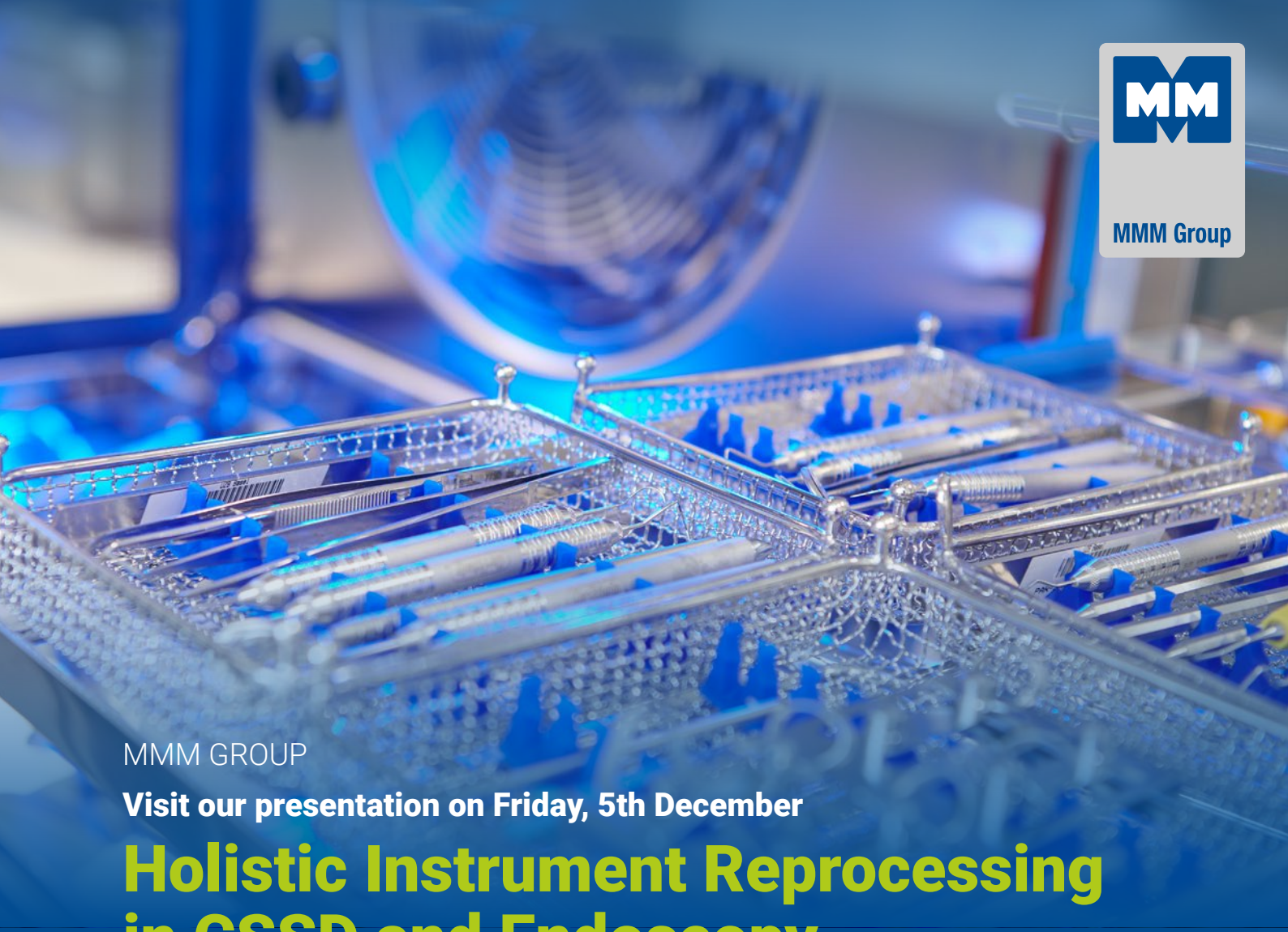
PLENARY ROOM - HALL 2 - ZONE C / 多功能会议室 – 2号展厅 – C 区

14.30 - 16.00	**SESSION 3 - CLEANING AND DISINFECTION** **第三部分 – 清潔和消毒** *Moderators - Harry OUSSOREN & Queenie Wai Leng CHAN / 主持人– Harry OUSSOREN & 陈惠玲*
14.30 - 15.00	**CONFERENCE 6 / 会议 6** **Research on the cleaning effectiveness of Vacuum Boiling Washer Disinfector in comparison with ultrasonic cleaner, washer disinfector and manual cleaning.** **减压沸腾清洗消毒机与超声波清洗机、清洗消毒机、手工清洗的清洗效果比较研究** *Huifen Zhou (China) / 周慧芬(中国)*
15.00 - 15.30	**CONFERENCE 7 / 会议 7** **Innovation in Reprocessing Robotic Surgical Instruments.** **机器人手术器械再处理的创新** *Nick Dassatti (USA) / Nick Dassatti (美国)*
15.30 - 16.00	**CONFERENCE 8 / 会议 8** **Quantitative Monitoring of Residual Protein in Cannulated Medical Devices: Multicenter Study.** **管腔医疗器械中残留蛋白的定量监测：多中心研究** *Silvia Martinez (Argentina) / Silvia Martinez (阿根廷)*
16.00 - 16.45	**COFFEE BREAK & VISIT EXHIBITION /** **茶歇和參觀展覽**

	201 C	201 B	201 A
16.00 - 16.45	**Automated reprocessing of surgical instruments: safety through innovation and knowledge** *Antonio Scavelli*	**Effective Endoscope Reprocessing: Best Practices & Quality Assurance** *Jamie McGloin, Yoshika Onishi*	**Efficiency by using robots with washers in CSSD's** *Albert Tsang*

PLENARY ROOM - HALL 2 - ZONE C / 多功能会议室 – 2号展厅 – C 区

16.45 - 18.15	**SESSION 4 - AUTOMATION AND AI** **第四部分 – 自动化和人工智能** *Moderators - Damien BERG & Samuel LAW / 主持人– Damien BERG & 罗达康*
16.45 - 17.15	**CONFERENCE 9 / 会议 9** **How We Built CSSDGPT: A Generative AI Assistant Designed for Reprocessing Practitioners.** **“幕后天使GPT”的台前幕后:消毒供应专业生成式AI** *Yongpeng Qin (China) / 秦永鹏 (中国)*
17.15 - 17.45	**CONFERENCE 10 / 会议 10** **AI-Powered Smart Table for Surgical Kit Reassembly in Sterilization Centers.** **用于消毒中心手术套件重新组装的人工智能桌子** *Chiara Taranto (Italy) / Chiara Taranto (意大利)*
17.45 - 18.15	**CONFERENCE 11 / 会议 11** **Application effect of artificial intelligence visual recognition system on the receiving and inventory process of loaner instruments.** **人工智能视觉识别系统在外来器械接收和盘点过程中的应用效果** *Chang-E Wang (China) / Chang-E Wang (中国)*



MMM Group

MMM GROUP

Visit our presentation on Friday, 5th December

Holistic Instrument Reprocessing in CSSD and Endoscopy

Smart solutions from a single source
and a view in the future

13:00 - 14:30 | PLENARY ROOM - HALL 2 - ZONE C

SPEAKERS

Andreas Schneider | *Marketing Director*
Ilka Barteldes-Neubauer | *Product Manager Endoscopy*
Markus Auly | *Head of Scientific Affairs*

We warmly invite you to visit us at Booth F01

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FRIDAY 5 DECEMBER
12月5日星期五

08.30	**OPENING OF THE REGISTRATION AND EXHIBITION /** VISIT OF POSTERS AND EXHIBITION **展览登记及开展 /** 参观海报和展览

PLENARY ROOM - HALL 2 - ZONE C / 多功能會議室 – 2號展廳 — C 區

09.00 - 10.30	**SESSION 5 - GREEN AND INNOVATION SUSTANABILITY** **第五部分 – 綠色與創新可持續性发展** *Moderators - Herve NEY & Samuel LAW /* 主持人– Herve NEY & 罗达康
09.00 - 09.30	**CONFERENCE 12 / 会议 12** **Implementation of sustainability strategies in central sterile service department (CSSD) in the Latin American context.** **拉丁美洲消毒供应中心实施可持续发展战略** *Mayra Samara Ordoñez Diaz (Colombia) /* Mayra Samara Ordoñez Diaz (哥伦比亚)
09.30 - 10.00	**CONFERENCE 13 / 会议 13** **Green strategies and possibilities all over the world.** **世界各地的绿色战略和可能性** *Cinthia Vera Fuentes (Chili) /* Cinthia Vera Fuentes (智利)
10.00 - 10.30	**CONFERENCE 14 / 会议 14** **Sterilizer Energy Consumption Monitoring and Energy-Saving Optimization Based on an Electronic Quality Traceability System.** **基于电子质量追溯系统的灭菌焗耗能监测与节能优化** *Xiaoguang LEE (China) /* 李晓光(中国)
10.30 - 11.30	**COFFEE BREAK & VISIT EXHIBITION /** **茶歇和參觀展覽**

	201 C	201 B	201 A
10.30 - 10.45	GETINGE		
10.45 - 11.30	**Low Temperature VH2O2 Sterilization: Myths, Methods, and Modernization** *Kevin Anderson, Can Ahiska*	Terragene **From assumption to evidence: quantitative protein testing in CSSDs** *Antonela Sdrigotti*	solventum **Revolutionizing Sterilization: Elevating practice of hydrogen peroxide for safety and precision** *Larry Talapa, Prof. Wing Hong Seto*

PLENARY ROOM - HALL 2 - ZONE C / 多功能會議室 – 2號展廳 — C 區

11.30 - 13.00	**SESSION 6 - PROCESS VALIDATION** **第六部分 – 过程验证** *Moderators - Karin BUNDGAARD & Christine Delebecque & Sing Yau YIP /* 主持人– Karin BUNDGAARD & 叶星佑
11.30 - 12.00	**CONFERENCE 15 / 会议 15** **Validation of Washer-Disinfectors in a Danish Hospital Setting: Focus on Cleaning Efficacy and Standardization.** **丹麦医院清洗消毒机的验证：关注清洁效果和标准化** *Peter Rubak (Denmark) /* Peter Rubak (丹麦)
12.00 - 12.30	**CONFERENCE 16 / 会议 16** **Performance Evaluation of Various Cleaning Methods.** **用各种清洁方法的效能评估** *Sulisti Holmes (United Kingdom) /* Sulisti Holmes (英国)

12.30 - 13.00	**POSTER AWARDS SESSION /** **海報頒獎典禮**
13.00 - 14.30	**LUNCH - POSTERS AND EXHBITION /** **午餐–海報和展覽**

	201 C	201 B	201 A
13.00 - 14.30	B BRAUN SHARING EXPERTISE **Interested in how to increase the efficiency in your CSSD?** *Massimo Fiamma, Davide D'Aprile & Juan Zhu*	SteelcoBelimed Miele Group Member **Innovation, Digitalization, Automation, and Continuous Education: SteelcoBelimed Pillars for Safe and Efficient Sterilization Processes** *Luigi Guarda*	MMM Group **Holistic instrument reprocessing in CSSD and Endoscopy – Smart solutions from a single source and a view in the future** *Andreas Schneider, Ilka Barteldes-Neubauer, Markus Auly*

PLENARY ROOM - HALL 2 - ZONE C / 多功能會議室 – 2號展廳 — C 區

14.30 - 16.30	**SESSION 7 - QUALITY AND RISK MANAGEMENT** **第七部分 – 质量和风险管理** *Moderators - David BELLAMY & Kam Yee HO / 主持人– David BELLAMY & 何锦儿*
14.30 - 15.00	**CONFERENCE 17 / 会议 17** **Investigating Surgical Instrument Damage: How to ensure your investment is protected.** **调查手术器械损坏：如何确保您的投资得到保护** *Matthias Tschoerner (Germany) / Matthias Tschoerner (德国)*
15.00 - 15.30	**CONFERENCE 18 / 会议 18** **Engineering Risk Management into Action: A Six Sigma Model for improving inventory management and implant safety.** **工程风险管理付诸行动：改善库存管理和植入物安全的六西格玛模型** *Michelle Odayan (Australia) / Michelle Odayan (澳大利亚)*
15.30 - 16.00	**CONFERENCE 19 / 会议 19** **The importance of quality improvement projects in the CSSD.** **质量改进项目在消毒供应中心的重要性** *Professor Seto (Hong Kong) / 司徒永康教授(香港)*
16.00 - 16.30	**CONFERENCE 20 / 会议 20** **Interfering Substances in Endoscopic Exams and Their Impact on Microbiologic Surveillance of Flexible, Reusable Endoscopes.** **内镜检查中的干扰物质及其对柔性可重复使用内镜微生物监测的影响** *Annette Rittich (Germany) / Annette Rittich (德国)*
16.30 - 17.15	**COFFEE BREAK & VISIT EXHIBITION /** **茶歇和參觀展覽**
	CONGRESS DINNER / **大会晚宴**

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26TH WORLD STERILIZATION CONGRESS

Find us at Booth **C01 in Zone A**

Scientific Symposium

Pioneering Excellence in Endoscope Reprocessing

The Topics:

Update on the shift from hld to sterilization of endoscopes

Patricia Ching, RN - *WHO Collaborating Centre for Infectious Diseases Epidemiology and Control, School of Public Health, The University of Hong Kong*

Economic and Environmental Trade-offs Between Steam and Low-Temperature Systems

Victoria McCreanor, PhD, MSc, LLB - *Hunter Medical Research Institute*

Elevating the standard of care in endoscope reprocessing

Dr. Ivan Salgo, MD, MS, MBA - *Chief Medical & Scientific Officer*

Moderator:

Dr. Seto Wing Hong,

MD, MBBS, MRCPI - *WHO Collaborating Centre for Infectious Diseases Epidemiology and Control, School of Public Health, The University of Hong Kong*

Thursday, **4 December**
13:00 - 14:30 **(GMT +8)**
Room: **201A**

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SATURDAY 6 DECEMBER
12月6日星期六

08.30	**OPENING OF THE REGISTRATION AND EXHIBITION /** VISIT OF POSTERS AND EXHIBITION **展览登记及开展 /** 参观海报和展览
	PLENARY ROOM - HALL 2 - ZONE C / 多功能會議室 – 2號展廳 — C 區
09.00 - 10.30	**SESSION 8 - FLEXIBLE ENDOSCOPES** **第八部分 – 软式内镜** *Moderators - David BELLAMY & Kam Yee HO / 主持人 – David BELLAMY & 何锦儿*
09.00 - 09.30	**CONFERENCE 21 / 会议 21** **A Centralized Endoscope Cleaning and Disinfection Department with Permanent Staff: Enhancing Quality, Safety, and Efficiency.** **配備固定員工的集中式內窺鏡清洗消毒部門：提高品質、安全和效率** *Anke van Rosmalen (Netherlands) / Anke Rosmaien (荷兰)*
09.30 - 10.00	**CONFERENCE 22 / 会议 22** **ISO 25224: Towards a new harmonized method for endoscope sampling and culturing.** **ISO 25224：迈向内窥镜取样和培养的新型协调方法** *Lionel Pineau (France) / Lionel Pineau (法国)*
10.00 - 10.30	**CONFERENCE 23 / 会议 23** **Then & Now, was borescope worth it.** **當時和現在，內視鏡值得推广嗎** *Frank Daniels (USA) / Frank Daniels (美国)*
10.30 - 11.00	**COFFEE BREAK & VISIT EXHIBITION /** **茶歇和參觀展覽**
11.00 - 12.30	**SESSION 9 - EDUCATION, HR AND OTHERS** **第九节 – 教育、人力资源及其他** *Moderators - Patricia GUTIÉRREZ & Queenie Wai Leng CHAN /* 主持人– Patricia GUTIERREZ & 陈惠玲
11.00 - 11.30	**CONFERENCE 24 / 会议 24** **Empowering Growth from Within, building an internal education program to advance the sterile processing career path.** **從內部賦權增長，建立內部教育計划，以推進無菌处理職業道路** *Randalyn Harreld(USA) / Randalyn Harreld (美国)*
11.30 - 12.00	**CONFERENCE 25 / 会议 25** **Comparative Analysis of Human Resources in the Sterile Services Department at Three Hospitals: Insights from Instrument Check Performance.** **三家醫院消毒供应中心的人力資源比較分析：來自器械檢查績效的啟示** *Wing Sum Ng (Hong Kong) / 吴咏芯 (香港)*
12.00 - 12.30	**CONFERENCE 26 / 会议 26** **How the education program in Serbia is designed** **塞尔维亚的消供教育计划是如何设计的** *Vesna Mioljevic / Vesna Mioljevic (塞尔维亚)*
12.30 - 13.00	**CLOSING REMARKS & FLAG CEREMONY /** **闭幕词及移交旗仪式**
	END OF THE CONGRESS / **大会结束**

WFHSS 2025 - Satellite Symposium

Innovation, Digitalization, Automation, and Continuous Education: SteelcoBelimed Pillars for Safe and Efficient Sterilization Processes

Friday, 5 December 13:00-14:30

Level 2, Room 201B

Visit **SteelcoBelimed** at **booth "H03" Zone B**
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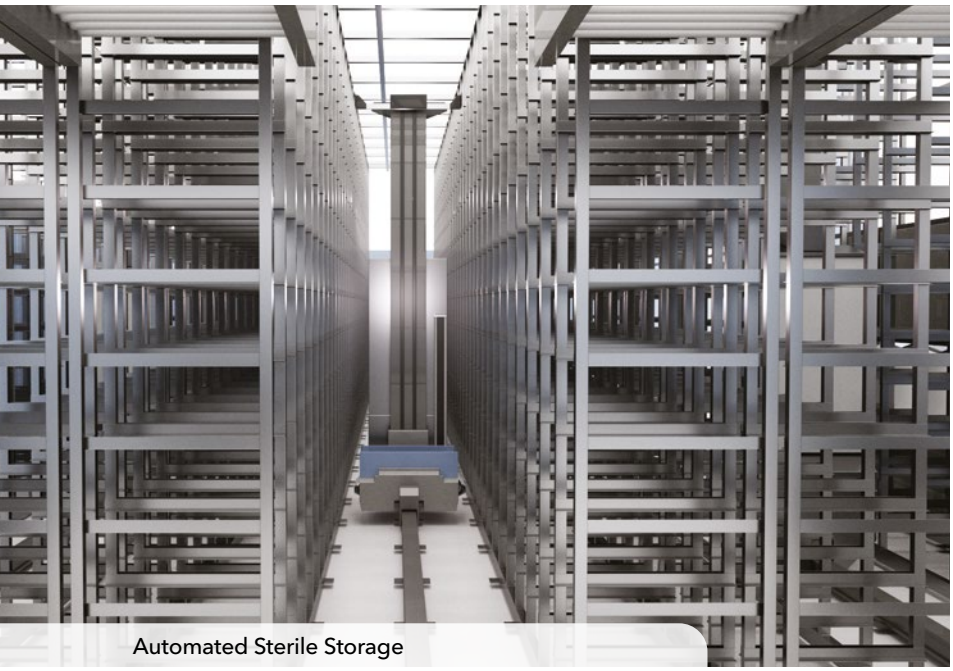
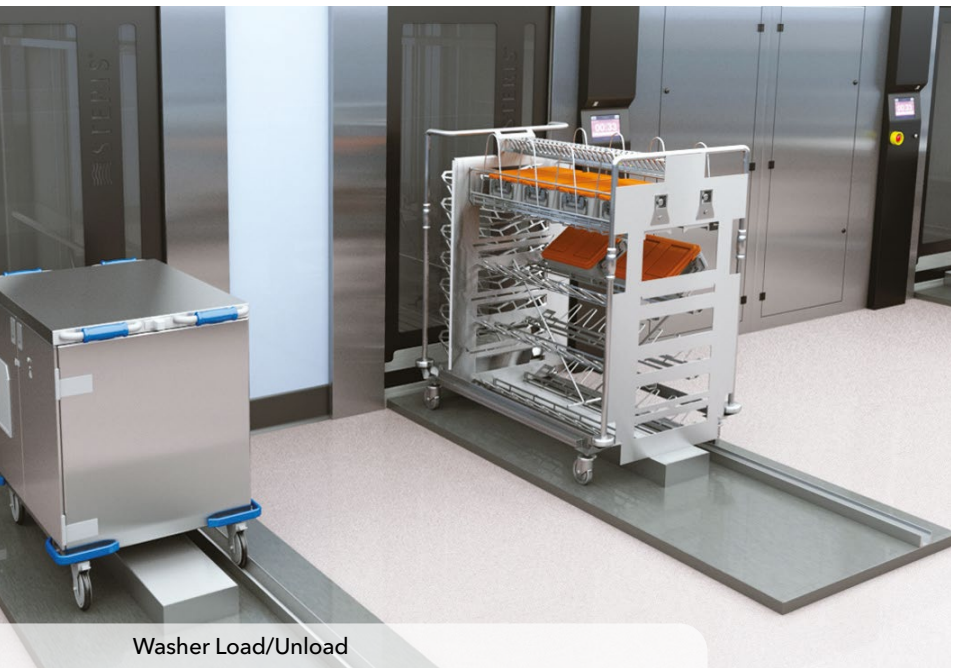
Autonomous Mobile Robot and Rack Storage



Automated Sterile Storage



Washer Load/Unload

SMARTER BETTER FASTER

REPROCESSING

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Choose a partner who can help transform department workflows at your pace.

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BOOTH 2H01

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CONFERENCE 1
CHECKING AND PACKAGING

A WELL-STRUCTED STERILE SERVICES DEPARTMENT TRAINING SYSTEM FOR SUSTAINABLE DEVELOPMENT IN A VOLATILE ENVIRONMENT

***Samuel Law** / Hong Kong*

AIM

This study presents the first clinical evaluation of sealing integrity in rigid sterilization containers within Hong Kong's Central Sterile Supply Departments (CSSDs). Conducted at Tuen Mun Hospital and Pok Oi Hospital, the investigation aimed to determine whether visual inspection alone is sufficient to ensure container performance and to validate alternative testing methods for both new and in-use containers.

METHODS

A total of 1,216 sterilization containers were examined between March 2018 and February 2019. Each container was uniquely identified and tracked through a computerized traceability system. Testing was performed in controlled CSSD environments compliant with ISO Class 8 standards. Three validation methods were employed: the smoke test, paper test, and water leakage test. The smoke test used a Flow Check device to simulate airborne transmission and detect leaks via visual observation. The paper test assessed frictional resistance along the gasket seal, while the water leakage test evaluated seal integrity under gravitational pressure.

RESULTS

Results revealed significant variability across methods. The smoke test demonstrated the lowest failure rate (5.90%) and was unaffected by external forces, making it the most reliable and user-friendly. The paper test showed a moderate failure rate (19.31%) but was limited by blind spots and weight sensitivity. The water leakage test yielded the highest failure rate (52.78%), likely due to gravitational stress. Containers in use for over 11 years exhibited notably higher failure rates, underscoring the impact of aging and wear. A key outcome of this study was the identification of progressive wear and tear in gasket seals. Based on failure patterns and container age, the data strongly supports a mandatory replacement interval: all container gaskets should be replaced at least every five years to maintain sealing integrity and ensure patient safety.

CONCLUSIONS

The study also identified environmental risks, particularly pressure gradients during vertical transport within hospital buildings. A pressure differential exceeding 5 mbar between the 2nd and 13th floors of TMH indicated potential for airborne contaminants to infiltrate through compromised gaskets, especially in containers using non-woven wrappers as bacterial barriers. This investigation highlights the limitations of visual inspection and supports the adoption of standardized, multi-method validation protocols. The smoke test is recommended as a routine performance qualification tool. Findings offer practical insights for CSSD operations and emphasize the need for continued research, environmental awareness, and proactive maintenance strategies to ensure sterilization safety and protect patient outcomes.

CONFERENCE 2
CHECKING AND PACKAGING

ENSURING STERILE SAFETY: A STUDY ON POUCH SEAL INTEGRITY IN HEALTHCARE FACILITIES

Mary Ann Drosnock

AIM

This study sought to systematically investigate and identify the underlying factors contributing to seal integrity issues observed in heat-seal and self-seal pouches within healthcare facilities. The research aimed to evaluate the effectiveness of current practices, equipment maintenance protocols, and user techniques to provide actionable insights into mitigating seal failures. By highlighting critical deficiencies, the study aims to equip educators and healthcare leadership with the necessary knowledge and strategies to enhance standards and patient safety.

METHODS

A comprehensive preliminary study was conducted using multiple test methods. For heat sealers, the Pouch Seal Integrity Test (PSIT) was employed alongside visual observation, both with magnification and the unaided eye. The testing process involved roll stock pouch material designed for either steam or low-temperature sterilization. The facilities heat sealer was utilized to create a test pouch which included the PSIT inside. The ink in the PSIT was then activated to detect any potential seal integrity issues. This method was complemented by magnified visual inspection of the pouch seals as necessary. For facilities utilizing bar heat-sealers, additional inspection was performed on the Teflon rolls within the equipment.

Ready-to-use sterile pouches were also examined for integrity issues. At each facility, ten pouches (five self-seal and five heat-seal where applicable) were retrieved from sterile storage for evaluation. Furthermore, sterile storage practices were audited for any potential factors that could compromise pouch integrity.

RESULTS

This 12-month preliminary study, conducted from January to December 2023 across 39 healthcare facilities, highlighted significant findings. Among these facilities, 35 utilized self-seal pouches, and 30 employed heat-seal methods (8 used continuous-feed heat-sealers and 22 used bar heat-sealers). Self-seal pouches exhibited a 100% defect rate in seal integrity, while heat-seal pouches showed a 37% defect rate.

Of the 22 facilities using bar heat-sealers, 95% were unaware of or failed to routinely rotate the Teflon roll, as specified in the manufacturer's instructions for use. Consequently, 68% of heat-sealers displayed damage to the Teflon roll. Regarding sterile storage, 72% of facilities had opportunities for improvement in the storage practices for peel pouches, and 93% of facilities were not conducting required quality testing on heat-sealing equipment in accordance with AAMI standards.

CONCLUSIONS

This preliminary study uncovered multiple factors contributing to compromised seal integrity in sterile processing pouches. These issues range from inadequate testing supplies and equipment to knowledge gaps among end-users regarding the importance of routine maintenance for heat-sealers and correct self-seal pouch techniques. Addressing these challenges should become an immediate priority for educators and healthcare leaders to enhance patient safety.

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ENSURING STERILE SAFETY: A STUDY ON POUCH SEAL INTEGRITY IN HEALTHCARE FACILITIES EXPERIMENTAL AND NUMERICAL DETERMINATION OF THE STEAM AMOUNT INSIDE LONG, FINE CAVITIES USING ABSORPTION SPECTROSCOPY AND COMPUTATIONAL FLUID DYNAMICS

***Simon Pletzer** / Austria*

AIM

The objective of this study is to quantify, both experimentally and numerically, the amount of steam at the end of a long, narrow channel during a steam sterilization cycle with high temporal resolution. On the basis of these findings, the steam sterilization cycle is to be modified in order to significantly increase the steam amount in the investigated channel.

METHODS

In the experimental part, a measurement setup based on wavelength modulation spectroscopy (WMS) was developed. This technique, which relies on light absorption by steam molecules, is a well-established method in the field of absorption spectroscopy. It enables the determination of the steam mole fraction (0-1) without the need for calibration. The measurement setup was designed for easy mounting on any autoclave via the required test port. In the numerical part of the study, a computational fluid dynamics (CFD) model was developed to study the fluid flow inside the entire internal cavity. Both methods were employed to investigate steam penetration inside a 100-centimeter-long pipe that was placed inside a commercially available autoclave.

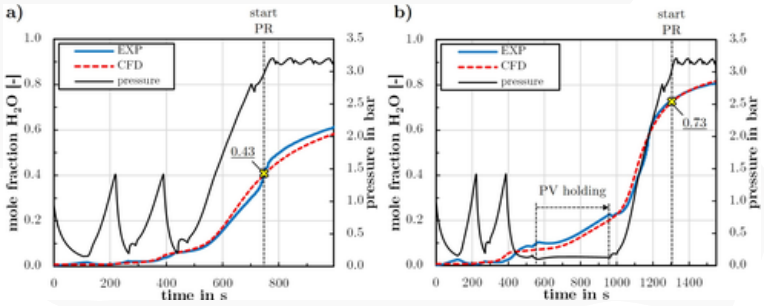
RESULTS

The experimental and numerical results are in excellent agreement throughout the investigated period. At the start of the sterilization plateau of an original «universal 134 °C» cycle (start PR, t = 758s, Figure 1a), the steam mole fraction at the end of the investigated pipe is 0.43. In order to increase the steam amount, the cycle is adopted to utilize the mass diffusion effect. Following the final vacuum phase (t = 558 s, Figure 1b), the pressure is sustained for 400 s at an average pressure of 0.13 bar (PV holding, t = 558 – 958 s, Figure 1b). This cycle adjustment increases the amount of steam to 0.73 at the beginning of the sterilization plateau. The primary benefit of this approach is that it does not require any additional energy or water.

CONCLUSIONS

The results clearly demonstrated that the amount of steam inside long, narrow channels can be determined experimentally and numerically with high temporal resolution. The proposed methods provide great opportunities for researchers and companies to better understand steam penetration into medical devices during steam sterilization cycles. This has the potential to significantly improve the sterility of medical devices, thereby improving patient safety.

a) orig. universal 134 °C cycle. b) PV holding cycle



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IMPACT OF LOAD WEIGHT ON PHYSICAL PARAMETERS IN LOW-TEMPERATURE VAPORIZED HYDROGEN PEROXIDE STERILIZATION

***Aiqin Chen** / China*

AIM

Manufacturer manuals for low-temperature vaporized hydrogen peroxide (VHP) sterilizers specify varying load weight limits depending on the brand and model. In clinical practice, it is challenging for staff in the Central Sterile Supply Department (CSSD) to accurately measure the load weight for each sterilization cycle, potentially resulting in overload and compromised sterility assurance [1]. This study evaluated the effects of load weight on the physical parameters during low-temperature VHP sterilization processes.

METHODS

From October 2024 to February 2025, three low-temperature VHP sterilizers (two brands, two models) at the CSSD of a cancer center were monitored using wireless data loggers to evaluate temperature dynamics under varying load weights during two injection stages. Two loggers were placed at the geometric centers of the top and bottom chamber shelves. For brand A sterilizers, which provided real-time VHP concentration monitoring, VHP levels were measured via integrated sensor. A total of 105 datasets were analyzed. Linear regression models assessed the effects of load weight on parameters, adjusted for logger location, injection stage, and sterilizer brand. A stepwise approach evaluated potential interaction effects, supplemented by subgroup analyses.

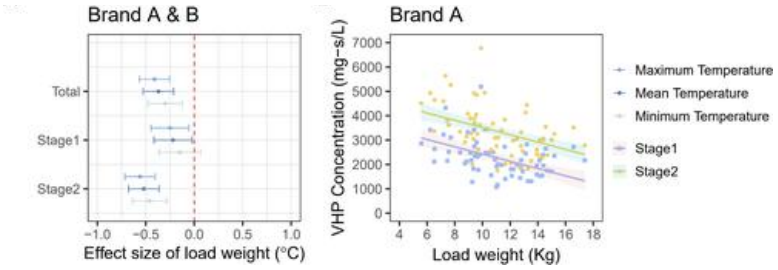
RESULTS

As illustrated in the figure, each 1 kg increase in load weight was associated with: 1) a 0.30°C decrease in minimum temperature (P<0.001; 95%CI: -0.48 to -0.13); 2) a 0.37°C decrease in mean temperature (P<0.001; -0.53 to -0.21); 3) a 0.41°C decrease in maximum temperature (P<0.001; -0.57 to -0.25) during injection stages of all sterilizers ; 4) and a 149.16 mg-s/L decrease in cumulative VHP concentration (P<0.001; -200.55 to -97.77) during injection stages of brand A. Subgroup analysis revealed a potential differential effect of load weight on minimum, mean and maximum temperature depending on injection stage with P for interactions of 0.032 and 0.052 and 0.064, respectively.

CONCLUSIONS

Temperature parameters exhibited inverse correlations with load weight in low-temperature VHP sterilization, and the effects of load weight were more significant during the second injection stage. Furthermore, the cumulative VHP concentrations also exhibited a negative association with load weight in the sterilizers equipped with the VHP sensor. These findings underscore the critical need for standardized operating protocols strictly enforcing manufacturer-specified load weight limits to ensure sterility assurance levels of ≤10-6.

Effects of load weight on physical parameters.



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CONFERENCE 5
STERILIZATION

HONG KONG EXPERIENCE IN CONTROL OF WET PACK THROUGH SCIENTIFIC APPROACH

***Teddy Lee** / Hong Kong*

AIM

This study highlights the critical importance of wet pack management in Sterile Service Departments (SSD), focusing on how wet loads compromise the sterility and safety of medical devices. By exploring the physics of water and characteristic of steam, identifying operational and environmental contributors, and applying evidence-based practices—including equipment inspection, packing weight control, optimized pack arrangement and material selection, effective drying cycles, water quality management, and strategic post-cycle handling. This study aims to guide healthcare professionals in scientifically managing wet packs within hospital sterilization workflows.

METHODS

A multidisciplinary team approach was adopted, integrating continuous staff training, systematic incident documentation, and root cause analysis using evaluation checklists and process mapping. Scientific principles—such as latent heat of vaporization, steam dryness, and condensation dynamics—were applied to interventions. These included routine equipment checks, precise control of instrument set weight, optimized arrangement of heavy or low heat capacity items, and enhanced drying protocols. Strategic post-cycle handling was implemented to prevent condensation. Within the SSD, these practices were continuously reviewed and refined. Additionally, "Nearly Missed Incidents" were monitored to track wet pack trends, enabling timely corrective actions through regular data evaluation and packaging intervention.

RESULTS

Scientific interventions led to a marked reduction in wet pack incidents. Key measures—such as limiting instrument set weight, reorganizing pack contents, improving steam flow spacing, and maintaining sterilizer performance—proved effective. Enhanced drying, achieved through optimized cycles, proper cooling, and use of high-quality saturated steam, ensured sterile packs consistently met safety standards. Incident tracking confirmed a drop from 82 wet pack cases per year to an average of 5, demonstrating improved safety and compliance.

CONCLUSIONS

Effective wet pack control is essential for patient safety and quality assurance in SSDs. Applying scientific principles related to steam and water behavior, combined with procedural discipline, teamwork, and continuous evaluation, enables reliable prevention. Monitoring nearly missed incidents and refining processes ensures consistent delivery of sterile devices, reduces infection risk, supports regulatory compliance, and fosters a culture of excellence in sterile processing.

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RESEARCH ON THE CLEANING EFFECTIVENESS OF VACUUM BOILING WASHER DISINFECTOR IN COMPARISON WITH ULTRASONIC CLEANER, WASHER DISINFECTOR AND MANUAL CLEANING

***Huifen Zhou** / China*

AIM

This study evaluates the cleaning effectiveness and efficiency of the Vacuum Boiling Washer Disinfector (VBWD) by conducting comparative experiments on various types of instruments. It compares the VBWD's performance with traditional cleaning methods, such as ultrasonic cleaners, washer disinfectors, and manual cleaning. Additionally, the study explores the prevalence of VBWD usage in China.

METHODS

This study examines the cleaning effectiveness for challenging surgical instruments, including lumen-based devices and instruments with multiple movable joints,such as Laparoscopic instruments.Soiled instruments were collected from clinical areas post-use for evaluation across various cleaning methods.
For ultrasonic cleaning, the instruments were submerged in an ultrasonic bath for 10 minutes. In the case of washer disinfectors, pipeline instruments were properly docked, while other complex instruments underwent cleaning in the washer disinfector. Manual cleaning involved scrubbing soiled instruments using soft brushes. As part of the VBWD cleaning process, instruments were placed directly onto washer racks and subjected to a standard washing cycle. All cleaning methods utilized a mild alkaline detergent with a pH of 8, applied without any pre-treatment. Before undergoing thermal disinfection, 221 lumen and complex instruments were assessed for cleanliness using ATP detection. An ATP reading below 200 RLU was required for passing the cleaning standard. Furthermore, by surveying CSSD staff, the study analyzed the willingness to adopt the new VBWD cleaning method, revealing its growing acceptance and popularity across China.

RESULTS

The experimental result is shown as below :
The comparison of instrument ATP test results [piece (%)]

Cleaning Method	Qualified quantity	Failed Quantity	Qualified Rate	χ^2 Value	P value
Manual Cleaning	173	48	78.28%	-	-
Washer disinfector	191	30	86.43%	5.044	0.025
Ultrasonic washing	187	34	84.62%	2.935	0.087
VBWD	218	12	98.64%	24.993	<0.001

The experimental graph shows a statistically significant difference (χ^2=24.993, P<0.01) between vacuum boiling washer disinfector and manual cleaning.
Out of 286 survey responses, 130 supporting staff and 156 nurses participated. Of these, 92.3% of the supporting staff and 97.4% of the nursing staff expressed a preference for the VBWD cleaning method.

CONCLUSIONS

Based on the results, it is evident that VBWD stands out as the most effective cleaning alternative to traditional methods. This device operates in a depressurized environment, which significantly lowers the boiling point of the cleaning solution. At just 50°C, the solution boils, and the vigorous bubbling action stirs the cleaning agent, enhancing its ability to flush out debris from intricate gaps and lumens. This process effectively removes stains and ensures thorough cleaning.
The VBWD excels in cleaning lumen and complex instruments with its innovative mechanism. Its design enables a straightforward cleaning process without the need for pipeline docking. Furthermore, the machine facilitates thermal disinfection at 90°C for 1 to 5 minutes during the final rinse stage. The survey revealed that 95% of CSSD staff favor the VBWD. Compliant with ISO 15883 standards, the VBWD incorporates all crucial washing processes, positioning itself as an efficient and practical alternative to conventional washer disinfectors.

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INNOVATION IN REPROCESSING ROBOTIC SURGICAL INSTRUMENTS

***Nick Dassatti** / USA*

AIM

Staffing shortage is a challenge that sterile processing departments (SPD) face and therefore there is a need for new reprocessing solutions which improve SPD efficiency without compromising patient safety. This is important for those adopting robotic surgery into their facility where automated cleaning and thermal disinfection of robotic surgical instruments typically requires the use of specialized load carriers and cleaning cycles developed by the washer-disinfector manufacturer, in collaboration with the robotic device manufacturer. The use of specialized racks and cycles specifically for robotics adds complexity to the user's process.
To streamline the development and user implementation for robotic instrument reprocessing, a simplified approach was developed and validated using a standardized automated cleaning and disinfection cycle with a robotic reprocessing tray and connector set, along with steam sterilization validation. The process enables compatibility across major washer-disinfector brands and models.
This study presents the challenges with customized robotic solutions while providing a simplified solution to users. The approach reduces the burden on SPD departments through a parametric cleaning solution with sterilizable tray.

METHODS

The streamlined approach to robotic instrument reprocessing was established through:
1) Review of washer-disinfector brands which have legally marketed robotic instrument wash racks and cycles
2) Development of trays to safely hold and flush robotic instruments with standard washer-disinfector equipment
3) Cleaning validation using a representative washer-disinfector and cycle. The instruments were soiled, cleaned, visually inspected, extracted, and residual protein was quantified using the bicinchoninic acid (BCA) assay. Residual protein values were then assessed against industry accepted criteria.
4) Steam sterilization validation with the instruments loaded into the trays to enable sterilization in the same tray following automated cleaning.

RESULTS

A robotic instrument tray was successfully developed to enable a streamlined approach to automated cleaning, thermal disinfection, and sterilization. Automated cleaning was validated using a standard cleaning cycle in a representative washer-disinfector with residual protein on all instruments falling below 100 µg and no soil was identified during visual inspection. The sterilization validation yielded no growth on all tested biological indicators.

CONCLUSIONS

A simplified method has been developed to reprocess robotic surgical instruments using trays and connector sets. This method supports automated cleaning and disinfection using standard washer-disinfector shelves and cleaning cycles and enables sterilization in the same tray used for cleaning. This approach reduces the burden on washer disinfector and robotics manufacturers and, more importantly, helps users reduce cleaning time, minimize handling, and streamline throughput during reprocessing of robotic surgical instruments.

CONFERENCE 8
CLEANING AND
DISINFECTION

QUANTITATIVE MONITORING OF RESIDUAL PROTEIN IN CANNULATED MEDICAL DEVICES: MULTICENTER STUDY

Silvia Martinez / Argentina

AIM

Cannulated medical devices -such as orthopadics reamers, endoscope channels, and phacoemulsification handpieces- present considerable challenges in healthcare due to their complex internal lumens. These narrow channels are difficult to clean and inspect, increasing the risk of organic material remaining post- reprocessing. This residual contamination, particularly protein and biofilm may compromise disinfection and sterilization, ultimately leading to patient cross-contamination and device associated infections. The aim of this study was to evaluate the effectiveness of a novel protein detection system: Chemdye® Pro1 Endo, specifically design to assess the internal cleanliness of cannulated instruments, with the goal of enhancing verification protocols and supporting quality management systems in hospital settings.

METHODS

A multicenter study was conducted across three major healthcare institutions in Buenos Aires, Argentina. A diverse group of cannulated instruments commonly used in clinical practice was included. These instruments were reprocessed either manually or using washer-disinfectors according to each hospital´s protocols. After cleaning, samples were taken from the intenal lumens using high-absorption swabs designed to collect residues from whithin narrow channels . The presence and quantity of residual protein were measured using a rapid colorimetric protein detection system, which yielded quantitative results whithin a clinically relevant range.

RESULTS

The system succesfully detected protein residues in a significant number of reprocessed cannulated devices. Results showed clear differences in cleaning outcomes between manual and automated processes. Instruments processed in washer-disinfectors tended to have lower and more consistent protein levels; however, certain complex designs still retained detectable residues. Manual cleaning yielded highly variable results, with several instruments exceeding safe thresholds for residual protein. In some cases, protein levels above 10 ug were detected, highlighting potential risks for biofim formation and sterilization failure. The detection system proved to be both practical and sensitive in a real-world hospital setting. It effectively identified instruments that would have passed visual inspection or ATP-based testing, thereby preventing false assurances or cleanliness. The ease of use, minimal disruption to workflow, and rapid turnaround time made the system a feasible solution for routine monitoring.

CONCLUSIONS

This study demonstrates the critical need for lumen-specific monitoring tools in the reprocessing of cannulated medical devices. The protein detection system evaluated here offers a reliable and quantitative method to verify internal cleanliness, overcoming limitations of traditional inspection and rapid assays. Its adoption in clinical settings can reduce the likelihood of residual contamination going undetected, thereby decreasing infection risk and improving patient pafety. Furthermore, the tool supports the implementation of data-driven quality management practices in sterile processing departaments. Regular use of such targeted monitoring system is recommended to ensure compliance with evolving international guidelines and to safeguard against the hidden threats posed by inadequately cleaned instruments.

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HOW WE BUILT CSSDGPT: A GENERATIVE AI ASSISTANT DESIGNED FOR REPROCESSING PRACTITIONERS

***Yongpeng Qin** / China*

AIM

To develop a specialized generative AI model, CSSDGPT, that:

- Provides accurate, instant answers to CSSD-related queries (e.g., disinfection/sterilization science, education and human resource management, departmental workflow management, quality and risk management, and reprocessing protocols etc.)
- Bridges knowledge gaps for CSSD staff by providing expert-level responses.
- Reduces reliance on manual searches and expert consultations, while improving workflow efficiency in sterile processing.

METHODS

To achieve these objectives, we implemented a Generative AI + RAG (Retrieval-Augmented Generation) framework through the following steps:

Step 1. Knowledge Base Construction

- Collected authoritative CSSD references including, standards and guidelines, reprocessing manuals, standard operating procedures, professional books, academic papers, IFUs, and so on.
- Segmented documents into retrieval-optimized chunks.
- Transformed text into mathematical vectors using embedding models (e.g., OpenAI Embeddings) and stored them in a vector database.

Step 2. AI Q&A Process

- When a user asks a question (e.g., «What are the possible reasons for B-D test failure?»), the system first retrieves the top N most relevant content segments from the vector database.
- The user's question and the retrieved content segments are then input into a large language model (e.g., GPT-4, DeepSeek) to generate accurate and reliable answers.

Step 3. Continuous Optimization

- Refine retrieval strategies and model outputs through user feedback to enhance answer reliability and practicality
- Systematically incorporate the latest evidence-based documentation, guidelines and regulatory updates to ensure response accuracy and compliance.

RESULTS

- Accuracy: Demonstrated 100% precision on questions with standard answers (e.g., sterilization parameters, expiration dates across packaging materials), while achieving 94.6% expert satisfaction rate for open-ended questions (e.g., departmental structure optimization, CSSD open-day event planning).
- Adoption: 78.6% of staff preferred the CSSDGPT over traditional knowledge acquisition methods (web-searching, document retrieval and expert/peer consultation) for resolving daily work queries and operational challenges.
- Limitations: Chinese-only language support, inability to process visual inputs (e.g., instrument identification).
- Efficiency: Reduced average query resolution time from around 15 minutes (traditional) to < 0.5 minutes (with CSSDGPT).

CONCLUSIONS

- The CSSDGPT significantly addresses CSSD staff's daily informational needs, proving its value as a decision-support tool.
- Key to success: domain-specific hybrid training combining authoritative guidelines with operational SOPs and closed-loop optimization through practitioner feedback.
- Future development: CSSD traceability system integration, multilingual expansion, and hands-free voice operation.

Database preparation and Query process of CSSDGPT

CONFERENCE 10
AUTOMATION
AND AI

AI-POWERED SMART TABLE FOR SURGICAL KIT REASSEMBLY IN STERILIZATION CENTERS

***Chiara Taranto** / Italy*

AIM

This study presents a novel AI-powered smart table designed to optimize the reassembly process of surgical instrument kits in sterilization centers. The system enables automatic recognition and verification of surgical instruments without requiring physical alterations such as DataMatrix codes or RFID tags. The primary objective is to reduce human error, enhance workflow efficiency, and improve patient safety, while significantly decreasing training time for new personnel in Central Sterilization Services Departments (CSSDs).

METHODS

The smart table was deployed in sterilization centers integrated with an instrument tracking system (ITS) to ensure real-time data alignment. The hardware configuration includes four high-resolution cameras, a projection system, a touch screen interface, and a light-guided packaging module. Upon scanning a barcode associated with a surgical kit, the system displays all required information and captures a real-time image of the instruments placed on the table. Using artificial intelligence, it recognizes each instrument based on its physical attributes—such as shape, size, and color—without requiring contact or pre-defined placement. Instruments not belonging to the selected kit are automatically flagged. Color-coded projections guide operators in assembling the kit according to predefined sequences, ensuring accuracy and speed. Manual verification and adjustment are available during the training phase to enhance learning and system adaptability.

RESULTS

The system demonstrated high accuracy in identifying and verifying surgical instruments across a variety of standard and complex trays. Compared to conventional manual methods, reassembly time was reduced by 30%, and operator training time decreased by 40%. Error rates associated with incorrect or missing instruments were significantly lowered. The system also generated automated reports, including checklists, instrument counts, detected anomalies, and photographic evidence. Integration with the ITS ensured traceability of each instrument, including maintenance records and kit assembly history. The solution was particularly effective for managing loaner sets, allowing rapid inventory creation and seamless integration into existing workflows.

CONCLUSIONS

This AI-driven smart table represents a significant advancement in the reassembly process within sterilization centers. By automating instrument recognition and guiding reassembly with real-time feedback, the system enhances operational efficiency, reduces the risk of human error, and minimizes the training burden for less experienced staff. It further contributes to improved traceability, quality assurance, and ultimately, patient safety. Future developments will aim to expand system capabilities and integration into broader sterilization workflows, supporting the evolving demands of healthcare facilities worldwide.

REFERENCES / ACKNOWLEDGEMENTS

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APPLICATION EFFECT OF ARTIFICIAL INTELLIGENCE VISUAL RECOGNITION SYSTEM ON THE RECEIVING AND INVENTORY PROCESS OF LOANER INSTRUMENTS

***Chang-E Wang** / China*

AIM

To explore the application effect of artificial intelligence visual recognition system in the receiving and inventory process of loaner instruments in CSSD.

METHODS

In June 2024, our hospital had got the Artificial intelligence visual recognition system equipment, The CSSD aggregates information on orthopedic instruments that need to be disposed of by hospitals that have signed contracts, CSSD will maintain information on loaner instruments that need to be disposed of and signed for by the hospital, including instrument names, images, and the number of items in each package, into an artificial intelligence visual recognition system. During the process of receiving loaner instruments, this system will automatically identify the quantity and structure of the instruments through AI recognition. It will also provide automatic alerts when discrepancies or errors occur between the maintained information and the actual items received. A control group was selected from 1,200 loaner instruments received by the CSSD from January to June 2024, when the AI recognition system was not used. The observation group consisted of another 1,200 instruments received from June to December 2024 after the AI recognition system was implemented. The study compared the time consumption for instrument counting,the incidence of counting errors, and employee satisfaction in both groups.

RESULTS

The observation group showed significantly lower inventory time compared to the control group, with a statistically significant differencet($P<0.05$) . The accuracy of instrument recognition (including quantity and structure) in the observation group was superior to that in the control group, also showing a statistically significant difference ($P<0.05$). Employee satisfaction in the observation group was higher than in the control group, with a statistically significant difference ($P<0.05$).

CONCLUSIONS

Compared with the traditional manual methods, the artificial intelligence system can shorten the counting time of loaner instruments on the receiving process, it has a lower error rate, and high employee satisfaction. It helps improve work efficiency and quality in the reception of external instruments, demonstrating good application effects.

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SYMPOSIUM | WFHSS 2025

- **Driving CSSD Excellence: Production, Efficiency and Sustainability**

  推动消毒供应中心卓越发展：生产力、效率与可持续性

  Elena Lorenzo

  Infection Prevention & Control Manager
  Matachana International Education Center

- **LTSF: Reaching sterilization where others fail**

  低温蒸汽甲醛灭菌：在其他灭菌方式失败之处实现灭菌

  Alejandro Ramirez

  Global Product Manager Low Temperature Sterilization
  Matachana Marketing Department

Thursday **4 December** | Time **10:30-11:30** | Room 201A

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CONFERENCE 12
GREEN AND INNOVATION SUSTANA-BILITY

IMPLEMENTATION OF SUSTAINABILITY STRATEGIES IN CENTRAL STERILE SERVICE DEPARTMENT (CSSD) IN THE LATIN AMERICAN CONTEXT

***Mayra Samara Ordoñez Diaz** / Colombia*

AIM

Analyze the implementation of sustainability strategies in Central Sterile Service Departments (CSSD) of healthcare institutions in Latin America, identifying current practices, challenges, and opportunities to optimize environmental, economic, and social sustainability in these services.

METHODS

A cross-sectional descriptive study was conducted through a structured survey directed to managers of Central Sterile Service Departments (CSSD) in various healthcare institutions across Latin America. The instrument specifically evaluated sustainability with a focus on environmental aspects and carbon footprint, including current practices, implementation barriers, and opportunities for improvement in these areas. Data collection was carried out through a questionnaire validated by experts in the field. Statistical analysis was performed using Microsoft Excel for data organization and cleaning, and Jamovi for descriptive and inferential analysis, including frequencies, percentages, measures of central tendency, and tests of association between variables.

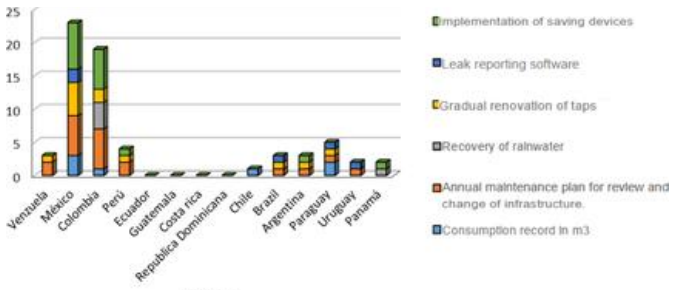
RESULTS

The analysis of 90 CSSD units in 14 Latin American countries revealed that 53.3% implement recycling programs, mainly for paper (24.3%), cardboard (21%), and plastic (20.1%). Regarding water management, 47.5% do not apply conservation strategies, while 33.3% use flow regulators in faucets. For energy efficiency, 25.2% turn off devices when not in use, 16.6% implement LED technology, and only 10% have incorporated renewable energies. 39.8% use reusable metal containers for packaging and 25.2% use biodegradable packaging. Mexico leads in implementing energy strategies, while Colombia stands out in water management and recycling programs. Significantly, 84.4% lack formal sustainability policies and 79.2% do not measure the carbon footprint of their operations.

CONCLUSIONS

Central Sterile Service Departments (CSSD) in Latin America implement various sustainability strategies such as recycling, energy efficiency, and water conservation, demonstrating an emerging environmental awareness. However, there is a marked regional disparity, with Mexico, Colombia, and Argentina leading different initiatives. The absence of formal policies (84.4%) and carbon footprint measurement (79.2%) represent the main challenges. The promotion of inter-institutional collaboration, standardization of processes, and creation of regional support networks are identified as opportunities. The results highlight the importance of aligning these practices with the Sustainable Development Goals related to health and well-being, responsible production and consumption, and clean water and sanitation, to maximize their contribution to sustainability in the health sector.

Strategies related to water consumption



REFERENCES / ACKNOWLEDGEMENTS

Acknowledgment is extended to all CSSD units from 14 Latin American countries that participated in this study. Recognition is given to the undergraduate students: Hector Navia, Estefan Heredia, and Daniela Rodriguez for their collaboration.

CONFERENCE 13
GREEN AND INNOVATION SUSTANA-BILITY

GREEN STRATEGIES AND POSSIBILITIES ALL OVER THE WORLD

***Cinthia Vera Fuentes** / Chili*

AIM

Identify global strategies and evidence-based approaches that enable medical device reprocessing units (RUMED/CSSD) to integrate the principles of sustainability and circular economy into their quality management systems (ISO 13485). The goal is to align patient safety with environmental protection and promote data-driven decision-making for resilient, low-impact reprocessing systems.

METHODS

A conceptual and exploratory methodology was applied, reviewing international sustainability initiatives relevant to the reprocessing of medical devices. The analysis integrated environmental and strategic frameworks published by Zentralsterilization (2025), The Green Revolution in SPD (Infection Control Today, 2025), and the French Green Guide (SF2S, 2024).

A specific review was conducted of sustainability efforts within the healthcare sector through the Global Green and Healthy Hospitals (GGHH) network and Health Care Without Harm initiatives led by disinfection and sterilization societies.

The study also examined the availability of tools such as Life Cycle Analysis (ISO 14040/44; Ecoinvent v3.9) and circular economy frameworks (OECD 2025, IPCC AR6, Lancet Countdown 2025) to highlight their potential for data generation, comparison, and future goal setting.

The objective was not to perform environmental calculations, but to identify fundamental concepts, global trends, and opportunities for collective action that can guide the development of sustainability strategies in the field of reprocessing.

RESULTS

The results show that, while numerous global initiatives are driving mitigation, adaptation, and resilience across the healthcare sector, the field of medical device reprocessing remains poorly integrated into these efforts. Hospitals, NGOs, governments, and industry have set 2050 climate targets aligned with international commitments; however, standardized environmental metrics for reprocessing are still lacking, limiting comparability and coordinated action worldwide.

Environmental impacts occur at every stage of reprocessing, from CO_2 emissions in supply chain transportation to intensive energy and water use for cleaning, disinfection, and sterilization, as well as non-recyclable chemical and plastic waste.

To address this gap, it is essential to create a collaborative network capable of generating robust, shared datasets that support goal setting and guide a common roadmap. Strengthening the involvement of reprocessing professionals in global green hospital initiatives and fostering alignment with industry is key to promoting a sustainable, circular model for medical device reprocessing. In addition, the generation of environmental data should enable the development of new quality indicators that can be incorporated into existing ISO 13485 systems, ensuring that sustainability actions are fully integrated throughout the reprocessing chain, rather than remaining isolated initiatives.

CONCLUSIONS

The transition to sustainable reprocessing requires a systemic circular model based on measurement, collaboration, and continuous improvement. A truly green CSSD must measure, optimize, redesign, and collaborate. The integration of new environmental indicators into established quality management systems is essential to ensure that sustainability becomes a structural component of reprocessing practices.

True safety will only be achieved when reprocessing is safe for both people and the planet.

CONFERENCE 14
GREEN AND INNOVATION SUSTANA-BILITY

STERILIZER ENERGY CONSUMPTION MONITORING AND ENERGY-SAVING OPTIMIZATION BASED ON AN ELECTRONIC QUALITY TRACEABILITY SYSTEM

***Xiaoguang LI** / China*

AIM

To fully leverage the data value of the Central Sterile Supply Department's (CSSD) electronic quality traceability system, analyze historical data to predict equipment idle periods, enable intelligent shutdown, reduce unnecessary energy consumption, and provide data-driven support for sustainable operations.

METHODS

Data from four large steam sterilizers (capacity: 1500L) operating on weekdays were extracted from the electronic traceability system, including sterilization cycle times and program types. Electricity and steam consumption during standby mode were recorded. Key analyses included average energy consumption per sterilization cycle, daily energy consumption curves, proportion of idle standby time and associated energy consumption, sterilization frequency and energy use across different time periods. Low-utilization periods were identified, and sterilization demand was predicted based on historical data to recommend optimal shutdown times. Energy consumption data before and after strategy implementation were compared, with records of failed early shutdown attempts. Staff acceptance and compliance with the new strategy were assessed.

RESULTS

Statistical analysis revealed that, per sterilizer annual total power-on time averaged 3,183 hours (operating time: 2,258 hours, standby time: 925 hours). Standby time accounted for 29.04% of total operation, consuming 305 kWh of electricity and 14,145 kg of steam. After implementing the energy consumption model and optimization strategies derived from the traceability system, workflow adjustments and revised shutdown schedules were applied. Data from the first three months of this year showed that standby time reduced to an average of 22.14%, a 23.76% decrease compared to the same period last year.Other data, such as total operating time and energy consumption data, have not been subjected to matching analysis or comparative evaluation.

CONCLUSIONS

The energy consumption model based on the electronic traceability system effectively analyzes sterilization operation and idle periods, predicts low-usage time windows, and enables early shutdown to conserve energy. This approach demonstrates measurable success in reducing standby consumption without compromising workflow efficiency.

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CONFERENCE 15
PROCESS
VALIDATION

VALIDATION OF WASHER-DISINFECTORS IN A DANISH HOSPITAL SETTING: FOCUS ON CLEANING EFFICACY AND STANDARDIZATION

***Peter Rubak** / Denmark*

AIM

This study explores the validation process of washer-disinfectors used for reprocessing sterilizable surgical instruments in a newly established Danish sterile department. Particular focus is placed on the Performance Qualification (PQ) phase - a critical step in ensuring that equipment functions correctly and complies with regulatory standards1,2.

Despite a structured framework, key challenges remain. The lack of a standardized method for detecting protein residues hampers objective assessment of cleaning efficacy. Additionally, many foundational studies guiding current practices are outdated, often neglecting modern technologies and methods. Addressing these gaps is essential for enhancing both safety and process quality3.

This presentation details the planning and execution of the PQ phase, emphasizing collaboration between the Central Sterile Services Department (CSSD), quality assurance teams, and researchers. By showcasing this multidisciplinary effort, we aim to support best practices and advocate for renewed research and standardized assessment tools.

METHODS

Several variables were systematically tested to evaluate their influence on cleaning efficacy, including: Type of instrument baskets, detergent dosage, detergent type, number of baskets loaded onto washing rack, and use of ultrasonic cleaning.

A consistent set of test instruments was used across all trials, contaminated with human blood via a standardized protocol carried out by the same trained individual. A drying period of at least eight hours preceded testing.

To ensure consistency, instruments were placed in identical tray positions for each run. Only one variable was changed per trial - e.g., tray type, detergent concentration, or use of ultrasonic (UL) pre-cleaning.

The washer-disinfector cycle was stopped before disinfection, and residual protein was eluted from the instruments by the same quality personnel each time, after which the residual proteinlevels were measured using the BCA (bicinchoninic acid) method4. All analyses were performed by two researchers and specialists in reprocessing and protein residue detection.

An upper limit of 100 micrograms of protein per instrument was applied, in line with current best practices.

RESULTS

Data collection is expected to conclude in May 2025. Final results will be presented at the World Federation for Hospital Sterilisation Sciences (WFHSS) Congress 2025 in Hong Kong.

CONCLUSIONS

This study highlights the importance of methodical testing during the validation of washer-disinfectors, particularly in the PQ phase. By systematically evaluating key process variables and employing standardized contamination and measurement methods, we contribute to a more robust framework for cleaning validation. The findings are expected to inform future guidelines, promote the development of standardized protein residue benchmarks, and encourage the integration of modern technologies into reprocessing protocols—ultimately enhancing patient safety and clinical hygiene standards.

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3 / World Health Organization (WHO). Decontamination and reprocessing of medical devices for health-care facilities, https://iris.who.int/bitstream/handle/10665/250232/9789241549851-eng.pdf?sequence=1; 2016 4. Smith PK, Krohn RI, Hermanson GT, Mallia AK, Gartner FH, Provenzano MD, et al. Measurement of protein using bicinchoninic acid. Anal Biochem. 1985;150(1):76–85. https://doi.org/10.1016/0003-2697(85)90442-7

CONFERENCE 16
PROCESS
VALIDATION

PERFORMANCE EVALUATION OF VARIOUS CLEANING METHODS

***Sulisti Holmes** / United Kingdom*

AIM

To compare cleaning performance of on instrument sets using various methods

METHODS

Browne test soil was applied to 3 sets of identical surgical instruments (n=80), then left to dry for 48 hours before cleaning. Afterward, the residual protein on each instrument was measured using the ProReveal Protein Detection Test. The 4 different methods used are Washer Disinfector (WD) only, pre-cleaning machine only, pre-cleaning machine followed by WD, manual cleaning follow by WD. To verify the results, heavily contaminated instruments (e.g. maternity and orthopaedic sets) previously used on patients were subjected to 2 different cleaning methods, i.e. WD only, and pre-cleaned machine followed by WD. A one-way ANOVA and a post-hoc tests were performed to determine whether there are any statistically significant differences between cleaning methods.

RESULTS

The ANOVA suggests that not all cleaning methods are the same ($F = 8.24$, $p < 0.0001$). Mean residual protein were 4.16 (standard deviation (SD) = 11.1066) for the use of pre-cleaning machine only (Method 1), 0.29 (SD = 2.5366) for pre-cleaning machine then WD (Method 2), 0.41 (SD = 1.0848) for WD only (Method 3) and 0.52 (SD = 2.7512) for manual cleaning then WD (Method 4).

Post hoc testing shows that cleaning using Method 1 produced higher protein residue than Method 2 ($p=0.0007$), Method 3 ($p=0.0011$) and Method 4 ($p=0.0018$). There were no significant differences found between the methods Method 2, 3 and 4.

WD processing successfully reduce the protein from all 65 heavily contaminated instruments trays to below the limit set by the guidance1. There was no significant difference found when comparing results from 2 different cleaning methods ($t = 0.56$, $p = 0.5778$). The mean results were 0.24 (SD = 0.8803) and 0.18 (SD = 0.2970) from pre-cleaning then WD, and WD alone, respectively.

CONCLUSIONS

Pre-cleaning machine only was unable to remove soiling to the level set by the national guidance1. Both studies using live sets and standard instruments demonstrated the introduction of pre-cleaning machine prior to WD processing did not significantly improve cleanliness. This emphasises the importance of proper validation of WD in the first place, using the worst scenario. Manual cleaning before WD process may help to target certain hidden areas for certain challenging types of instruments, however, most instruments can be successfully cleaned in a properly validated WD.

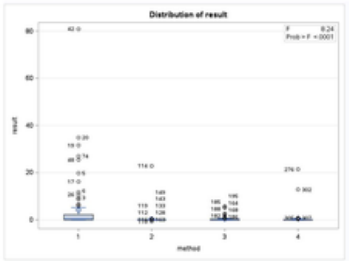

Figure 1. Box plot of residual protein concentrations on instruments after being processed using 4 different methods.

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CSSD(Central Sterile Supply Department) >>>

- **Design**
  Optimal process plan
- **Equipment**
  Reasonable equipment configuration
- **Construction**
  Installation and commissioning
  Safety and advisable program
- **Training**
  Systematic theory and practice
- **Maintenance**
  Free technology consulting,
  fast feedback and action

INVESTIGATING SURGICAL INSTRUMENT DAMAGE: HOW TO ENSURE YOUR INVESTMENT IS PROTECTED

***Matthias Tschoerner** / Germany*

AIM

Surgical instrument acquisition, repair, and replacement account for a significant portion of most healthcare facilities' budgets, yet the care and consideration taken to protect this valuable investment is often overlooked. Different measures are commonly used to protect instruments from corrosion, especially when the processing cannot start immediately after use e.g. due to the need of transportation or delayed reprocessing.
The most common corrosive effect on surgical instrumentation in the clinical use is the interaction with chloride containing fluids especially saline or other physiological solutions. Chloride induced corrosion can start within short time even on so called stainless steel [1].
Often pre-treatment products are used to overcome the time between the use and the start of the processing. Previous investigations have found that there are differences in the behavior of the pre-treatment products regarding duration of application and corrosion protection in the presence of blood [2].
In a new study the corrosion protection behavior of several pre-treatment products was evaluated without chlorides and in the presence of chlorides.

METHODS

The common causes of instrument damage by corrosive effects of different materials on surgical instrumentation will be identified. The potential hygienic risk which is connected to corrosion on surgical instruments due to corrosion products as well as surface damages are explained on examples using analysis by scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDX).
The corrosion protection behavior of several pre-treatment products were investigated using adjusted simplified standards (e.g. DIN 51360-2) and pre-described methods [1] without as well as in the presence of chloride-containing solutions.

RESULTS

Significant differences between the pre-treatment products were observed in respect to the corrosion protection behavior using the accelerated tests of the adjusted simplified standards (e.g. DIN 51360-2). Some show no corrosion protection at all, others show moderate to good corrosion protection also in the presence of chlorides over up to 72 hours.
These results are reflected partially also in the investigations towards the corrosion protection on chromium steel (e.g. X20Cr13) widely used for surgical instrumentation. The application of a few pre-treatment products could inhibit the pitting corrosion in the presence of chlorides for up to 72 hours, whereas the protection of others last only for short times.

CONCLUSIONS

Chloride induced corrosion can start within short time even on so called stainless steel. Especially chromium steel (e.g. X20Cr13) which is commonly used for surgical instruments shows higher corrosion sensitivity to chloride ions.
Based on the results of the investigation it must be expected that the corrosion protection of pre-treatment products on surgical instruments at contact times up to 72 hours in the presence of chloride ions is different and depends on the individual formulation.
Right handling and instrument pre-treatment at the place of use may help to ensure to protect surgical instrumentation. However, it must not be expected from each formulation.

CONFERENCE 18
QUALITY AND RISK MANAGEMENT

ENGINEERING RISK MANAGEMENT INTO ACTION: A SIX SIGMA MODEL FOR IMPROVING INVENTORY MANAGEMENT AND IMPLANT SAFETY

***Michelle Odayan** / Australia*

AIM

Orthopaedic implant-associated infections (OIAIs) remain a significant challenge in surgical care, with implications for patient morbidity, prolonged hospitalisation, and increased healthcare costs.This Quality Improvement Project (QIP) aimed to reduce reprocessing variations, ensure implant traceability, and improve overall patient safety using a Six Sigma framework. The project focused on optimising the management of orthopaedic trauma implant inventories by removing redundant items, streamlining storage, and introducing traceability, individual packaging and quality assurance measures.

METHODS

Conducted at a metropolitan trauma hospital in Australia, a retrospective analysis of orthopaedic implant usage and the frequency of reprocessing using non identable patient surgical records and electronic tracking data from 2022-2023. Implants were classified into usage categories (zero, low, medium, high) to guide the decision-making. The Six Sigma DMAIC (Define, Measure, Analyze, Improve, Control) methodology was employed to identify root causes of inefficiency and risk. Multidisciplinary perioperative and sterilization stakeholders collaborated to implement improvements in defined phases:

RESULTS

This retrospective review identified a total of 8,165 orthopaedic implants used for trauma and elective procedures during the study period. Analysis of usage data revealed 5,566 distinct implant types, with a significant proportion 71% (n = 3,953)-classified as having zero recorded usage.

Implants were stratified by usage frequency:Low usage: 1,593 implants (28.6%), Medium usage: 11 implant types (0.2%), High usage: 9 implant types (0.2%) Many implants lacked traceable lot numbers, making it impossible to determine if the five-year expiry had been exceeded. There was no systematic rotation for selection or replacement process, and the same type of implant was found in up to seven different sets.

Repeated reprocessing and cumulative aerosol exposure in the operating theatre introduced additional contamination risks. Cross-referencing the instrument tracking system with implant sets revealed that many SKUs in the zero-usage category had not been used in over 13 years and had undergone multiple cycles of reprocessing during this time.These findings validated the need for a systematic improvement strategy and informed each phase of the Six Sigma intervention, targeting reductions in reprocessing volume, improving implant traceability, and enhancing sterility assurance practices.

CONCLUSIONS

The project's outcomes led to a comprehensive action plan involving stakeholder engagement, the removal of unused implants, and the implementation of a revised implant storage system. Findings indicated potential annual savings of $881,190.10 through the elimination of zero-usage inventory.

This initiative not only enhanced patient safety by minimising risks but also contributed to improved cost-effectiveness in sterilisation processes. The implementation followed a staged approach, featuring a systematic reorganisation of implant storage ensuring sustainability through regular reviews and continuous feedback from surgical stakeholders.

The project serves as a model for improving surgical implant safety, optimising inventory management, and aligning clinical practices with best practice standards—ultimately advancing both patient safety and healthcare operational efficiency.

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THE IMPORTANCE OF QUALITY IMPROVEMENT PROJECTS (QIP) IN THE CSSD

***Seto Winghong** / Hong Kong*

A brief history of quality improvement, with its origin from WE Deming will be given and how it relates to the hospital environment. The hospital is the most complex human organization ever devised but the CSSD is really the ideal environment to initiate QIP in the hospital. Reasons for this will be provided.

However, the processes and procedures in the CSSD are increasingly becoming more complex, especially as they relate to surgical implants. With this in mind, the Asia Safe Surgical Implant Consortium (ASSIC) was formed. It was founded in Japan (2023) and expanded to Korea (2024) and Thailand (2025), bringing together CSSD, OR and infection preventionists, to raise the bar on safe reprocessing for loaner instrument and implants. In the first year of the consortium, three consensus documents on (1) The proper use of indicators, (2) The proper recall procedures and (3) The proper management of loaner instruments and implants have been formulated and published. The three documents have received endorsements from 17 professional associations all across Asia Pacific.

Based on these consensus documents, hospitals are encouraged to initiate QIP projects that will enhance patient safety and improve efficiency. Through our education events and QIP coaching, 10 hospitals successfully completed their QIP projects and were recognized as QIP Winners in 2023. In 2024, 23 hospitals achieved this recognition, followed by 12 hospitals in 2025, reflecting real gains in safety and compliance. A brief summary of these success stories will be provided. Other hospitals can also join the ASSIC in this process of initiating more QIP projects in the CSSD in the coming years.

CONFERENCE 20
QUALITY AND RISK MANAGEMENT

INTERFERING SUBSTANCES IN ENDOSCOPIC EXAMS AND THEIR IMPACT ON MICROBIOLOGIC SURVEILLANCE OF FLEXIBLE, REUSABLE ENDOSCOPES

***Annette Rittich** / Germany*

AIM

Microbiological surveillance plays a crucial role in ensuring the hygienic safety of reusable medical devices, such as endoscopes. Despite its significance, there is no universally accepted standard for microbiological sampling and culturing (S&C); guidelines are often determined locally.
A study by Pineau et al. underscored the variability in S&C approaches, demonstrating that bioburden extraction rates are influenced by factors such as the type of sampling solution, the neutralizing agent used, and the bacterial species involved. However, the effect of residual soil within endoscope channels on microbial recovery has not been thoroughly investigated. While current reprocessing agents and procedures are designed to eliminate organic and inorganic contaminants, their effectiveness in removing substances commonly used during patient exams remains unclear.
The aim of this presentation is to provide a deeper understanding of the characteristics of interfering substances commonly utilized in endoscopic procedures and to assess their potential impact on microbiological sampling and culturing.

METHODS

A comprehensive literature review and analysis of endoscopic procedures were conducted to identify prevalent interfering substances. In-vitro assessments were performed to evaluate the bacteriostatic effects of selected substances. A study was then modeled on the work of Pineau et al., utilizing the French Sampling & Culturing method to analyze bioburden extraction efficacies in the presence of interfering substances.
In the initial experiment, 4 different substances commonly used in endoscopy were evaluated: a defoaming agent, an anesthetic gel, X-ray contrast media and dye. Individual tests were executed per substance, flushing or suctioning the substance through the duodenoscope's instrument channel prior to or after the artificial contamination with selected microorganisms. The bioburden extraction rate was then evaluated according to ISO 11737–1: 2018, and the results were compared with those from the initial study that did not involve any interfering substance.

RESULTS

The in-vitro tests demonstrated that none of the tested interfering substances had any bacteriostatic or bactericidal property. When the French method was subsequently employed to assess the bioburden extraction efficacy of endoscope sampling and culturing, the results varied considerably between different substances. These initial results confirm that substances used in endoscopic exams may interfere with sampling and culturing results, leading to varying bioburden recovery rates.

CONCLUSIONS

Interfering substances are commonly used in endoscopic procedures. Literature suggests that some of them, i.e. simethicone, can be challenging to remove during standard endoscope reprocessing. Incomplete removal of such substances may lead to the formation of deposits within the endoscope channels. Additional research is necessary to investigate the impact of interfering substance at different concentrations, and to develop effective strategies for their removal during reprocessing.

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2 / ISO 11737-1:2018. Sterilization of health care products — Microbiological methods — Part 1: Determination of a population of microorganisms on products

Acknowledgements
1 / Dr. L. Pineau, A. Col, Eurofins (Aix-en-Provence / France)
2 / Dr. F. Brill, Dr. A. Krampe, Dr. J. Klock, Dr. Brill & Dr. Steinmann Laboratories (Hamburg / Germany)

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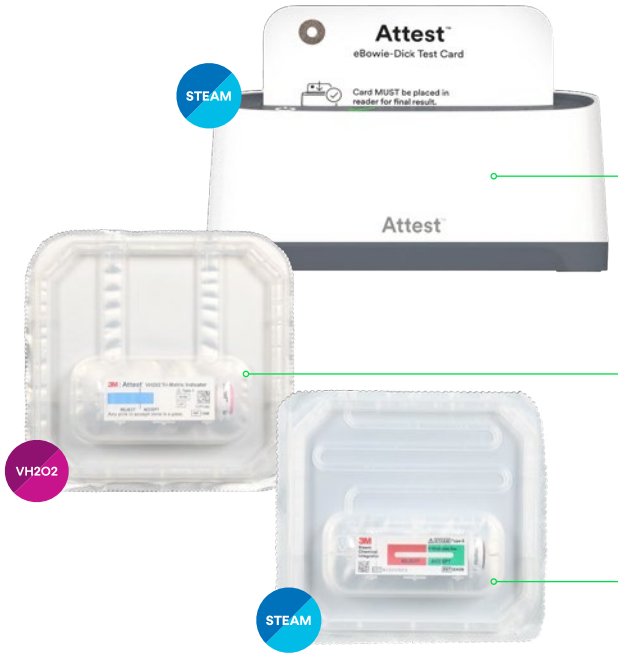

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December 5
Room 201A
10:45 - 11:30

Revolutionizing Sterilization: Elevating Practice of Hydrogen Peroxide for Safety and Precision

Presenter: Larry Talapa, Medical Liaison, Solventum

Visit us at booth 2A03

December 4
10:30

Elevating Sterilization Monitoring in Implant and Loaner instruments

Presenter: Prof. Wing Hong Seto and Ms. Patricia Ching, WHO Collaborating Center Norman Lu, Solventum Medical Liason

December 4
16:00

The Sterilization Challenge: The Million-Dollar Question on Chemical Indicators in Steam and VH2O2 Sterilization

Presenter: Kayla Ostrander BS, MS CRCST, CHL, CER — Solventum Professional Practice and Content Specialist

December 5
10:30

Sterilization Showdown: Best Practices and New Innovations in Bowie-Dick Testing

Presenter: Kayla Ostrander BS, MS CRCST, CHL, CER — Solventum Professional Practice and Content Specialist

December 5
16:00

Game of Sterilization: Are you Ready to Ace Every Load Monitoring Across Sterilization Modalities?

Presenter: Caroline Liu Solventum Medical Liason

December 6
10:30

'Magic' Behind Surgical Instrument Cleaning Detergents

Presenter: Yin LUI, PhD — Solventum Regulatory Affairs & Clinical Service Manager, Hong Kong

A CENTRALIZED ENDOSCOPE CLEANING AND DISINFECTION DEPARTMENT WITH PERMANENT STAFF: ENHANCING QUALITY, SAFETY, AND EFFICIENCY

***Anke van Rosmalen** / Netherlands*

AIM

This study evaluates the benefits of a centralized Endoscope Cleaning and Disinfection (ECD) department in hospitals and highlights the importance of well-established processes in ensuring high-quality reprocessing and patient safety.

METHODS

This study is based on the experience gained after centralizing the ECD department at Vlietland Hospital. Previously, endoscope reprocessing was performed in decentralized locations across multiple departments. These locations were staffed by Central Sterile Services Department (CSSD) employees who were assigned to endoscope disinfection only a few times per year. Due to limited exposure, many employees lacked experience, leading to concerns about competency and adherence to protocols. The task was often perceived as undesirable, resulting in frequent shift swaps or absences on scheduled disinfection days. This inconsistent workflow increased the risk of improper reprocessing. With the centralization, a dedicated ECD department was established, staffed with permanently assigned personnel, specially trained. Research was conducted to determine the optimal workflow, including: - Establishing standardized processes to ensure timely availability of disinfected endoscopes for scheduled procedures. - Optimizing pick-up and drop-off schedules to efficiently serve all departments. - Implementing protective measures for safe and secure internal transport of endoscopes. Additionally, a structured, long-term staff training program was introduced to ensure continuous professional development and adherence to best practices.

RESULTS

The implementation of a centralized ECD department with trained and dedicated personnel led to significant improvements:

- *Reduced endoscope damage and failures** due to consistent handling by experienced staff.
- *Improved microbiological culture results** through adherence to strict hygiene protocols.
- *Higher satisfaction** among departments using endoscopes, as they could rely on the consistent availability of disinfected instruments.
- *Fewer delays in procedures**, ensuring smoother patient scheduling and optimized resource utilization.
- *Enhanced interdepartmental collaboration**, leading to more efficient workflows.
- *Greater staff engagement and accountability**, fostering a stronger sense of responsibility for equipment and hygiene standards.
- *Higher employee satisfaction**, driven by structured supervision and the ability to work independently.

CONCLUSIONS

The establishment of a centralized Endoscope Cleaning and Disinfection Department, combined with process optimization and specialized staff training, has significantly improved the quality, efficiency, and reliability of endoscope reprocessing. This model enhances patient safety by ensuring rigorous adherence to hygiene standards, reduces operational disruptions due to equipment failures, and fosters better collaboration between departments. Given its success, this approach could serve as a benchmark for other hospitals seeking to improve endoscope reprocessing workflows.

Reduction damage over a year

REFERENCES / ACKNOWLEDGEMENTS

Uptime reports damages en failures from manufacturer

ISO 25224: TOWARDS A NEW HARMONIZED METHOD FOR ENDOSCOPE SAMPLING AND CULTURING

***Lionel Pineau** / France*

AIM

The study published by Pineau and all in 2024 (1) demonstrates that the extraction efficacy of existing endoscope sampling and culturing methods varies considerably from one method to another (mean overall bioburden extraction efficacy varied from 1% for the Australian method to 39% for the French one). The lowest endoscope sample extraction efficacy was associated with the absence of any neutralizer, friction, or tensioactive agent, and when only a small portion of the sampling solution collected was analyzed. Some differences were also observed according to the nature of micro-organisms present in the endoscope, and the time between sampling and culturing.

METHODS

Based on these observations and other published studies, it seems essential to harmonize endoscope sampling and culturing practices. This presentation reviews the existing data and the orientations taken by ISO TC 198 WG 17 to develop a reliable and reproducible endoscope sampling and culturing method.

RESULTS

The objective of the working group 17 of the ISO technical committee 198 is to develop an international standard on endoscope sampling and culturing (ISO 25224) addressing all key parameters including:
-The sampling method (e.g. one channel vs all channels, with or without mechanical action),
-The nature of the sampling solution (e.g. solution including or not a neutralizer and/or a tension active),
-The culturing protocols (e.g. filtration vs centrifugation),
-The interpretation criteria for detected growth and action plans for positive endoscope cultures,
-The sampling time, sampling circumstances and environment,
-The required accessories, interpretation criteria with a common definition of high concern organisms.
Complementary tests performed in laboratory conditions have also demonstrated that for complex endoscopes such as ultrasound-endoscopes the flush only and flush-brush-flush methods may not be efficient enough to access all internal channels. An alternative method using endoscope valves has been developed and tested to improve the extraction efficacy of the existing methods. Results obtained demonstrate that the extraction efficacy of the valve-assisted sampling method can reach value up to 95% against 85% for the flush-brush-flush method and only 40% for the flush only method. Further data have also highlighted that the additives used during endoscopy exam (e.g. lubricant, contrast medium,..) may have an influence on the ability of the sampling method to detach microorganisms from the channels and need to be considered in the validation of the sampling/culturing method.

CONCLUSIONS

The publication of such standard should help to improve the accuracy and reliability of periodic microbiologic surveillance proposed by many authorities and professional associations.

REFERENCES / ACKNOWLEDGEMENTS

1 / L. Pineau, M. Alfa, C. Radix, Endoscope sampling and culturing methods, Journal of Hospital Infection, Volume 149, 2024, Pages 36-45, ISSN 0195-6701, https://doi.org/10.1016/j.jhin.2024.03.017.

CONFERENCE 23
FLEXIBLE
ENDOSCOPES

THEN & NOW, WAS BORESCOPE WORTH IT

***Frank Daniels** / USA*

AIM

To provide a patient-ready, flexible scope to every patient needing a procedure. First, the integrity of a scope needs to be free of all damages to ensure that the flexible scope can't harm the patient. Every patient deserves to have peace of mind when having a procedure done.

METHODS

Inspect each lumened flexible scope in a high-volume practice post-manual cleaning to determine if it can be disinfected/sterilized for patient use. This process will show that if done correctly, it will not delay the reprocessing, and each scope has passed the inspection.

RESULTS

The results came back with 3,731 out of 47,839 inspections that failed using the borescope, giving an overall percentage of 7.8% fail rate. The total amount of failed leak tests and borescope inspections was 2,136. The 1,595 flexible scopes passed a leak test but failed the borescope inspection. Out of the 3,731 failed flexible scopes, 3,610 failed the borescope inspection due to internal physical damage, and 121 failed due to debris and were sent back to manual cleaning.

CONCLUSIONS

In conclusion, we had an eight percent fail rate of flexible scopes that could not adequately be disinfected or appropriately sterilized for patient use. The number of flexible scopes that passed a leak test was 1,595 but failed the borescope inspection are potential misses. All 1,595 flexible scopes had the potential to seriously harm patients because they couldn't be cleaned due to the impenetrable scratches, crushes, staining, or peeling that could harbor many things that could harm the patient. This study was conducted at a high-volume facility that uses a borescope to audit manual cleaning and repairs periodically and any new flexible scope introduced into the facility. Using the borescope has also increased staff and team members' awareness and confidence that each flexible scope sent out of the room is ready for patient use.

REFERENCES / ACKNOWLEDGEMENTS

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26TH WORLD STERILIZATION CONGRESS

TERRAGENE SYMPOSIUM

From Assumption to Evidence: Quantitative Protein Testing in CSSDs

FRIDAY 5 DECEMBER

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CONFERENCE 24
EDUCATION, HR AND OTHERS

EMPOWERING GROWTH FROM WITHIN, BUILDING AN INTERNAL EDUCATION PROGRAM TO ADVANCE THE STERILE PROCESSING CAREER PATH

Randaly Harreld / USA

AIM

To provide a clear understanding and purpose; that by using specific practices, protocols and strategies any healthcare team can build a satisfactory career ladder and pathway for sterile processing professionals at the organization/hospital level. To help leaders, educators alike, keep their departments fully staffed with long term, successful and happy sterile processing professionals and work to eliminate the staffing shortages by using education and training methods.

METHODS

The observations, selections and strategies completed in this educational session were collected by me in varying institutions and with different support/models within the United States. Working collaboratively with different leaders, SPD and OR, students at the college level and working directly in internships, adult learners who were fully employed and functioning in a department, and during the on boarding of new team members in 5 different departments. Each example provided, was in a specific situation and supporting a specific goal.

RESULTS

Model 1	Helped department go from 4 position department to 10 position dept. Helped department go from 6 position department to 19 position dept. Helped department go from 17% certified to 100% certified. Increase salary and pay for 3 positions within the department Created educational opportunities for already employed staff members.
Model 2 (Apprenticeship)	Implemented the first sterile processing apprenticeship program internally in the hospital level. Recruited staff throughout the organization from other areas, Created a training room to be used by other students and employees Cohort #1 (18 months) 160 applicants, accepted 4 students Cohort 2 (12 months) 120 applications accepted 6 students
Model 3 (standardized roles & cross training program)	Identify baseline of staffing trends over 12 -16-24-month span. Identify areas in department where "duties" not being completed (observations, walks, assessments, audits, surveys) Implement 17 new assignments from original 6 Implement 6 shifts versus the original 3

CONCLUSIONS

Standardizing education within the Sterile Processing Department (SPD) can substantially boost staff morale and foster long-term career success. By creating a unified educational framework, employees gain access to consistent training and resources, enabling them to excel in their roles. This approach not only enhances individual competencies but also instills a sense of professionalism and pride among staff members.

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COMPARATIVE ANALYSIS OF HUMAN RESOURCES IN THE STERILE SERVICES DEPARTMENT AT THREE HOSPITALS: INSIGHTS FROM INSTRUMENT CHECK PERFORMANCE

***Wing Sum Ng** / Hong Kong*

AIM

Staff in Sterile Services Departments (SSDs) play a crucial role in providing safe reusable invasive medical devices. However, excessive and uneven workloads among supporting staff can compromise healthcare quality. This study aims to assess the checking and packaging performance of SSD staffs across three hospitals, as well as to evaluate the current situations and demands for sterile services. The insights gained will inform strategies for enhancing operational efficiency and effective management of human resources.

METHODS

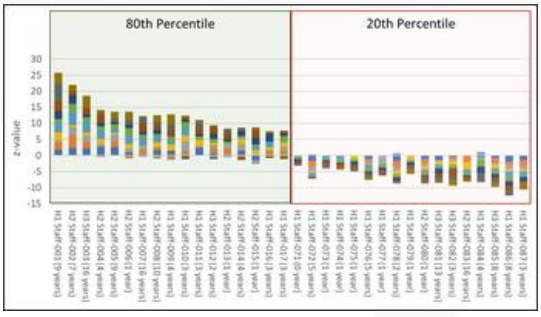
Using a weighted average approach, performance scores were calculated for each instrument set type based on the number of instruments contained. Reprocessing progress reports from June 2024 to March 2025 were analyzed, quantifying the checking and packaging performance of 87 staff members across three hospitals through 129,952 tracking sets and pre-pack items they engaged with. Individual performance was visualized using Z-scores and stacked bar charts. Further analysis examined relationship between work experience and performance, as well as overall departmental workload and the per capita workload of staff, presented via bar and line graphs.

RESULTS

Method has been developed to compute total performance scores for SSD staff, significantly reducing calculation time. Results can now be generated from over 10,000 inspection records per month in under 10 minutes. By utilizing the 80th and 40th percentiles along with z-scores, high performers and those needing additional support were identified. The z-value stacked bar chart illustrated clear performance trends among SSD staff, highlighting members who consistently achieved higher and lower scores (Figure 1).
Additionally, average monthly score for each SSD staff member was calculated. A weak positive correlation was identified between years of experience and average monthly score. Analysis of monthly workload and per capita staff workload across three hospitals revealed that Hospital 1 managed a larger volume of instruments, with an upward trend in workload over time. However, when accounting for staff numbers, the per capita workload indicated that staff in Hospital 2 were sharing a heavier workload compared to their peers in the other hospitals during most of the observed period.

CONCLUSIONS

Significant variations in workforce and operational needs were observed across the three hospitals. The study demonstrated various analytic tools for managing human resources to achieve fair staffing assessments, streamline healthcare staff allocation, and attain optimal cluster management. Future research should investigate staff job satisfaction and incident rates to further refine manpower planning strategies.
Z-values stacked bar chart



HOW THE EDUCATION PROGRAM IN SERBIA IS DESIGNED

Vesna Mioljevic / Serbia

AIM

Sterilization of instruments is the first and basic step for the safe work of medical personnel in the process of treating and caring for the health of patients, as well as in the prevention and control of the spread of hospital infections. For this reason, it is important to constantly improve knowledge about the importance of sterilization and participate in education programs.

METHODS

https:wfhss.com;www.cdc.gov/infectioncontrol/guidelines/disinfection/sterilization/sterilizing,practices.html

RESULTS

The Sterilization and Disinfection Association of Serbia (USDS) has organized several national symposia on the importance of the sterilization process. The first national symposium was dedicated to washing and cleaning instruments before the sterilization process. The topic of the second national symposium with international participation was the importance of respecting standards in all processes of the sterilization cycle. The topic of our third national symposium was the proper packaging of instruments before the sterilization process. At all three symposia, in addition to lectures, we organized a workshop, work in small groups with the acquisition of knowledge about biological control of sterilization, washing of instruments and proper packaging of instruments before the sterilization process. Our education has been extended to staff who do not work in the CSSD, doctors and nurses, but who should have knowledge about the importance of the sterilization process in preventing infections. We plan to organize a symposium on the topic of types of sterilization processes.

CONCLUSIONS

Education in medicine is the basis of the proper work of medical staff in all areas of medicine, but in the process of sterilization of instruments.