

## ICPIC Summaries

### Contributions:

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The 7th International Conference on Prevention & Infection Control (ICPIC) was held on 12-15 September 2023 and was attended by professionals in infection prevention, public health, and other relevant areas from Switzerland and around the globe.

The four-day conference featured many high-quality presentations on IPC, antimicrobial resistance, device-related and other healthcare-associated infections, and patient quality of care. Various sessions presented methods applicable to current hospital epidemiology research and early results of major clinical trials in the field. Other sessions discussed the impact of the COVID-19 pandemic on health services alongside economic and societal aspects of IPC. Furthermore, several sessions presented new approaches to IPC prevention strategies using implementation tools such as telemedicine, and simulation models.

### Conference opening and session on global IPC strategy

The opening session included contributions from Bertrand Levrat, director-general of the Geneva University Hospitals, Dr Céline Gardiol from the Federal Office of Public Health, the ICPIC chair, Prof Didier Pittet, and a recorded video message from Dr Tedros Adhanom Ghebreyesus, director general of the World Health Organization. The speakers highlighted the importance of effective infection prevention and control (IPC) to combat healthcare-associated infections (HAIs) at the local hospital, national and global levels.

On the first conference day, the new WHO global strategy on infection prevention and control (GSIPC) was introduced, which had been developed following a resolution on IPC at the 75th World Health Assembly. The strategy focuses on IPC in any setting where healthcare is delivered. It has eight strategic directions for national implementation: 1. Political commitment and policies; 2. Active IPC programs; 3. IPC integration and coordination; 4. IPC knowledge of health and care workers and career pathways for IPC professionals; 5. Data for action; 6. Advocacy and communications; 7. Research and development; 8. Collaboration and stakeholders' support. The three key objectives are: to prevent infection in health care; act to ensure IPC programmes are in place and implemented; and coordinate IPC activities with other areas and sectors. Member States must achieve measurable improvements and substantially reduce the risk of HAIs, antimicrobial resistance, and infectious disease outbreaks by 2030. The strategy also focuses on workforce development and staff training, e.g. on the use of personal protective equipment. An associated action plan and monitoring framework are being developed and will be published soon. Subsequent presentations and an expert panel discussion concluded that challenges and gaps exposed by COVID-19 and other health emergencies clearly demonstrate the need for investing in IPC. Specifically, active IPC programmes will help prevent the amplification of transmission of infectious diseases in the healthcare setting and during emergencies.

## Session on nosocomial fungal infections focused on *Candida auris*.

The session on nosocomial fungal infections focused on *Candida auris*. Kalisvar Marimuthu from the National Centre for Infectious Diseases, Singapore, showed the increase in *C.auris* prevalence in most parts of the world in recent years. He argued that classical IPC measures can help control *C.auris* clusters and outbreaks, even during challenges such as those posed during the COVID-19 pandemic. Horizontal IPC measures include antimicrobial stewardship programs and enhancing hand hygiene compliance and environmental hygiene. Vertical measures include the identification of *C.auris* from clinical samples (source identification) as well as from screening, single room isolation, contact tracing, and admission screening of high-risk patients. The presentation highlighted the need to explore the cost-effectiveness of high-risk screening strategies based on country of origin, the role of including a routine environmental hygiene strategy, the effectiveness of adding newer environmental disinfection technologies (UV-C).

Petra Gastmeier from Charité – Universitätsmedizin Berlin presented the Berlin experience of nosocomial *C. auris* that occurred during the COVID-19 pandemic. The first episode (2021) involved the [detection of a \*C. auris\* colonization in an intensive care patient](#). Adapted IPC measures included changing the disinfectants for patient room surfaces and ultrasound probes to products effective against *C. auris*. The following month, *C. auris* was detected in a second patient (from blood cultures) presenting with clinical infection in the same intensive care unit. Enhanced IPC measures were implemented, which included a multidisciplinary outbreak panel, patient isolation with designated nursing staff and separate medical equipment such as x-ray, ultrasound, and ECG machines, enhanced disinfection measures, and additional cleaning staff. Both isolates had a similar antifungal resistance profile, suggesting a transmission link between both cases, which most likely were reusable blades used in (video laryngoscopy-guided) intubation. Products effective against *C. auris* were in use for routine manual disinfection of the blades but deemed insufficient due to their complex design. Therefore, they were replaced by disposable blades. Additional IPC measures included regular ward screening and environmental swabs with no further *C. auris* detected. The second episode of *C. auris* transmission (2022) involved two patients treated in the same trauma unit (in different rooms) with *C. auris* detection two months apart but the same clone. As in the first episode, following the enhancement of IPC measures there was no further detection of *C. auris*. Reference laboratory data suggested high-level genetic similarity between the two transmission episodes.

The Berlin experience underlines the need for high-level awareness of *C. auris* among the laboratory and IPC

teams and guidelines for a) laboratory detection, b) single patient detection, and c) nosocomial transmission (NB: The updated Swissnoso guidelines can be found [here](#)).

Detecting a single patient with *C. auris* warrants careful application of IPC measures. Detecting nosocomial transmission of *C. auris* requires an outbreak team and implementing rigorous IPC measures. The Berlin example shows the benefit of liaising with the national reference center for fungal infections, effective interactions and communication between all local hospital departments concerned and the IPC team, the support from the hospital management, and disseminating information on *C. auris* and IPC measures to relevant staff.

## The session A Year in Infection Control caught the audience's attention on several topics.

[Classification of nosocomial infections: Development and Evaluation of a Structured Guide to Assess the Preventability of Hospital-onset Bacteremia and Fungemia \[Schrank et al, 2022\]](#)

The guideline for assessing the preventability of nosocomial infections was compared with an expert panel as a reference standard. A 10-member panel of clinical experts was assembled as the standard for evaluating preventability, and two physician reviewers applied the evaluation guideline for comparison. The expert panel independently assessed 82 hypothetical nosocomial infection scenarios using a 6-point Likert scale categorized into three categories: preventable, uncertain, or not preventable. Consensus was defined as agreement in the same category by  $\geq 70\%$  of experts. Scenarios for which no consensus could be reached were discussed and evaluated in a second round. Eighty-two scenarios were evaluated by two independent experts in two rounds, with interim revisions being made. Interrater reliability was assessed using the  $\kappa$  statistic (kappa).

After two rounds, the consensus criteria of the expert panel were met for 52 scenarios (63%). 40 out of 52 (77%) and 39 out of 52 (75%) of the cases of experts 1 and 2, respectively, agreed with the expert panel's consensus after two rounds. The overall agreement rates between the two reviewers were 84% ( $\kappa$ , 0.76; 95% confidence interval [CI], 0.64-0.88) and 87% ( $\kappa$ , 0.79; 95% CI, 0.65-0.94) for the 52 scenarios with expert consensus. The assessment of the preventability of nosocomial infection scenarios by two reviewers using an assessment guide agreed with the expert consensus in most cases, with moderately high inter-rater reliability. Although the diversity of expert opinions and the uncertainty of preventability require further investigation, this is a step towards a standardised assessment of the preventability of nosocomial infections.

These infections are now categorised as most likely preventable to probably not preventable, depending on the intrinsic risk posed by the patient. This classification emphasises that not all nosocomial infections are preventable and that the concept of «zero risk» cannot be implemented. However, it also shows that we should focus on nosocomial infections that are highly likely preventable. (Figure)

Figure and caption reproduced from [Schrank et al, 2022](#): Preventability matrix for rating of hospital-onset bacteremia and fungemia (HOB) case scenarios. Examples of intrinsic risk conditions include desquamating skin condition (high), neutropenia (high), solid organ transplant >30 days prior (medium), and acute myocardial infarction (low). Examples of preventability relative to extrinsic healthcare-related risk include temporary central venous catheter infection (high), pressure ulcers that develop or worsen during the hospital stay (high), mechanical ventilation complicated by pneumonia (medium), and infection following contaminated/dirty surgical procedures (low).

		PREVENTABILITY RELATIVE TO EXTRINSIC HEALTHCARE-RELATED RISK		
		LOW	MEDIUM	HIGH
INTRINSIC RISK DUE TO UNDERLYING CONDITIONS (ACUTE ILLNESS AND CHRONIC CO-MORBIDITY)	LOW	Less Likely Preventable than Not (4)	Moderately Likely to be or Probably Preventable (2)	Definitely or Almost certainly Preventable (1)
	MEDIUM	Moderately likely to be or Probably Not Preventable (5)	More Likely Preventable than Not (3)	Moderately Likely to be or Probably Preventable (2)
	HIGH	Definitely or Almost certainly Not Preventable (6)	Moderately Likely to be or Probably Not (3)	More Likely Preventable than Not (3)

Surface coatings to prevent bacterial colonisation: Nanosilver/DCOIT-containing surface coating effectively and constantly reduces microbial load in emergency room surfaces [1]

The colonisation of surfaces close to patients in hospitals plays an important role as a source of healthcare-associated infections. Regular disinfection methods only lead to a short-term elimination of pathogens. In this prospective, double-blind study, frequently touched surfaces of a routinely used treatment room in a hospital emergency department were treated with a surface coating (nanosilver/DCOIT-coated surface, NCS), containing nanosilver particles and another organic biocidal agent (4,5-dichloro-2-octyl-4-isothiazolin-3-one, DCOIT), while the surfaces of another room were treated with a coating containing neither the nanosilver nor the DCOIT-containing ingredient and served as a control. Bacterial contamination of the surfaces was analysed daily with contact plates and liquid-based swabs throughout the 90-day trial period. After incubation, the total bacterial count and bacterial species were determined.

A significant reduction in the total bacterial load (median: 0.31 CFU/cm<sup>2</sup>; interquartile range: 0.00-1.13) was observed for a total of 2880 antimicrobial samples in the NCS room compared to the coated control surfaces (0.69 CFU/cm<sup>2</sup>; 0.06-2.00; P < 0.001). The nanosilver and DCOIT-containing surface coating reduced the relative risk of critical bacterial contamination (defined as >5 cfu/cm<sup>2</sup>) by 60 % (odds ratio 0.38, P < 0.001). No significant difference in species distribution was found between the NCS and control groups.

Interpretation: Several studies - also from Switzerland - demonstrate a long-term antimicrobial effect on so-called «high-touch» surfaces. One study even showed a favourable effect on nosocomial infections, but this was strongly questioned [2,3]. The cost-benefit of this investment is worth examining for new intensive care units, emergency wards and transplant centres. [1,2,3]

1. Weber J, Henssler L, Zeman F, et al. Nanosilver/DCOIT-containing surface coating effectively and constantly reduces microbial load in emergency room surfaces. *J Hosp Infect* 2023;135:90-97. (doi):10.1016/j.jhin.2023.01.024. Epub 2023 Mar 21. (Clinical Trial).
2. Widmer AF, Kuster S, Dangel M, Jäger S, Frei R. Long-term antimicrobial effectiveness of a silver-impregnated foil on high-touch hospital surfaces in patient rooms. *Antimicrob Resist Infect Control* 2021;10(1):120. (In eng). DOI: 10.1186/s13756-021-00956-1.
3. Ellingson KD, Pogreba-Brown K, Gerba CP, Elliott SP. Impact of a Novel Antimicrobial Surface Coating on Health Care-Associated Infections and Environmental Bioburden at 2 Urban Hospitals. *Clin Infect Dis* 2020;71(8):1807-1813. doi: 10.1093/cid/ciz1077.

Transfer of methicillin-resistant Staphylococcus aureus by fist bump versus handshake

The handshake is a widespread social habit that poses a potential health risk. The hands of healthcare workers and patients are often contaminated with pathogenic bacteria, viruses, or fungi. These organisms can be efficiently transmitted from person to person through hand contact. Hand hygiene reduces the risk of transmission but does not eliminate it.

In this study, alcohol-based hand sanitizer did not entirely remove the risk of transmission in methicillin-resistant Staphylococcus aureus (MRSA), which was common in patients with a high baseline level. Each participant served as an internal control and performed greetings with the dominant hand in order from least to greatest contact:

1. Cruise tap (the dorsal surface of one knuckle touches the dorsal surface of another knuckle)



2. Fist bump (one fist meets another with the dorsal side of all four ulnar proximal phalanges touching)



3. Handshake, and

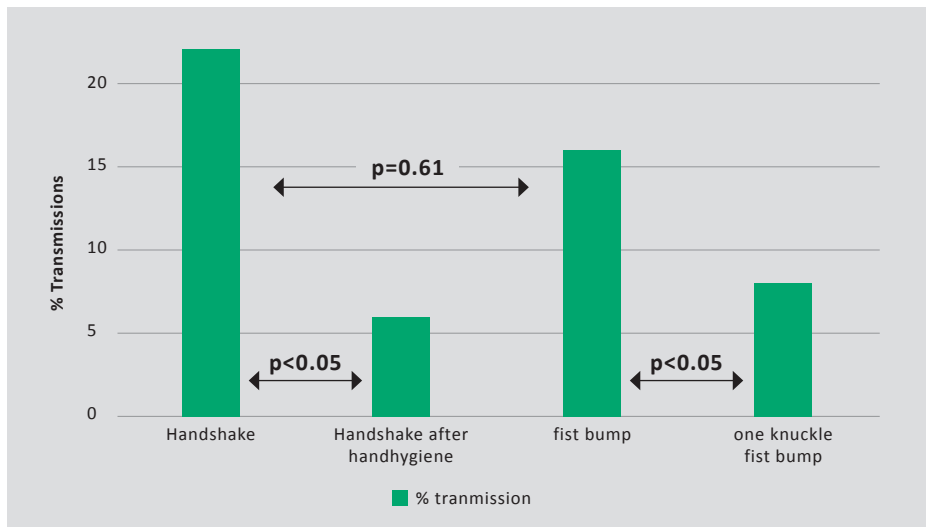


4. Handshake after patient hand hygiene using 2 mL of alcohol gel.

The recipient of the greeting wore a sterile glove. As shown in the graph, there were no significant differences between shaking hands and the fist bump. These studies were also performed with a bacteriophage MS2, which showed no significant reduction in the transmission of viruses.

Interpretation. The various alternative forms of shaking hands are by no means a substitute for hand hygiene: even if the fist bump transmits fewer bacteria and viruses, the differences are not significant. Of note is that the recipient of the greeting wore a sterile glove. Furthermore, these are experimental results with high bacterial counts, which do not necessarily correspond to reality.

Figure Rates of transmission of methicillin-resistant S.aureus (MRSA)



Adapted from Pinto-herrera, N., Jones, L., Ha, W., Alhmidi, H., Li, D., Wilson, B., & Donskev, C. (2020). Transfer of methicillin-resistant Staphylococcus aureus by fist bump versus handshake. *Infection Control & Hospital Epidemiology*, 41(8), 962-964. doi:10.1017/ice.2020.192

#### List of further articles covered in this session:

Strategies to minimise and monitor biases and imbalances by arm in surgical cluster randomised trials: evidence from ChEETAh, a trial in seven low- and middle-income countries. PMID: 37020311

Aqueous skin antiseptics before surgical fixation of open fractures (Aqueous-PREP): a multiple-period, cluster-randomised, crossover trial. PMID: 36244384

Hospital-onset bacteremia and fungemia: An evaluation of predictors and feasibility of benchmarking comparing two risk-adjusted models among 267 hospitals. PMID: 36082774

Active Surveillance and Contact Precautions for Preventing Methicillin-Resistant Staphylococcus aureus Healthcare-Associated Infections during the COVID-19 Pandemic. PMID: 37390613

Ultraviolet-C Light Evaluation as Adjunct Disinfection to Remove Multidrug-Resistant Organisms. PMID: 34636853

Effectiveness of Ultraviolet-C Disinfection on Hospital-Onset Gram-Negative Rod Bloodstream Infection: A Nationwide Stepped-Wedge Time-Series Analysis. PMID: 36124706.

#### Additional references of interest:

Transmission of Carbapenem-Resistant Enterobacterales in an Overcrowded Emergency Department: Controlling the Spread to the Hospital. PMID: 37406046

## Hand hygiene «meet the expert» session

In this session, David Calfee and John Boyce primarily discussed the changes to the SHEA/IDSA/APIC hand hygiene guidelines (REF: PMC10015275). The changes presented compared to the last version of 2014 were as follows:

1. monitoring is now recommended to include hidden observations that provide the following advantages: In addition to monitoring adherence rates, contextual barriers, and facilitators to correctly implementing hand hygiene can also be recognized. The opportunity for corrective feedback to individuals is still available.

2. another new focus is to ensure that gloves are not used unnecessarily/incorrectly (see the existing Swissnoso recommendation [https://www.swissnoso.ch/fileadmin/swissnoso/Dokumente/6\\_Publikationen/Bulletin\\_Artikel\\_D/220829\\_Bellini\\_et\\_al\\_DE\\_fin.pdf](https://www.swissnoso.ch/fileadmin/swissnoso/Dokumente/6_Publikationen/Bulletin_Artikel_D/220829_Bellini_et_al_DE_fin.pdf)). This includes ensuring that gloves are removed correctly. Particular attention should be paid to the correct removal technique and the disinfection of hands immediately after removal. Active training of employees is recommended for both points.

3. the current guidelines now also include recommendations on hand-washing basins, which employees use regularly. The following points are recommended (selection):

- a. Ensure that hand wash basins are constructed in accordance with local administrative regulations.
- b. Include hand washing sinks in the risk assessment of infection control in healthcare facilities.
- c. Where possible, sinks should be used for hand washing only.
- d. Educate healthcare workers not to dispose of substances that promote biofilm growth (e.g., intravenous solutions, medications, food, or human waste) in hand washing sinks.
- e. Use an approved disinfectant to clean sinks and taps daily.
- f. Do not store medications or patient care supplies on countertops or mobile surfaces less than 1 meter from sinks.
- g. Provide disposable or single-use towels for drying hands. Do not use hot air dryers in patient care areas.

### Swissnoso comment:

These changes are greatly welcome, and it would be desirable for them to be implemented in Switzerland in the same way. They are good examples of how infection prevention in hand hygiene now goes beyond the «actual disinfection» of hands.

## Session on “How to prevent severe device-related complications?”

David Calfee presented the 2022 updated guidelines on the prevention of central-line associated bloodstream infection (CLABSI) [Buetti et al. Strategies to prevent CLABSI, 2022 update]. Compared to the 2014 edition, the current version lists the use of chlorhexidine-containing dressings as an “essential practice” following recent evidence [Puig-Asensio et al. ICHE 2020, 10.1017/ice.2020.356] and to use of antiseptic or antimicrobial-impregnated CVCs as an additional approach [Wang et al. Syst review. Ann Intensive Care 2018]. At the same time, he stressed that due to the multifactorial etiology, preventing catheter-related complications requires a multi-pronged approach. As an example, he reminded us of the work by Parienti et al. (NEJM 2015) that suggested a low infection risk at the subclavian site. However, still, in terms of safety outcomes, the femoral site is associated with fewer mechanical complications. Further, he recalled that tunneled or implanted devices are associated with lower infectious complications (various studies: Ullman AJ, Pediatrics 2015, Moos JG, Lancet 2021, Zanoni F. J Vasc Access 2021). In summary, one should always weigh the risks and benefits in setting the intended use for each patient.

## Surgical site infections (SSI)

SSIs as the leading cause of HAI, were a frequent topic during ICPIC. Among SSIs, colorectal surgery has the highest incidence. Risk factors are diverse, and it has been hypothesized that the microbiome plays a role in SSI and anastomotic leak.

There is an ongoing debate regarding the best approach for preparing the bowels in planned colorectal surgery. Previous European studies have indicated a low utilization rate of oral antibiotics (OAB) in this context, ranging from 10% to 16.8%. Mohammed Abbas presented, among other studies, a network meta-analysis that focused exclusively on data from randomized controlled trials (RCTs) and included 60 RCTs involving 16,289 patients (Tan et al. BJS Open, 2023).

The most noteworthy findings revealed a significant decrease in the risk of overall surgical site infections and anastomotic leaks (AL) when utilizing strategies that combined intravenous antibiotics (IAB) with oral antibiotics (OAB) for bowel preparation, specifically IAB + OAB and IAB + OAB + mechanical bowel preparation (MBP). Interestingly, including MBP did not yield a statistically significant advantage over using IAB + OAB alone in the comprehensive analysis. These results underscore the critical role of the intestinal microbiome in the healing of surgical anastomoses and offer compelling evidence in favor of selective antibiotic decontamination of the

gastrointestinal tract through the combined use of IAB + OAB as the standard of care for patients undergoing planned colorectal resection.

Abbas also delivered a comprehensive presentation on the most recent Cochrane review authored by Willis et al. in 2023. This review showcased the superiority of the MBP+OAB approach compared to using MBP alone in reducing the incidence of surgical site infections (SSI) overall. It notably demonstrated significant advantages in preventing overall SSI, organ/space SSI, and anastomotic leak (AL). However, it did not show a significant impact on mortality rates.

In his concluding remarks, Abbas emphasized the substantial benefits of preoperative oral antibiotic preparation in reducing the risk of SSI. However, he underscored the need for further research to determine the optimal regimen and timing for administration. Consequently, he strongly recommended against the use of MBP alone for colorectal surgery.

## 2nd ICPIIC 2023 Innovation Academy

Here are the five finalists of the ICPIIC 2023 Innovation Academy, selected by an international jury of experts in a competition with 15 submissions:

Kaur D et al. successfully developed a method to detect genetic markers for resistance in *Plasmodium vivax* and *P. falciparum* using «Loop-Mediated Isothermal Amplification» (LAMP). This method shows promising results in identifying mutations in these markers to improve drug resistance monitoring in malaria cases.

Jerry T and his team from Dublin focussed on the quality of manual high-level disinfection of ultrasound probes. They developed an innovative process in which a dye is added to the cleaning detergent to colour the surface of the probes blue, allowing a visual check of the disinfection completeness.

K R and colleagues from Bangalore, India, used gamification with a WhatsApp treasure hunt game to improve training and understanding of infection prevention (IP) among healthcare workers. The results showed better knowledge transfer and inter-professional teamwork.

Jerry J and his team presented the AI-driven virtual training platform HAND3T to improve hand hygiene in healthcare. This innovative tool combines hands-on training, hand hygiene technique assessment, surface coverage detection, and theoretical training.

Demuth H and his team from Borer Chemistry AG, in collaboration with EMPA, investigated the longevity and reparability of reusable surgical instruments. They found that passivation with phosphoric and nitric acid leads to a thicker passivation layer, which could improve the service life of the instruments.

«And the winner is...»

First prize went to the LAMP method for detecting resistance in plasmodia, second prize went to the quality

monitoring of high-level disinfection of ultrasound probes using color change, and - for the first time in the history of the Innovation Academy - third prize went to J Jerry's team for their AI tool to improve hand hygiene.

## Sessions on antimicrobial stewardship

### Antimicrobial stewardship in special populations: From the elderly population to the ICU

With regards to the **rational antimicrobial use in older people**, the speaker, Matteo Cesari, stressed the clinical and social complexity in older people and the heterogeneity of aging, all of which pose significant challenges. There is often a lack of evidence due to the difficulties in conducting RCTs in this population. Therefore, guidelines such as the WHO Practical Guide on ASP Interventions (2021) do not mention older people. ASP in the elderly and frail population is an emerging topic that needs addressing in the near future. There seems already some light on the horizon: For example, Hartman et al. dedicated their intervention on rational use of antibiotics in UTI to frail older adults (BMJ2023;380:e072319 <http://dx.doi.org/10.1136/bmj-2022-072319>). Their pragmatic cluster-randomized controlled trial on a modified participatory-action-research approach showed a relevant reduction in antibiotic prescribing for suspected urinary tract infections without an increase in complication rates across older adult care settings in four European countries. The data shown by Mauro and colleagues suggest that rigorous de-escalation and curtailing of antibiotic therapies are beneficial and without risk for hospitalized patients aged 65 years and over (Mauro, JAC Antimicrob Resist doi:10.1093/jacamr/dlab118).

Arjun Srinivasan discussed **potential opportunities to improve antibiotic use in ICUs and older patients**. The cornerstone of antimicrobial stewardship (AS) in the ICU is the use of procalcitonin (Huang et al. Ann. Intensive Care (2017) 7:114 DOI 10.1186/s13613-017-0338-6) and cultures from BAL to guide antimicrobial treatment and to clarify insecurities with beta-lactam allergies by performing a proper history and considering skin testing.

The presenter advocated for a stop of antibiotics for culture-negative VAP/HAP (Am J Respir Crit Care Med Vol 171. pp 388–416, 2005DOI: 10.1164/rccm.200405-644ST), which requires that adequate diagnostics are performed and culture results are readily available. Another yet underused approach is shortening the duration of antimicrobial treatment for HAP/VAP. According to a Cochrane Review (Cochrane Database Syst Rev. 2015; 2015(8): CD007577. doi: 10.1002/14651858.CD007577.pub3), a 7 to 8 days course of antimicrobial treatment is sufficient in most ICU patients, except for immunocompromised

and other high-risk patients and those infected with non-fermenting Gram-negative bacilli.

It became evident during the discussion that the fear of ICU physicians harming patients by not providing the maximum care due to restricted antimicrobial treatment seems an unresolved issue. However, this tension between antimicrobial stewardship teams and ICUs needs to be resolved. Stewardship teams should express an understanding of these concerns, and collaboration between stewardship teams and ICUs should be improved, where improving patient outcomes should be the primary goal.

The speaker highlighted the misconception that promoting antimicrobial stewardship might obstruct efforts to enhance the treatment of sepsis. But instead, there is evidence that hospitals can simultaneously improve their approach to sepsis management and their efforts to ensure responsible antibiotic use (JAMA Intern Med. Aug 1 2022;182(8):805-813. doi:10.1001/jamainternmed.2022.2291)

#### **AWaRe classification of antibiotics**

Benedikt Huttner and Deborah Yick Kwan Tong (WHO, Switzerland) presented updates on the World Health Organization AWaRe classification for antibiotic use. There has been an increase in overall and “Access” group antibiotic use and an even greater increased use of “Watch” group antibiotics, which is associated with the risk of infection/colonisation with multidrug-resistant organisms (MDRO). Following its establishment in 2017, the AWaRe classification has undergone several revisions. [The AWaRe antibiotic book \(2022\)](#) aims to support the rational use of antibiotics. The WHO global target is for at least 60% of antibiotic consumption at country level to be “Access” group antibiotics by 2030. In addition, the EU recommends a 20% reduction of overall antibiotic use in humans for the same period.

Sumanth Gandra (Washington University School of Medicine in St. Louis, United States) presented findings from a systematic review on the association of exposure to different classes of AWaRe antibiotics and the isolation of MDRO. The 349 eligible studies were all observational, with two-thirds being case-control studies and one-third cohorts. They covered carbapenem-resistant *Acinetobacter baumannii* (CRAB, n=34), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA=20), Extended-spectrum beta-lactamase producers (ESBL, n=133), methicillin-resistant *Staphylococcus aureus* (MRSA, n=32), vancomycin-resistant enterococci (VRE, n=59). Prior exposure to any antibiotic was associated with infection/colonization with at least one MDRO. The association was stronger for Watch and Reserve antibiotics than Access antibiotics. Within the limitations of interpreting pooled estimates of observational studies (high potential of residual confounding due to indication, concomitant use of multiple antibiotics, timing between antibiotic treatment and MDRO detection, among others), the findings support using the **AWaRe classification**.

## Swissnoso & SSHH Symposium: The best of Swiss IPC Science

In his presentation **The last word has not been said on operating room ventilation systems** Jonas Marschall (Swissnoso) presented a [novel ventilation index estimating ventilation quality in operating rooms](#) that goes beyond the current, somewhat oversimplified, dichotomy of laminar airflow vs. mixed-turbulent air. The study captured ventilation characteristics in operating rooms of participating hospitals and correlated them with national SSI rates using high-quality SSI surveillance data.

A ventilation index was developed (based on experiments in a mock operating room) and applied in a survey on ventilation characteristics among participating hospitals to assess the impact on SSI rates (procedures 2017 – 2019). A total of 182 operating rooms in 47 hospitals were evaluated and correlated to 6,791 SSI events among 163,740 performed procedures. Within the limitations of the study methodology (e.g., no individual matches of patients and operating rooms), the findings suggest that better airflow characteristics are associated with lower SSI rates (superficial SSI). The main impact of ventilation is observed in orthopaedic and cardiac surgery, while ventilation does not seem to be relevant in other procedure types. The novel ventilation index could guide resource allocation and should undergo further correlation and validation in future research.

In his presentation, Rami Sommerstein (Swissnoso) discussed the question: **Has COVID become less dangerous than flu?** The transition from the SARS-CoV-2 Wuhan/Delta variants to Omicron was associated with lower mortality from COVID-19, as shown in two consecutive cohort studies (2020/21 and 2022) from the CH-SUR hospital network (Swiss hospitals collecting information on hospitalized because of/with COVID-19 (n=17) and corresponding data for patients hospitalized because of/with Influenza A/B (n=7)).

The lower replication competence of omicron in human lungs (ex vivo cultures) may explain the lower severity of Omicron disease reported in epidemiological studies. [The 2022 comparison of hospital outcomes showed that patients with the SARS-CoV-2 Omicron variant had \(in 2022\) higher risk of in-hospital mortality than those with influenza](#) (adjusted subdistribution hazard ratios for mortality 1.54 (95% CI: 1.18– 2.01). In contrast, the CH-SUR data for the winter season of 2022/23 suggest that in-hospital outcomes of Influenza and COVID-19 are becoming more and more similar. Likely reasons include the adaptation of SARS-CoV-2 to humans, increased immunity (post-infection and vaccine-mediated), and improved therapeutic strategies. There is an ongoing need for genomic epidemiology and hospital-based surveillance. Confirming that SARS-CoV-2 does not pose a more severe threat than seasonal influenza would be a



critical piece of information for public health authorities to update their planning for future respiratory virus season.

Two further presentations from the [Swissnoso Symposium September 2023](#) have already been summarised in the [Newsletter 2023/November \(Highlights SGSH Annual Meeting\)](#): Routine vs. clinically indicated exchange of peripheral venous catheters (Niccolo Buetti) and Results of the USZ project to prevent nvHAP: the focus is now on implementation (Aline Wolfensberger).