APIC
Association for Professionals in Infection Control and Epidemiology

Research Gaps Impacting the Practice of Infection Prevention and Control

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This Research Agenda is Presented by APIC's Center for Research, Practice, and Innovation (CRPI)

Rebecca Bartles, DrPH, CIC, FAPIC, *Executive Director*

Sara Reese, PhD, MPH, CIC, FAPIC, *Research Director*

Ria Gupta, MPH, *Program Manager*

Frankie Catalfumo, MPH, CIC, CRCST, *Practice Guidance and Health Equity Director*

Tania Bubb, PhD, RN, CIC, FAPIC, *2024 APIC President*

Carol McLay, DrPH, MPH, RN, CIC, FAPIC, *2024 APIC President-Elect*

Devin Jopp, EdD, Chief Executive Officer

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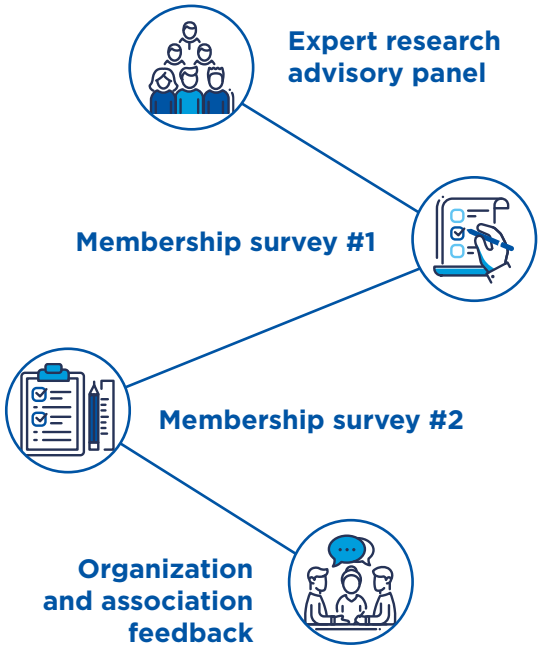
Research Agenda Development Process

The content in this document was compiled using a multi-step process with the goal of soliciting comprehensive input from individuals working in Infection Prevention and Control (IPC). The categories included are intended to be inclusive of areas in which further research is needed to inform IPC practice within healthcare settings (including acute, ambulatory, long-term, and home care). Foodborne, waterborne, and zoonotic illnesses are excluded not because they cannot have a significant impact within healthcare settings, but because disease transmission typically occurs outside of the healthcare environment. Quality improvement, implementation science, and human factors research have not been listed as separate categories, rather these areas of interest have been embedded within the research questions that arise for each category.

The development of the research agenda, which occurred between March and August 2024, is outlined in steps to the right. Research questions were divided into two categories (APIC research agenda and research gaps for partners) based on the expertise and resources required to effectively answer the question. The Center for Research, Practice, and Innovation (CRPI) will prioritize both internal and collaborative research efforts based on feedback from APIC's members regarding significance to practice and internal capacity. CRPI will continue to encourage other organizations and researchers in the field to do the same in hopes of providing infection preventionists with the evidence needed for a continuously evolving practice environment.

DEVELOPMENT OF RESEARCH AGENDA



Expert Researcher Advisory Panel

A summit was held in March 2024 in which seventeen researchers outlined the initial content of the research agenda, including categories, topics, subtopics, and questions. Following the summit, the panel provided a second round of content review and feedback and assisted in dividing the research questions into the categories mentioned above.

Membership Survey #1 Results

There were 126 responses from members on the prioritization survey of the research subtopics, including 61 infection preventionists (IPs), 37 IP leaders, 7 corporate IP leaders and various other professionals. Respondents reported working in varied care settings, including acute care hospitals, ambulatory clinics, long-term care (skilled nursing facilities), home health, hospice, veterinary hospitals, schools, prisons, public health, dental clinics, government, behavioral health, consulting, and industry.

Respondents utilized a four level Likert scale to express their interest in each subtopic including:

- "This should be a top priority area, significant gaps exist,"
- "More information is needed for optimal practice,"
- "Enough information already exists on this topic for effective IPC practice," and
- "This topic is not important for IPC practice."

The research subtopics that emerged as top priorities for APIC members include:

- The impact of artificial intelligence on IPC practice,
- Utilizing electronic medical records to improve practice,
- The efficacy and impact of multidrug-resistant organisms (MDRO) testing guidelines and interventions,
- Implementation challenges of manufacturer's instructions for use (IFUs),
- Identification of gaps in surveillance definitions,
- IPC staffing requirements and required tasks, and
- The frequency of the use of transmission-based precautions for MDROs and their impact on healthcare-associated infections (HAIs).

Many other topics emerged as top choices including aerosol generating procedures; device-associated infections; diversity, equity, and inclusion; and cleaning, disinfection and sterilization.

Membership Survey #2 Results

There were 101 responses from members on the second survey, further prioritizing the research questions from the top priority subtopics identified in the first survey. **Based on member rankings, the following constitute the research questions ranked by APIC members as the most important for advancing IPC practice at the time of survey:**

Category	Research Questions
Research Gaps in Data and Informatics	How accurate and efficient is HAI surveillance with algorithms using Artificial Intelligence (AI) compared to human-performed surveillance? Determine the predictive capability of AI to identify patient infection risk and detect early outbreaks and clusters. What would be required for infection preventionists to feel confident utilizing surveillance data gathered through AI?
Research Gaps in Workforce Development and Training	How is IPC program effectiveness defined and measured, and how is the value of an effective IPC program determined? What is the projected staffing need for IPs in the future? What are the impacts of having a fully staffed IPC program (according to the APIC staffing calculator)? What is the relationship between education and discipline of IPs on effectiveness and outcomes in practice? Is IP compensation (including managers and directors) appropriate in comparison with responsibilities and requirements?

Organization and Association Feedback

Following member feedback, multiple key organizations and associations whose work involves IPC were asked to review the draft agenda and provide feedback and additions to content. Nine associations provided comprehensive review and feedback, adding robust and diverse perspectives to the agenda. Those participating groups are noted in the acknowledgement section.

Airborne Disease Transmission

During the COVID-19 pandemic, there was a renewed interest in understanding the risk associated with aerosol-generating procedures (AGPs) and the overall risk of transmission from a patient with a known or suspected respiratory infection. The available evidence relating to which medical procedures are aerosol-generating and associated with an increased risk of respiratory transmission needs further research to prompt optimal safety practices for patients and healthcare workers. Significant additional gaps exist regarding the nature of aerobiology in respiratory disease transmission.

SIGNIFICANT ADDITIONAL GAPS EXIST REGARDING THE NATURE OF AEROBIOLOGY IN RESPIRATORY DISEASE TRANSMISSION.

Aerosol-Generating Procedures (AGPs)

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding the nature of AGPs and associated infection risk	What is the frequency in real-world healthcare scenarios in which AGPs occur without appropriate PPE and ventilation requirements (according to the current CDC guidelines)?	What is the definition and criteria used to identify an AGP (including a quantifiable microorganism threshold)? What is the likelihood of disease transmission following exposure to an AGP (stratified by procedure type, organism, and other relevant criteria, and in comparison to coughing, sneezing, speaking, singing, and breathing normally)? What are the key risk factors for disease transmission during AGPs in certain healthcare settings (including EDs, open patient care areas, emergency response vehicles, and ambulatory clinics)?
Reducing the risk of disease transmission due to AGPs	What risk reduction strategies are most commonly used to minimize transmission due to AGPs, stratified by care setting? What constitutes best practice to minimize risk of transmission during AGPs? What are the most effective strategies for implementing and monitoring best practice in reducing transmission of disease during AGPs?	To what extent can ventilation and air handling interventions minimize the risk of transmission of AGPs both in a setting in which PPE is reliably utilized and in a setting in which PPE is not reliably used?

Air Handling and Movement

SUBTOPIC	RESEARCH GAPS FOR PARTNERS
Air handling and movement	What are the most effective tools, measurements, and thresholds for assessing ventilation quality in a healthcare setting regarding airborne disease transmission? What are the most effective tools, measurements, and thresholds for assessing ventilation quality in a non-healthcare setting regarding airborne disease transmission? How effective are the current CDC Airborne Infection Isolation Room (AIIR) standards at preventing airborne disease transmission? What impact do space and population density have on airborne disease transmission? How can ultraviolet light be used most effectively to reduce the risk of respiratory virus transmission?

Antimicrobial Resistance

Antimicrobial resistance is a multi-faceted issue within healthcare settings, resulting in significant patient morbidity and mortality. Additional research is needed to fully define best practice regarding multidrug-resistant organism (MDRO) testing and mitigation strategies in patients with known or suspected MDROs. In addition, understanding both the drivers of non-compliance with best practice in lab testing and prescribing, as well as the impacts will provide additional insights into effective prevention strategies.

ANTIMICROBIAL RESISTANCE IS A MULTI-FACETED ISSUE WITHIN HEALTHCARE SETTINGS, RESULTING IN SIGNIFICANT PATIENT MORBIDITY AND MORTALITY.

Diagnostic Stewardship

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Impact of laboratory test ordering practices	What is the actual risk to patients and organizations associated with each potential failure in lab test ordering and collection practices (including both diagnostic and surveillance cultures)? What are the most effective interventions for reducing blood culture contamination at time of collection? What are the relative burdens and benefits of surveillance testing (stratified by organism and scenario)?	What constitutes safe and effective diagnostic stewardship? What constitutes an optimal diagnostic work-up for suspected bloodstream infection or vascular access device-associated bloodstream infection? What is the true impact of non-adherence to best practice recommendations for lab test ordering based on disease/organism? What is the most effective method for quantifying the cost and impact to patients in unnecessary procedures and treatment associated with inappropriate laboratory test ordering practices? Are the accepted criteria for blood and urine culture contamination appropriately sensitive and specific?
Understanding laboratory testing practices	What are the perceptions of members of the healthcare team regarding their role in preventing over-testing (physician, nurse, pharmacist, infection preventionist, etc.)?	Could suppression of culture results, in cases where contamination is likely, positively impact prescribing practices without putting patients at risk? What is the value of re-testing to assess treatment failure or success following anti-infective therapy? What strategies are effective in ensuring lab test order and collection occurs prior to initiation on anti-infectives? Do electronic medical record workflows that encourage best practices in testing impact provider behavior?

Multidrug-Resistant Organisms (MDRO)

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
MDRO testing and interventions	What are the most effective interventions for reducing MDRO transmission by organism type and care setting? What common IPC strategies are not effective for reducing MDRO transmission by organism type and care setting? Are enhanced barrier precautions (EBP) effective for preventing MDRO infection and colonization in long-term care settings? What is the frequency of utilizing transmission-based precautions (TBP) for various MDROs, and do facilities that do not utilize TBP have higher rates of MDRO colonization and infection? Are the results of MDRO surveillance being effectively communicated across healthcare settings?	What are the positive and negative consequences caused by the routine interventions intended to prevent MDROs? What is the environmental impact of transmission-based precautions? Are there human and or psychological costs associated with the use of EBP in long-term care settings? What are the most effective testing guidelines for MDROs based on care setting and organism? What are the most effective testing guidelines to remove isolation for patients colonized with an MDRO? What is the average and longest described length of colonization for each MDRO type, and how do these timeframes correlate with contamination of the healthcare environment? How can a root cause analysis be leveraged to identify potential gaps in antimicrobial stewardship practices when new MDROs are identified in a facility? How effective is antibiotic stewardship in preventing the emergence of new MDROs?

Prescribing Practices and Patterns

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Impact of prescribing practices	How do antimicrobial prescribing practices in specialty ambulatory clinics and long-term care settings differ from acute care hospital settings?	What are disease-specific impacts (i.e., antimicrobial resistance, cost, patient clinical status) to over-prescribing antimicrobials? What is the most effective method for quantifying the amount of antimicrobial waste associated with inappropriate prescribing practices?
Understanding prescribing practices	What are the perceptions of non-prescribing members of the healthcare team regarding their role in preventing over-prescribing (nurse, IP, etc.)? How is penicillin allergy currently assessed among patients? What is the impact of a screening tool on the accuracy of recording penicillin allergy?	How often are best practice surgical prophylaxis recommendations adhered to (stratified by setting and procedure)? How can healthcare teams work together to effectively de-label allergies when appropriate? What impact does immunosenescence have on prescribing practices in long-term care settings? How can guideline updates pertaining to antimicrobial prescribing be effectively communicated to involved staff in a timely manner? Do electronic medical record workflows that encourage best practices in prescribing impact provider behavior?

Data and Informatics

As technology continues to develop, the field of IPC must also evolve and adapt. The potential role of Artificial Intelligence (AI) within the practice of IPC has yet to be determined, but the reliability of this new technology and associated risks must be well understood. In addition, new knowledge gaps have arisen due to the increasing complexity and sophistication of electronic medical records (EMRs) and associated surveillance software programs. Research will be critical to determine how these robust systems can best be leveraged to assist in IPC work, particularly regarding early identification of patient risk factors for infection, early identification of clusters and outbreaks, and to reduce the burden of surveillance among IPC professionals.

THE POTENTIAL ROLE OF AI WITHIN THE PRACTICE OF IPC HAS YET TO BE DETERMINED, BUT THE RELIABILITY OF THIS NEW TECHNOLOGY AND ASSOCIATED RISKS MUST BE WELL UNDERSTOOD.

Artificial Intelligence

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding AI as an IPC tool	Is healthcare-associated infection (HAI) surveillance with algorithms using AI less, equally, or more accurate and efficient than human-performed surveillance? Determine the predictive capability of AI to identify patient infection risk and detect early outbreaks and clusters.. What are the risks associated with using AI for surveillance, risk assessment, and monitoring for early outbreaks and clusters? What characteristics would be required for infection preventionists to feel confident using AI routinely in their work?	Can literature review and evidence grading be reliably performed by AI? Can AI be used to reduce racial and ethnic disparities in HAI rates? What is the availability of AI in healthcare facilities for helping link frontline workers with policies and protocols?

Surveillance

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
National Healthcare Safety Network (NHSN)	Does the NHSN surgical site infection (SSI) definition drive unnecessary laboratory testing practices among surgeons?	What are the gaps and deficiencies in the NHSN definitions? What is the impact of the 2019 update to the NHSN healthcare-onset *Clostridiodes difficile* infection (HO-CDI) definition requiring facilities to report only the last test result if a two-step testing algorithm is utilized?

Electronic Medical Record (EMR)

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
EMRs as IPC tools	What are the most effective ways to utilize the EMR as a tool for streamlining surveillance? How can the medical record be leveraged to identify early clusters or outbreaks? How can the medical record be leveraged to identify HAI trends epidemiologically related to staff members? How can the medical record be leveraged to identify HAI trends associated with specific patient risk factors?	What proportion of acute and skilled nursing facilities have access to Fast Healthcare Interoperability Resources (FHIR) standards for automated reporting of HAI? What opportunities exist for leveraging existing EMR systems to share relevant IPC information both internally and across organizations and care settings? What decision support mechanisms are currently in use within electronic medical records in the United States? Can the EMR, using an algorithm, reliably be leveraged to identify patients at highest risk of colonization at time of presentation (i.e., *C. auris*, *C. difficile*)? Can the EMR, using an algorithm, reliably be leveraged to identify patients at highest risk of specific healthcare-associated infections? If so, are there specific interventions that effectively reduce the risk of infection in these patients?

Device-Associated Infections (DAIs)

Preventing device-associated infections has historically been a targeted focus area of the IPC field, with many DAIs falling under required state and federal reporting programs. However, as products, technologies, pathogens, and surveillance definitions evolve, new knowledge gaps arise, and new questions are created. Continuous monitoring, learning, and innovation are necessary to mitigate DAI risks.

CONTINUOUS MONITORING, LEARNING, AND INNOVATION ARE NECESSARY TO MITIGATE DAI RISKS.

Understanding Catheter-Associated Urinary Tract Infections (CAUTI)

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding UTI prevention products and processes	Are specific types of indwelling urinary catheters or prevention strategies more effective in preventing CAUTI in pediatric patients? Does implementation of enhanced barrier precautions result in an increased utilization of indwelling urinary catheters in long-term care (LTC) settings, and in turn CAUTI rates? What are the risks associated with external catheters and urine collection devices?	What are the risks associated with external catheters and urine collection devices?
Diagnostic stewardship		How predictive are the individual criteria utilized in a urinalysis for identifying an actual urinary tract infection (across all unique patient populations, including immunocompromised hosts, transplant recipients, patients with altered genitourinary anatomy, and elderly patients)? What combination of these criteria would most accurately reflect the presence of a UTI?
Understanding CAUTI impact	Is the overall impact of CAUTI to patient morbidity and mortality sufficient to continue tracking and reporting this infection?	

Understanding Vascular Access Device-Associated Bloodstream Infections (VAD-BSI)

SUBTOPIC	APIC RESEARCH AGENDA
Understanding BSI risk factors and impacts	What are the unique risk factors for BSI in different healthcare settings and patient populations? What are the long-term outcomes of patients who have experienced a BSI, and how do prevention strategies impact these outcomes?
Understanding BSI prevention products and processes	How can the impact of individual bundle elements for reducing the risk of BSI be assessed ethically? What are the most effective BSI prevention bundle elements for specific devices, care settings, and patient populations? What are the most effective prevention strategies for mucosal barrier injury laboratory-confirmed BSI (MBI-LCBSI)? What are the economic impacts of different BSI prevention strategies in various healthcare environments? How do patient comorbidities influence the effectiveness of BSI prevention bundles? How does patient engagement and education on hygiene practices influence BSI prevention? What is the impact of staffing ratios and workload on BSI rate in hospitals? How is adherence to BSI prevention processes best measured?
Understanding VAD-related HAI burden	What is the burden of peripheral intravenous (PIV) catheter-associated BSI? What is the impact of TPN (total parenteral nutrition) on VAD-BSI? In hospital settings, what is the prevalence of BSI due to ECMO, dialysis, and continuous renal replacement therapy (CRRT)?

Understanding Ventilator-Associated Events (VAE)

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding VAE prevention products and processes	Is routine oral care an effective strategy in reducing ventilator-associated events (VAE)?	Is there a relationship between hospital onset pneumonia and non-invasive ventilation devices?
Understanding VAE burden	What is the burden of VAE in post-acute care?	

Emergency Management and Response

Emergencies occurring within healthcare systems can be widely variable in nature, including natural disasters, bioterrorism, outbreaks and pandemics, supply chain deficiencies, and any other event that might significantly disrupt operations. Effective emergency management and response are crucial for IPC as they ensure rapid containment and mitigation of infectious threats, protecting public health and safety. Addressing gaps in emergency management and response is essential to enhance resilience and efficacy, especially in regard to refining emergency response protocols and improving strategies for handling product disruptions.

ADDRESSING GAPS IN EMERGENCY MANAGEMENT AND RESPONSE IS ESSENTIAL TO ENHANCE RESILIENCE AND EFFICACY.

Emergency Management and Response

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Emergency response protocols	How prepared are IPs to respond to an emergency (stratified by type of event)? To what degree are IPs included in emergency management planning and response? What strategies are useful in allowing healthcare facilities to maintain effective IPC practices during stresses on the healthcare system? How are IPC-related issues prioritized during stresses on the healthcare system, particularly staffing shortages?	What is the ideal relationship between public health authorities and IPs in healthcare settings during an emergency response? How well do LTC settings adhere to Centers for Medicaid and Medicare Services (CMS) regulations regarding emergency management response?
Responding to product disruptions	What are the critical IPC factors to be considered during product disruption events?	

Environmental and Equipment Cleaning and Disinfection

Environmental and equipment cleaning and disinfection are foundational to the prevention of infectious disease in healthcare settings. The terminology "environmental cleaning and disinfection" is used in the broadest sense in this category and includes all areas within the healthcare setting, with the greatest focus being on patient rooms and frequently touched surfaces. The term "equipment" here is also used very broadly and refers to various types of equipment that might contact surfaces in care areas or a patient's intact skin directly (non-critical items). Although this topic has been studied for decades, new technologies continue to arise. Gaps remain regarding the impact of processes to healthcare-associated outcomes as well as best methods to account for and optimize compliance with those processes.

ENVIRONMENTAL AND EQUIPMENT CLEANING AND DISINFECTION ARE FOUNDATIONAL TO THE PREVENTION OF INFECTIOUS DISEASE IN HEALTHCARE SETTINGS.

Environmental Cleaning and Disinfection

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding disinfectants	What is the failure rate of disinfectant dispensers at appropriately mixing dilutable disinfectant solutions?	What is the impact of drain disinfection? What is the impact of cleaning agents for drains to the integrity of the plumbing system? What are the most effective methods for eradicating biofilms and preventing recolonization in sinks and drains?
Impacts of room cleaning and disinfection to HAI	Does environmental cleaning and disinfection impact HAI outcomes?	
Understanding monitoring processes	What percentage of healthcare facilities utilize indicators to monitor surface cleaning efficacy (stratified by product type)?	
No-touch surface disinfectants/ whole room solutions	How are ultraviolet (UV) devices actually being used, and what are the cost, benefit, and burden? How do simple surface cleaning/disinfection protocols and no-touch/ whole room disinfection methods (UV, hydrogen peroxide) compare with regard to both effectiveness and cost? How can technology be leveraged to identify gaps in cleaning processes?	Do newer non-touch technologies that use continuous decontamination have improved effectiveness over intermittent technologies?

Equipment Cleaning and Disinfection

SUBTOPIC	APIC RESEARCH AGENDA
Understanding roles in equipment cleaning	How does reliability and consistency with effective equipment cleaning compare between the clinical team and environmental services team? Do team-building efforts between clinical staff and EVS staff impact effectiveness of cleaning? What strategies could optimize reliable and consistent implementation of cleaning and disinfection processes?
Impact of equipment cleaning and disinfection to HAI	For dialysis equipment, how effective are the current culturing protocols and the response when positive water cultures are found? What proportion of non-critical equipment is cleaned and disinfected according to manufacturer's instructions for use?
Disinfecting high touch items	Can human factors science be utilized to ensure high reliability in disinfection of high touch items?

Health Equity

Health equity is defined as the attainment of the highest level of health for all people. In practice, organizations focused on health equity ensure that all individuals receive personalized, high-quality care, regardless of their social determinants of health (SDOH). Understanding the relationship between health equity and IPC practices, healthcare-associated infections (HAIs), and resource allocation ensures that interventions are equitable and address the needs of all populations.

Social Determinants of Health (SDOH)	
SUBTOPIC	**APIC RESEARCH AGENDA**
Understanding the impact of SDOH to IPC practice	How do differences in demographics and culture affect perceptions of and response to various forms of messaging and education regarding evidence-based IPC practices? What is the level of training and knowledge among IPs regarding SDOH and their impact on care? Do the SDOH of IPs themselves impact IPC practices?
Impact of SDOH to HAI	Do relationships exist between SDOH and healthcare-associated infections? If so, what strategies are effective in eliminating these inequities? Do relationships exist between key SDOH and antimicrobial resistance? If so, what strategies are effective in eliminating these inequities?
Impact of resource allocation	Do resource allocation and IPC practices differ in safety net and non-safety net facilities? If so, in what ways?

Instrument Cleaning, Disinfection, and Sterilization

Disinfection and sterilization are critical in reducing the spread of HAI via reprocessed instrumentation. In this context, the term “instrument” is used to describe both semi-critical and critical instruments and devices. The degree to which specific protocols and processes are effective in reducing or preventing the spread of infections needs to be further investigated to enhance patient safety and prevent outbreaks related to multi-use instrumentation.

DISINFECTION AND STERILIZATION ARE CRITICAL IN REDUCING THE SPREAD OF HAI VIA REPROCESSED INSTRUMENTATION.

Instrument Reprocessing

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Efficacy and feasibility of Instructions for Use (IFU)s	What is the rate of feedback to US Food and Drug Administration (FDA) when IFUs are inappropriate or insufficient? What is the actionable response rate of FDA to reports that IFUs are inappropriate or insufficient? What is the risk of unclear or difficult-to-follow IFUs to patient and healthcare worker safety?	
Understanding HLD processes and protocols	What percentage of healthcare facilities utilize indicators to monitor endoscope disinfection efficacy (stratified by technology type)?	What are the potential impacts to bioburden in endoscopes when using forced air versus hanging dry? Is sterilization a more effective process than high-level disinfection for endoscopes? What are the safest reprocessing practices for external fixators? What are current practices in storing and transporting sterile supplies?
Understanding sterilization processes and protocols	What factors should be considered when attempting to improve compliance with point-of-care cleaning protocols for instruments? What are the best methods to empower Sterile Reprocessing Department (SPD) staff to ensure quality practice is met and provide feedback when it's not? What is the relationship between infection risk and staff turnover in sterile processing departments?	What is the actual impact to product safety of temperature and humidity being out of range with regard to sterile supply storage?

IPC Workforce

Research topics surrounding IPC as an occupation have been a focus in recent years as the complexity of the IP role and demand for qualified IPs continues to grow. Significant knowledge gaps remain regarding the role and impact of certification, as well as barriers to achieving certification. As IPC programs continue to move into more care settings, understanding the key requirements for effective staffing, competency, and compensation will be critical.

SIGNIFICANT KNOWLEDGE GAPS REMAIN REGARDING THE ROLE AND IMPACT OF CERTIFICATION, AS WELL AS BARRIERS TO ACHIEVING CERTIFICATION.

IP Certification

SUBTOPIC	APIC RESEARCH AGENDA
Impact of certification	Does the presence of certified IPs (CIC, LTC-CIP) improve IPC program success and/or impact HAI rates (stratified by certification type)? Does IPC certification correlate with job satisfaction, health, and quality of life for IPs?
Understanding certification	What are the barriers and facilitators for obtaining IPC certification? What is the perceived value of IPC certification (stratified by role)?

Workforce Development and Training

SUBTOPIC	APIC RESEARCH AGENDA
IPC Program Staffing	What is the ideal skill mix for a multi-person IPC team? What are the minimum effective staffing requirements by care setting (stratified by risk assessment and taking into account IPC experience and career stage)? How can IPC tasks and associated time be quantified, and their impact determined, outside of surveillance? What is the projected need for IPs in the future? What are the impacts of having a fully staffed IPC program (according to the APIC staffing calculator)? What is the relationship between education and discipline of IPs on effectiveness and outcomes in practice? What is the most effective model for staffing system IPC programs? What is the cost associated with training an IP from novice level to proficient?
IPC Program Design and Management	For multi-hospital systems, what are the risks and benefits of implementing a system surveillance program? What aspects of organizational culture and environment impact IP retention and attrition? What existing tactics for avoiding burnout and attrition in other professions can be leveraged for use in IPC? What is the relationship between IP mental health and attrition? What are the main drivers of IP job satisfaction and retention? How is IPC program effectiveness defined and how is the value of an effective IPC program determined? What are the predictors of an effective IPC program? What are the most effective strategies for building confidence and trust of frontline workers in an IPC program? What performance obstacles or barriers exist that prevent an IP from optimal, effective practice?
Competency	How does each domain in the competency model relate to success in IPC practice? Which competency model domains are universal, regardless of work setting or specialization? What skills and traits are most important for success as an IPC program leader?
Compensation	Is IP compensation (including managers and directors) appropriate in comparison with responsibilities and requirements?

Primary Prevention Strategies

This section addresses the foundational strategies utilized for preventing the spread of infectious disease in healthcare settings. Historically, these primary prevention strategies have been well studied, but the growth of technology, societal shifts, and evolution in the healthcare environment continue to generate new knowledge gaps.

THE GROWTH OF TECHNOLOGY, SOCIETAL SHIFTS, AND EVOLUTION IN THE HEALTHCARE ENVIRONMENT CONTINUE TO GENERATE NEW KNOWLEDGE GAPS.

Standard Precautions

SUBTOPIC	APIC RESEARCH AGENDA
Hand hygiene	Which types of electronic hand hygiene monitoring systems are most effective, and how is information most effectively and reliably communicated to healthcare personnel? What is the minimum hand hygiene observation sample size that is representative of overall hand hygiene rates? Is direct observation of hand hygiene still a useful measure for understanding hand hygiene compliance?
Implementation	What strategies are most successful for teaching and implementing standard and transmission-based precautions in clinical settings?

Transmission-Based Precautions

SUBTOPIC	APIC RESEARCH AGENDA
Effectiveness	Could a more nuanced approach to transmission-based precautions, in which some versus all measures are utilized, provide a similar level of safety while reducing product and time waste?

Personal Protective Equipment

SUBTOPIC	RESEARCH GAPS FOR PARTNERS
Respirators	For what organisms and in what scenarios are respirators appropriate? How effective are respirators other than N95s in preventing the spread of viral respiratory illness? Can the N95 fit-testing interval safely be expanded from annually to every two or three years?
Human factors	What is the impact of human factors engineering on efficiency, effectiveness, and cost of PPE use?

Vaccination

SUBTOPIC	RESEARCH GAPS FOR PARTNERS
Vaccine impact	Do facility-mandated influenza and COVID-19 vaccination programs reduce healthcare worker infections and related call-outs? What is the impact of mandatory vaccination programs on nosocomial influenza and COVID-19?
Vaccine hesitancy	Among healthcare workers with vaccine hesitancy, what is the attitude and reported potential impact of financial incentives on intention/willingness to become vaccinated? What are the key drivers for vaccine hesitancy in healthcare workers (stratify by vaccine type)? What strategies are most effective to counter misinformation that contributes to vaccine hesitancy?

General Prevention Topics, not Otherwise Specified

SUBTOPIC	APIC RESEARCH AGENDA
Impact on patient safety	Are there unintended consequences of "zero HAI" initiatives in healthcare?
Healthcare worker trust	What is the impact to practice related to individuals to practice related to individuals who are distrustful of federal or state guidance following COVID?
Human behavior	What theories of behavioral change could be successfully leveraged to improve compliance with IPC practices?
Decolonization	Which decolonization methods are most effective at preventing SSI, CLABSI, and MDRO transmission?
Visitation	How do age limitations impact patient visitation for patient visitation during respiratory season prevent viral respiratory illness transmission? What role do visitors have in spreading disease within healthcare settings and what mitigation strategies are most effective to reduce that risk? Are facility-mandated masking and symptom screening for visitors during respiratory outbreaks effective strategies for reducing spread of disease?
Understanding disease transmission risk in facilities design	Which methods for assessing disease transmission related to the hospital environment are most effective? To what degree does room design (patient bays, semi-private rooms, private rooms) influence HAI rates and contribute to clusters or outbreaks? What strategies are most effective in each type of room to mitigate risk? Which physical locations (i.e., waiting rooms, emergency departments, etc.) in the healthcare environment are most likely to result in disease transmission?
Non-ventilator hospital-acquired pneumonia (NV-HAP)	What are the epidemiology and risk factors for NV-HAP? What strategies for preventing NV-HAP are effective?
Sustainability	What are the environmental impacts of IPC policies?
Patient bathing	What is the relationship between patient bathing protocols and healthcare-associated infections?

Procedure-Associated Infections

Healthcare-associated infections (HAI) related to invasive procedures continue to be an area of focus for infection preventionists. Knowledge gaps remain regarding effective surveillance methods, safe device design, impact of design on ease of reprocessing, and efficacy of common prevention strategies.

HEALTHCARE-ASSOCIATED INFECTIONS RELATED TO INVASIVE PROCEDURES CONTINUE TO BE AN AREA OF FOCUS FOR INFECTION PREVENTIONISTS.

Endoscope-Related Infection

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding products and processes	How well do endoscopy centers comply with safe injection practices? What is the distribution of use of second party repair companies for endoscope repair? What is the role of IPC in endoscope purchasing decisions? What are effective surveillance mechanisms for capturing endoscope procedure-related infections? What are the barriers to implementing surveillance programs for endoscope procedure-related infections?	How can endoscope designs be improved to reduce the risk of contamination and facilitate ease of reprocessing? What alternatives to simethicone exist, and what are the risks/benefits of each?

Surgical Site Infection

SUBTOPIC	APIC RESEARCH AGENDA	RESEARCH GAPS FOR PARTNERS
Understanding products and processes	What is the overall incidence of surgical site infection associated with procedures in ambulatory care settings? How can the impact of individual bundle elements for reducing the risk of SSI be assessed ethically? What is the feasibility and reliability of implementation of each of the current SSI bundle elements for each procedure category?	What is the impact of negative pressure dressings for SSI risk (stratified by population)? Is bowel prep an effective strategy to prevent SSI in colon surgery? How can surgical instrumentation design be improved to reduce the risk of contamination and facilitate ease of reprocessing?
Surgical antimicrobial prophylaxis		What is the impact of penicillin allergy on prophylactic antibiotic selection? What is the impact of selecting alternative antibiotics due to penicillin allergy on SSI rates? What strategies are most effective in antibiotic allergy data collection regarding optimizing surgical antimicrobial prophylaxis selection?

About APIC

Founded in 1972, the Association for Professionals in Infection Control and Epidemiology (APIC) is the leading association for infection preventionists and epidemiologists. With more than 15,000 members, APIC advances the science and practice of infection prevention and control. APIC carries out its mission through research, advocacy, and patient safety; education, credentialing, and certification; and fostering development of the infection prevention and control workforce of the future. Together with our members and partners, we are working toward a safer world through the prevention of infection. Join us and learn more at apic.org.

About CRPI

APIC's Center for Research, Practice, and Innovation (CRPI) aims to transform the practice of infection prevention and control by uniting scientists and practitioners to answer leading research questions and translate findings to improve practice and outcomes.

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