

Curriculum for ICAS IPC certification

1. Leadership (9%)

- a. Establish clear goals for IPC program and collaborates with other leaders and colleagues to align IPC program goals with strategic goals of organization
- b. Demonstrates problem solving and critical thinking skills when presented with situations involving infectious threats.
- c. Has effective communication skills incorporating emotional intelligence and situational awareness.
- d. Uses critical thinking in evaluation and planning of the IP program.
- e. Implements IPC interventions by working with multidisciplinary teams and using multimodal strategies and campaigning when indicated.
- f. Collaborates with relevant stakeholders to facilitate/lead interdisciplinary and interprofessional projects and research, serving as a champion for safety and evidence-based Infection Prevention practices.
- g. Links the local IPC team to Ministry of Health (MOH) and Communicable Disease Agency and Planning Office (CDA) to help coordinate the outbreak response (community or multi-hospital/facility outbreaks), promote an exchange of information, and generate regular reports.
- h. The IPP is an effective change agent using behavioural science, implementation science and change management theories in planning and execution of IPC interventions.
- i. The IPP is an effective and efficient manager of budget, resources, personnel and programs. He/she uses relevant tools such as cost-benefit analysis and is guided by healthcare economic principles to determine cost-effectiveness of IP initiatives. He/she uses team building skills to build the IPC team.
- j. Mentors other IPPs to contribute to the professional development and competency advancement of the future IP workforce.

2. Professional stewardship (9%)

- A. Ethical Responsibility
 - a. Uphold high ethical standards to ensure accountability measures are in place for IP practices
 - b. Avoid conflicts of interest, maintain confidentiality, and be committed to fairness and justice in their practices.
- B. Resource Management
 - a. Careful management of tangible and intangible resources (e.g. financial resources, time, expertise, or physical assets; maximizes value while minimizing waste or harm)
 - b. Manages budget, ensuring the efficient use of materials, or preserving the integrity of intellectual property.
- C. Long-Term Sustainability
 - a. Adopt sustainable practices, such as environmental responsibility or fostering a sustainable corporate culture.

- D. Accountability and Transparency
 - a. Accountable to stakeholders (clients, employees, customers, or public)
 - b. Ensuring that one's actions align with the values of the organization and the expectations of stakeholders.
 - c. Sharing information, being open about decisions, and providing clear communication about goals, outcomes, and challenges.

- E. Community and population-focused
 - a. Collaborates with the community partners to keep the community healthy and safe
 - b. Keep abreast with Healthier SG and initiatives/program related to Population Health and advocates for IPC practises to be implemented across the continuum of care in the community (step-down care and home care environment).

3. IPC Operations (65.8%)

A. IP programme

- a. Develop IP goals, measurable objectives, and plan for the IP Programme
- b. Assess needs through regular risk assessment and recommend resources needed to support the IP Programme
- c. Facilitate and monitor implementation of Infection Prevention Programme, and communicate with appropriate stakeholders

B. IP guidelines

- a. Develop and implement IP policies and procedures based on law and regulation, manufacturer's IFU, evidence-based guidelines and national standards
- b. Adapt transmission-based precautions to the specific healthcare setting, the facility design characteristics and the type of patient interaction
- c. Collaborate with key stakeholders on ASP (e.g. leadership, pharmacist, ID physician to monitor and interpret the relevance of antimicrobial susceptibility patterns
- d. Collaborate with key stakeholders on emergency preparedness and management
 - i. Plan for influx of patients with known/suspected communicable diseases (e.g. bioterrorism, emerging IDs, syndromic surveillance)
 - ii. Identify IPs role in mass casualty incidents and emergency/disaster management
 - iii. Assess readiness of emergency management plans
 - iv. Establish IP coverage in emergency situations
 - v. Integrate IP strategies into the 4 phases of emergency/disaster response in the emergency operations plan (viz. mitigation, preparedness, response, recovery)
- e. Collaborate with relevant groups and agencies in planning community/facility responses to biologic threats and disasters (e.g. public health, emerging pathogens)
- f. Participate in product evaluation

C. IP education and training

- a. Conduct learning needs analysis, develop goals and measurable objectives for preparing educational initiatives using evidence-based approach (e.g., adult-learning theory) to diverse audience
- b. Prepare, present, coordinate, and communicate the educational content via approach or format that is relevant to targeted groups of audience
- c. Provide a conducive environment to learning utilizing innovative teaching methodology
- d. Facilitate education of patients, families, and others regarding prevention and control measures
- e. Assess the effectiveness of education and learner outcomes

D. ID-related occupational health

- a. Assess and/or develop screening and immunization programmes for healthcare workers
- b. Collaborate with employee/occupational health regarding counseling, follow up, and work restriction recommendations related to communicable diseases and/or exposures
- c. Collaborate with employee/occupational health to identify HCW who may present a transmission risk to patients, coworkers and communities
- d. Educate on safe work practices (e.g. PPE, safe injection practices, hand hygiene)
- e. Monitor and analyze trends of infectious diseases related to occupational health in healthcare workers and provide recommendations for risk mitigation

E. Multimodal strategies

- a. Identify and implement infection prevention strategies related to main activities during delivery of care (include but not limited to Standard Precautions, Transmission-based Precautions, safe injection practices, asepsis) using multimodal strategies
- b. Facilitate and monitor implementation of Infection Prevention Programme and policies using multimodal strategies
- c. Collaborate with relevant stakeholders to ensure necessary infrastructure to facilitate system change in implementing Infection Prevention interventions (include but not limited to enhanced accessibility of PPE, hand hygiene facilities/stations, ergonomics)
- d. Engage leadership for their support for Infection Prevention Programme as champions and role models in promoting and strengthening Infection Prevention culture

F. Monitoring, audit, feedback

A. Surveillance

- I. Design of surveillance system
 - a. Conduct a risk assessment based on the following: geographic location, demographics of the population served, care, treatment, services provided, analysis of IP data, evidence-based guidelines or recommendations, and regulatory or other requirements as applicable
 - b. Develop goals and objectives based upon the risk assessment

- c. Develop a surveillance plan based on the goals identified from the risk assessment
 - d. Adopt or establish standardized surveillance definitions
 - e. Create a process to identify epidemiologically significant findings and notify relevant parties (e.g. nursing unit, health department, leadership)
 - f. Integrate surveillance activities across health care settings (e.g. ambulatory, home health, long term care, acute care, behavioural)
 - g. Establish process for identifying individuals with communicable diseases requiring transmission-based precautions and/or follow up (e.g. reporting to MOH)
 - h. Periodically evaluate the ability of the surveillance plan to obtain relevant data and modify as necessary
- II. Collection and compilation of surveillance data
- a. Collect data using standardized definitions
 - b. Utilize a systematic approach to obtain and record surveillance data
 - c. Organize and manage data in preparation for analysis
 - d. Calculate the incidence and/or prevalence of infections
 - e. Calculate specific infection rates/ratios (e.g. provider specific, unit specific, device specific, procedure specific, SIR)
- III. Interpretation of surveillance data
- a. Validate surveillance data
 - b. Use basic statistical techniques to describe, analyze and interpret data (e.g. mean, standard deviation, rates, ratios, proportions)
 - c. Compare surveillance results to published data and/or other relevant benchmarks (e.g. prior surveillance data, national databases)
 - d. Monitor and interpret the relevance of surveillance data (e.g. antimicrobial susceptibility patterns)
 - e. Prepare and present findings in a format that is relevant to the audience/stakeholders (e.g. graphs, tables, charts)
- B. Audit
- a. Develop an audit system to monitor the effectiveness of implementation of IPC policies, guidelines and interventions
 - b. Assess needs, select indicators, develop goals and measurable objectives for the audit system
 - c. Select the appropriate type of audit mechanism specific to the indicators selected to be audited
 - d. Develop tools and resources for conducting process assessments for specific settings and/or population

- e. Analyze trends and key issues and gaps in practices and collaborate with key stakeholders in identifying and implementation of mitigation measures (e.g., provide immediate feedback, education, and/or training to healthcare workers when lapses in practice are observed)
- f. Evaluate and facilitate compliance with accreditation standards/regulatory requirements

G. Workload, staffing, bed occupancy

- a. Collaborate with relevant stakeholders to assess needs and recommend on appropriate staffing levels, ratio of Infection Prevention professionals to patients, according to patient workload and profile/acuity using national standards and/or a standard staffing needs assessment tool
- b. Establish recommendations on the design of healthcare facilities in accordance with national standards regarding bed capacity and national standards for healthcare buildings (include but not limited spacing between patient beds)
- c. Collaborate with relevant stakeholders to establish a system to respond to sudden influx of patients

H. Built environment

- I. Environmental safety
 - a. Recognize and collaborate on processes for a safe care environment (e.g. ACMV management, water management, laundry, waste management, environmental cleaning)
 - b. Collaborate on the evaluation and monitoring of environmental cleaning and disinfection practices and technologies
 - c. Collaborate with others to select and evaluate environmental cleaning and disinfectant products
 - d. Identify IP processes related to recall of potentially contaminated equipment, food, medications and supplies
 - e. Monitor for environmental pathogens (e.g. *Legionella*, *Aspergillus*)
- II. Recognize and monitor elements important for a safe care environment (e.g. ACMV, water standards, construction)
 - a. Evaluate infection risks and make recommendations during planning, design, and commissioning phases of construction (e.g. surface choice, number of isolation rooms, type and placement of sinks)
 - b. Assess infection risks and provide recommendations for risk mitigation during construction, renovation, and maintenance (e.g. establishment of negative pressure, type of barriers)
 - c. Establish through collaboration, the monitoring of risk mitigation measures during construction, renovation, and maintenance through commissioning

I. Antimicrobial and diagnostic stewardship

- a. Monitor and interpret the relevance of antimicrobial susceptibility patterns
- b. Collaborate with key stakeholders to develop and implement initiatives for antimicrobial stewardship using surveillance data, antibiogram, and antibiotic use data
- c. Collaborate with key stakeholders in developing diagnostic stewardship audit systems and recommendations for improvement

J. Outbreak detection and management

- a. Outbreak detection and management
- b. Verify existence of outbreak or exposure
- c. Notify appropriate internal and external stakeholders
- d. Collaborate with appropriate persons to establish case definition, period of investigation, and case finding methods
- e. Define the problem using time, place, person, and risk factors
- f. Formulate hypothesis on source and mode of transmission
- g. Collect additional data (e.g. environmental samples, active surveillance cultures)
- h. Design and implement control measures, including ongoing surveillance
- i. Monitor and evaluate control measures for effectiveness
- j. Provide recommendations based on outbreak findings and communicate to relevant groups of internal and external stakeholders
- k. Prepare and disseminate outbreak reports
- l. Monitor and plan for emerging infection threats and challenges

4. Quality improvement (2.7%)

- a. Participate in QI activities related to IP (e.g. PIRs, IRs, failure mode and effects analysis, PDSA)
- b. Develop, monitor, measure and evaluate IP performance indicators to drive QI initiatives
- c. Select and apply appropriate QI tools (e.g. Ishikawa diagram, Pareto chart, flowchart, SWOT, gap analysis)

5. IPC informatics (6.3%)

- a. Collaborate with key stakeholders to develop an electronic surveillance system to facilitate effective and accurate capturing of information for Infection Prevention surveillance and data analysis, and storage and reporting of data to internal and external stakeholders
- b. Collaborate with Information Technology and other stakeholders to incorporate data visualization tools for effective Infection Prevention management (e.g., tagging and communication to healthcare on cases for Isolation Precautions) and identifying inappropriate Isolation Precautions to drive high compliance with evidence-based care bundles

- c. Develop an electronic reporting system to facilitate timely notification and prompt management of staff exposure to infectious diseases and data analytic component to enable accurate analysis of risk factors (e.g., contributing factors of needlestick injuries)
- d. Develop a comprehensive electronic infection control system that manages staff and patient for exposure to infectious diseases, analyzes risk factors, and identifies trends. Integrate with existing EHRs for efficient data entry, real-time analysis, and monitoring. Provide customizable IPC dashboards and reports for stakeholders, offer data visualization tools, ensure security and compliance, and allow updates to meet evolving needs and technological advancements.
- e. Integrate advanced technologies to automate IPC tasks, reduce errors, and enhance predictive analytics. Implement AI and machine learning for improved HAI detection and trend analysis. Utilize data visualization tools and statistical methods to inform decision-making. Ensure seamless integration with existing systems and establish a continuous improvement cycle to adapt to evolving clinical needs and technological advancements.
- f. Develop IT solutions to enhance IPC surveillance, data management, and reporting. Integrate advanced technologies, including AI and machine learning, to automate tasks, improve HAI detection, and enhance predictive analytics.
- g. Implement robust data security measures and ensure compliance with relevant privacy regulations (e.g., HIPAA). Supports decision-making processes for implementing preventive measures and improving infection control protocols. Implement encryption and secure access protocols to protect sensitive IPC data and comply with privacy regulations.

6. Research (7.2%)

- a. Conduct a literature review
- b. Critically appraise the literature
- c. Facilitate incorporation of applicable research findings into practice
- d. Identify opportunities for research related to performance improvement (e.g. health economic analysis [CEA, CBA], product trials)
- e. Share research findings through presentations at IPC-focused conferences and events, contributing to knowledge exchange within the field.
- f. Submit research for publication in reputable journals to contribute to the broader IPC evidence base.
- g. Summarize and share research findings with key stakeholders, including IPC teams, clinical staff, and decision-makers.
- h. Highlight the practical implications of research outcomes and provide recommendations to guide evidence-based changes in IPC practice.