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Reliable Design of Infection Prevention Programs

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Introduction

Currently there is no published guideline or community standard for the way in which infection preventionists (IPs) should spend their time each day in hospitals and ambulatory-based settings. The Infrastructure Report and the APIC IP Competency Model both help to address this, building on the SENIC study,[1] though none offers a level of guidance that would support reliable design for the time constructs of IPs.[2-3] The way in which IPs spend their time varies widely among facilities and across the continuum of care, driven in part by regulations, by the priorities to the IP's manager, and by the strengths and interests of the IP.

In the absence of a guideline, the goal of this paper is offer a best practice model for structuring the day of an IP based on the APIC IP Competency Model, and for staffing a qualified and successful IP department/team. A sample organizational chart is also offered (see Figures 1-3). We intend for this paper to be used to inform executives in hospitals and ambulatory-care facilities in order to support the priorities and scope of infection prevention and control programs, and to ensure that these programs are adequately resourced to protect relevant clinical imperatives.

Background

Currently there is no evidence based or "community standard" guideline for the way in which IPs should spend their time each day in hospitals and ambulatory-based settings. The APIC IP Competency Model suggests that there should be four key areas of focus, but without any descriptive direction supporting reliable design for day-to-day operations. The continually evolving role of the IP includes prevention and control of current and emerging infections and diseases, and an understanding of new clinical and data mining technologies. It requires increased focus on infection rate data due to reimbursement policies and mandatory public reporting of infections. The Infrastructure Report and the APIC IP Competency Model both help to address this role expansion, building on the SENIC study.[2-3] However, none of these offer a level of guidance that would support reliable design for the day to day operations of Infection Prevention and Control professionals.

The way in which IPs spend their time varies significantly from hospital to hospital and across the continuum of care, though in this commentary we will focus only on hospitals. This variation is driven in part by regulations, by the priorities of local hospital executives and supervisors of IPs, and by the strengths and interests of the IPs. In addition exponentially increasing mandates for public reporting of infections, and non-reimbursement laws have resulted in positioning of IPs in many facilities as primarily data managers, below the level of their peers (e.g., directors of nursing and quality). The APIC re-branding of the infection prevention and control professional's title to "infection preventionist" may have further contributed to this trend, since "IP" is commonly considered subordinate to "director."

In the absence of a published guideline, the goal of this commentary is to offer a best practice model for structuring the day of an IP based on the APIC IP Competency Model. In addition, a best practice model for staffing a qualified and successful IP department/team is offered, with an associated sample organizational chart (see Figures 1-3). Our overarching goal is to support reliable design within the IP community, as well as to inform executives in hospitals and ambulatory-care facilities regarding the priorities and scope of infection prevention and control programs. In this way we hope to support optimal resourcing and utilization of IP programs, and ultimately patient safety.

Discussion

The elements of an effective Infection prevention and control program have been dramatically transformed over the course of the last four decades. The SENIC study concluded that effective programs should include hospital-wide infection surveillance, policies and procedures to correct patient-care practices which predispose patients to infection, and reporting surgical wound infection rates to practicing surgeons. In addition, one "IC nurse" was recommended

> THE CONTINUALLY EVOLVING ROLE OF THE IP INCLUDES PREVENTION AND CONTROL OF CURRENT AND EMERGING INFECTIONS AND DISEASES, AND AN UNDERSTANDING OF NEW CLINICAL AND DATA MINING TECHNOLOGIES.

for every 250 hospital beds, in addition to a trained medical doctor as an "epidemiologist." Infection prevention and control priorities were identified as "CNS (coagulative negative staph aureus), enterococci, Candida species, infections of the bloodstream, surgical wound infections and infections in critical care units."

As the profession of infection prevention and control has evolved over the past several decades, staffing needs have increased proportionately, though not all hospitals have kept pace. Additional diversion of IP time due to delegation of unrelated responsibilities to IP staff such as employee health, emergency preparedness, communicable disease reporting, oversight of the sterile processing department, oversight of the hemodialysis unit, "Isolation police," etc. adds to the primary clinical priorities of the IP in many hospitals. And, although no published studies address it, in order to perform successfully in this expanding role, many IPs are required to be on call and carry a pager 24/7. This is typically not compensated call time, and can involve a range of added responsibility from simply carrying a pager with few or no calls, to actively working to respond and react to calls for much more than eight hours and 40 hours per week. This uncompensated call is not sustainable and can be one of many challenges to retention of specialized, experienced IPs.

Two decades after the SENIC study, the Association for Professionals in Infection Control and Epidemiology (APIC) and the Society for Healthcare Epidemiology of America (SHEA) joined forces to develop the next iteration of the SENIC study with the Infrastructure Report. This report provided recommendations for an effective infection prevention and control program organized in five categories: managing critical data and information; developing and recommending policies and procedures; intervening directly to prevent infections; educating and training of healthcare workers, patients, and nonmedical caregivers; and resources.[2]

The IP Competency Model published widely several years ago reflects a similar, but slightly different set of categories: Leadership, Performance improvement and Implementation Science, Infection Prevention and Control, and Technical.[3] This guidance is especially important in an era where media and political posturing has been observed to commonly generate knee-jerk responses by healthcare executives. IPs are often required to focus primarily on the current "concern" (e.g., SARS, Ebola), to the exclusion of their

Figure 1: Proposed Sample Staffing Model IP Program for a 300 bed hospital and/or oversight of 10 outpatient clinics[4-7]

POSITION	REPORTS TO	QUALIFICATIONS
Director Infection Prevention and Control Program (peer to other departmental Directors, e.g. Director of Pharmacy, Director of Nursing, Director of Quality) Salaried – not organized labor	Chief Executive Officer and Medical Director or other senior leader (for sufficient understanding of clinical priorities)	Graduate degree in Healthcare – ideally Masters in Infection Prevention and Control and Epidemiology, Public Health, or other CIC mandatory
Manager and/or Coordinator Infection Prevention and Control Program Salaried – not organized labor	Director Infection Prevention and Control	Bachelor degree in Laboratory Science, Nursing, Public Health, other CIC mandatory Manager CIC preferred Coordinator
Data Analyst for infection rate data collection, collation, report creation; infection prevention process measure data collection, collation, report creation. Or outsource via surveillance vendor	Director Infection Prevention and Control	Associate degree or equivalent experience
Clerical support	Director Infection Prevention and Control	Associate degree or equivalent experience
Physician Partner	Chief Executive Officer and Chief of Service	Infectious Diseases, Training and/or experience in Epidemiology and Infection Prevention and Control
Total FTE = 5		

Figure 2: Proposed Sample Organizational Chart
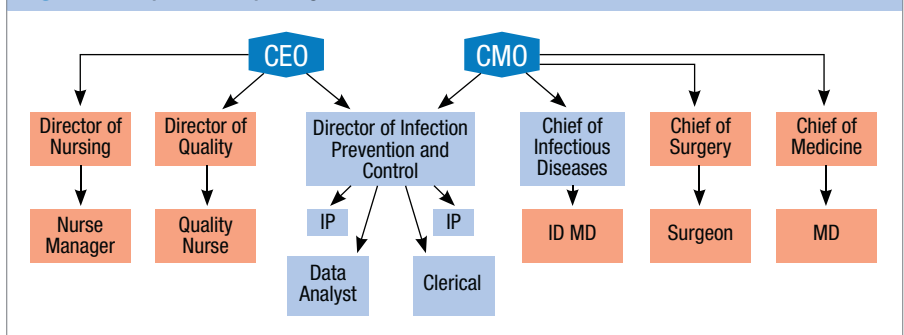
AS THE PROFESSION OF INFECTION PREVENTION AND CONTROL HAS EVOLVED OVER THE PAST SEVERAL DECADES, STAFFING NEEDS HAVE INCREASED PROPORTIONATELY, THOUGH NOT ALL HOSPITALS HAVE KEPT PACE.

program and associated clinical priorities, which can compromise patient safety. A similar phenomenon is observed relative to the exponentially increasing demand for publically reported infection data which often leads to healthcare executives directing IPs to focus (exclusively or primarily) on data management. Electronic tools, including automated infection detection/data mining software programs, can assist IPs in screening large numbers of medical records to identify potential healthcare associated infections, clusters, and outbreaks of pathogens of concern. These tools can expedite, streamline, improve accuracy, reduce human error, and reduce inter-rater reliability issues associated with manual infection surveillance. However, it is important to understand that these systems are expensive, and can result in the unintended consequence of identifying many more performance improvement areas for IP teams, which can ironically increase work load and resourcing requirements.

Figure 3: Proposed Sample IP Program Model for a 300 bed hospital and/or oversight of 10 outpatient clinics[4-7] *NOTE: Assumes MD has some protected time dedicated to IP Program					
APIC IP COMPETENCY MODEL CATEGORIES	**EXAMPLES OF RESPONSIBILITIES WITHIN EACH CATEGORY**				
	IP Program Director	***MD Partner**	**IP Coordinator**	**Data Analyst**	**Clerical**
1 Prevention and Control of Infections (40%)	Leadership rounds and huddles Department visits including just in time consultation PI and research project leadership	Antibiotic stewardship ICU rounds	Communicable disease exposure follow up as needed Outbreak management as needed ICU rounds, construction rounds, nursing huddles, isolation rounds PI and research project execution	N/A	N/A
Hours/day (per week for MD)	2	4	3	0	0
2 Leadership (10%)	Risk assessment, work planning and communication IP&C committee work and preparation Committee meetings representing IP APIC chapter meetings Compliance with regulations/accreditation Regular meetings with IP team	Regular meetings with IP Team Planning IP Committee meetings F/U work from IP Committee meetings	Policy and procedure review and development Other meetings e.g. OR, EVS, Safety, New Product, APIC chapter, other	N/A	N/A
Hours/day (per week for MD)	2	1	2	0	0
3 Education and Training of staff and patients (30%)	Present to C Suite and co-present with MD partner to MD groups	Present training MD meetings Just in time MD education/ training	New employee and annual training	N/A	N/A
Hours/day (per week for MD)	1.5	1	.5	0	0
4 Technical – managing critical data and information (15%) • Surveillance – case finding, denominator data collection • Reporting – internal and external NOTE – Time estimates assume some method of data collection	Present to committees and executive teams Business case Budget	HAI case confirmation as requested by IP Director and Coordinator Report to Executive Committee	HAI case finding confirmation Prepare reports for committee and other meetings	Apply HAI definitions to screen patient medical records and/or use data mining programs NHSN upload Prepare reports, graphs and charts for presentation to committees	Schedule meetings Event planning Answer phone Minutes from infection control committee
Hours/day (per week for MD)	2	1	2	6	7
5 Other (5%): responding to urgent issues, questions, concerns, email, phone messages	Respond to leadership inquiries Email Phone	Hallway consults	Just in time teaching/ consults Email Phone	Phone messages	Phone messages
Hours/day (per week for MD)	.5	1	.5	2	1
TOTAL	8	8	8	8	8

Conclusion

This commentary is offered to aid in informing healthcare executives regarding the imperative of a balanced and clinically directed Infection Prevention and Control program in hospitals. It further offers a best practice model for the minimum members of an effective IP team, a set of recommended actions/functions for day to day operations of the hospital based IP and a sample organizational chart (see Figures 1-3). These are based on the APIC IP Competency Model as the underpinning, and are informed by extensive informal surveying of frontline IPs as well as several published studies.[4-7] A more current time in motion study for this clinical profession to better inform a guideline such as this, is much needed. The over-arching goal of this document is to support patient safety via reliable design of infection prevention and control programs nationwide.

Looking forward, similar guidance would be useful for corporate IP teams serving multi-hospital systems, as well as infection prevention and control programs in ambulatory-based facilities including ambulatory surgery centers, long-term acute care Facilities (LTCFs) and medical office buildings where minor surgical (e.g., Mohs procedures) and non-surgical procedures (e.g., flexible endoscopy and interventional radiology) are performed. ICT

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For references, see the online version of this article at www.infectioncontroltoday.com