Physical Environment and Infrastructure

Managing the physical environment is a key to breaking the chain of infection and AHS IPC works closely with partners to provide appropriate infrastructure, risk mitigation strategies, and clean care environments. There is collaboration at site, zone, and provincial levels with AHS Capital Management; Contracting, Procurement and Supply Management; Facilities Maintenance and Engineering; and Linen and Environmental Services.

Infrastructure and construction

AHS IPC supports new facility construction and ongoing renovations at existing facilities. Facility design is fundamental in the prevention of infection transmission. Current design requirements include but are not limited to use of single versus multi-bed hospital rooms; adequate spacing between patient spaces; ability to prevent airborne infections using negative airflow; heating, ventilation, and cooling in operating theatres; and use of non-splash sinks in clinical areas. AHS IPC works closely with stakeholders to optimize design in new and existing facilities.

Three new facilities are in progress: Arthur J.E. Child Comprehensive Cancer Centre, South Edmonton Hospital, and Covenant Wellness Community. To provide guidance on IPC principles related to construction and design, AHS IPC staff and physicians are active participants of the multidisciplinary project teams.

Covenant Wellness Community

Southeast Edmonton is one of Edmonton's most diverse and fastest-growing neighbourhoods, with its population nearly doubling over the last 20 years. The Grey Nuns Community Hospital is a key health provider in the area. The emergency department at the hospital is often used as an entry point to the health system. Many of these visits could be better served in community-based settings.

In 2022/2023, construction started on the Covenant Wellness Community, which will be a health and wellness hub that uses innovative designs to provide person-centered care to patients, residents, and families of all backgrounds. This hub will include a community health centre, multigenerational housing, an integrated seniors' centre and more. The Covenant Wellness Community will be in the heart of Mill Woods, just blocks from the Grey Nuns Community Hospital and Valley Line LRT.

Airborne isolation rooms

An inventory of airborne isolation rooms in AHS and Covenant Health acute care facilities is updated annually. In 2022/2023, Capital Management conducted a thorough review and provided a more comprehensive and detailed format for the inventory. The new format will be used to inform the annual validation confirming that rooms included in the inventory meet minimal functional criteria based on current standards, including air exchange rates, airflow, and the ability to monitor pressure differentials. The inventory provides guidance to frontline staff when managing patients with suspected or confirmed communicable diseases that require airborne precautions, such as measles, pulmonary tuberculosis, and varicella.

Humidity control response in medical device reprocessing areas and surgical suites

Over the last few years, sites across the province have increasingly experienced humidity events. If sterile sets and packs are exposed to increased humidity for prolonged periods of time, sterility may become compromised. In the surgical suite, the risk of wound infection may be affected by moisture in the theatre as well as staff inability to work in humid conditions. AHS Facilities Maintenance and Engineering monitors humidity and temperature levels to identify and respond to humidity events based on the data collected daily. Due to the provincial rise in humidity events AHS Facilities Maintenance and Engineering in collaboration with AHS IPC developed two documents – *Evaluation and Response to Incidents of Temperature and Humidity Extremes in the Medical Device Reprocessing Area (MDRD) Sterile Storage Area and Decontamination Area* and *Evaluation and Response to Incidents of Temperature and Humidity Extremes in the Surgical Suite*. These documents provide a consistent approach to humidity events in the medical device reprocessing areas and the surgical suite where increased humidity has the biggest impact.

There are defined consistent triggers for AHS Facilities Maintenance and Engineering to initiate humidity response plans. The notification of site operations occurs immediately. A multidisciplinary group is assembled to mobilize contingency plans should the humidity event escalate.

In mid-2022/2023, there was a soft launch of the documents where humidity events had occurred. The outcome from the soft launch was that communication occurred quickly and more efficiently. AHS Facilities Maintenance and Engineering mobilized humidity response plans based on the triggers while site operations and the multidisciplinary team were kept informed of the progression of the humidity events.

Adapting spaces and expanding capacity in response to the COVID-19 pandemic

Part of AHS' response to the COVID-19 pandemic was to increase capacity in acute care settings. AHS IPC staff and physicians worked with local stakeholders such as site operations and programs to select areas not traditionally used for inpatient care to be repurposed for inpatient care. These spaces were in existing areas of healthcare facilities and involved adapting spaces for delivery of safe healthcare services.

AHS IPC staff and physicians supported the opening and ongoing operation of these overcapacity spaces. In 2021/2022, AHS IPC developed the *IPC Patient Risk Assessment Checklist for Use of Overcapacity Spaces* and *IPC Space Risk Assessment for Potential Acute Care Overcapacity Space during Pandemic*. In 2022/2023, these resources were revised to support the ongoing bed pressure and overcapacity needs beyond the COVID-19 pandemic response as a result of the fall and winter viral respiratory season.

Supporting Alberta's youngest

In Canada, the viral respiratory season typically starts in October to November and finishes in April to May, with most cases occurring in December through March. In 2022/2023, there was a surge in cases of influenza and respiratory syncytial virus among pediatric populations. This surge created an unprecedented burden on the Alberta Children's Hospital and the Stollery Children's Hospital and their emergency rooms, inpatient units, and intensive care units. Often there is no treatment for these types of infections beyond care and time and, this surge, was complicated by country-wide shortages of children's acetaminophen and ibuprofen that made managing at home more complicated. With children's hospitals operating at or over 100.0 per cent occupancy, sites focused on appropriate patient placement and visitor management.

Source control and patient placement, accommodation, and flow

Infection control professionals at these sites focused on education of Emergency Department staff and supporting these staff in augmenting spaces to better support patient flow.

> *"Early symptom identification in the care journey helped to ensure that patients [are] placed appropriately contributing to patient flow success throughout the remainder of the facility"* – Roberta McCombie, Infection Control Professional, IPC

In addition to confirming patients were triaged and placed on additional precautions if needed, infection control professionals supported these sites to increase inpatient capacity. Where possible, new spaces were opened. For example, at the Alberta Children's Hospital, beds in the Day Surgery unit were allocated for medically acute patients that would not need to be admitted for more than a day or two before being sent home. This space became known as the Medically Acute Short Stay Unit. When needed single patient rooms were redesigned to accommodate two patients and cohorting, where appropriate, at both sites. Infection control professionals helped to confirm appropriate patients were placed together. Communication was important during this surge to support this type of work. For example, at the Stollery Children's Hospital, daily meetings with staff at the site – Organizational Safety Brief – were implemented to ensure staff at the site were aware what had changed and what was happening on the units.

Visitor management

Patient and Family Centered Care is integral at these sites. While visitors were limited for adult populations, there were exceptions for pediatric populations to allow care givers to support children while admitted. Children and their caregivers were often considered as a whole unit and, if needed, both were isolated. Additionally, infection control professionals worked closely with the Patient and Family Centred Care programs to help patients and their families that were in hospital to celebrate the various holidays throughout December-January such as Christmas and Hannukah, Kwanzaa, Omisoka, and others.

> *"Regardless of the influx of patients with viral respiratory infections, we never had an outbreak within the Alberta Children's Hospital, which speaks to the effort staff put in to control transmission."* – Jennifer Happe, Infection Control Professional, IPC

Supporting vulnerable populations

In 2020/2021, in response to the pandemic, a network was established to support vulnerable populations. In 2022/2023, despite the lifting of mandatory public health restrictions, the network agreed to continue to support vulnerable populations. From an IPC perspective, shelters required ongoing support for the use of personal protective equipment, client placement, and guidance for client management to prevent the spread of transmission of viral respiratory infections and other communicable diseases in shelter settings. The network was rebranded as the Edmonton Zone Shelter Support Group.

In September 2022, the Edmonton Zone declared an outbreak of *S. flexneri*, which affected vulnerable populations. While outbreak discussions began at the Edmonton Zone Shelter Support Group the scope of the outbreak exceeded the means of this group and the Edmonton Zone *Shigella* Outbreak Taskforce was formed. The taskforce included representatives from: Indigenous Services Canada, Alberta Health, several AHS programs, the City of Edmonton, and community-based organizations such as Radius Community Health and Healing, Hiregood/Boyle Street Community Services, George Spady Society, Bissell Centre, and Homeward Trust.

The taskforce assisted in the coordination and management of the *Shigella* outbreak. The taskforce supported the implementation of IPC measures to limit further transmission of infection using a collaborative, multi-sectoral approach. Several resources were developed to support this including: *Shigella Outbreak Washroom and Resources Guide*; *Guidance for Community Treatment, Diagnosis and Data Collection for Shigella*; *Outbreak Edmonton Zone*; *Vulnerable Person Leaflet*; and *Stool Collection for Enteric Bacterial Screen*. In addition to these resources, the taskforce worked to secure hygiene packs that consisted of alcohol-based hand rub, disposable wipes, and incontinent supplies. The shelter agencies were instrumental in distributing these hygiene packs and making them accessible to those that required them. The City of Edmonton provided added hygienic assets such as bathrooms, showers, and laundry facilities in addition to the already existing facilities located in shelters.

From an IPC perspective, prevention and treatment of cases were the key components to manage the outbreak. Shelter agencies were proactive in the prevention of disease transmission. Not only did they provide support at the shelters, Radius Community Health and Healing went into the encampments to bring support and supplies. The education about the prevention of disease transmission and encouragement to pursue early medical intervention was instrumental in controlling the outbreak.

The *S. flexneri* outbreak was declared over in late 2022/2023 but reopened shortly afterwards. While ongoing surveillance continues, the taskforce was scaled down to the original Edmonton Zone Shelter Support Group. Having an established group of stakeholders for vulnerable populations led to the quick response and mobilization of a multi-sectoral approach that helped to control the *Shigella* outbreak and is invaluable as both a resource and a group that can operationalize interventions as needs arise in vulnerable populations.

Provincial capital funding review of medical device reprocessing areas

In 2010, a provincial review of all AHS medical device reprocessing areas began. The reviews identified the equipment and infrastructure required to maintain essential operations. Assessing compliance with current design guidelines and regulatory standards was a critical component of the reviews. All AHS and Covenant Health medical device reprocessing areas were assessed. Correcting identified deficiencies in equipment and infrastructure decreases the risk of reprocessing failures, addresses patient and staff safety issues, and contributes to maintaining surgical service.

To support capital requests arising from the provincial reviews, two Major Capital Needs Assessments were completed, one in 2013 (Phase 1) and one in 2021 (Phase 2), which outlined the background and scope of projects for priority sites. The needs assessment was followed up with business case equivalent documents that provided cost estimates and were used to inform the funding request to the treasury board. Capital was requested for a total of 26 AHS and Covenant Health sites with medical device reprocessing areas, and, to date, 18 sites have received funding. Funding was announced for three sites in 2019/2020, eight sites in 2020/2021, two sites in 2021/2022, and five sites in 2022/2023. Sites in the most recent announcement include Foothills Medical Center, Northern Light Regional Hospital, Westlock Healthcare Center, Royal Alexandra Hospital, and Sturgeon Community Hospital. A total of eight sites remains unfunded. These unfunded projects will be reviewed for priority, scope, and cost confirmation in the coming years.

Cold Lake Healthcare Centre and medical device reprocessing

At the Cold Lake Healthcare Centre, as part of the medical device reprocessing reviews, several infrastructure deficiencies were identified in the decontamination areas such as exposed pipes or duct work, sharing of spaces that needed to be separated, and textured surfaces that were difficult to clean. Funding to address these infrastructure deficiencies was announced in 2020/2021 with renovations starting that fiscal year and finishing in 2022/2023.

IPC provided consultative advice on the design of the space and on accommodations for the continuation of the sites reprocessing needs. For example, to continue to offer surgical services to the community a plan was made to ship surgical sets to another site for reprocessing. A small temporary medical device reprocessing area was created for the initial washing of instruments, surgical sets, and for the reprocessing of endoscopes before these were shipped to Lac La Biche Healthcare Centre for the final step of sterilization. All of this was done with minimal interruption to surgical services.

A multidisciplinary team completed an Infection Control Risk Assessment (ICRA) to determine the actions required to minimize the risk of infection for patients, staff, and visitors during renovations. IPC was on site to ensure the contractor followed preventive measures and to respond to concerns. IPC was always available to offer input on ways to best protect patients.

Medical device reprocessing plays a vital role in the healthcare system and is the backbone of the hospital. Without it, sites cannot perform elective or emergency surgeries, endoscopies, and other minor procedures. This renovated area will be an asset to the community by allowing the expansion of surgical services and reducing the need for members of the community to travel for services. With new equipment, medical device reprocessing staff will be able to reprocess surgical instruments in less time, while ensuring that the equipment is sterilized properly to prevent infection.

The Provincial Medical Device Reprocessing Department Upgrades project was one of AHS' top priorities submitted in the 2022 Capital Submission. Additional medical device reprocessing upgrades have also been requested as part of the Alberta Surgical Initiatives Submissions. These Alberta Surgical Initiatives submissions are more focused on additional capacity or functionality to support surgical uplifts and changes in service rather than deficiencies to maintain essential operations.

Construction-related resources

Design and construction

The Design and Construction Working Group is a conjoint initiative between AHS Capital Management and AHS IPC that supports compliance with IPC measures during facility design, construction, and maintenance activities. In 2022/2023, the Design and Construction Working Group continued to focus on revision of design and construction documents. Additional updates were made to *Infection Control Risk Assessment (ICRA) and Preventive Measures Toolkit for Construction, Renovation and Maintenance*, specifically Appendix C: Plenum Box Position Statement and Form 1: Infection Control Risk Assessment (ICRA).

In 2022/2023, AHS IPC also participated in the review of the *Design Guidelines for Continuing Care Facilities in Alberta (2018)*. This tripartite document, authored jointly by Alberta Infrastructure, Alberta Health, and AHS, is being updated to incorporate learnings from the COVID-19 pandemic, and is expected to be released in 2023/2024.

The Design and Construction Forum, which includes representatives from Alberta Infrastructure, meets monthly to share information and discuss topics in a multidisciplinary setting. In 2022/2023, forum frequency and attendance returned to normal pre-pandemic levels, which was monthly. IPC involvement in construction projects as part of the multidisciplinary team also returned to normal pre-pandemic levels in 2022/2023.

Linen and Environmental Services

AHS IPC and Linen and Environmental Services work together on the Linen and Environmental Services Practice Working Group. This multidisciplinary working group is responsible for developing and revising practices related to cleaning and disinfection. Stakeholders actively collaborate to develop and update practices for clean and safe patient environments. In 2022/2023, this working group reviewed and updated approximately ten AHS Nutrition, Food, Linen, and Environmental Services resources with IPC content.

The partnership between AHS IPC and AHS Linen and Environmental Services continues to remain strong. This important relationship enabled the creation of collaborative responses to emerging needs and the development of key resources for frontline staff. In 2022/2023, in response to the 2022 Ebola outbreak in Uganda, IPC and Linen and Environmental Services reviewed and revised or revoked viral hemorrhagic fever resources created in response to the 2015 outbreak in West Africa. For example, the *Contact and Droplet Precautions Suspect/Confirmed Viral Hemorrhagic Fever (VHF)* resource was revised, while the Viral Hemorrhagic Fever (VHF) Cleaning Recommendations resource was rescinded due to duplicate and out-of-date information.

The Alcohol-based Hand Rub and Disinfectant Working Group continued to proactively address disinfectant and hand hygiene supply issues. Though most of the supply issues were resolved in early 2021/2022, the working group remained active as it serves as a critical point of engagement between AHS Contracting, Procurement and Supply Management, AHS IPC, AHS Linen and Environmental Services, and AHS Workplace Healthy and Safety, to address concerns as they arise. Throughout 2022/2023, the working group broadened its scope to include updating documents such as *Viral Hemorrhagic Fever (VHF)/Ebola Waste Management* guidelines.

Auditing for Excellence

The AHS Linen and Environmental Services Auditing for Excellence program continued to perform audits. Environmental Services staff perform visual and ultra-violet cleanliness audits using an application-based program accessed through use of hand-held mobile devices. The web-based platform supports real-time access to cleanliness results. These results are used to inform AHS' response and improvement initiatives.

As of January 31, 2023, close to 12,000 audits, both ultraviolet and visual, were completed across AHS sites. With continued staffing pressures and other challenges faced by Environmental Services, achievement of completed audits demonstrates the importance of and commitment to the program within the department and the organization.

Other Linen and Environmental Services and IPC collaboration

Throughout 2022/2023 Linen and Environmental Services representatives continue to be ad hoc members on several AHS IPC working groups and committees including the Provincial Medical Device Reprocessing Working Group and the IPC Document Working Group.