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Volume 5, Number 1, Summer 2023

Hand Hygiene



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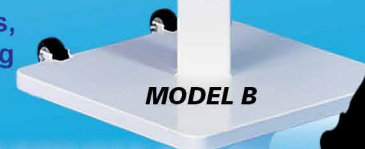
Robust and durable

The carbon steel vertical post is extremely robust and possesses properties that softer aluminum could never match. In our experience, using self-tapping screws will ensure a long-lasting and secure connection between the steel and the majority of gel dispensers available on the market. All steel surfaces are coated with white electrostatic powder, free of solvents, and cured through thermal baking to provide resistance suitable for exterior-grade applications.



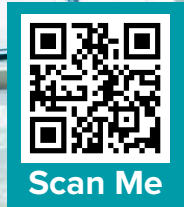
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Foreword



“This collection of articles on hand hygiene could not be timelier as we review our programs using a multi-modal approach and assess the products we are using, innovative strategies to motivate staff and tools for hand hygiene monitoring.”

As we emerge from the COVID-19 pandemic feeling a little battered and worse for wear, there has been a review of IPAC programs are their protocols, and reassessing practice. We have slowly been removing additional interventions like universal masking in healthcare, and getting back to routine practices. One of the key interventions throughout the pandemic that will remain an integral part of our programs is hand hygiene.

What we have noticed in my facility – and what is also being reported by my peers across the region – is that compliance with hand hygiene and other IPAC practices has dipped over the last few months. Staff are exhausted and we are seeing it reflected in our compliance rates. For those of us who have been in the field of infection prevention and control for a while, it is not unexpected. We have seen this phenomenon before with prolonged outbreaks. We will need to refresh and renew our programs going forward and breathe new life into them. We cannot expect to take the same approach and get improved results.

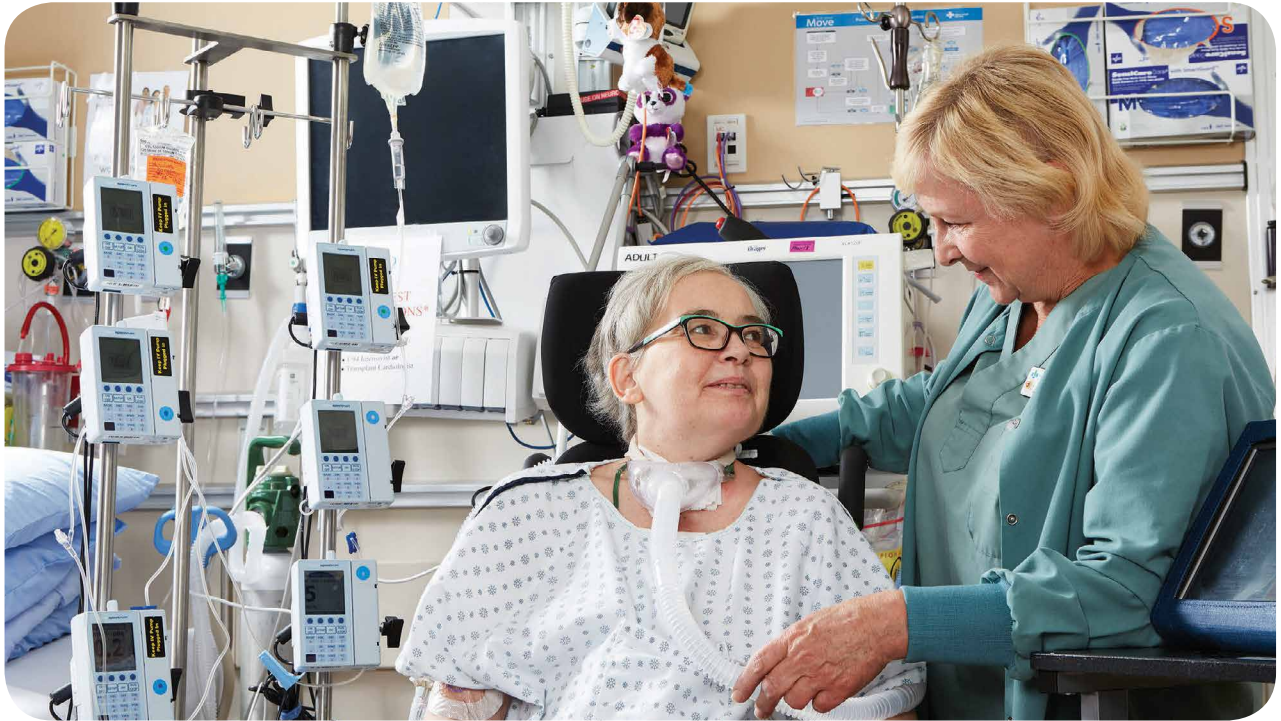
This collection of articles on hand hygiene could not be timelier as we review our programs using a multimodal approach, and assess the products we are using, innovative strategies to motivate staff, and tools for hand hygiene monitoring. At one point during the pandemic, many healthcare facilities ran out of their usual alcohol-based hand rub products, and had to rely on new suppliers to provide alcohol-based hand rubs. As we reassess all elements of hand hygiene, we need to review whether the products we are currently using meet required standards, and whether they are meeting staff needs.

We will also need to explore innovative approaches to hand hygiene monitoring. Visual auditing, with just-in-time feedback will always be required, but it can no longer be considered the gold standard when this type of auditing picks up a small percentage of the moments of hand hygiene. When we compared electronic monitoring and visual audits on one of our units, we discovered that we were only picking up 0.02% of hand hygiene moments with visual audits, several articles in this insert explore different possible approaches to electronic hand hygiene monitoring and their impacts on compliance.

Finally, do not miss out on the story of one program’s success, and the generous offer by staff to share their learnings.

Anne Bialachowski RN, BN, MS, CIC
Guest Editor, *Industry Innovations* ■





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Building Technology Partnerships: A Winning Strategy for Improving Hand Hygiene

Abstract

The brand that created PURELL® hand sanitizer provides a complete solution with efficacious hand hygiene (HH) products, advanced monitoring technologies, and clinical support designed to help improve patient safety. The PURELL SMARTLINK® Activity Monitoring System (AMS) collects HH performance data 24/7 at the group level. This system is well-suited to healthcare facilities which prefer a team approach to improving HH, with the entire group or unit accepting responsibility for HH performance.

In healthcare, the adoption of technology is rapidly replacing the manual gathering of data for more efficient and accurate measurement of quality of care. However, when it comes to gathering HH data, we still rely on direct observation (DO) as the gold standard.

The challenges of DO are indisputable. Only a small portion of HH opportunities that occur are captured. Published literature has shown that data gathered through DO yields less than 3% of all opportunities.¹ This implies that we cannot speak with certainty to the HH practices of healthcare providers (HCPs) for about 97% of all opportunities – rendering the data generated from DO as statistically insignificant. Additionally, the results are skewed by the Hawthorne effect. One study found that HH compliance rates were threefold higher

in hallways where a covert observer was visible.² The mere presence of even a covert observer can produce data that is inaccurate and misleading. Given the inherent challenges of DO, a rate of 95% would be best interpreted as: 95% of the time when there is an observer watching, HCPs clean their hands.

The goal of any quality metric is to obtain reliable data to improve patient safety. Quality and safety leaders acknowledge that a gap exists between reported compliance rates and HH behaviours taking place, and are questioning whether this gold standard is sufficient to manage risk in the wake of the growing burden of healthcare-associated infections. Over the past decade, healthcare facilities have been introduced to automated hand hygiene monitoring systems (AHHMS) as a tool to estimate HH compliance rates and to guide improvement efforts. AHHMS quickly and efficiently provides substantially more quantitative data than DO without observer bias or a Hawthorne effect.²⁻⁴ The continuous generation of data provides insight into adherence patterns, allows for frequent feedback, and can quickly detect changes in HH performance as a result of improvement initiatives, or provide the opportunity for rapid course correction if lack of effect is noted.^{2-3,5-6}

PURELL SMARTLINK® AMS was developed to serve as a better metric for

capturing HH data and managing risk associated with HH behaviours. However, data alone is not enough to improve HH, and implementing an AHHMS without also initiating complementary interventions may not result in sustained behaviour change.⁷ Our PURELLSM Clinician-Based Support is an important part of our solution providing tools and support needed to build and sustain improvement to help customers achieve the full potential of the system.

Performance improvement of any kind begins with having a valid number. PURELL SMARTLINK® AMS provides data for managing risks associated with HH behaviours, and can be a value-added tool in any multimodal strategy. Combining an innovative AHHMS with a reliable vendor partnership can provide a winning strategy for hand hygiene improvement. This whitepaper will provide a review of the technology along with the implementation and improvement processes.

Specifications

The PURELL SMARTLINK® AMS operates via radio frequency technology between the devices and the stand-alone network infrastructure. The system is comprised of four main components: touch-free dispensers (soap and sanitizer), activity counters, network gateways and a secure web-based dashboard (Figure 1).

One of the keys to a successful hand hygiene improvement program is a reliable, easy-to-use system that accurately gathers information. The PURELL SMARTLINK® AMS seamlessly integrates into our innovative ES8 touch-free soap and sanitizer dispensers. An internal communication module plugs directly into the ES8 dispenser for a 99% accurate capture rate of hand hygiene activities.⁸ This integrated module also eliminates the need for an additional external device and a separate energy source. Each dispenser event is captured and wirelessly sent in near-real time through the gateway to Microsoft Azure Cloud Services. Each dispenser is equipped with a blue LED light, which is located on the front of the dispenser. Each time a dispenser is actuated, the light illuminates, serving as an indicator that the HH event has been captured by the system.

The activity counters are battery-powered devices equipped with passive infrared heat sensing technology and a built-in proprietary sensor transmitter. Each activity counter is placed inside a monitored room, usually near the entrance. When a person enters or exits the room, the movement is picked up by the infrared sensor, and the data are wirelessly sent via the transmitter through the gateway to Microsoft Azure.

Gateways establish an independent self-contained network which have one-way communication between monitoring devices and the gateway, communicating across an ethernet connection. The network gateway requires an available outbound connection across the hospital network. Typically, one gateway is required per clinical unit (20 patient rooms). All network devices require line power (120VAC).

The gateway collects the device data (from dispensers and activity counters) and passes it along to Microsoft Azure through an outbound-only connection. Microsoft Azure provides a scalable global infrastructure which allows efficient collection and processing of HH data with secure encryption protocols. The data transmitted are aggregated and processed within Microsoft Azure providing metrics which can be accessed through the PURELL SMARTLINK® software.

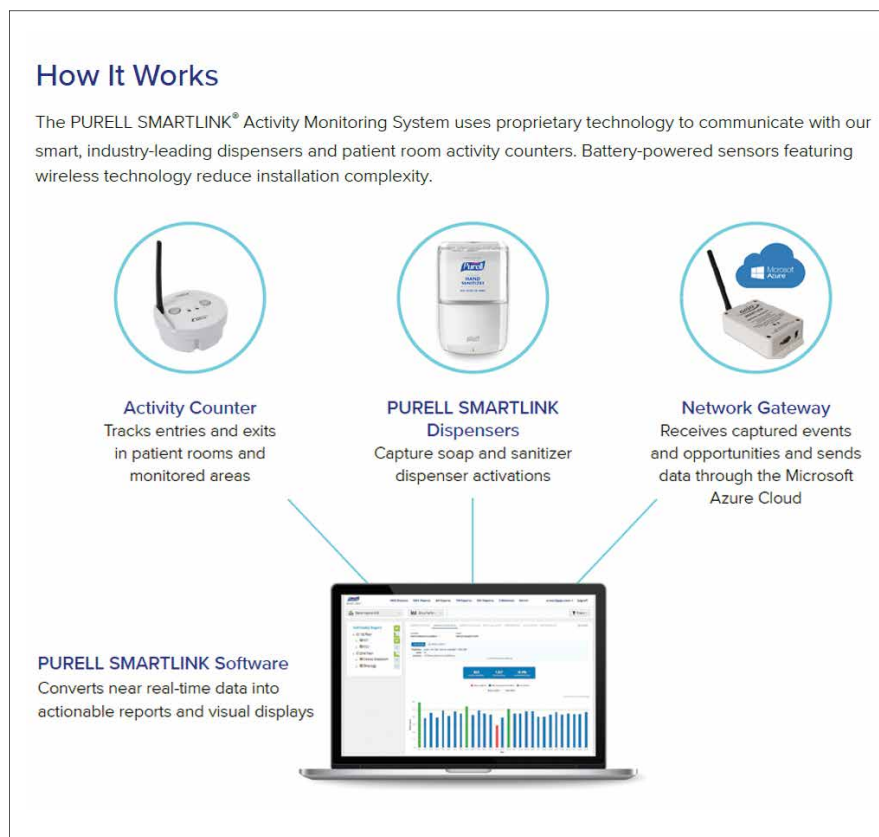


Figure 1

The PURELL SMARTLINK® software provides a secure, web-based platform, which presents 24/7 near-real time data in actionable reports and visual displays for authorized users. Data can be formatted into customizable reports at the facility, unit, and room level.

PURELL SMARTLINK® Service Alerts help simplify dispenser maintenance, reduce unnecessary service trips and product waste, and ensure HH products are always available for HCPs. Service Alerts also provide online reports for all PURELL SMARTLINK® AMS devices. The PURELL SMARTLINK® software web portal allows users to customize alerts and include data on dispenser usage, estimated refill replacement dates, and alert status and history. This is a key benefit to direct environmental services and maintenance staff to only those dispensers that need attention. Additional support provided by the healthcare facility over time will include maintenance of devices that utilize batteries (dispensers and activity counters).

Metrics

PURELL SMARTLINK® AMS reports HH metrics at the group level. Soap and sanitizer use by any person is considered an event, and patient room entry and exit by any individual (e.g., HCPs, patients, and visitors) is considered an opportunity for HH. Compliance rates are calculated by dividing the number of HH events by the number of HH opportunities.

The group-level data generated from the system is aggregated to include events and opportunities from HCPs and non-HCPs. HCPs often overestimate the contribution of non-HCPs on patient room entries and exits. Therefore, it is important that HCPs understand the impact that non-HCPs have on the aggregated HH opportunities. An observational study was performed to determine the percentage of patient room entries and exits which could be attributed to HCPs and non-HCPs. The data revealed that HCPs were responsible for 83.6% of patient room entries and exits.⁹



Figure 2

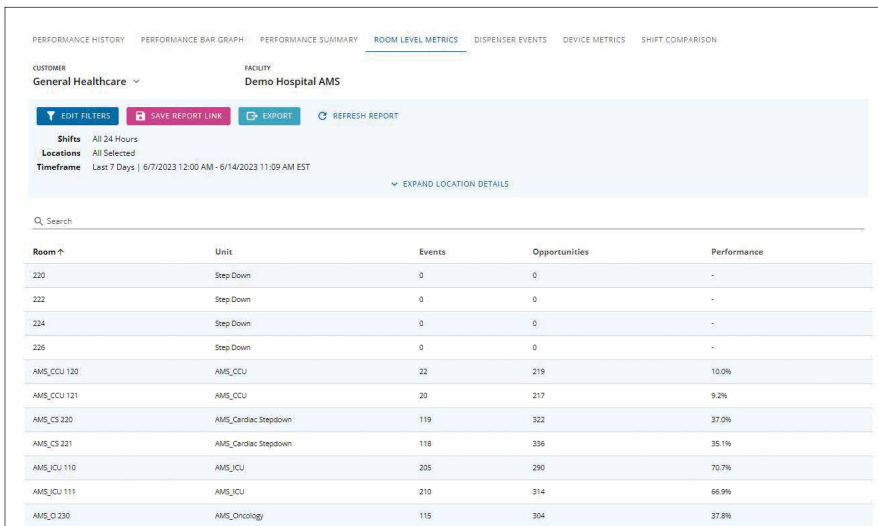


Figure 3

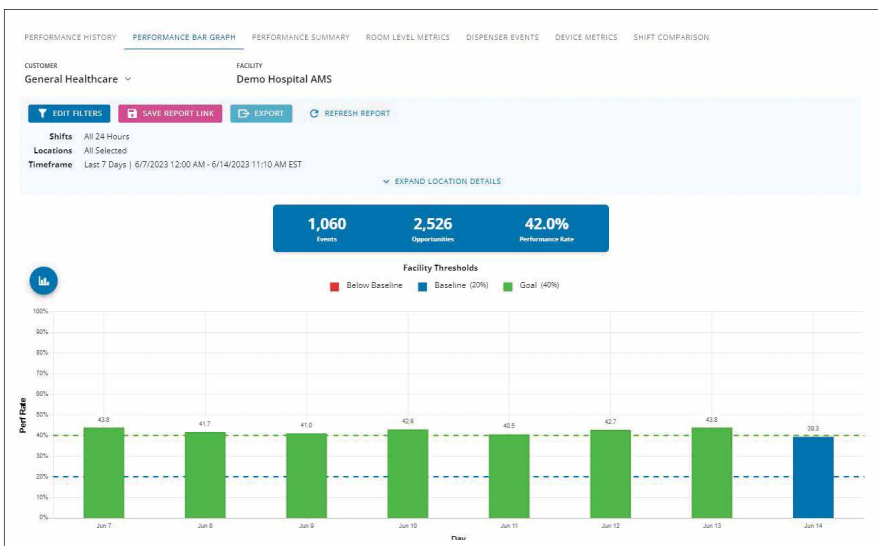


Figure 4

Across Canada, the indications for HH can be simplified into four moments: 1) before initial patient/patient environment contact; 2) before an aseptic procedure; 3) after body fluid exposure risk; and, 4) after patient/patient environment contact. PURELL SMARTLINK® AMS serves as a surrogate for moments 1 and 4.

Boyce conducted a review of 28 studies which assessed the compliance rates for the WHO 5 Moments for Hand Hygiene: 1) before touching the patient; 2) before a clean/aseptic procedure; 3) after body fluid exposure risk; 4) after touching the patient; and, 5) after touching the patient surroundings.

The analysis revealed that moments 1, 4 and 5 (Canada's Moments 1 and 4) accounted for 81.3% of all 5 Moments.⁶ These data suggest that measuring room entry/exit captures the majority of the moments for HH.

PURELL SMARTLINK® AMS is not meant to be a replacement for DO, but a complement to it. DO will continue to be valuable as a qualitative measure to evaluate and improve technique, assess whether HH is performed with the recommended product (soap or sanitizer) at the right Moment, determine barriers and facilitators to hand hygiene, and provide verbal feedback for missed opportunities.^{4,6,10} DO also creates the opportunity to observe workflow patterns and gather valuable insight from a frontline perspective.^{4,6}

The PURELL SMARTLINK® dashboard provides authorized users a portfolio of customizable reports, several are included in this publication. The Device Metrics Report (Figure 2) provides a view of room level device metrics (soap, sanitizer, and activity counters).

The Room-Level Metrics Report (Figure 3) can be customized to include all rooms or only select rooms. The information in this report includes the events and opportunities as well as compliance rate by room.

The Performance Bar Graph (Figure 4) is customizable by time periods and displays colour-coded bars to allow for quick visualization of baseline and goal metrics along with compliance rates.



Figure 5

The PURELL SMARTLINK® software includes a slideshow feature which allows for a display of reports via feedback monitors. Many of the report options described may be included in the customized slideshow. These reports are updated in near-real time, providing feedback to HCP.

Practice Change

Implementing technology of any kind in complex healthcare environments is painstaking work and requires diligence and commitment. An AHHMS may be rendered ineffective in its ability to guide hand hygiene improvement efforts if HCPs do not accept the system, distrust the accuracy of the system, or do not understand how leadership will use the data.^{4,6,10} HCPs will need to understand how the system captures and reports HH activity and how system accuracy will be validated. Therefore, it is recommended that leaders communicate and collaborate with HCPs early in the planning and implementation process, well in advance of the initiation of monitoring.¹⁰

Implementation

Project initiation begins with a conference call between the PURELL SMARTLINK® project team and the facility project team. The purpose of the call is to create a shared understanding of the conditions of satisfaction for the project, and to determine the degree of involvement, participation, and support of the members on the PURELL SMARTLINK® project

team and on the facility project team. Key stakeholders on the facility project team include a project leader, infection prevention and/or quality professionals, a clinical leader from the involved nursing unit(s) along with representatives from information technology, environmental services and facility services. During this call, system operation and technology requirements are communicated. The Project Plan and timeline are also reviewed with emphasis placed on the alignment of the scope, objectives and important milestones.

Following acceptance of the Project Plan, a site survey is conducted at the facility, beginning with a brief meeting, and including members from both project teams. A unit walkthrough is performed to allow for technology analysis and assessment. After the walkthrough is completed, the Project Plan is updated and reviewed with team members.

During the installation and validation phase, all system components are installed by the PURELL SMARTLINK® Project Manager and qualified third-party installation team. System performance is validated per acceptance standards. During this phase, a Clinical Consultant on the PURELL SMARTLINK® project team plays a key role with clinical leadership and frontline HCPs.

Post installation, PURELL SMARTLINK® Clinician-Based Support led by a Clinical Consultant is available as agreed upon within the statement of work to provide ongoing clinical engagement with the

facility. This support can include a variety of value-added services which can assist the facility with achieving project objectives.

Technical support programming options are also available as agreed upon within the statement of work. Ongoing maintenance will vary with each customer depending on the level of technical support requested. Typical activities managed by the healthcare facility will include management of the dispensers, such as replacements due to breakage, replacing of batteries, and verifying that network devices are maintaining line power and network connection. A combination of facility and vendor-supplied support activities will be required to ensure ongoing system health for reporting HH data.

Once the system is fully implemented, it is recommended that the hospital and PURELL SMARTLINK® Clinical Consultants work collaboratively to initiate complementary HH improvement strategies. One study reported that combining AHHMS with vendor clinician-based support and hospital-led initiatives resulted in the greatest improvement in HH performance as compared to combining AHHMS with only vendor-clinician-based support, or combining AHHMS with only hospital-led improvement strategies.⁷

Narrative

Figure 5 illustrates how PURELL SMARTLINK® AMS works post-implementation. All movement by any person in and out of patient rooms is captured by activity counters as well

as all HH events (soap and sanitizer) from monitored dispensers. Data is then sent in near-real time from the devices to the gateway and then to Microsoft Azure for processing. Once the system is up and running, it is important to ensure that HCPs understand how the system collects data, and to provide HCPs with an opportunity to ask questions, express concerns, and address barriers to HH. Unit leadership may have responsibility for the HH project once PURELL SMARTLINK® AMS is installed. Review and acceptance of baseline data is the starting point of the HH improvement process.

Authorized users can access the dashboard at any time for reporting purposes and sharing data with frontline HCPs. The continuous 24/7 capture and sharing of data allows for frequent feedback. One of the most important advantages of gathering HH data through PURELL SMARTLINK® AMS is the ability to quickly identify units or time periods of greatest risk (e.g., low compliance), allowing HH leadership to rapidly observe workflow and HH behaviours, provide education and HH reminders, and importantly seek input from HCPs. Impact from interventions can be seen quickly in the data; as well, lack of effect can also be identified quickly allowing for course correction. Additionally, HH leadership will have immediate access to robust HH data for examination and dissemination in response to infections caused by multidrug-resistant organisms and other organisms of epidemiological significance.

Cost Estimate

Pricing is customizable to meet the specific end-user needs and may vary per deployment (Table 1). Offers are typically budgeted as a higher year-one upfront capital purchase with lower recurring annual program agreement fees. Annualized payment structures are also available typically across a multi-year contract requirement.

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Item	Description	Acute Care/LTC
1	Program package includes: Hardware/Installation Software Program Agreement Maintenance Plan	Customized per request
2	OPTIONAL Clinician-Based Support Per-hour billing based on approved statement of work with min of 24 hrs. Services provided according to the Guideline for Delivery of CBS Services	Customized per request

Table 1

Contact information

Company: GOJO Industries, Inc.
Website: www.GOJOCanada.ca/SMARTLINK
e-mail: SMARTLINK@GOJO.com

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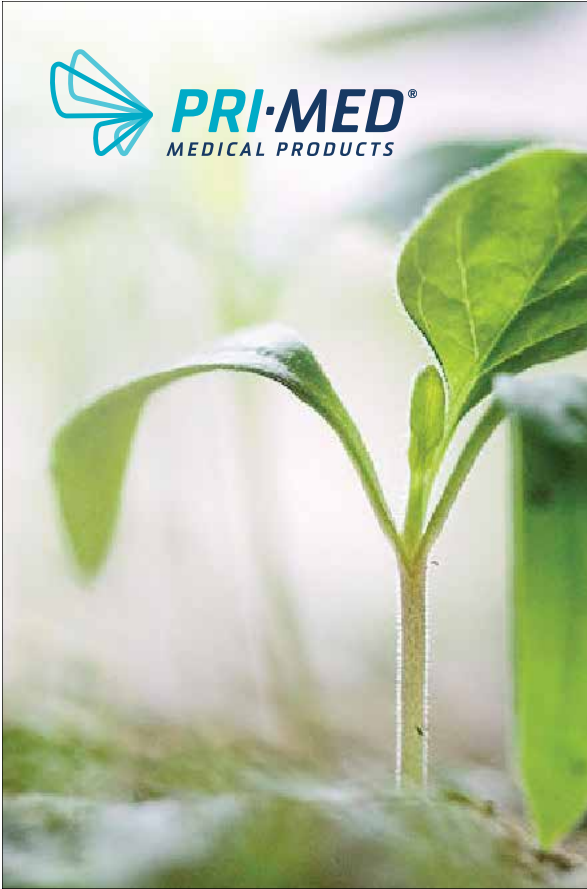


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Clean Wave Campaign

Deer Lodge Centre, Winnipeg, Manitoba



Deer Lodge Centre (DLC) has developed an effective Hand Hygiene Campaign, which has been noted as an exemplary quality improvement project by Accreditation Canada. We are proud of the results we have achieved from our Clean Wave campaign, and want to share our resources with others!

In 2019, DLC embarked upon a campaign to improve hand hygiene compliance rates at the site called Clean Wave. With the majority of hand hygiene compliance rates close to 60%, a DLC hand hygiene working group was convened and collaborated on initiatives to improve hand hygiene practices and compliance rates. Collaboration enabled diverse teams to work together to achieve a common goal.

Leadership support and communication facilitated staff engagement throughout the campaign. Communication was transparent and frequent. Hand hygiene messaging was added to the CEO weekly email updates to 'All staff'. Opportunities for hand hygiene improvement were communicated on an ongoing basis. Hand hygiene rate increases were rewarded and celebrated as they occurred. An "All staff" memo was distributed, clearly communicating the DLC Senior Leadership's commitment to increasing hand hygiene compliance rates at the facility. The memo was adapted with permission from another facility.

A large cohort of facility hand hygiene auditors were trained, and baseline data was collected over a period of six months for all clinical units.

Over a 24-week period (September 2019 to March 2020), the Clean Wave Campaign focused on the four moments for hand hygiene. Team members were provided a mini hand hygiene audit tool, dedicated to one of the four hand hygiene moments. For a six-week period, team members were asked to observe coworkers for hand hygiene compliance during an activity, and to write what was observed on the moment-specific audit tool. The goal was to enhance knowledge and increase awareness of the four moments for hand hygiene.



The completion of the mini hand hygiene audit results demonstrated that team members had understood the education and completed the audits accurately.

Team huddles were held to encourage team members to become comfortable in providing friendly reminders to coworkers missing a hand hygiene opportunity, i.e., give a Clean Wave (hand wave), or verbally request that a coworker perform hand hygiene. The objective was to generate a positive work environment, to create a learning opportunity to improve the hand hygiene performance of the team, and to help each other achieve a goal in a friendly, blameless way.

Rather than focusing on the six weeks of hand hygiene compliance data, an eye-catching report displayed the number of audits submitted from

each unit across the facility. Reporting the participation rate by unit increased engagement and friendly competition quickly grew between the units.

A team of Hand Hygiene Champions met on a regular basis to have hand hygiene improvement conversations, to keep the campaign moving forward to achieve better hand hygiene compliance rates.

Hand hygiene compliance rates steadily increased throughout the facility. Within months the site achieved the targeted goal of over 80% hand hygiene compliance, bringing that specific initiative in the Clean Wave Campaign to an end.

Some may wonder why the focus of the discussion is on the past. This historical information was the foundational work to brand the Clean Wave Campaign that created the

facility wide ‘positive hand hygiene culture’. Close to completion of the campaign, it was realized that this was not an end but a new beginning. The process has led us to identify some skilled, keen hand hygiene auditors who provide excellent feedback on what is observed at the front line. Monthly meetings are scheduled with auditors and targeted plans for improvement are implemented. A Clean Wave continues to wash over DLC, to meet the new regional target of 100% compliance.

Davenna Conrod, RN, BN, Clinical Team Leader, Infection Prevention Control

Karen Murphy, RN, BScN, Manager of Resident Care

www.deerlodge.mb.ca/about/clean-wave-campaign ■

CLEAN YOUR HANDS

BEFORE
coming into contact with a patient or patient environment

- Examples (not an exhaustive list):**
- Prior to entering patient room and touching patient's environment.
 - Prior to entering patient room and touching patient.
 - Prior to touching patient or their environment, after touching curtain/door in a multi-patient room.
 - Prior to touching a patient or their environment, after touching your face/uniform/lab coat.
 - Prior to touching patient's equipment.
 - Prior to transferring patient.
 - Prior to shaking hands.
 - Prior to taking any vital signs.
 - Prior to using a stethoscope on a patient's body.
 - Prior to making patient comfortable in bed.
 - Prior to patient's morning hygiene.
 - Prior to contact with patient's wheelchair or walker.
 - Prior to bringing patient a puzzle/exercise equipment in physiotherapy/occupational therapy.
 - Prior to touching a patient while assisting with their physiotherapy/occupational therapy.
 - Prior to putting on gloves and/or other PPE.
 - After touching one's face or clothes, prior to touching patient or his/her environment.
 - Prior to touching an IV pump.

CLEAN YOUR HANDS

BEFORE
aseptic/clean procedure

NOTE: Hand hygiene is required for both Moment 1 and then Moment 2.

- Examples (not an exhaustive list):**
- Prior to dressing change.
 - Prior to skin lesion care.
 - Prior to preparing medications or removing them from the Pyxis machine.
 - Prior to adding meds to the Pyxis machine/med charts.
 - Prior to changing TPN.
 - Prior to starting a peripheral IV.
 - Prior to changing an IV.
 - Prior to giving patient an IV medication.
 - Prior to giving a vaccination.
 - Prior to opening a vascular access system or draining system.
 - Prior to taking blood specimen.
 - Prior to taking a blood glucose test.
 - Prior to giving a patient an oral medication.
 - Prior to subcutaneous/intramuscular injections.
 - Prior to instilling eye/ear drops.
 - Prior to oral care.
 - Prior to setting up a patient's food tray.
 - Prior to preparing food.
 - Prior to feeding a patient.
 - Prior to giving a patient a drink of water.
 - Prior to inserting a catheter.
 - Prior to inserting an NG tube.
 - Prior to secretion aspiration.
 - Prior to putting on sterile gloves to perform any aseptic procedure.

CLEAN YOUR HANDS

AFTER
body fluid exposure risk

NOTE: After any of these activities, gloves must be removed and hand hygiene performed prior to moving to next activity.

- Examples (not an exhaustive list):**
- After a dressing change.
 - After skin lesion care.
 - After inserting an IV.
 - After taking a blood specimen.
 - After taking a urine specimen.
 - After cleaning up a body fluid spill.
 - After inserting a catheter.
 - After providing oral care to a patient.

CLEAN YOUR HANDS

AFTER
contact with a patient or patient environment

- Examples (not an exhaustive list):**
- After exiting patient room and touching patient's environment.
 - After exiting patient room and touching patient.
 - After touching patient's equipment and exiting the room.
 - After transferring patient.
 - After shaking hands.
 - After taking any vital signs.
 - After using a stethoscope on a patient's body.
 - After making patient comfortable in bed.
 - After patient's morning hygiene.
 - After contact with patient's wheelchair or walker.
 - After bringing patient a puzzle/exercise equipment in physiotherapy/occupational therapy.
 - After touching a patient while assisting with their physiotherapy/occupational therapy.
 - Between patients while assisting with their physiotherapy/occupational therapy.
 - After taking off gloves.



Recent Advances with the Buddy Badge Hand Hygiene System

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Abstract

In this paper, we briefly review the importance of hand hygiene (HH), and outline how the Buddy Badge System improves HH compliance for healthcare staff. We summarize the results of earlier research which showed the need for personalized real-time prompting to effectively increase HH. This means that the user needs to wear a badge to measure individual actions, and to provide personalized real-time prompting. Further research results also showed that if the Buddy Badge system is deactivated, HH compliance decreases back to baseline over eight to 12 weeks. We then describe astonishing results obtained after introducing an automated reward program, which caused staff's HH to increase above the 90% compliance level, and was sustained for more than 10 months at the time of writing. Most of the development and testing of the Buddy Badge System has taken place in a hospital setting. The paper concludes with a report of our experience with Buddy Badge in a nursing home environment.

Hand Hygiene as Part of Infection Control Practices in Healthcare Environments

When healthcare staff wash their hands, patients get less sick, and transmission of infections across the healthcare unit or ward where the staff are employed is lower.¹ It is as simple as that. Why

then, do staff not wash their hands more often? Several reasons exist for low HH compliance among healthcare staff.² Lack of knowledge of when and how to wash hands and/or limited time to do so, not realizing its importance, wearing gloves, forgetting to wash hands, cognitive overload, limited access to HH products or sinks, and many other structural, operational or cognitive barriers interfere with HH compliance.³ Several studies analyzing the impact of courses and training, or sharing compliance numbers from group observations have not led to any sustainable increases in staff's HH.¹ Our research team took a different approach and aimed at changing HH behaviour by providing continuous and individual reminders to complete HH, as well as performance feedback, all supported through innovative wearable technology – the Buddy Badge System.

Buddy Badge System

The Buddy Badge System is shown in Figure 1. It is comprised of four component devices.

Kiosk and Charging Unit

The kiosk is located in a convenient, high-traffic area. Every user receives a personalized QR code that is printed on a sticker, or can be loaded onto a mobile phone. At the beginning of the shift, the user displays the sticker to the QR scanner on the kiosk, which automatically

recognizes it and identifies a Buddy Badge that is sufficiently charged and loaded with the identity of the user, thereby flashing green. The user takes that badge and clips it in a visible location over their chest. The kiosk functions as both a charging unit for the badges, and as the means of uploading badge data to the cloud.

Buddy Badge

The Buddy Badge is a compact, intelligent badge that is attached to the user. The badge has a bright LED that glows green for 60 seconds whenever the badge detects that the user has dispensed hand sanitizer or soap. All of the logic is processed in real time within the badge, communicating with dispensers and zone markers by receiving near-visible light signals from them. No radio-frequency communication is used to avoid the disadvantages of radio signals.

Zone Marker

The Zone Markers are attached to the ceiling to send light signals to the user's badge telling it when the user changes location. For example, a signal would be sent from zone markers to the badge to indicate that the user has entered a washroom area. The Zone Marker sends information on the location of the user. As such, the system can prompt the user to perform HH when changing locations, e.g., leaving a patient room and entering a washroom.



Figure 1

Dispenser Counter

The Dispenser Counters detect when any type of wall-mounted soap or hand sanitizer dispenser is operated by the user and send a light signal to the user's badge causing it to glow green. The user is now aware that he/she can safely proceed with activities, as the HH status is deemed clean (green).

Recent Enhancements Resulting from Research

Hygienic Echo was incorporated to bring the results of research conducted at Toronto Rehabilitation Institute to market. The results of each stage of the research were published in a series of 20 peer-reviewed journal articles.

Some of the key findings from the hospital research labs include:

1. Muller et al. (2014)⁴ conducted a trial where the Buddy Badge system was used to simply track

and report HH performance while the “reminder-in-real-time” feature was turned off.¹ This approach did not demonstrate any improvement in HH performance. Immediate reminders to consider performing HH, when at risk of missing it, are essential. Receiving an email or attending a meeting sometime later is not an effective way of increasing compliance within a complex, busy healthcare environment.

2. Pong et al. (2019)⁵ showed that when the Buddy Badge System was implemented, there was an immediate increase in HH compliance. After four weeks, the system was deactivated and compliance measured by volume of sanitizer and soap dispensed dropped asymptotically back to baseline over a period of eight to 12 weeks. This cycle of introducing

and withdrawing Buddy Badge was repeated twice more with the same result of instant improvement on introduction and decline back to baseline following withdrawal.

The above research established that individual user feedback is needed and that this feedback must be provided continuously. Yet, this earlier work found that it was difficult to sustain use of the badge and performance gains over long periods of continuous use of the Buddy Badge System. We often saw a very slow decline in usage and performance over extended lengths of time. The concept of intermittent use of the badges was found to be promising but obviously a better solution is needed. In the next section, we describe how a reward program has been found to solve this problem and achieve sustainability at high compliance.

A Trial of the Effectiveness of an Automated Reward Program Using Buddy Badge

In September of 2022, we introduced a reward program called the Buddy Badge Hero Award. Each night, the system calculated the highest performer at each site where Buddy Badge is installed amongst the users that day. The algorithm takes into account the individual's compliance among other factors, including the number of HH opportunities, history of recent Hero awards, improvements in performance, and a chance element so that the opportunity of winning the Hero Award is distributed somewhat across the healthcare team. An email congratulating the winner is sent automatically. The email is accompanied by a gift certificate worth \$10. The result has been astonishing. On the previously mentioned hospital rehabilitation unit, HH compliance rose from the 62% measured over a five-month period with 42,659 recorded opportunities to 91% over a 10-month period with 68,664 recorded opportunities. This extraordinarily high compliance showed no sign of declining at the time of writing.

Evaluation of a Seven-month Trial of Buddy Badge in a Nursing Home

Given the dramatic impact of the COVID-19 pandemic in Canadian nursing homes, any existing research on prevention of infection transmission ought to be applied to these settings. Not surprisingly, the move to a nursing home environment was not without challenges. Consistent staffing made the implementation somewhat easier, however, the communal spaces (dining room, sitting areas, residents group activities, etc.), as well as the fact that nursing home residents often spend their days outside of their bedroom, made this setting very different from previous implementation sites. Healthcare staff spend a considerable amount of time in these communal spaces, and as such, location-specific prompting as the only method of sending reminders was not sufficient. We introduced 'interval'

prompting when staff were in these communal spaces, interacting with many residents at the same time, urging staff to perform HH every few minutes. In addition to the Buddy Badge system, we implemented the Buddy Badge Hero Award. Findings of the trial are promising, indicating a sharp and sustained increase in HH compliance among nursing home staff. These results will be reported in detail at a later date.

Conclusions

Introducing an automated reward program in a hospital site increased compliance significantly and sustainably. One single reward of a \$10 gift card each day in each nursing unit produced an astonishing result. This effect seems to conform to the nudge theory of behaviour change. Recent research has demonstrated the effectiveness of Buddy Badge in a nursing home.

In closing, the importance of performing HH for all healthcare staff is a given; the quest is now to fine tune the appropriate technology to support individual staff with their HH behaviour, identify high-risk rooms, locations or patients or residents, and provide data to make informed decisions about preventing and containing infection transmission. The Buddy Badge System has been successful in doing so in a hospital setting, and its performance in the nursing home setting is promising. Future work includes linking the data to the onset or spread of infections, and assessing the long-term impact of the technology on the users, infection control data and measures, and integrating sustainable practices into care.

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Hygienic Echo was a spinoff company launched to bring the results of research that was performed at the Toronto Rehabilitation Institute. Dr Janidarmian and Dr Fernie are shareholders in Hygienic Echo.

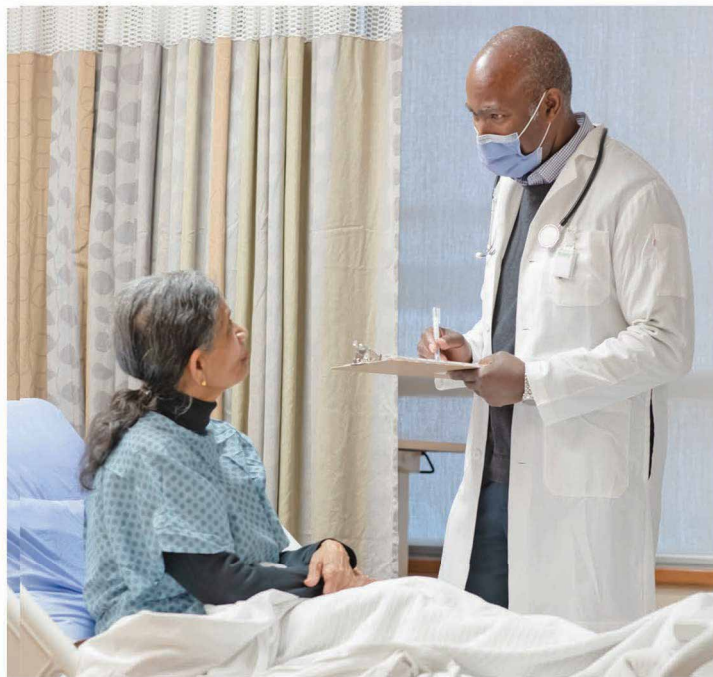
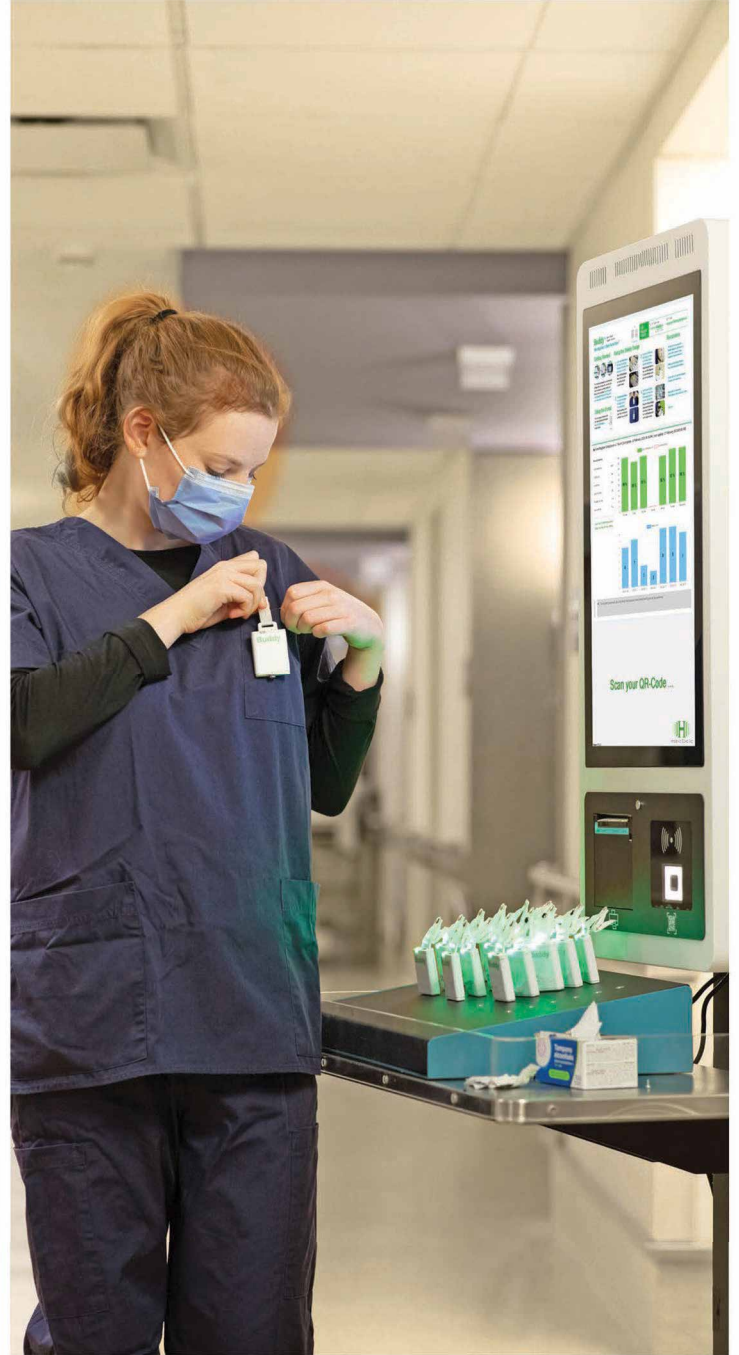
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The Significance of Choosing Human-Use, Antiseptic Drug-Compliant ABHRs in Healthcare Settings

Hand hygiene is the cornerstone of infection prevention and control in healthcare facilities. Healthcare-associated infections (HAIs) pose a significant risk to patients, leading to prolonged hospital stays, increased healthcare costs, and even mortality. alcohol-based hand rubs (ABHRs), with their ability to quickly and conveniently kill or inactivate microorganisms, have become indispensable tools in combating HAIs. However, not all ABHRs are created equal.

While there are numerous considerations when choosing an ABHR, efficacy is paramount. How do you know if a product is truly effective? Infection Prevention and Control professionals need assurances of the efficacy of ABHR specific to various pathogens. When it comes to choosing an ABHR, it's essential to understand the distinctions between products designed for domestic use versus those designed for use in healthcare settings. According to Health Canada, professional-use ABHRs must meet the safety and efficacy requirements of the Human-Use Antiseptic Drugs (HUAD) guidance. Choosing a product that is approved by Health Canada as meeting HUAD guidance ensures you are using ABHRs that have passed the rigorous safety and efficacy testing standards specific for healthcare settings.

Alcohol-Based Hand Rub (ABHR) Use in Healthcare

Infection Prevention and Control Canada (IPAC) says that using ABHRs, gels and rinses is the preferred method of hand hygiene. In the U.S., the CDC Healthcare Infection Control Practices Advisory Committee guidelines issued in 2002, and still in place today, defined alcohol-based hand rubbing as the standard of care for hand hygiene practices in healthcare settings, whereas handwashing is reserved for specific situations. The World Health Organization's hand hygiene guidelines support these positions.

Hand Hygiene and Public Perception

The COVID-19 pandemic changed the way healthcare workers and the world emphasized the importance of hand hygiene. During the pandemic, governments and healthcare agencies recommended behavioural modifications like social distancing, frequent hand hygiene, and the use of personal protective equipment to slow the spread of the virus. This elevated public perception of the importance of good hand hygiene.

Natural Health Products Regulations and Monographs

ABHRs are natural health products (NHPs) in Canada that are regulated

under Natural Health Products Regulations (NHPR). These regulations are designed to give Canadians access to a wide range of NHPs which are safe and effective, and all marketed ABHRs must adhere to the NHPR. There are two pathways to approval of an ABHR in Canada.

In the first route, the product will be licensed and receive a Natural Product Number if the ABHR meets all requirements of the antiseptic skin cleansers monograph (2018). This monograph is used to register products that have specific concentration ranges of active ingredients and are limited in the statements that can be included on the labels. In the case of ABHRs, the concentration range is 60-80% ethanol or 60-75% isopropanol (isopropyl alcohol). Products approved under the monograph are for domestic use only.

The other route is for applications that go beyond the parameters of the monograph, such as professional products for use in healthcare settings, or that make additional efficacy claims which are not eligible for licensing under the monograph process. In these cases, an applicant must provide supporting evidence about the safety and efficacy of the product to receive a product license for professional use. This is where the HUAD guidance comes into play.

Health Canada HUAD Guidelines

Health Canada plays a pivotal role in safeguarding public health by regulating and monitoring various healthcare products. Its HUAD guidelines support the regulation of professional- and commercial-use antiseptic skin products, such as ABHRs and other non-monograph personal use products. The intent of the guidance is for these products to be supported by data and provide sufficient labelling information to promote safe use. The supporting data may vary relative to the risk associated with the environment in which the products are used and the claims being made. Sufficient information to support the labelling claims must meet HUAD guidelines.

HUAD Guidance: Ensuring Quality in Healthcare Products

Through HUAD guidance, Health Canada regulates ABHRs and other topical antiseptic healthcare products to assure their safety and efficacy. ABHRs that comply with HUAD standards have undergone extensive and rigorous testing to demonstrate that they meet the required safety and antimicrobial efficacy levels necessary to protect patient safety in healthcare settings. These compliance measures address critical aspects of the product, including alcohol concentration, efficacy claims, and labelling.

Key reasons to choose HUAD-guidance-compliant ABHRs include:

1. Assuring the product is appropriate for use in healthcare settings.

Choosing HUAD-compliant ABHRs ensures that the product has undergone rigorous testing to assess its efficacy in healthcare

environments. Compliance with HUAD guidance standards assures Infection Prevention and Control Professionals that the product is effective against common pathogens in healthcare settings, and does not pose unnecessary risks or hazards to patients, staff, or visitors.

2. Assuring products are effective.

The primary purpose of ABHRs is to eliminate microorganisms and prevent their transmission. HUAD-compliant ABHRs are specifically formulated and tested to ensure their efficacy against a broad range of bacteria, viruses, and other pathogens commonly encountered in healthcare settings. Using compliant products provides confidence that the ABHR is effective in reducing the risk of infections.

3. Building trust and enhancing a healthcare provider's reputation.

By using HUAD-compliant ABHRs, healthcare providers demonstrate their commitment to patient safety and infection control. This adherence to regulatory standards not only upholds professional trust, but also contributes to the reputation of the hospital or healthcare institution as a whole. It sends a message that patient well-being and safety are of utmost importance.

Microsan: First Alcohol-Based Hand Rub Approved by Health Canada to Make Anti-Viral Claims

SC Johnson Professional® offers the healthcare industry's first ABHRs, Microsan Encore® and Microsan® Optidose™, approved by Health Canada

to make virucidal claims. These products have undergone extensive testing to prove they kill 99.9% of bacteria, are effective against all enveloped viruses and some (norovirus and rotavirus) but not all non-enveloped viruses, and effective against fungi.

Microsan® ABHRs are a great option for healthcare settings as they are fragrance- and dye-free, hypoallergenic and latex- and nitrile-glove compatible. These ABHRs also contain skin moisturizer to help prevent drying, leaving skin feeling smooth after use. The ABHRs are available in a 1L cartridge, a 1L TouchFREE cartridge, a 400mL pump bottle, and a 50 mL pump bottle to meet the hand hygiene program requirements of any healthcare facility.

Conclusion

In Canadian hospitals, selecting HUAD-guidance-compliant ABHRs is of paramount importance to ensure that products meet required healthcare standards. While all ABHRs in Canada are NHPs and are regulated under NHPR, not all are tested for efficacy in healthcare settings. ABHRs that comply with HUAD standards have undergone extensive and rigorous testing to demonstrate that they meet the required safety and antimicrobial efficacy levels necessary to protect patient safety in healthcare environments. By prioritizing use of HUAD-compliant ABHRs, healthcare providers can enhance their infection control practices. Make hand hygiene a top priority by ensuring that only HUAD-guidance compliant ABHRs like SC Johnson Professional Microsan are used. ■



Microsan® Alcohol Hand Sanitizer

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EFFECTIVE AGAINST BACTERIA FUNGI CERTAIN VIRUSES*

*Effective against all enveloped viruses and some (norovirus/rotavirus), but not all non-enveloped viruses.



First Alcohol Hand Sanitizer approved by Health Canada to make virucidal claims under the Human-Use Antiseptic Drug requirements.

†Influenza tested as one of several enveloped viruses.

*This product is certified to meet ECOLOGO UL 2845 Standard based on criteria for product formulation and manufacturing, and human health & environment toxicity. UL.com/EL.



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