### DEFINITIONS

**Client** – resident, client or patient receiving care or services by SHR in the acute settings.

**Health Care Professional (HCP)** – for the purpose of this policy, HCP will be used to refer to any Registered Nurse (RN), Graduate Nurse (GN), Registered Psychiatric Nurse (RPN), Nurse Practitioner (RN(NP)), Licensed Practical Nurse (LPN), Graduate Licensed Practical Nurse (GLPN), Anesthesia Assistants, Respiratory Therapist (RT), Paramedics, and nursing/paramedic/RT students.

**MAR** – refers to the Medication Administration Record, pharmacy generated Medication Administration Record or other record used for charting/documenting medication administration on a unit/department/therapeutic care areas.

**Pyxis MedStation** – is an automated medication dispensing cabinet.

**Unit** – for the purpose of this policy, Unit will be used to refer to any patient care area.

### 1. POLICY

1. The Clinical Nurse Educator (CNE) or Manager of Nursing (MON) will identify and qualify any HCPs (end-users) for access to the Pyxis® MedStation ES v1.4x.

   1.1 User identification entry/role assignment and maintenance will be the responsibility of the CNE, or in some areas the Clinical Coordinator or Clinician.

   1.2 Changes to HCPs status will be determined by the default network timeout. When Network access is removed, access to Pyxis will not be available.
1.3 Education and Training

1.3.1 All HCPs operating a Pyxis MedStation shall require initial mandatory training achieved by a means of completion of Pyxis E-learning modules and/or Hands on training via Clinical Nurse Educator/Clinical Coordinator, Clinician (in emergency departments) or SuperUsers.

1.3.2 All HCP’s employed by a unit will be able to access all MedStations on that unit. Float pool nurses will have access to MedStations in the areas they have been orientated to.

1.3.3 HCP’s who has not received training will be paired with an HCP who will access medication until training can be completed.

1.3.4 HCP’s who are trained in Pyxis who float to another unit will be granted visitor access for a period of 14 hours.

1.3.5 New HCP’s that do not yet have network access:

- must complete the confidentiality agreement(Appendix A) with the MON or CNE
- must complete the on-line tutorial- see Appendix C for access instructions
- must be added as a “local user”. Will expire in 2 weeks
- CNE and/or CC or MON will create “local user” access. See Appendix D for process

1.3.6 Preceptored nursing students and faculty that do not have network access or do not know their network ID:

- must complete the on-line tutorial- see Appendix C for access instructions
- may be added as a “local user”. Will expire 2 weeks after their practicum is completed.
- CNE and/or MON can create “local user” access. See Appendix D for process

**Exception:** 4th year nursing students in the Emergency departments will have network access.

1.4 User Identification, BioID, Password and Logon/Logoff

1.4.1 The login user ID for the MedStation will be the HCPs Saskatchewan Health Authority (SHA) network ID, typically last name + first initial of first name. Passwords will be changed every 90 days based on SHA network password policy.

1.4.1.1 Expiring passwords are updated through your SHA network account on a SHA computer, and not through Pyxis. New accounts must be activated on a SHA computer prior to logging into Pyxis.
1.4.1.2 Lock-out of 15 minutes from Pyxis will occur with three consecutive failed sign in attempts.

1.4.2 The BioID fingerprint identification system (BioID) will be activated on all MedStations (see Appendix B for more information on the BioID fingerprint identification system).

1.4.2.1 All HCPs will be required to register their fingerprint, except if unsuccessful after three consecutive failures. Exceptions will be granted on a case by case basis for employees who are opposed to utilizing BioID for user identification.

1.4.2.2 If the fingerprint fails to register, a witness is required for password login.

1.4.2.3 For those HCPs who’s Bio ID is not readable, it is recommended that they attempt to re-register using the BioID system, every 3 months.

1.4.3 HCPs must log off immediately after completing any transactions on the MedStation. They cannot leave the MedStation unattended with their user status active and logged onto the system.

1.4.4 The following policies and procedures will continue to be enforced:
- SHR Region-wide Policy and Procedures Manual - #7311-60-004 Ordering of Medications, #7311-60-020 High Alert Medications
- Tri-Hospital Nursing Policy and Procedure Manual - #1170 Medication Administration, #1091 Medication Administration Record (MAR), #1023 Aerosolized Medication for Inhalation; #1118 Intravenous &/or Peripheral Saline Lock Insertion & Maintenance; #1089 Intravenous – Push Medication Administration

2. PURPOSE

2.1 To comply with nursing, medical and legal standards.

2.2 Utilization of the Pyxis® MedStation ES v1.4x will support the safety and efficiency of medication administration through the following examples (not an exhaustive list):

- Streamlines medication distribution and workflow
- Improves nursing and pharmacy staff collaboration
- Supports regulatory compliance efforts
- Protects against unauthorized access, documents use, promotes pharmacist order review, provides patient education material
- Enhances narcotics and controlled substances management
- Facilitates the start of patient therapies faster by reducing time to first dose
- Improves medication availability, even after hours
3. PROCEDURES

3.1 Medications will be removed for one patient at a time from the MedStation just prior to administration.

3.2 Remove only the amount specified – do not remove extra doses for use later or for a different patient as this action will lead to inventory discrepancies.

**Exception:** In areas where HCPs restock non-narcotic medications into kits/trays/carts, there will be a patient named “Restock” which can be chosen. Quantity of medications needed will then be removed under the patient “Restock” and put into the intended location for future use.

3.3 A removal warning is triggered if any user requests the same inventory item be removed within 150 minutes (2.5 hours) of that item being removed for the same patient (as a prompt to avoid double dosing). The medication can still be removed.

3.4 The medication administration record (MAR) will always be referred to when a discrepancy exists between the Pyxis® MedStation ES and the MAR.

3.5 During pharmacy hours of operation, the turn-around time for a medication order to appear on the patient’s profile will be targeted for one hour. This time is reflective of when the order is received in pharmacy and the order being assessed for appropriateness and correctness prior to being entered into the pharmacy information system. The medication order is then displayed on the patient’s profile on the profiled MedStations. Patient’s Own Medication orders are not sent to the patient’s profile in Pyxis.

3.5.1 For stat orders, that are not available through the override medications in Pyxis, send order to the pharmacy STAT line, then page the pharmacist.

3.5.2 A Once or STAT order will only appear on Pyxis for 2 hours. If still needed, notify physician of the delay and call pharmacy to have it re-entered.

3.6 Not all medication may be available from the MedStation, this differs by MedStations.

3.6.1 Medications not loaded in the Pyxis MedStation will be delivered to the unit by Pharmacy.

3.6.2 Medications may be added to the MedStation for long stay patients or high volume orders at the discretion of the Pharmacy Department.
3.6.3 Medications not stored in the MedStation will be stored in unit specific designated locations.

- Patient own (controlled and non-controlled)
- Refrigerated (Controlled and non-controlled)
- Multidose/multi patient

3.6.3.1 A multi-dose medication that is removed from a Pyxis Medstation for a specific patient, must be labeled with a patient label immediately. Example might be inhalers or creams.

3.6.3.2 Multi-dose medications with “Use by” dating, must be labelled upon removal from the Pyxis MedStation.

3.7 Changes to the MedStation inventory will be considered by submitting a request using the Floor Stock Request form to the Pharmacy Department.

3.8 Profiled MedStation (Not applicable for PACU, OR, POPD, Women’s Health Center, SCH 4300, Ambulatory Care, Day Medicine Oncology)

3.8.1 Each MedStation will display a full patient profile of medications ordered (with the exception of patient’s own medications).

3.8.2 Medication profiles for transferred out or discharged patients will be displayed for 2 hours.

3.9 Non-Profiled MedStation (Only applicable for PACU, OR, ED, POPD, Women’s Health Center, SCH 4300, Ambulatory Care and Day Medicine Oncology)

3.9.1 For Emergency Department(some medstations), POPD, Women’s Health Center, SCH 4300, Ambulatory Care, Day Medicine Oncology, RAAM/Ambulatory Care

3.9.1.1 A patient list will display but no medication orders will be associated with those patients. A list of medications that are kept in that MedStation will display and it will be necessary to enter dose needed for each medication.

3.9.2 For PACU and Maternal Recovery

3.9.2.1 Some patients can be found under “All Available Patients.” If unable to see patients on that list, facility search must be used to remove, waste, and return medications. When patient is selected, a list of medications that are kept in that MedStation will display and it will be necessary to enter dose needed for each medication.

3.9.3 For OR/Maternal OR
3.9.3.1 The MedStation will be accessed by anesthesia, and other groups of HCP’s. Process for each group is unique. Refer to unit specific policy for more information.

3.10 Narcotic Medications and Controlled Substances

3.10.1 Narcotic medications and controlled substances (e.g. lorazepam) must be stored in the MedStation.

3.10.1.1 Patient’s Own Medication that is a controlled medication will not be stored in the MedStation. There will be a designated area on your unit where these will be stored.

3.10.2 When a narcotic medication is not currently loaded in the MedStation, it will appear “grayed out” on the screen. Contact the Pharmacy Department in order to have the medication loaded in a timely manner.

3.10.3 A blind count is required on all narcotic medications and controlled substances prior to removal from the MedStations.

3.10.3.1 If the count entered does not match the expected amount, a second request will be made to enter the drawer count.

3.10.3.2 If the second count entered does not match the expected amount, a discrepancy icon will be displayed on the MedStation.

3.10.3.3 It is the responsibility of the nurse who found the discrepancy to facilitate resolving it by end of shift. Charge nurse to assist, if needed.

3.10.4 Narcotic medication and controlled substances discrepancies will be identified and attempted to be resolved daily on the nursing unit prior to shift end.

3.10.4.1 A discrepancy that is found after a patient has been transferred to a new unit is the responsibility of the transferring unit to resolve. See Appendix E for Work Standard.

3.10.5 All “fixed” discrepancies will generate a receipt that is deposited in the “Fixed Discrepancies” basket on top of the Pyxis MedStation or near the Pyxis MedStation, depending on the unit.

3.10.6 If efforts made to resolve a discrepancy are unsuccessful, communication to the CNE regarding same is suggested.

3.10.7 Unresolved discrepancies must be communicated to the Pharmacy Department by the MON

3.10.8 Inventory of accessed controlled medications must be completed, at minimum, once per week. A full inventory of controlled medications must be conducted,
at minimum, once a month. Inventory will be conducted by the charge nurse or delegate, and a witness.

3.11 Medication Returns

3.11.1 Unopened narcotic medications and controlled substances will be returned to the internal return bin in the MedStation and not to the original cubie it came from. A witness is required for these returns. Non-controlled medications will be returned to the pharmacy return bin external from Pyxis.

3.11.1.1 If documenting a return after a patient has been discharged, you must add a temporary patient with as much information as possible, then choose Return and the Search All Meds function to find specific medication to be returned.

NOTE: It is best practice to return an unused controlled medication as soon as possible.

3.11.2 If a patient is on isolation precautions and the medication was in contact with that patient’s environment, the medication must be wasted and not returned.

3.11.3 If a unit is on outbreak, all narcotics and controlled medications must be wasted instead of returned.

3.11.4 External and internal return bins will be emptied by pharmacy technicians.

3.11.4.1 A witness is required when the narcotic medication/controlled substances return bin is emptied.

3.12 Medication Wastage

3.12.1 All medications that have been opened (packaging is not intact) are to be wasted and disposed of in the sharps bin.

3.12.2 The wastage of narcotic medications and controlled substances requires a witness on the MedStation to verify.

3.12.2.1 If documenting waste after a patient has been discharged, you must add a temporary patient with as much information as possible, then choose Waste and the Search All Meds function to find specific medication to be wasted.

NOTE: It is best practice to choose Waste Now function and have witness at MedStation while preparing the medication.

3.13 Override Function on Profiled MedStations (Not applicable for OR and PACU, POPD, Women’s Health Center, SCH 4300, Ambulatory Care, Day Medicine Oncology, RAAM/Ambulatory Care)
3.13.1 During pharmacy hours of operation, new medication orders will appear on the profile once they have been processed by pharmacy.

3.13.1.1 If the medication is not on the profile, contact pharmacy.

3.13.1.2 If the medication is urgent/emergent, override medication (if the medication is on the MedStation’s override list) and administer.

3.13.1.3 Outside of pharmacy hours, override will allow the HCPs to access all medications in the MedStation.

3.13.2 The Pharmacy Department may review the Override Report to ensure a physician order was written for each medication and will follow-up when an order was not received.

3.13.3 Changes to the Override Medication list will be considered by submitting a request using the Floor Stock Request form to the Pharmacy Department.

3.14 Process for new patient not on MedStation Census

3.14.1 If medication administration is required before the patient is visible on the MedStation, use “Facility Search” option. If patient not found, the patient must be added as a temporary patient using the patient’s name (first and last name) and unit they are admitted to.

*Note:* It is important to include as much patient info as known to allow accurate identification when reconciling this patient in the system.

3.14.2 *Note:* Adding temporary patients should only be required if the ADT system or the pharmacy system are non-functional or for trauma patients where medication prep is done prior to the patient arriving at the site.

If name is unknown, enter John/Jane Doe, and as much information as known – gender, location they are coming from, any information known about condition.

3.14.3 Temporary patients will show with a blue indicator reading “Temporary.”

3.14.4 Temporary patients will only display for 2 hours.

3.14.5 Once the true patient admission appears after pharmacy processes it, ensure you are removing medication against the true admission. Any orders will be entered by pharmacy against the true admission.

3.15 Process for providing medications to another unit

3.15.1 Other unit also has Pyxis: Grant visitor access to the HCP.

3.15.2 Other unit does not have Pyxis and the medication is not in the night cupboard:
3.15.2.1 Charge nurse will confirm with requesting unit that night cupboard does not have this medication.

3.15.2.2 Charge nurse will ask requesting unit to bring patient label to Pyxis unit for information to facility search the patient.

3.15.2.3 If non-controlled/narcotic medication, nurse from Pyxis unit can remove medication and give to requesting nurse.

3.15.2.4 If controlled/narcotic medication, the requesting nurse will bring NAR to Pyxis unit. The nurse from Pyxis unit will sign in medication to NAR with requesting nurse double counting and co-signing.

Note: In Pyxis, enter full amount to be given so that waste is not required to be documented in Pyxis. It will be recorded on the receiving units NAR instead.

3.15.2.5 These transactions may be reviewed by the Pharmacy Department to ensure a physician's order was written for each medication.

3.16 Process for pass medications

3.16.1 The MedStation will not be utilized for the removal and distribution of medications for passes longer than 6 hours. HCPs will contact Pharmacy with requests for pass medications, indicating both the scheduled and prn medications that are required.

3.16.2 Unused pass medications (including narcotic and controlled medications) returned by the patient will be discarded and/or wasted in the sharps container.

3.17 Quality Assurance of the MedStations

3.17.1 Scheduled audits are recommended to be performed to maintain the quality assurance of the MedStations. A designated person will be responsible for this. See Unit Standards. The reports below do not need to be saved each month after being reviewed.

3.17.2 Any retraining requirements of HCPs will be forwarded to the CNE(s), as identified by data in the audits.

3.17.3 Any notable trends and/or areas of concern will be forwarded to the Manager of Nursing for further investigation.
3.18 **Pyxis® Downtime/Troubleshooting**

3.18.1 In the event of a problem with the MedStation, such as a failed drawer/door, nursing should contact the following in the order listed:

- Job aid within Pyxis Reference binder on Recovering Failed Storage Unit.

- If that process fails, refer to Algorithm for restoring failed storage space in the Pyxis Reference Binder.

- Next, call pharmacy. If after hours, call BD Carefusion at 1.800.727.6102 The ticket number that is received from this phone call needs to be recorded and shared with pharmacy. Refer to the card on the Medstation for your account number and device name.
  
  **NOTE**: the staff member that is calling BD Carefusion does not need to be a nurse.
3.18.2 In the event that the MedStation cannot be accessed for an extended period of time, contact pharmacy and they will advise as to where to get medications from during downtime.

Always check your Pyxis Reference Binder for any downtime algorithms. For after pharmacy hours, check your unit standards on further downtime procedures.

3.19 Pyxis BioID Downtime

3.19.1 If the BioID function experiences downtime, the system will force the HCP to log on with a password.

3.19.2 If HCPs do not remember their password, call 8200, option 2, for IT support with changing password 24hrs a day. Pyxis user ID and password is the same as the Network ID and password.

3.19.3 Temporary passwords given from IT cannot be changed on a Pyxis MedStation, they must be changed from a network computer

3.20 Power Failure

3.20.1 Pyxis® ES MedStations will always be connected to the emergency back-up power supply (red plug).

3.20.2 If back-up power supply fails, nursing will contact Pharmacy for medications.

3.20.3 When Pharmacy is closed, nursing will contact the on-call Pharmacist for required medications.

3.21 ADT Downtime (Sunrise Enterprise Registration)

3.21.1 During Pharmacy hours of operation, pharmacy will manually admit patients to the BDM system that will be visible on the MedStation. When the registration system is restored, Pharmacy will correct the visit numbers to match the registration system. Outside pharmacy hours, new patients will not appear on the MedStation.

3.21.2 Nursing will inform Pharmacy of the patient’s location by identifying the location on any scanned orders or communication to pharmacy.

3.21.3 Outside Pharmacy hours of operation (if applicable), if nursing staff notice patients are not appearing on the Medstation or being transferred/discharged, nursing staff will be required to call 8200 (Ehealth). Outside Pharmacy hours of operation (if applicable), nursing will add temporary patients for new admissions or transfers not appearing on the MedStation.

3.22 Pharmacy (BDM) Downtime
3.22.1 During unplanned pharmacy downtime, the interface from Pharmacy to the MedStations will not function.

3.22.2 Nursing will add temporary patients for new admissions or perform a facility search for patients not appearing on their Medstation, if needed.

3.22.3 A pharmacy Manager (or designate) will determine if the MedStation should be turned on to Critical Override, allowing the HCPs to access all medications in the MedStation.

3.23 Pyxis Interface Downtime

3.23.1 If the Pyxis® Interface is down, the interface between BDM and the MedStations will not function.

3.23.2 Any new information will not be sent to the MedStations, including new or changed medication orders and ADT (Sunrise Enterprise Registration) information.

3.23.3 Icons will appear on the MedStation to indicate the Console and/or Interface is not communicating with the MedStation.

3.23.4 During Interface downtime, nursing may need to add temporary patients. A pharmacy Manager or designate may also need to turn the MedStation on to Critical Override, allowing the HCPs to access all medications in the MedStation.

3.24 Pyxis® MedStation ES Operations –

4. REFERENCES
Appendix A

PYXIS® MEDSTATION ES CONFIDENTIALITY AGREEMENT

The following is your User ID/Initial Password for the Pyxis® ES MedStation system. It will be used to access patient medications. The first time you access a Pyxis® ES MedStation system, you will be required to enter a new, confidential password and enroll four finger scans using BioID. **It is your responsibility to keep your new password secret and utilize your BioID access for personal access only.** You will be accountable for all transactions performed under this User ID and confidential Password/BioID. Please read and sign the following statement to verify that you understand this statement; and will maintain the integrity of your password/BioID access once it has been changed.

Below is a copy of my User ID and my initial password to the Pyxis® ES MedStation system. Upon accessing the Pyxis® ES MedStation system for the first time, I will change my password to a new confidential password and enroll my finger scan for BioID. I understand that my User ID and password/BioID will be my electronic signature for all transactions to the Pyxis® ES MedStation system. I understand that no retrievable record of my new password or BioID exists. All of my transactions on the Pyxis® ES MedStation system will be permanently recorded with my User ID and a date and time stamp, and will be audited as outlined in the Pyxis Policy, Procedures and Operations Manual.

I also understand that to maintain the integrity of my electronic signature, I must not give my password to any other individual. Unauthorized access, release or dissemination of this information shall subject me to disciplinary action. Should I have any suspicion that my personal password has become known to another individual, I will change it immediately and, if deemed appropriate, will immediately report such to the Manager of Nursing.

Signature: ___________________________ Date: ______________
Witnessed By:
Signature: ___________________________ Date: ______________

*******************************************************************************

Confidential

Use this User ID and First Time Password to access the Pyxis® MedStation ES system

User ID: ________________________________
Initial Password: To be entered by Pyxis Nursing Administration
(This password will expire when you first enter the system—press OK and then enter a new, personal, and private password.)

Adapted from ID/Password/BioID Confidentiality Agreement Pyxis® MedStation 4000 system (2009) by CareFusion Corporation
BioID fingerprint identification system
The next generation technology

Executive summary
The BioID fingerprint identification system on the Pyxis MedStation® 4000 system includes biometric sensor technology that provides reliable authentication and identity verification in healthcare settings, accommodating multiple environmental and demographic variables. In this technical whitepaper, we will provide an overview of biometrics applications in healthcare, a brief discussion of how biometrics work, an overview of technical challenges for biometrics in healthcare settings and a thorough discussion of the third-generation biometric solution for the BioID fingerprint identification system.

Biometrics applications in healthcare
Biometrics play an important role in healthcare applications, especially when there is a need to control access through positive identification of authorized users. Biometrics also facilitate operational efficiency in healthcare by providing quick and easy access—reducing costly workflow interruptions that occur when passwords are forgotten or access cards are misplaced. Pyxis medication dispensing technologies were the first automated dispensing devices to widely deploy a biometrics solution to meet the needs of the challenging healthcare environment. Today, millions of Nurses access secure systems using BioID to care for their patients every day.

Biometrics overview
Biometric systems provide a means of verifying identity by collecting information about unique human characteristics and comparing that information to previously-submitted data. BioID incorporates a biometric sensor that collects information about users’ unique fingerprints and a matcher that facilitates decisions on whether access should be granted to the user based on data collected from the sensor.

The user places a finger on the external surface of the sensor, or platen, and relevant information is quickly extracted and transformed into a digital representation of the user’s fingerprint, or template. A template is not an image of a fingerprint, and fingerprint images cannot be restored from the encoded templates.

The user’s template is compared to the reference template the authorized user provided during an initial enrollment process. If the two templates match, the user is granted access. The entire process, from finger placement to match result, takes place in approximately two seconds with the BioID fingerprint identification system.

Understanding biometric performance
In order for a biometric deployment to be successful, the system needs to be able to quickly and reliably accept authorized users and reject unauthorized users. The two most common metrics for assessing biometric performance are the false accept rate (FAR) and the false reject rate (FRR). FAR measures the number of times the system allows access to someone who is not enrolled in the system. A high FAR exposes the system to security risks. FRR measures the number of times an authorized user is not recognized by the system. A high FRR creates hassles for authorized users who must try again or use an alternative method of gaining access.

The success of a biometric deployment also depends on how many authorized users can actually use the system. Failure to enroll (FTE) measures that portion of the authorized population that cannot use the system because the sensor cannot read their unique biometric information. These people will be unable to enroll in the system because the system will never recognize them. The failure to acquire (FTA) rate measures the number of times a sensor does not collect any biometric data at all. A high FTA rate slows system throughput.
Bringing biometrics to healthcare: the challenge

A sensor’s ability to collect usable data can be influenced by various external conditions, including demographic variables, users’ skin conditions, environmental variables and throughput requirements—making healthcare a particularly challenging environment.

- **Diverse user population**: Demographic variables such as ethnicity, sex and age all affect biometric performance and the diverse user population in healthcare has historically presented a challenge to conventional biometric systems.

- **Hand washing protocols**: Hospital policies require frequent hand washing and sanitizing for Nurses and others who come into contact with patients. Such users commonly have either very dry fingers or overly moisturized fingers. Both conditions can negatively impact an individual’s ability to enroll or use a fingerprint biometric system.

- **Environmental conditions**: Hospitals are often kept cool and dry. This type of environment, especially when combined with frequent hand washing, can result in dry, cracked fingers. Ambient fluorescent lighting can affect a sensor’s ability to capture a usable image. Hospital-approved disinfectants and moisturizing products can degrade sensor performance by damaging the data collection area of the sensor or interfering with the sensor/finger interface.

- **Throughput requirements**: Healthcare workers typically have time-critical duties and are susceptible to rushing through a biometric authentication process, which can affect the quality of data that is collected for future matching processes. In addition, all users may have variable finger placement or finger pressure on the sensor.

A successful biometric access system in the healthcare setting must maintain high biometric performance for each of these industry-specific challenges. Failure to reliably and efficiently authenticate the user places a burden on the staff, leading to unnecessary user frustration, a reduction in efficiency and poor adoption rates—reducing overall system security.

Conventional technologies fall short

The interface between the sensor and the surface of the finger is the primary vulnerability point of conventional sensors. Conventional fingerprint sensors fall into two main categories: semiconductor sensors and optical sensors. A new class of biometric sensor that relies on multispectral imaging will be discussed in the next section.

The two most common types of semiconductor sensors use small silicon arrays to measure either the difference in capacitance caused by contact of fingerprint ridges with the sensor, or the difference in radio frequency signals returned by the ridges and valleys of the fingerprint.

The fragile silicon array in semiconductor sensors is directly exposed to the environment and is susceptible to damage. Capacitive sensors don’t work well when the skin is very dry, and both capacitive and radio frequency sensors fail when the sensor surface is wet. Both capacitive and radio frequency sensors measure the surface features of the skin only, resulting in reduced performance when the features are worn or absent.

Semiconductor sensors are widely used for commercial applications where size and price point are the primary considerations. However, their fragility and unreliability make them inappropriate choices for secure healthcare applications.

**Optical sensors**, typically with a glass or acrylic platen, are configured to look for the presence or absence of total internal reflectance (TIR), which is the phenomenon whereby the interface between glass and air acts like a mirror at certain angles. The points of contact between the skin and the platen are imaged.

Conventional optical sensors are very susceptible to non-ideal skin conditions. In particular, if the skin is too dry or does not make good contact with the sensor, the performance is severely degraded. This difficulty with dry fingers can be addressed with a special coating on the platen that improves the quality of contact between the finger and platen. However, this coating is vulnerable to scratching and erosion from cleaning products that are commonly used in hospital settings.
Both of these conventional technologies—semiconductor and optical—have inherent vulnerabilities that make them unsuitable for the healthcare environment. In large-scale deployments or adverse environments, the overall biometric failure rates can be as high as 20% for semiconductor or optical sensors.

**BioID third-generation biometric solution:**

**Lumidigm**

To address the shortcomings of conventional fingerprint technologies, Lumidigm technology—multispectral imaging—was chosen for the BioID fingerprint identification system. This technology was specifically designed for and is uniquely suited to difficult application environments, such as healthcare settings.

**Multispectral Imaging Technology**

An important characteristic of fingerprint ridges is that their structure descends beneath the surface of the skin. Multispectral imaging collects information about the sub-surface fingerprint in order to augment available surface fingerprint data. Unique biometric data is collected under a variety of optical conditions: different wavelengths of visible illumination light, different polarization conditions and different illumination orientations. The varying optical conditions illuminate the skin at different depths, resulting in information-rich data about the surface and sub-surface features of the fingerprint.

The imager will collect data from the finger even if the skin has poor contact with the sensor (e.g., is dry, wet or contaminated with hand sanitizers and moisturizers). Multispectral sensors also have an uncoated glass platen that resists damage from harsh cleaning products.

**Meeting the healthcare challenge**

BioID with multispectral biometric technology was deployed in hospital settings in late 2008. Biometric performance has been enhanced in the following ways:

- **Lower FRR:** Multispectral sensors are less sensitive to variable conditions and poor sensor/finger contact, resulting in higher user satisfaction with BioID.
- **Lower FTE:** People who cannot use conventional sensors have no difficulty using the new BioID.
- **Lower FTA:** More people can successfully verify their identity using BioID on the first try.
- **Lower FAR:** The sub-surface capability of multispectral biometric sensors means more relevant data is collected, reducing the possibility that the system will mistake one user for another—enhancing security.

Tomball Regional Medical Center, a 357-bed hospital in Texas, dramatically increased user enrollment. Many users were previously utilizing alternate methods of authentication because they either couldn’t reliably use the system themselves, or they observed that other users had difficulty. With the third generation BioID, biometric performance skyrocketed, increasing reliability, convenience and security along the way.

“Before upgrading to the Pyxis MedStation 4000 system, only about 50% of staff was using BioID—now we have 100% compliance, which has greatly enhanced system security. It even works for users with skin issues like eczema.”

- Margaret Osburn, Pharmacy Informatics Project Manager, Tomball Regional Medical Center

**Conclusion**

Biometrics has a significant role to play in healthcare. The BioID fingerprint identification system provides reliable, secure, robust and easy-to-use biometric fingerprint authentication to the healthcare industry. BioID with multispectral biometric technology is the only biometric access solution in the industry that solves the special problems commonly found in the healthcare environment.
Appendix C

PYXIS MedStation ES v1.4x On-Line Nursing Tutorial

1. Please go to the following website: https://eim.carefusion.com/Account/Login?to=CU

2. Click Sign Up. This will take you to the registration page. Continue through all the steps and complete registration, then activate your account and log in.

   ![Sign Up Button]

   **NOTE:** If your CNE or MON has registered previously, you will have received a confirmation e-mail.

   Your email address is: Email you provided
   Your password is: Password1

3. Once you have logged in, search for Nurse/Clinician – Pyxis MedStation ES v1.6: Essentials for Profile mode and/or Nurse/Clinician - Pyxis MedStation ES v1.6: Essentials for Non-Profile Mode.

4. If your pop-ups are blocked on your computer, you will receive a message indicating this (usually a yellow bar at the top of your screen). Please click on the message to unblock pop-ups.

5. Watch the video and complete the simulation in each module, which will take approximately 45-60 minutes.

6. When done, select training completed and then can view and print certificate of completion.

8. Bring a copy of the certificate to orientation or give it to one of the CNE’s.
## Title: Adding Local Users to Pyxis ES

### Role performing Activity: CNE, Clinical Coordinator, Manager of Nursing

<table>
<thead>
<tr>
<th>Location:</th>
<th>Department/Unit:</th>
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<tbody>
<tr>
<td>Former SHR</td>
<td>NP &amp;E</td>
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<tr>
<th>Document Owner:</th>
<th>Date Prepared:</th>
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<tr>
<td>NP&amp;E</td>
<td>Sept 4, 2018</td>
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<th>Date Approved:</th>
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### Related Policies/Documentation

Medication Administration for the Pyxis® MedStation ES v1.4x

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**Work Standard Summary:** How to add staff and students (who do not have network IDs) as local users to Pyxis ES

<table>
<thead>
<tr>
<th>Essential Tasks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Go to prod ES server link: <a href="https://pyxis-es.ehealthsask.ca">https://pyxis-es.ehealthsask.ca</a> and log in.</td>
</tr>
<tr>
<td>2. Go to <strong>Settings</strong>, then <strong>Users</strong>, then <strong>User accounts</strong>.</td>
</tr>
<tr>
<td>3. Click on <strong>Add user</strong> on bottom right of screen.</td>
</tr>
<tr>
<td>4. Add users information. Last name required.</td>
</tr>
</tbody>
</table>
| 5. When choosing User Id, do **not** use format of last name and first initial.  
  For new staff without network access yet, use “tempLastnameFirstinitial”  
  For preceptored nursing students, use “NSLastnameFirstinitial”  
  For faculty that do not have network access or do not know their network ID: “F Lastname Firstinitial” |
| 6. Choose initial password that will be given to the user. |
| 7. Choose end date.  
  For new staff, use date 2 weeks after first shift.  
  For preceptored nursing students, and faculty use date 2 weeks after their final scheduled shift. |
| 8. Select Facility for access. |
| 9. Assign role.  
  For new staff and faculty – Nurse role.  
  For student - Nurse student. |
| 10. Click **Edit** and choose area they will have access to and then Save |
Title: Pyxis: Resolving Undocumented Waste from another unit

Role performing Activity: Nursing staff/CNE

Location: Former Saskatoon Health Region

Department/Unit: Acute care

Document Owner: NP&E

Date Prepared: November 8, 2018

Last Revision: Date Approved:

WORK STANDARD

Work Standard Summary: If undocumented waste is identified on the patient’s profile after patient has been transferred to a new unit, the transferring unit will still be responsible for having the healthcare provider document the waste.

Essential Tasks:

1. Upon transfer, when the receiving unit identifies undocumented waste on a patient, immediately notify the transferring unit’s charge nurse with patient name, MRN and short description of which controlled medication requires documentation.

2. The transferring unit’s charge nurse will then identify the staff member to document waste.

3. If the staff member is still on shift, the transferring unit’s charge nurse will notify that staff member to document the waste.
   To document waste when a patient is on another unit:
   Use the Facility Search option to locate the patient on the Pyxis MedStation and then document waste.

4. If the staff member has already completed their shift, the transferring unit’s charge nurse will identify when that staff member is scheduled to return to work. If they are scheduled to return in the next 24 hours, the charge nurse may pass the information through the following charge nurse to notify the staff member. If it is more than 24 hours that the staff member is scheduled to return, the information will be given to the CNE or MON to follow up with that staff member on their next shift.
   To document waste after a patient has been discharged:
   Add temporary patient with as much information as possible, then choose Waste and the Search All Meds function to find specific medication to be wasted.

NOTE:
Only factual explanations will be used to resolve controlled substance discrepancies or waste. Clearing these with unknown reasons goes against Policy 1127 – Narcotic Control: Documentation and Count and is therefore a culpable performance issue.

In accordance with the Controlled Drugs and Substances Act and the Narcotic Control Regulations, ALL narcotics must be tracked and documented. Discarding waste without two health care providers’ documentation will not be supported. Non-compliance with policy and Government of Canada Acts and Regulations can lead to legal follow-up with your licensing body.
WORK STANDARD

Location: Saskatoon Area
Department/Unit: Nursing practice and education, pharmacy
Document Owner:
Date Prepared: December 20, 2018
Last Revision:
Date Approved:
Related Policies/Documentation

Work Standard Summary: The Pyxis policy expects that an inventory count of controlled substances be run at least once a week. Each unit will have its own specified days that count will be performed on. In order to assess when inventory has been done, follow the outlined steps.

**Essential Tasks:**

1. Log onto Pyxis Server (production)
2. Select Reports ➔ Run reports
3. Select “All device events report” ➔ Group by device
4. Under device- ☑ allow selection
   ☑ Your unit
5. Under med classes- ☑ allow selection
   ☑ 2 (controlled substances)
6. Under Transaction type ☑ allow selection
   ☑ count inventory
7. Select Report Start date
8. “Run” the report
   You can eliminate columns so you can see who performed the count and what date if you choose to do so.
Work Standard Summary: Reports required for auditing can be added to My Reports on the server and then further scheduled to print at specific intervals to a secure printer.

**Essential Tasks:**

<table>
<thead>
<tr>
<th>Step</th>
<th>Task Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Log onto Pyxis ES Server</td>
</tr>
<tr>
<td>2.</td>
<td>Move to the Reports tab and choose Run Reports</td>
</tr>
<tr>
<td>3.</td>
<td>Choose a report and the filters required for desired information. (See policy under 3.17 for how to choose each type of report)</td>
</tr>
<tr>
<td>4.</td>
<td>Choose Run</td>
</tr>
<tr>
<td>5.</td>
<td>In the report viewer, in the bottom right corner, choose Add to My Reports and then name the report</td>
</tr>
<tr>
<td>6.</td>
<td>Close the report viewer and move back to the Reports tab, then choose My Reports</td>
</tr>
<tr>
<td>7.</td>
<td>Find the report you added (only the reports you added will show up here), then click on the clock icon</td>
</tr>
<tr>
<td>8.</td>
<td>Choose frequency, time and day of the week. Then the start date and choose no end date</td>
</tr>
<tr>
<td>9.</td>
<td>Add Printer – (Must be a printer in a secure location, NOT at a nursing station)</td>
</tr>
<tr>
<td>10.</td>
<td>Select landscape orientation and set to zoom level to desired amount (can preview what that looks like before choosing)</td>
</tr>
<tr>
<td>11.</td>
<td>Choose Ok. Reports will now print on the specified days and times to the chosen secure printer</td>
</tr>
<tr>
<td>12.</td>
<td>To edit in future – Go to My Reports and choose the clock icon on the report, then select edit</td>
</tr>
</tbody>
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