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Prescribing and Dispensing Medications within Correctional Environments: The Role of Health Information Technology

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Introduction

Going to a pharmacy and filling a prescription is not an uncommon experience. The process often begins with a visit to a physician or urgent care clinic. The physician makes an assessment and perhaps orders tests and if necessary fills out a prescription. The prescription is either in a paper format or, more frequently, in an electronic format that is transmitted to a patient-specified pharmacy. When collecting the medication at the pharmacy, the patient will present a form of identification and an insurance card, if one is not already on file. A patient without insurance will pay the pharmacy directly. When a patient receives the medication, the pharmacist reviews with the patient the physician instructions and dosage. Once that step is complete, the patient, regardless of what the pharmacist or physician has specified, is responsible for compliance.

Within the correctional environment, this process, like most, becomes far more complicated. In most cases, incarcerated people cannot decide on their own to contact their primary care provider, receive a prescription, have it filled at the local pharmacy, or even administer the medication themselves. The correctional institution is responsible for the entire process. This process includes identifying health conditions needing medication, verifying existing medications, ordering the medication, receiving delivery of the medication, and dispensing the medication. But the process does not end there, the correctional institution must also monitor and assure compliance.

The dispensed pharmaceuticals are not just analgesics or other over-the-counter type medications. Individuals entering correctional environments are often very ill, suffering from a host of ailments like diabetes, hypertension, mental illness, cancer, and a multitude of other conditions[1]. In fact, poor health is more the rule than the exception for people being incarcerated. There are 11.6 million people who cycle through our nation's jails each year. Of that population, 80 percent have chronic medical conditions that have not been treated, 68 percent have substance use disorders[2], and close to 15 percent of males and over 30 percent of females are seriously mentally ill (SMI)[3]. For a variety of reasons, many of these patients have inconsistently or never sought care for their chronic medical, mental health or dental needs.

Correctional institutions are legally required to respond to the health requirements of detained individuals, although the extent of that response often varies. Correctional institutions must provide healthcare because of a series of Supreme Court cases beginning in

1976 with *Estelle v. Gamble*[4]. This decision stated that correctional institutions cannot be deliberately indifferent to the serious medical needs of individuals within their custody, since that would contravene the Eighth Amendment's ban against cruel and unusual punishment. Jurisdictions can and have been sued for the negative outcomes of not providing medical care and medications to inmates.

Identifying illnesses and dispensing medications within correctional environments is not an easy task. Complexities abound when an institution takes over responsibility for every aspect of the health care of an individual. Identifying ailments requires an individual to cooperate with health care providers. This cooperation is particularly crucial when a person is booked into a correctional institution after arrest. Medical providers within jails are required to perform a health assessment. During a health assessment, health care providers will question a person about known health conditions and medications that the person is taking. Often an individual at booking can be under the influence of drugs or alcohol, have a mental health condition, and may be uncooperative. Even if the individual is cooperative, health providers need to validate any self-reporting with pharmacies or providers outside of the correctional environment.

While within a correctional institution, a person's health needs might change and systems must be in place to respond to these changes. To notify health care providers of changes, institutions implement sick call systems. Nurses triage all requests following nursing protocols for non-urgent needs as well as emergent conditions. If the inmate-patient is referred to a clinic, a physician may prescribe medications. Whether it is a physician within the correctional institution ordering pharmaceuticals or the correctional institution continuing medications prescribed in the community, the correctional institution needs a way of obtaining the medications and dispensing them.

In order to provide the prescribed medications, correctional institutions may have a pharmacy on site or contract with an external pharmacy which could a be local pharmacy or a national organization that directly services the correctional market. Once medications are delivered from the pharmacy, they then need to be dispensed. Dispensing requires knowledge of where the person is located within the institution, which can often change, and knowledge about the medication itself, its dosage, schedule, and course. In addition, inventory needs to be tracked, reconciled, and reordered. To perform these tasks, correctional institutions will often rely on multiple health information technology (health IT) solutions.

Unlike in the non-correctional environment where prescribing, dispensing and tracking are routinized, each correctional environment needs to develop its own systems, especially in regards to health IT. These differences are more pronounced in jails. Jails are county institutions usually responsible for newly arrested individuals not yet convicted of a crime or individuals serving sentences of less than a year. As county institutions, jails will develop systems independently of other jails. The reason for this heterogeneity are complex, but it could be best explained by the fact that jails are usually run by a sheriff, an independently elected official whose budget and health care provider is often controlled

and monitored by county officials, who are also, most likely, elected. Therefore budgets, health care resources, governance structures, and political relationships can greatly affect how systems are implemented. Prisons, on the other hand, which house people convicted of a crime usually serving a sentence of a year or more, may be able to more easily implement homogenous systems as prisons are either statewide or federal institutions.

With this diversity in mind, it is not hard to understand how different the delivery of health care and health IT solutions can be between correctional institutions. Some correctional institutions still employ paper systems to track the medication needs of incarcerated people. But in other institutions there might be electronic health records (EHRs), health information exchanges (HIEs), order entry systems, or electronic medication administration records (eMARs). These health IT solutions may be electronically interfaced or there may be manual solutions in place to assist in the transfer of data from one health IT solution to another. In the following sections examples from various correctional institutions will be discussed to show how health IT assists in the ordering, delivering, and dispensing of medication. Prominent among correctional institutions cited will be Vermont Department of Corrections[5], New York City Department of Correction[6], Bergen County Jail (New Jersey)[7], Washington DC Department of Youth Rehabilitation Services[8], Orange County Jail (Orlando, Florida)[9], and Multnomah County Detention Center (Portland, Oregon)[10].

But this discussion will not just be confined to correctional institutions. There will also be a section on how EHR vendors, pharmaceutical distributors, and related technical solution providers respond to the complex and multiple needs of correctional institutions, sometimes going beyond their core product line. Combining industry examples with correctional institutional implementations, the reader will see that what might appear to be the straight forward process of prescribing and dispensing medications involves correctional institutions in a multistep and multi-stakeholder process that is becoming more and more reliant on health IT to meet the health care needs of incarcerated people.

Identifying Health Needs Requiring Medications

Before addressing health IT solutions that directly involve the prescribing of medications to incarcerated people, it is important to describe the existing technologies within correctional institutions that assist health providers in identifying medication needs and technologies that provide inmates the ability to request medical assistance.

Initial Health Assessment

As already mentioned, there is an initial health assessment which is usually performed within a set amount of time after being booked into a jail. In the initial health assessment, there are several health IT solutions available to help health providers identify conditions that require medications and medications that have already been prescribed. Many facilities have adopted electronic health records (EHRs). Since the early years of this century many correctional institutions have migrated from paper medical records to EHRs. Since it is common that individuals can be detained multiple times, a person previously detained might have existing records within the EHR that can assist providers reviewing previous ailments and prescribed medications. Of course, this type of historical documentation is limited. Since a

previous incarceration, the individual could have developed other conditions and been treated by providers outside of corrections or could have been incarcerated in another institution whose records are often unavailable. Also, it is possible that this is the first time a person has been detained and no information is available. In these instances, the provider will most likely need to rely on self-reporting and the assessment itself.

In recent years, however, another option has become available. Through both private, local, and federal resources HIEs have been developed throughout the country. HIEs allow disparate providers to share records between EHRs through electronic portals either internal or external to the EHR interface. Some correctional institutions have begun to connect to HIEs. By this means, correctional providers can see records generated by providers outside the walls of corrections.

HIEs within corrections are not widespread but there are nevertheless examples of jails and prisons using this technology throughout the nation. The Vermont Department of Corrections, which oversees a combined jail and prison system, has access to data in the Vermont Health Information Exchange (VHIE) as well as health data from the systems used by the hospitals at the University of Vermont and Dartmouth in New Hampshire. New York City in its correctional facilities connects to the HealthIX that connects doctors throughout Manhattan, Brooklyn and Long Island. In Savannah, Georgia, the Chatham County Detention Center exchanges health data with the Georgia Regional Academic Community Health Information Exchange (GRAChIE) that serves healthcare providers across Georgia. The EHR in the jail in Lexington, Kentucky interfaces with the KHIE, the statewide HIE. Providers in the correctional facility in Pima, Arizona (Tucson), have access to health record through the Arizona Health-e Connection (AzHeC). In Portland (Multnomah County, Oregon), the Corrections Health Division of the county health department uses the Epic EHR within the jail. EPIC is used by roughly 80 percent of providers within the county including Federally Qualifying Health Clinics (FQHCs). Because of the high penetration rate of Epic within the county and because Epic has a product that lets health records be shared seamlessly between installations, the EHR functions as an HIE.

In a similar vein to HIE are pharmaceutical clearinghouses like Surescripts which routes e-prescriptions to pharmacies. Having access to prescriptions filled for individual can be almost as informative as a medical record itself in identifying health conditions. When local pharmacies are closed, after hours bookings of new arrivals may make medication verification difficult. For this reason, having universal electronic access to pharmacy records would ensure safe medication ordering for the nurses and providers. New York City contracts with a pharmacy data clearinghouse. It sends demographic data on inmates to the clearinghouse, which conducts a search against its database and has a current match rate of about 22 percent. For a period of time the underlying software infrastructure of the AzHeC, the HIE in Arizona, had a contract with Surescripts which allowed the jail in Pima, Arizona to view prescriptions for detained people. But, when the vendor for the software infrastructure was changed, the connection to Surescripts was no longer available. Another clearinghouse was made available but at $1.25 per query, the price was too prohibitive for the county. However, a reconnection with Surescripts is under consideration[11].

SickCall

Sick call was traditionally handled through a paper system. An inmate would write down on a sick call slip a description of the condition that needed medical attention and deposit the slip in a sick call box. In the case of illiterate individuals, a fellow inmate or correctional officer might fill out the slip. Depending on the institution, these slips are usually collected by a nurse at least once a day. The nurse then triages the sick-call slips to determine who can be seen by the nurse or a physician. To track the sick-call slips some correctional institutions scan the sick-call slip into the record of the EHR. This is the process that is employed in Bergen County. Sick call slips are scanned into Fusion[12] a correctional version of General Electric's Centricity EHR. Other EHRs like CorrecTek in Vermont allow for manual entry of these sick call slips so that they can be electronically tracked and triaged.

The challenge with sick-call slips is that they can go missing or inmates may claim that they have filled out a slip and their request for medical attention was ignored. To avoid these issues and make certain that requests are responded to and medications prescribed when needed, a number of correctional facilities use electronic kiosks to capture medical requests. In some jurisdictions, the requests are printed out and the nurse then proceeds to enter the list into the EHR (similar to Vermont) so that triaging can be electronically tracked. But even with electronic kiosks, gaps can occur and transferring a request from a kiosk record to an EHR. To address all possible gaps the jail in Orlando (Orange County, Florida) has a sick-call kiosk that interfaces directly with the EHR. This kiosk is a phone system from which an inmate can select language and then proceed down a phone tree to specify ailments. A sick-call list is maintained within the EHR (a version of Centricity specifically modified for this jail) and the sick-call request is recorded within the persons health record.

Prescribing and Ordering Medications

Once the nurse at the initial medical assessment or the nurse triaging sick-calls slips makes the determination that the inmate needs to see a provider, the nurse can notify the physician in several ways: make a phone call to a physician, text the physician (in the rare correctional institutions where cell phones are permitted), schedule an appointment, or immediately send the inmate to a physician. After the physician examines the patient and determines medication or medications are warranted, a prescription is ordered and submitted to a pharmacy.

Correctional institutions themselves may or may not have pharmacies on site. If there is no pharmacy the institution will at least have a stockroom or med room as it is commonly called. This is the area where commonly prescribed medications are stored and is the activity hub for all medication related activities. This includes ordering, tracking inventory, preparing for dispensing, and stocking and reconciling medications. The actual medications are usually supplied by a pharmaceutical distributor specific to the correctional environment. The distributors most commonly cited are Diamond, Maxor National Pharmacy Services, BosWell Pharmacy Services, Correct RX, and Contract Pharmacy Services[13]. These distributors specialize in overnight deliveries using FedEx or UPS. There are also local pharmacies that correctional institutions may rely on either as their sole source of medications or as an emergency backup.

Transmitting Prescriptions

Whether there is a pharmacy or not, the prescription made by a provider needs to be transmitted to a pharmacy or to the distributor. If this transmission is through an electronic interface between EHR and the distributor, the means to achieve this is through an order entry system. The order entry system cited by most institutions is a product called CIPS by Kalos, a company in Topeka, Kansas[14]. Most correctional EHRs interface with CIPS --a rare example of one technological solution from one vendor being employed across multiple correctional institutions. In the Bergen County's jail, orders for medications entered into Fusion are transmitted via an interface with CIPS to Diamond. Likewise, the District of Columbia's Youth Rehabilitation Services also employs an interface between CIPS and Fusion; however, its pharmacy vendor is Correct RX. At Vermont's DOC, which is comprised of eight facilities, the EHR is CorrecTek[15]. Again, this is another example of an EHR interfacing with CIPS, but in this instance the pharmaceutical distributor is BosWell Pharmacy Services.

Sometimes ordering medication may be more complicated because of the health IT infrastructure. In Portland, Oregon, the jail also receives its pharmaceuticals from Diamond; however, there is no direct interface between the Epic EHR and Diamond because Epic is not designed with the correctional market in mind. Instead, Epic does have an interface with Surescripts to order pharmaceuticals, but that interface does not include data elements necessary for an order to Diamond. Health providers, therefore, enter their orders directly into Sapphire, an order and inventory management system that uses CIPS to interface with Diamond. There is, however, an interface from Sapphire back to Epic. When an order is entered into Sapphire, Epic is updated with the order information. This solution may sound convoluted, but often because of budgetary constraints optimal solutions cannot be implemented. In this case, an interface that transmitted orders directly to Sapphire from Epic was deemed too costly. Since Epic has a large presence in Multnomah County, the jail's access to the county-wide health provider records makes the manual entry into Sapphire worth the extra step.

So far, the presented examples have been of institutions that interface directly through the EHR to the pharmacy distributors. But there are institutions that have their own pharmacy management systems. Both Orlando and New York City have onsite pharmacies which are stocked respectively by Cardinal and Diamond. In both instances, these jurisdictions have their own pharmacy management system. In Orlando, the pharmacy management system is BD Medical Pharmaceutical Systems (BDM). A fully integrated interface between the EHR (Centricity) and BDM is not implemented. When the provider orders a medication in the EHR the order automatically prints out in the pharmacy. There the order is entered into the pharmacy system for the pharmacist to fill the prescription.

New York City's correctional institutions had a similar workflow to Orlando's. The medication order was not directly sent to Ascend, the pharmacy management system. Instead, the order was printed out from the jail's EHR, eClinicalWorks (eCW) and sent to the pharmacy. However, in 2016, the state of New York implemented a requirement that all providers, even in corrections, needed to electronically prescribe. This necessitated the correctional institution's implementation of an interface between eCW and Ascend, and as a result orders are automatically transmitted from the EHR to the pharmacy management system.

Inventory

Whether correctional institution has a full-blown pharmacy or just a stockroom, the facility will most likely maintain a stock of commonly ordered medications. To prevent a shortage of these medications, correctional institutions track PAR (Periodic Automatic Replenishment) Levels. For this reason, in Vermont, even when there is sufficient medication, the pharmacy distributor receives a copy of all orders to maintain an accurate record of what medications are in the stock room and resupplying when the PAR levels are insufficient. In Orlando's stockroom, there is a locked medication tower that keeps track of PAR levels. The pharmacist sets the PAR levels for the tower and orders are made once or twice a week to replenish medications. New York City has a more involved system for maintaining PAR levels. There are multiple jails on Rikers Island (the main complex of jails) and other jails throughout the boroughs of New York City. Each jail's clinic keeps certain inventory on hand. When the PAR levels are insufficient, the medications are replenished from the pharmacy warehouse on Rikers Island. When the pharmaceuticals are transferred, the warehouse management system updates the pharmacy management system. These systems are not only important for tracking PAR levels but also for the tracking medication expiration dates.

Formulary

Any discussion concerning prescribing medication in corrections would not be complete without mentioning formularies. Like hospitals, health plans, and insurance policies, correctional institutions maintain formularies. Formularies are lists of medications from which a provider can prescribe. Similar to the use of formularies in non-correctional environments, formularies in corrections are designed to address the health needs of incarcerated people while also controlling costs. Often correctional pharmaceutical vendors will work with correctional institutions to create a formulary. Formularies will usually be maintained in the EHR to guide providers in selecting the appropriate medications.

In certain instances, however, providers may well consider that a non-formulary medication is called for. When this happens, procedures vary between institutions. In some instances, a verification is made to ascertain that there is not a similar medication on the formulary. Sometimes an institution may decide to continue a non-formulary medication if the patient is doing well on a medication that was prescribed before incarceration. In other institutions, off-formulary medications are only allowed for psychotropics and newer HIV drugs. Some institutions have a paper procedure that needs to be completed for an off-formulary medication to be ordered. Other institutions have forms available in their EHR to request off-formulary medications, and it is common for the medical director to have the final say on whether an off-formulary medication is approved. In Vermont, a work flow within the EHR handles all aspects of a non-formulary requests for psychiatric and somatic medications. This includes the original order, a required form to detail the reasoning for the request, the medical director's decision, and notification to the nurse for administration of the medication. Once an off-formulary medication is approved, the scenarios for ordering is generally no different from the scenarios described for prescribing medications.

Delivering and Dispensing Medications

Pharmaceutical distributors deliver medications to jails in multiple formats. The most common format is blister packs. A blister pack contains the medications for one individual during a medication pass (or med pass). The packaging, similar to many commonly available over the counter medications, consists of a thin cardboard panel with each pill encased in a plastic bubble or "blister". Behind the pill is an aluminum backing through which the pill can be pushed in order to dispense. Another less common format is strip packaging. Strip packaging is a series of connected plastic satchels specific to one patient. Each satchel contains the medications for a single med pass. Besides blister packs or strip packaging there are free standing pills that may not be identified as being for a specific patient and are generally delivered within pharmacy bottles. It should also be mentioned that volatile medications needing refrigeration, usually by means of dry ice, will be shipped in their own specific packaging.

Between institutions there is a basic similarity in the steps used for dispensing medications. These steps include verifying orders, loading medication carts, and the actual dispensing of the medications themselves. Other steps that are closely related are handling missed medications, discontinuing and modifying medication orders, preventing diversion, and supplying medications post incarceration. There are naturally variations in these workflows depending on institutions' physical layouts, medication packaging, and technologies available.

Verifying Orders

When medications are delivered from onsite pharmacies or vendors, jurisdictions will match medications ordered with the delivered pharmaceuticals. In Bergen County, a pharmacy technician checks the orders recorded in the EHR. Likewise, at the Washington DC Youth Rehabilitation Services, when the medication arrives a nurse double checks the prescription label with the actual order in the EHR. In Vermont, a nurse compares the list of what has been delivered with what has been ordered by scanning each blister pack.

Loading Medication Carts

When medications are delivered to correctional institutions, they are usually placed into carts for dispensing. In institutions with multiple units there are carts specific to each unit. Typically, carts have the ability to organize medications by patient. In Vermont, the carts are divided by large plastic tabs with patient names. In New York City, the carts have trays specific for patients where the medications are placed. In both of these examples, the medications are delivered in patient specific blister packs. But, in jurisdictions that receive free standing medications, the carts might have drawers specific to medication rather than patients.

Dispensing

Dispensing medication requires a medication administration record (MAR) that specifies who receives the medication and the medication dosage. MARs also capture whether the medication was dispensed. Many correctional institutions rely on paper MARs for dispensing. However, there is a distinct trend to use electronic MARs (eMARS) for dispensing in corrections. EHRs specifically designed for corrections will often have an integrated eMAR

solution. This is the case for the jurisdictions already discussed (Vermont DOC, Bergen County, and District of Columbia's Youth Rehabilitation Services) that use CorrecTek and Fusion. In these examples orders as well as discontinued and changed dosages are immediately visible to health providers in the systems interfacing with the eMAR. But, there are other examples where the eMAR does not interface with the EHR. Porltand's jail uses the Sapphire ordering system for Diamond as the de facto eMAR. Although eCW has an eMAR, New York City chose not to use this product. Instead New York City uses an eMAR by Mediware that interfaces with its Ascend pharmacy system. Another solution common within corrections is to use the inmate management solution (IMS) as an eMAR. In Orlando, the IMS interfacing with the EHR that has an eMAR component. IMS connections are valuable as the location of inmates can often change[16]. Generally, the IMS is the technology that tracks movement and an interface with the eMAR would in many cases be the most direct method of updating the record and making sure the individual does receive the prescribed medication in the correct location.

An eMAR might be cloud based or installed locally on the internal network of the correctional institution. For dispensing purposes, the eMAR runs on portable devices such as laptops or tablets that accompany medication carts. The portable device running the eMAR can be networked either by cable or by Wi-Fi. However, in many cases, because of the construction material used in corrections, physical or Wi-Fi connections are not always possible. In these instances, the eMAR will upload its data once it is returned to area where networking is possible.

When med passes occur, medication carts with devices running an eMAR are taken into units where they will be centrally located and detainees will line up or be called up to receive their medication. There is a process of identification that needs to be performed before medications are dispensed. In Orlando, the LPN dispensing the medications scans the inmate's identification card and a list of medications is displayed on the eMAR. Medications are taken from the medication cart and dispensed to the patient. The eMAR then records that dispensing has occurred. Since technologies differ from jurisdiction to jurisdiction, the process for identifying an inmate varies. Vermont does not have scanners, but inmates do have identification cards. To receive medications, the patients present their identification cards and state their birthdate. The nurse enters the name into the eMAR and verifies the displayed birthdate while checking the identification card.

In most institutions, there are subsets of inmates that cannot safely line up for a group med pass. These detainees are segregated because of a predilection towards violence, mental illness, or a need for protection. Segregated inmates remain in their cells during med passes. A correctional officer will accompany nurses and will open the cell for the nurse to dispense.

Whether patients receive medications in their cells or in a pill line, there is the possibility that the individual will not actually take the medication. If a medication is not swallowed, it can easily become contraband to be resold for non-prescribed purposes or it might be hoarded to be used later for self-harm. Therefore, there is often a process to verify that medications are ingested. This process is commonly known as direct-observation therapy (DOT). A correction officer will perform a mouth check inspecting beneath the tongue and around the gums.

There are other medications that are not so rigorously surveyed such as Tylenol or Motrin. These are known as keep-on-person (KOP) medications. Patients will often receive a 30-day supply. KOP medications are a subset of take-as-needed medications commonly referred to as PRN medications. PRN medications vary widely depending on state and jurisdiction. PRN medications can include the common analgesics, antihistamines or even valium and Xanax. Both KOP and PRN medications are often tracked within the eMAR, but this may not always be the case. In many institutions, some over the counter medications can be purchased from a commissary, and these might not be tracked.

Missed Medications

There are instances when medications might not be dispensed to a detainee. A detainee might be at court, be on a work crew, or a detainee might refuse medication. eMARS track dispensing anomalies. CorrecTek's eMAR tracks delivered, refused, or not present. Medications are color coded to indicate the hierarchy of need. Similarly, in the Fusion eMAR, when medications are not dispensed, the nurse logs the event as a non-administered dose with a drop-down list for the nurse to specify the reason.

There are different ways in which institutions handle non-administration. At the Washington DC's Youth Rehabilitation Services, if court appearances are scheduled, medications will be dispensed before children are transported. In Orlando if for some reason other than refusal the medication administration did not occur, it might be rolled over to the next med pass. In Vermont, a provider might be contacted to administer a missed medication when warranted, even if it is beyond the administration window.

All missed medications are of concern but refusals are especially challenging. Refusals can be symptoms of mental illness or oppositional behavior, which if not addressed can lead to self-harm and even death. An eMAR that tracks refusals is important but also policy and procedures that actually specify what to do in such cases are essential. In Orlando, the policy is to have patients sign a form indicating they have refused. The health provider will describe to the patient the medical consequences if medication is refused. If the patient refuses three consecutive medications, they are scheduled for a doctor's sick call. If the medication is critical like insulin, then the nurse informs the doctor, and blood sugar is monitored. Vermont uses CorrecTek's color coding of medications (yellow, orange, red) to govern the response of nurses. Yellow indicates the lowest risk, orange is medium risk, and red, the highest risk. A missed medication report in CorrecTek is run at least every 5 days and nurses will contact the patient for a discussion about why they are missing their medications. At the third refusal, the report flags these patients and the nurse will seek an explanation from the patient. These conversations may lead to medication discontinuation (if there are adverse reactions to the medication), a visit with the provider, a symptom check, patient education, or continuation of the prescription until the next appointment when changes may be made to the prescription. For refusals of orange or red medications, the patient needs to sign a refusal form and for medication classified as red, the provider may decide that the patient needs to be monitored or that a visit to an emergency room is required.

Discontinuing and Modifying Medication Orders

During the prescription process, physicians will enter the medication and the dosage as well as a termination date for the medication into the EHR. In most systems that interface with a pharmacy system, medications will be discontinued at a set point in time so that the delivery of medication will be halted. As mentioned earlier, Orlando does not have a direct interface with its pharmacy system. The EHR prints out medication changes in the onsite pharmacy and those changes are entered into BDM, the pharmacy system. This workflow, although not automatic, still accomplishes the same goal of modifying delivery of a prescription although with an extra step.

But it is not enough that a pharmacy stops delivering medications or modifies dosages, the eMAR used to dispense the medication must also reflect any changes in an order. In Orlando, the pharmacy system is updated manually rather than directly through the EHR, but changes within the pharmacy management are propagated automatically to the tablets running the eMARs that go out into the units. In Bergen County, Washington DC's Youth Rehabilitation Services and Vermont, both Fusion or CorrecTek are seamlessly integrated with the eMAR and all changes made in the EHR are reflected immediately in the eMAR.

Throughout this discussion on discontinuing medication and modifying a prescription, it has been assumed that the changes are generated by health providers but this is not always the case. In jails, a detainee's release can be unpredictable. Most people in jail have not been convicted and can be released at any time by the court or bailed out by a relative or friend. In addition, an inmate can be transferred to another correctional institution as happens in Vermont that has contracted with facilities in Pennsylvania to limit overcrowding. For these reasons, it is not uncommon for there to be an interface between a jail management system and a pharmaceutical system like CIPS, or the IMS to interface with the EHR which in turn interfaces with the pharmacy management system.

Preventing Diversion

Unfortunately, it is not unheard of that some medical staff within corrections may divert medication for personal use or to be resold inside or outside the facility[17]. It seems that no electronic system can fully prevent diversion. To try and prevent diversion there are certain strategies that correctional institutions have implemented. For narcotics, there will be a count before and after each shift requiring signatures from two nurses. If there is not a correct reconciliation, some correctional institutions like in Vermont will perform a search. When an institution has a pharmacy on site as in Orlando, the pharmacy has an exact count of what has been put on the medication carts. Empty blister packs must be returned in the cart as a means to verify dispensing. Bergen County and Vermont have a log book for controlled substances, and two signatures are required to verify the correct count for all narcotics. Another way an institution can detect diversion is through inmate grievance which in some institutions can be entered into kiosks used for sick call. Inmates can use the grievance process to complain that prescribed medications have not been dispensed. However, basing suspicion of diversion solely on grievances without corroborating discrepancies in log books or other tracking mechanisms creates a difficult situation that pits an inmate's word against that of a health provider or even a correctional officer who might accompany a health provider dispensing medications.

Supplying Medications Post-Incarceration (Discharge Medications)

Many correctional institutions supply medications to individuals when they are released. These medications are commonly referred to as discharge medications or sometimes as bridge medications. Knowing when to supply discharge medications is not a simple matter especially within jails where a person can be released at any time. But, in the instances when a release is predictable, this information can be shared with correctional health providers in various ways. IMSs often interface with EHRs and health providers can view the correctional calendar within the EHR or the correctional health providers may have direct access to the IMS itself. In some cases, correctional staff may print out a report of imminent releases. Discharge medications are often stored with the person's property which is returned to the individual on release. For those individuals released unexpectedly, correctional health providers, when notified, will also include medications in the person's property. But it is often the case that a person released from court may not return to a correctional institution to collect property or whatever medications have been placed with the property.

Just as important as providing discharge medications is the question of how much discharge medication to supply and this depends on the institution. Some jails, like Bergen County, provide the balance of the remaining medications. This means that an individual might receive as much as a 60-day supply. In other institutions quantity ranges from three to a thirty-day supply. Or even within an institution the case may vary for individuals. Vermont varies the amount based on the amount of time spent within the facility. Generally, the policy is to release a person with a thirty-day supply in the blister packs used to distribute the medication or prescriptions are phoned into the pharmacy of the patient's choice. However, for newly detained persons, who might be quickly released, the health provider will ascertain if the detained person is on any medications and then verify with that person's pharmacy if the prescription has recently been filled: if then the newly detained person is released quickly and a prescription was recently filled, a thirty-day supply of medications might be deemed unnecessary. Another variation in Vermont is that case workers may make an appointment with a provider in the community who will take over the care of the individual in the community prescribing the necessary medications.

Selecting from a Diversity of Options

Correctional environments are complex, and it is often difficult to make generalizations about how technological solutions are implemented that can be applied to all institutions. Wading into this idiosyncratic environment pharmacy suppliers and health IT vendors need to anticipate what clients are seeking and often will provide services and solutions beyond the scope of a core product.

eMARs are important component in dispensing medications, yet they are not as widespread as EHRs in corrections. Many facilities still depend on paper systems. Nevertheless, all the major players in the EHR market believe market forces are moving in the direction of eMARs and so offer some type of eMAR component. The medical director of the District of Columbia Department of Youth Rehabilitation Services reported that one of the reason that Fusion was selected was because it had an eMAR component integrated with the EHR. For him it was very important that provider orders and modifications to orders would be propagated to the eMAR, and subsequently whether the medications dispensed status could be viewed in the EHR.

Although Kalos is well known in the correctional environment for its CIPS product that interfaces between correctional EHRs and pharmacies, its business strategy tries to take into account all the permutations of a correctional institution's health IT infrastructure. Many smaller institutions may not have an EHR and may be still using a paper system. In these instances, Kalos has a computerized physician order entry system (CPOE) so these institutions do not need to rely on faxes to submit an order to a pharmacy. Although CIPS has been cited already as interfacing with EHRs to receive transmission of orders, Kalos also interfaces with IMSs. Since detainees can often be moved from unit to unit, it is important when medications are dispensed that the movement of the individual has been communicated between all systems. And to cover all bases, Kalos like the EHRs already mentioned, has developed an eMAR for the correctional environment.

But not only health IT vendors offer additional products to their core products. Pharmacy vendors will often provide services beyond just delivering medications. In a response to a request for proposal (RFP) released by the Delaware Department of Corrections for a pharmacy vendor in 2014, the incumbent pharmacy vendor, Correct Rx, detailed how it was supplying technical expertise to integrate with the department's EHR and its eMAR[18]. It also specified that it was using Kalos's CIPS software to allow the department's EHR to transfer current pharmacy data electronically. In addition, detailed scope of work and testing plans were included.

How a correctional institution makes a selection of software is as diverse as the options available. As was mentioned in Delaware there was an RFP process used to make a selection for a pharmacy vendor. However, an RFP may request many different combinations of technology described above. An RFP may not be primarily for a pharmacy vendor, but can be for an EHR that may include a specification for an eMAR or an interface with a sick call kiosk. In other instances, depending on jurisdictional policy an RFP may not be required. Choices impacting medication ordering, delivery, and dispensing might be at the discretion of a sheriff, warden, medical director, IT director, or some combination of all. Where a hospital or public health department has been put is in charge of medical delivery they might decide to bring in their own health IT solutions and pharmacy.

Conclusion

In the community, providers can assume that when they write a prescription that there exists an infrastructure such as a pharmacy where their patients can go to fill that prescription. Within correctional institutions, no such assumption can be made. The correctional institution not only needs to provide for the medication needs of incarcerated individuals but also the institution needs to build the infrastructure that allows for there to be a health provider with the qualifications to diagnose and prescribe, a pharmacy to fill the prescriptions, and health care professionals to dispense the prescribed medications. And in each institution, those in charge (whether they are health providers, civil servants, wardens, sheriffs, elected officials outside of public safety, or a combination of all of these stakeholders) must decide how to put that infrastructure together. So, it is easy to see why health IT solutions can be so different between institutions but are nevertheless deemed necessary for so many. A health IT infrastructure helps automate many of the tasks associated with the prescribing of medication and permits providers like those in the community to concentrate on what needs to be done as opposed to how it is to be implemented.

Although this paper has described the different processes and health IT solutions involved in the prescription process, these systems are not perfect. Medications may not be prescribed or dispensed. The reasons for these omissions are various: some health care vendors specific to corrections have been accused of putting profits above health, and it is not unheard that detainees will malinger and request medications that are not required, which might cause health care providers to become inured to such requests. But whatever the reasons for the negligence, a person's health care might deteriorate or even end with death[19]. These negative outcomes can occur to someone convicted of a major crime, a minor crime, a misdemeanor, or no crime whatsoever, since being arrested and booked into jail is not necessarily indicative of a crime.

When someone's health is seriously impacted on account of not receiving treatment within corrections, expensive lawsuits can follow and public trust in institutions can be diminished. Jurisdictions and officials overseeing correctional institutions are aware of these outcomes, having most likely experienced a lawsuit and negative public perceptions or know of other institutions that have. The panoply of health IT solutions discussed could be interpreted as more than just a means to create a robust infrastructure, but to have health IT streamline health workflows and let the correctional institution perform its main function of providing a safe and secure environment. But no matter how advanced a health IT system is, if no health care provider responds to a to the warnings that are being generated when a person perhaps because of mental illness is refusing lifesaving medication, then an interface between an EHR and an eMAR cannot solve this issue. Such technological solutions are in reality just bits and bytes of electronic data transmitted between different systems and not health care. For this reason, many institutions will implement clinical quality improvement process to address and rectify when systems are not as effective as they should be.

But correctional institutions are not always in a reactionary position being governed by the last negative event. In response to the opioid epidemic, some correctional institutions have been influenced by recent studies that suggest that opioid addiction is more insidious than previously thought and that brain chemistry is changed by the drug. Instead of enforcing abstinence some institutions have begun to prescribe drugs related to medication-assisted treatment (MAT)[20]. These drugs can include Methadone, Suboxone, or Vivitrol. Some institutions supply Naloxone (also known as Narcan) upon release which is used to block the effects of an overdose as many released individuals who are addicted to opioids will assume that they can tolerate dosages similar to the ones that they were using pre-incarceration. How the usage of MAT plays out in the future in corrections is worthy of a more in-depth analysis as these solutions evolve, especially from a health IT perspective and legal protections surrounding substance abuse treatment.

Finally, having attempted to discuss the multiple issues involved with providing medications to incarcerated people, it is very hard to imagine any one health IT system that could be used as a boiler plate solution for all correctional institutions given the difference that exists between jurisdictions. What can be offered to guide institutions is more of a simple meta-rule that is prevalent across the correctional institutions cited: medication prescribed, must somehow get delivered and then dispensed to the patient in a timely manner. And whether that might entail a paper-system, a hybrid paper and health IT solution, or a

complete health IT system, the goal is to make sure that by whatever means the correctional institution has at its disposal, it ensures compliance to a prescription for the patients under its care.

Endnotes

1 Minton TD. Jail inmates at midyear 2012—statistical tables [Internet]. Washington (DC): Department of Justice, Justice, Bureau of Justice Statistics; 2013 May [cited 2014 Jan 21]. Available from: http://www.bjs.gov/content/pub/pdf/jim12st.pdf

2 Substance Abuse and Mental Health Services Administration. (2003). Results from the 2002 National Survey on Drug Use and Health: National Findings (Office of Applied Studies, NHSDA Series H-22, DHHS Publication No. SMA 03–3836). Rockville, MD.

3 Substance Abuse and Mental Health Services Administration, Results from the 2012 National Survey on Drug Use and Health: Mental Health Findings, NSDUH Series H-47, HHS Publication No. (SMA) 13-4805. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013.

4 429 U.S. 97, Estelle v. Gamble, 1976, http://www.law.cornell.edu/supremecourt/text/429/97

5 Information about the Vermont Department of Corrections is based on interviews and correspondence with Ben Watts, Health Service Administrator for the Department of Corrections and Sharon Butler, Director of Staff Development, Centurion Managed Care.

6 Information about the New York City Department of Correction is based on an interview with Richard (Rick) C. Stazesky, Jr. MP, former Senior Director, Information Technology, Correctional Health Services, NYC Health + Hospitals.

7 Information about the Bergen County Jail is based on an interview with Josephine Rodriguez MSN, RN Director of Nursing, Bergen County Jail.

8 Information about the Washington DC Department of Youth Rehabilitation Services is based on an interview with Dr. Alsan Bellard, Medical Director

9 Information about the Orange County Jail is based on interviews and correspondence with Jane Jenkins, former Administrator, Orange County, FL, Corrections Health Service.

10 Information about the Mutlnomah County County Detention Center is based on interviews and and correspondence with Nancy Griffith, the former Director of Corrections Health.

11 Information about the Pima County Detention Center is based on interviews and correspondence with Spencer Graves, Special Staff Assistant at Pima County Health Department.

12 Information about Fusion is based on correspondence and interviews with Eli Dunn, Executive Vice President, Fusion Consulting.

13 Information about pharmaceutical distributors is based on an interview with Scott D. Seres Director of Sales and Marketing, Contract Pharmacy Services.

14 Information about Kalos and CIPS is based on an interview with Kristin Runyan, CIPS Project Manager, Kalos Inc.

15 Information about CorrecTek is based on correspondence and interviews with Dan Jarett, President, CorrecTek.

16 Knox, Catherine M. “Medication Reconciliation.” Correctional Health Care Report, March/April 2018, 33- 34 and 46.

17 https://www.daytondailynews.com/news/crime--law/former-jail-medical-director-admits-stealing-drugs/X61vCM2fqUNeTgI77ZI5fI/

18 http://bidcondocs.delaware.gov/DOC/DOC_1427-PHARM_AN1.pdf

19 http://www.newsobserver.com/news/politics-government/politics-columns-blogs/under-the-dome/article200511079.html https://www.delawareonline.com/story/news/local/2018/02/23/suit-terminal-cancer-spread-prison-neglected-delaware-inmates-pleas/346489002/

20 https://health.usnews.com/health-care/articles/2018-02-20/fatal-opioid-ods-drop-for-people-treated-while-jailed https://vtdigger.org/2018/03/13/senate-votes-to-expand-prisoners-addiction-treatment/ https://www.reuters.com/article/us-health-addiction-prisoners/pioneering-approach-to-addiction-in-rhode-island-jails-saves-lives-idUSKCN1GA29V https://www.sctimes.com/story/news/local/2017/09/28/little-falls-opioid-fight-teamwork-critical/712043001/ http://www.santafenewmexican.com/news/local_news/santa-fe-jail-steps-up-effort-to-help-inmates-with/article_65fe9649-1cd2-5f1f-acbb-2fc3ed677df6.html