FROM HOSPITAL TO HOME

A Process Map for Successful Infusion Therapy Transition
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Healthcare delivery in the United States is rapidly evolving with many forces driving the change. The aging population, nearly half of which have a chronic medical condition, has contributed to rising healthcare costs (Ward, 2014). Healthcare workforces are changing, including staff shortages and the type of staff needed. Annual growth of healthcare spending has surpassed the rate of inflation for many years, with the burden increasingly shouldered by consumers (Lorenzetti, 2016).

The role healthcare providers play in evolving delivery models is critical to ensuring patients receive the care they need following a hospitalization to avoid a re-hospitalization that can result from ineffective care transitions or management (AHA, 2015). Improving transition of care communications has been a goal of The Joint Commission’s Center for Transforming Healthcare since the late 2000s.

As evolving healthcare reimbursement models shift the focus from fee-for-service to value-based payments, healthcare providers must become adept at utilizing patient outcomes to evaluate the effectiveness of the care provided. Penalties now associated with re-hospitalizations that can result from ineffective care transitions or management (AHA, 2015). Improving transition of care communications has been a goal of The Joint Commission’s Center for Transforming Healthcare since the late 2000s.

Sending patients home to self-administer and monitor their care requires significant coordination and hand-off between healthcare professionals at each step along the care continuum. Currently there isn’t one particular group, or organization to take responsibility for moving healthcare from clinical settings to the home. Patients previously hospitalized for short-term acute episodes of care such as wound management, are increasingly being sent home for post-acute care with equipment, supplies, and education to manage on their own—typically with intermittent visits from a healthcare professional.

To address these and other issues, in October 2013, AAMI and the United States Food and Drug Administration (USFDA) held a Summit on Healthcare Technologies in Non-Clinical Settings. (AAMI, 2013) working from the premise that the movement from hospital-based to home-based care is increasing.
Approximately 150 summit participants determined the use of advanced healthcare technologies by lay persons to be an alarming outcome of the growing movement from hospital to home-based care. Over the course of the summit, clinical to non-clinical transitional models of care became a critical focus.

Participants agreed that technology is advancing at a rapid pace to meet the changing environment for the lay person; typically, a patient or a caregiver. Advances can be seen in mobile apps, telehealth, monitoring systems, wearables, interoperable products, and smaller and more portable healthcare products. While technology is moving toward patient-centered and patient-controlled care, there still need to be assurances that such technology can be transitioned and used safely in non-clinical environments.

Roles and responsibilities by healthcare professionals are designed to be very clear in a clinical setting; however, when a patient has transitioned from a clinical setting to a non-clinical setting, roles and responsibilities for healthcare can become unpredictable and disjointed. Patients assume responsibility for some or all aspects of their care, with healthcare provider roles varying based on patient and caregiver needs. This can lead to miscommunication, with necessary actions or tasks being mishandled or forgotten, impacting care as roles become confused, leading to inappropriate “handoffs” from one setting to another. Most importantly, it creates a potentially unsafe or dangerous situation for the patient and increases the likelihood of an avoidable readmission to the hospital because of poor continuity of care.

Two clarion themes emerged from the summit that spoke to the need for a collaborative and comprehensive approach to improving the delivery of healthcare access across all settings. First, is the need to advocate for a model for safe and coordinated transition from the clinical to the non-clinical environment; and second, to develop a systems approach, encompassing people, workflows, therapies, technology, and payment that would demonstrate safe movement and transition of the patient from the hospital to the home. Participants at the summit determined that synchronizing these critical themes through a systems or process model, the results of which are contained in this publication, should ultimately lead to improved quality in patient care. (AAMI, 2013).

In 2016, the AAMI Foundation (AAMI Foundation, 2018) convened a team of subject matter experts to consider clinical to non-clinical transitional models of care. Given the wide scope of concerns, and based on conversations with pharmacists, nurses, physicians, and representatives of home infusion agencies, home medical equipment suppliers, and patient advocates, the AAMI Foundation determined that developing a systems model on a smaller scale was the best way to begin to address this issue.

The AAMI Foundation team of experts chose to focus on infusion therapy, and set out to develop a process to assist healthcare providers to create the ideal state for infusion therapy transitions from hospital to home.
THE CURRENT STATE of Infusion Therapy

Based on discussions during the 2013 AAMI summit by the National Home Infusion Association (NHIA) and the Infusion Nurses Society (INS), and post-summit conversations with pharmacists, nurses, physicians, and representatives of home infusion agencies, home medical equipment suppliers, and patient advocates, the AAMI Foundation chose to begin addressing transition of care concerns by developing a systems model on a smaller scale, specifically a roadmap, or guide, to establishing the proposed “future state” for infusion therapy.

Infusion therapy has migrated and advanced beyond the very first infusion therapies administered in the home: total parenteral nutrition (TPN) and antibiotics (Gorski, 2010). As longer term vascular access devices (VADs) and smaller, more ambulatory pumps, infusers, and implantable pumps made their way into the market, patients have experienced greater independence. Today, technologies for infusion therapy are capable of meeting the needs of medically sophisticated patients in the non-clinical setting.

Individual home infusion pharmacies have established processes for coordinating services based on the type of nursing care provided; however, no standardized process exists for all providers, including acute care hospitals, to follow as patients are transitioned from the hospital back to the home with infusion therapy. Home infusion medications are prepared and dispensed by a licensed pharmacy; however, home infusion nursing care can be provided by nurses employed by the pharmacy, a licensed home health agency, or nurses working in a physician’s office or outpatient clinic setting.

Developing the infusion therapy process presented in this guide allowed for further evaluation of this transition of care, identifying potential gaps in communication and process, and opportunities for standardization that can promote an integrated approach to home infusion therapy.
As noted in the Introduction, in 2016 a team of subject matter experts was convened by the AAMI Foundation to develop a process to assist healthcare providers in creating a standardized methodology for transitioning infusion therapy from hospital to home. The process can be used to determine if certain practices should be adopted within an agency’s or hospital’s current model, to identify potential gaps and constraints to implementing those practices, and to make the necessary adjustments or changes to enable the organization to successfully improve its methods of transitioning infusion therapy from the hospital to the home.

In crafting this process, the team worked from the following assumptions:

- Patients are transitioning from the hospital in-patient setting to the home environment
- The guide focuses only on adult patients
- There is a prescription for infusion therapy in the home environment
- There is access to a home infusion provider
- Reimbursement issues are addressed throughout the process
- Communication across the inter-professional care team occurs throughout the process
- Documentation is encompassed throughout the process
- The patient’s access to care is based on payer coverage policies

The team reviewed available standards and guidelines and other materials related to the transition of infusion therapy from hospital to home. They conducted a gap analysis to determine differences across states and between agencies, and finally, they created a process that would help institutions bridge the gaps between their own current state and the desired future state. The AAMI Foundation team determined that in the world of home infusion therapy, a single model would not work for all organizations; however, there exists a set of actionable tasks or activities essential to building and maintaining a successful process to ensure patients receive safe and effective infusion therapy in the home. These tasks must occur whenever infusion therapy is initiated in the hospital, and then continue as the patient returns to the home.

The team identified 26 “jobs” that make up “what” needs to be done, rather than the “who”, “how”, or “when,” all are illustrated in the process depicted on pages [24 to 37]. While the jobs, or roles, will not change, the logistics of who does them, how they do them, and when they do them will vary across the hospitals and agencies providing home infusion services.

The process developed by the AAMI Foundation team was designed to accommodate the differences in details identified, as well as the noted gaps, across the hospital and agencies providing infusion services—the logistics of who performs each job or role, and how and when it is done. Healthcare professionals have different needs, timing, technology, workflows, personal preferences, policies, and other factors impacting their use of this guide. The objective was to provide a template that could be incorporated into the existing operations of an organization.

Regardless of how an organization applies these recommendations for moving from their current state to the process depicted in the map, each job or role should have one person responsible to ensure all tasks are completed. Those tasks can be assigned to multiple people; one person carries the responsibility to get them done. Each job or role could be considered as a position description.
Each job or role operates independently of the other; however, more than one job or role can occur concurrently—they are not necessarily sequential. A job or role may even recur if needed. Below is a visual map of the proposed process.

### Infusion Therapy “Future State” Process Map

<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN-PATIENT SETTING</td>
<td>PATIENT TRANSITION AND ADMISSION TO HOME INFUSION</td>
<td>ONGOING PATIENT CARE AND SERVICES</td>
<td>DISCONTINUATION OF PATIENT THERAPY</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td>Identify that infusion therapy at home is appropriate</td>
<td>Prepare supplies and equipment</td>
<td>Deliver medications and supplies</td>
<td>Coordinate communications with team and patient</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>Confirm insurance or ability to pay</td>
<td>Prepare medications</td>
<td>Administer medications</td>
<td>Perform patient discharge evaluation</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td>17</td>
<td>25</td>
</tr>
<tr>
<td>Align inter-professional healthcare team</td>
<td>Deliver medications, supplies and equipment</td>
<td>Monitor medication/equipment responses</td>
<td>Retrieve equipment</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>18</td>
<td>26</td>
</tr>
<tr>
<td>Provide infusion therapy overview for patient and caregiver</td>
<td>Assess patient, caregiver, equipment, and environment</td>
<td>Assess patient during home visits</td>
<td>Dispose of medications and supplies</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
<td>19</td>
<td></td>
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<tr>
<td>Coordinate the discharge</td>
<td>Set-up equipment, and administer medication (if needed)</td>
<td>Re-evaluate skill of patient and caregiver</td>
<td></td>
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<tr>
<td>6</td>
<td>12</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Discharge the patient</td>
<td>Provide patient and caregiver education</td>
<td>Provide on-going education</td>
<td></td>
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<tr>
<td>7</td>
<td>13</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Schedule on-going doses, deliveries, and communications</td>
<td>Ensure inter-professional healthcare team collaboration and care coordination</td>
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<tr>
<td>8</td>
<td>14</td>
<td>22</td>
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<tr>
<td></td>
<td></td>
<td>Modify therapy as needed</td>
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</table>

A detailed analysis of the “future states” begins on page 23.
A CLOSER LOOK
Gaps and Constraints of the Current System,
Organizational Techniques and Measurable Outcomes

In the process of determining the proposed “future state” for infusion therapy transition, the AAMI Foundation team of experts identified constraints in the current system that lead to gaps in patient care coordination. They conducted a gap analysis of differences across states and between agencies to help institutions address the gaps.

The following analysis clarifies the 11 identified gaps and the constraints in the current system blocking the closing of those gaps. It provides suggested organizational techniques to overcome the gaps and constraints, and explores the improved outcomes that can result when those gaps are closed.

GAP #1 (G1)
Inconsistent Discharge Planning

Deciding when to start the discharge planning processes is notably inconsistent across hospitals. Depending on the institution, planning and related patient discharges begins at any time, from immediately following admission to minutes before the patient leaves the hospital. Hospitals will designate a different person to coordinate discharges, depending on the time of day or the day itself, such as a weekend. It could be a floating nurse, a case manager, a social worker—or a combination of different healthcare professionals. Inconsistent and incomplete discharges can lead to unsafe transitions of care and potential readmissions for the same or similar diagnosis.

Current Gaps in Patient Care Coordination for Infusion Therapy

1. Inconsistent discharge planning
2. Inconsistent teaching of the patient and caregiver while in the hospital
3. Lack of consistent inter-professional healthcare teams
4. Inconsistent processes for device or pump selection, lack of criteria to ensure the device or pump meets the needs of the patient and/or their environment
5. Embracing new technology for home infusion underutilized
6. Workforce shortages, training needs, and other concerns facing the industry
7. Inconsistent patient and caregiver involvement
8. Inconsistent coverage from payers when sending a patient home on infusion therapy
9. Lack of consistent reporting of adverse events and outcomes
10. Inconsistent communication after the patient has gone home with infusion therapy
11. Not making the discharge process from home infusion a valid part of the process
A CLOSER LOOK
Gaps and Constraints of the Current System

Constraints
Many hospitals do not have designated or dedicated discharge planners in place. This specialty is typically not reimbursed and is given minimal thought as to what is needed before the patient leaves the hospital. Lack of policy for a proper, coordinated, and safe discharge leads to inconsistent discharges and transitions of patient care.

Organizational Techniques
Hospitals should have a policy that states when discharge planning begins. Preferably, this occurs at admission into in-patient services or as soon as it is determined that the patient will be going home with infusion therapy. This type of policy is supported by regulatory and accreditation bodies. This allows enough time for healthcare professionals to meet with each other and with the patient to plan a proper and safe transition from in-patient back to home. Hospitals need a consistent and dedicated discharge planner with a checklist— for each patient—who is knowledgeable and can ensure all aspects of a discharge are covered including reimbursement, education, proper transitioning from hospital to home, knowledge of infusion therapy, and the ability to coordinate all of these aspects into the care transition. Checklists should be used because they help a person manage complex problems, provide clear priorities, and help people function better as a team. The checklist should be efficient, succinct, and practical, having about 5-9 items to check (Guwande, 2010). Develop a discharge program, using laws and standards to ensure that discharge planning is no longer an orphan service providing little to no revenue and that it focuses on safe and positive outcomes for the patient.

Improved Outcomes
The assigned discharge planner should use a checklist that covers standardized aspects of a proper and safe transition from the hospital back to the home. They are responsible for assuring all items on the checklist are accomplished before the patient is discharged. This information becomes part of the patient record. Providing a universal discharge plan for infusion therapy, by a consistent discharge planner with a checklist, that is used 100% of the time minimizes the possibility that an aspect of the discharge is being forgotten or neglected. By starting this process early during the in-patient stay, and incorporating an inter-professional healthcare team, it will minimize the chance that the patient or caregiver is not prepared for discharge and to administer home infusion. It may minimize the cost of equipment and supplies. It may minimize the time delays regarding the completeness and accuracy of everything that needs to be done before the patient is discharged to the home. Having a universal discharge plan will maximize the potential for a successful and safe transition to the home.

GAP #2 (G2)
Inconsistent Teaching of the Patient and Caregiver While in the Hospital
Patients and caregivers receive inconsistent training and education about home infusion while still in the hospital. Most hospital-based healthcare professionals do not understand the complexities of administering care in a home setting. Some healthcare professionals will teach the patient and caregiver about the pump that is being used in the hospital, but this pump may not be the one they will use at home. Some patients and caregivers receive some education about their VAD and medication and others receive minimal or no education. Hospital healthcare professionals may forget or not know how to teach the patient about infection control at home, what to expect when they get home with the infusion therapy, and they may not know the best choice for an infusion agency. They may not understand the nuances of billing and reimbursement for home infusion. The healthcare professionals in the hospital may not assess a patient and caregiver’s wants and needs before they leave the hospital.
Constraints

Many hospitals are not affiliated with a home infusion agency, and therefore do not understand what occurs in the home care setting. Many hospital personnel do not have training in home care and understanding how to assess a patient and caregiver, and their environment, to ensure that home infusion is possible. Hospitals may have policies in place prohibiting home infusion healthcare professionals meeting with the patient and caregiver before discharge because of potential liability issues.

Organizational Techniques

When determining that home infusion is a probability for a patient to be discharged, contact the home infusion agency that will be used and ask for a liaison to come to the hospital to work with the inter-professional healthcare team, and with the patient and caregiver before discharge. This may not be needed for all types of infusion therapies such as antibiotics; but, would be very valuable for those patients going home on more complex therapies. The patient’s and caregiver’s willingness, abilities, and understanding should be factored in when considering whether or not the therapy is simple or complex. Work with hospitals to change policy to allow interactions between the home infusion agency and the patient and caregiver when a patient is going back home with infusion therapy. Make this an adjunct of the universal discharge checklist. Surveys are also beneficial and provide for quality improvement; they should be a part of the discharge process. (CMMS, HCAHPS assessment, 2016).

Improved Outcomes

By providing mandated patient-satisfaction surveys upon discharge from the hospital, with home infusion agency training included in the survey, patient and caregiver confusion may be minimized regarding what they need to know before going home with infusion therapy. It may maximize the hospital’s understanding about the importance of accurate teaching and assessment before the patient goes home. Incorporating the home infusion agency into the inter-professional team for discharge planning may minimize the potential for misunderstanding and miscommunication among the healthcare professionals before the patient is discharged. Providing assessment and education by the home infusion agency will maximize their understanding of what the patient and caregiver understand, what they are taught, and what is needed before coming home. It may also maximize the patient’s and caregiver’s understanding of what the infusion process is, provide education before going home, minimize their anxiety about home infusion, and maximize their ability to administer the therapy safely in their home because of consistent pre-discharge home assessments and teaching.

GAP #3 (G3)
Lack of Consistent Inter-Professional Healthcare Teams

Communication between healthcare professionals, both inside and outside of the hospital, and with the patient and caregiver, is inconsistent and sometimes non-existent. This occurs for many reasons and may include a lack of cooperation and collaboration between key members of the inter-professional healthcare team—those who are involved in safely transitioning the patient from the hospital to the home—and lack of an efficient means for sharing communications across sites of care. Lack of communication leads to poor and untimely discharges, and inconsistent care because certain tasks remain undone, unnoticed, or are poorly accomplished. If payment issues are not addressed in a timely and knowledgeable way, there could be a delay in care, care initiated that is not in compliance with health plan policies, or a rude awakening for the patient regarding lack of coverage once back at home with the therapy. Frequently, patients and caregivers are not included in decision making, including their needs and wants, even though they are the ones who experience the consequences of what is decided for them before discharge back to the home.

Constraints

Hospital policy may keep some key players from being involved in the pre-discharge phase of the patient’s stay. Many hospitals do not have a shared electronic health record for team members to access and provide
their information, and typically will not have shared electronic records with other agencies such as a home infusion agency. Hospital policy may not have discharge planning as a necessary part of the work plan. Some do not consider discharge to be a team effort nor that all aspects of a discharge must be accomplished in a timely manner in order to have a safe transition of care.

**Organizational Techniques**

A relatively new term in use, “inter-professional care collaboration” sums up what is needed for safe and effective home infusion therapy. As defined by the Infusion Nurses Society in their standards, it is a “cooperative approach to patient care that depends on overlapping knowledge, skills, and abilities of each professional team member.” (Gorski, et al., 2016). The INS definition focuses on clinical staff for these teams; having the patient, caregiver, and other non-clinical people, who are invested in a positive home experience for therapy, are also recommended. Engage a consistent core inter-professional healthcare team that meets as soon as it is known the patient is going home on infusion therapy. Core team members should consist of a discharge planner, home infusion nurse liaison, pharmacist who is filling the prescription for the patient, prescriber for in-hospital and home, a payment specialist, an infection control specialist, a nutritionist/dietician, and the patient and caregiver. The team should also consider the need for a HME supplier, social worker, and a specialist for other co-morbidities. Each team member brings special knowledge and skills that other team members may not possess. The team will consistently address patient and caregiver needs, the home environment, the needs of the pharmacist when communicating with the patient and caregiver, whether the patient is a candidate for home infusion (and continues to be while in the hospital) and payment options (including co-pays, agency choice, and coverage once the patient is at home). They will also consistently address co-morbidities and other therapies that patient’s may receive at home concomitant with the home infusion, proper training and education of the patient and caregiver before discharge, and assuring the information for the patient and caregiver remains consistent from the hospital to the home. The patient and caregiver must be part of the team’s decision making. They are the reason the team is meeting and they will need to understand and respond to any changes in the therapy process.

**Improved Outcomes**

Having an inter-professional healthcare team, with core members, may assist in a consistent approach to discharge planning and maximize the communication between all members of the team. It may minimize the risk that the patient’s needs are misunderstood or not understood and may also minimize the risk of having to rework the discharge plan because of miscommunication. Utilizing a shared electronic health record that the inter-professional care team can use and update in real time will maximize the communication process and provide for a consistent care plan. Using a checklist covers all of the items needed for a safe discharge back to the home. Having a home infusion nurse liaison as part of the hospital team may also maximize the potential that the home infusion therapy will be successful because of cross-agency communication before the patient goes home.

**GAP #4 (G4)**

Inconsistent Processes for Device or Pump Selection, Lack of Criteria to Ensure the Device or Pump Meets the Needs of the Patient and their Environment

Not all pumps and medication delivery systems are alike, not all environments are alike, and not all patients are alike. Arguably, the pump/device may be the most important interaction a patient will have on home
infusion therapy and it needs to be appropriate for the patient and caregiver to use. There are a variety of infusion devices on the market and, depending on the pharmacy and home medical equipment supplier, the choice will be limited to what they carry in inventory—which may not be the best choice for an individual patient. Some pumps may be very old with older software; others may be new and contain the newest software. Older pumps/devices may not have been designed for use in the home, nor by lay persons; their use can pose a potential for adverse events to occur through improper programming, improper safety mechanisms, improper installation of the drug delivery cassette or tubing, and overriding the programmed rate of infusion. Many of these pumps, and even the newer ones, have not been tested through usability (human factors) testing that takes into account patient age, cognitive and sensory function, physical abilities, and literacy levels. What may appear to be a simple piece of equipment ends up being very complex and difficult to use. Use error is typically a result of poor device design. This can lead to readmissions, non-compliance, and serious injury. Long term treatments may require that a person has a pump that has a long battery life, does not need preventive maintenance in the near future, and that a backup pump is in the house. Having a pump in the home that has reached a preventive maintenance date results in the home infusion pharmacy having to exchange the pump so that the maintenance can be performed. This can add to the overall cost of care.

Constraints

HME suppliers and pharmacies will stock a certain number and type of infusion pumps/devices. It is not cost effective to stock and manage multiple infusion devices and tubing/administration sets in inventory. Home infusion agencies must provide competency assessments for their infusion nurses to operate all pumps/devices that the agency is using; keeping the pumps/devices to a manageable number works better when assuring each nurse is properly assessed for competency. Manufacturers do not always carefully consider the person using this technology in daily life and were not required or prompted to consider human factors when developing technology for use in non-clinical settings. Some manufacturers do not evaluate the range of home usability scenarios during device design even though tools are available to help them understand what to do. Because most of these tools are provided as voluntary compliance, instead of mandated by regulators, manufacturers do not have an incentive to design devices for the home. Accreditation bodies are not clear on how important the usability and design of devices is when used in the home environment. There is no consistent pathway for a pump/device to get into the home and possibly no consistent means of reimbursement. The provider may own pumps/devices and deliver them through their HME supplier or through their clinical staff. There may be an independent HME supplier supplying the home with the pump/device. Also, pumps/devices are delivered through a third-party delivery (UPS, FedEx, U.S. Mail, private couriers). Not all suppliers of pumps/devices are accredited. Accreditation bodies require that infusion agencies provide equipment that meet applicable FDA regulations and that the HME supplier assessing the home, deliver the equipment to someone in the household and document the delivery, safely set up the equipment, and ensure proper storage and functioning of the device. They also require preventive maintenance rules for HMEs to follow.

Organizational Techniques

Ensure that all infusion pumps/devices used in the home environment meet regulatory requirements and guidance for design and usability (FDA/CDRH Guidance for Human Factors, 2016) and (Design Considerations for Devices Intended for Home Use, 2010), and that the specific electrical pumps have met the voluntary standard for home use design (IEC 60601-1-11, 2015 and ANSI/AAMI 60601-1-11, 2015). Move toward “smart” pumps when possible or pumps that need minimal interaction by the patient or caregiver, have pre-programmed drug libraries, and give feedback to ensure the pump is operating correctly. Safeguards should be in place to ensure the pump is programmed for the right dose, the right time, the right drug, and the right route. Verify with a trained individual to ensure the pump is programmed correctly. When feasible, use pumps that are interoperable and provide real time information to a remote monitoring system that the inter-professional healthcare team can look at without necessarily going to the patient’s home and can then provide real-time diagnosing and treatment. Provide instructions for use that are easy to read and follow and contain
specific operating steps, warnings and precautions, risk mitigation strategies to prevent harm, and a list of pump alarms along with what to do when the alarm sounds. Pharmacists selling HME must be familiar with Medicare laws and have software that can handle billing and documentation, similar to what the HME supplier has (Kopf, 2016). This is a logical extension to their business, especially in rural areas. HME suppliers should be following all regulatory and reimbursement processes when providing equipment into the home. HME suppliers should participate in an accredited program to ensure they are following safe guidelines when putting equipment into the home. Use a checklist to ensure that the patient’s needs have been incorporated into the decision-making process for the right pump.

**Improved Outcomes**

By following accreditation standards, regulatory requirements, and voluntary design guidance and standards, the risk for adverse events, improper use, and incorrect programming is minimized. It will also maximize patient compliance with the therapy and minimize their anxiety about administering the therapy in the home. It will maximize consistent decision-making for pump selection by HME suppliers and pharmacists. Designing pumps/devices with the user in mind, and following the regulatory, standards, and accreditation body guidelines minimizes the potential for recalls and safety alerts by the manufacturer for a poorly designed or labeled device and maximizes the potential for the device to safely function in home environments by lay persons.

**Constraints**

There is inconsistent reimbursement from payers when new technology is introduced. Some agencies are reluctant to pay for a new operating system, such as electronic health records, when the system they have in place currently works just fine for them even though it isn’t as useful or usable as a newer system. Some healthcare professionals are reluctant to teach patients on technology that they are still uncomfortable using. Often there is an overall mistrust of using something new, including an expectation that there will be faults with the product. Patient privacy is of concern with mobile apps and other interoperable data sources. Some patients refuse to learn anything new, preferring their established
and comfortable use of infusion therapy. Mobile health (mHealth) is governed by many federal agencies including the Federal Communications Commission (FCC) that governs wireless operators and the spectrum, the Federal Trade Commission (FTC) that regulates interstate commerce and works for consumer protection on data security, and the Food and Drug Administration (FDA) that determines whether or not a mobile app is a medical device and therefore subject to regulatory clearance. The Office of the National Coordinator for Health Information Technology (ONC) works to make new systems applicable to their health IT strategic plan; and, the Civil Rights Office in Health and Human Services (HHS) ensures that patient privacy needs are being met (IEEE, 2008). FDA 21 CFR Part 821 and requires complete tracking documentation through the supply chain; accreditation bodies also require that HME suppliers have verified the equipment is not adulterated or counterfeit and that they are intended for the distribution channels the HME oversees. However, there is no regulation about medical device title transfer or a single depository of a device registry to efficiently identify the current device owner. This causes a disconnect by the Original Equipment Manufacturer (OEM) to ensure all medical device recalls and notifications reach the current owner or user.

Organizational Techniques

Pilot test products with new technology; engage with the manufacturer to provide input as to how it works and how it doesn’t work. Learn the technology and how it can help lead to decreased emergencies (telehealth) or unanticipated crises with home infusion patients. Teach patients to use a personal monitoring tool that is interoperable with their patient record; this allows for real time data and intervention if needed. Use trusted sources of data that provide patient privacy and can ensure that the data entered is what is being transmitted. Wireless home-based health monitoring systems have sensors that store data where you want it stored. HME suppliers and pharmacists should be providing the infusion products that have been designed and tested for patients in the home, on a consistent basis and get these into Durable Medical Equipment, Prosthetics, Orthotics and Supplies (DMEPOS) Quality Standards. Manufacturers should evaluate how their products are performing based on the design considerations for home use and determine the return on investment with the agencies using their products. Incorporate new and validated technology into accreditation processes. Use electronic health records that are shared with other members of the interprofessional healthcare team, when feasible. Choosing devices that are designed to monitor physiological conditions to control and deliver appropriate therapy may help identify adverse medical conditions earlier and provide for better and faster decision-making for appropriate interventions, as such devices become available for home infusion patient use (Banerjee, 2013). When purchasing new technology, ensure that what you are using is following all of the regulatory requirements for a medical device through a means such as a checklist.

Improved Outcomes

Using new technology can maximize faster patient information in real time with quicker interventions by the healthcare team and maximized consistent care. Use of the data points, through a standard process such as a checklist, that are acquired from the newer technology can be accumulated from one patient and similar patients to maximize quality processes in the home infusion agency and maximize the best and safest care to the patient. Using new technology can maximize the use of the newest types of equipment that could be safer and more secure than other types of technology.

GAP #6 (G6) Workforce Shortages, Training Needs, and other Concerns Facing the Industry

Home infusion nurses must receive specialized training and demonstrate competency in order to provide home infusion therapy. (NRC, 2011). A lack of available trained and competent home infusion nurses within a broader nursing workforce shortage has contributed to staffing shortages in this field. Employers differ in the training and competency assessments they provide their home infusion nursing staff, resulting in a wide variation in skill sets among these professionals. There are nurses lacking experience in infusion therapy and the skill to
A CLOSER LOOK
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educate others, including patients. There is no standard checklist for assessing minimum levels of infusion nurse competency. Though there are some certification programs, individuals or agencies may not take advantage of them. Graduates in the nursing profession are not always aware that infusion therapy nursing is an option. There is a lack of information about the number of trained professionals, both practicing and non-practicing. Accreditation and licensure across states can become an issue in home care; some home health agencies use a 24-hour weekend or regional on-call system for access to a healthcare professional. Sometimes, the regional system crosses states lines and the person responding on the telephone must be licensed in every state that is a part of the on-call system. Home infusion nursing can be socially isolating and require work in high-crime areas. Additionally, payer limitations on coverage of nursing visits can lead to frustration when nurses perceive they have insufficient time to effectively teach the patient and caregiver self-care procedures. Depending on telephone calls to communicate with the patient can be time-consuming and delay therapy. Commuting distance to a patient’s home and the inability to visually assess a patient before coming to the home can be a disincentive to work in this environment. The home may not be designed for administering healthcare and professionals must undertake a thorough home assessment before initiating home infusion. Ongoing assessment of the home environment, the patient, and the caregiver are necessary throughout the therapy. HME suppliers may not be able to provide services to all areas in which they operate and this can delay or prevent home infusion therapy.

Constraints

Some home infusion agencies are unable to find nurses who are licensed in more than one state to provide service in regional on-call systems. Federal and state laws may conflict with regard to the provision of nursing services across state borders. HME suppliers have to follow certain reimbursement rules which may keep them from providing services. Home infusion agencies need to find enough staff, and provide training and certification, in order to keep up with the home infusion demands. Infusion nursing, as a specialty, competes with many other nursing specialties.

Organizational Techniques

Working with state agencies to find ways for healthcare professionals to provide 24/7 regional on-call systems may be of benefit to everyone involved. Develop a minimum standard set of skills for home infusion competency validation that is written by organizations that represent home infusion nurses. Develop these skills in-house that provide for a consistent approach to good patient care; many agencies are already providing intensive training and competency validation when a nurse is hired for this position. Develop evaluations to measure their competency with pumps/devices on scheduled intervals, and keep the number of pumps/devices they use to a minimum. Ensure they can teach patients without the use of jargon and provide simple instructions for use. Teach new infusion therapy nurses that they have control over their practice decisions, flexibility and autonomy which could be driving forces to retain them. By working as an inter-professional healthcare team, rather than isolated healthcare professionals, the healthcare professional should feel part of a team that is working together for successful patient outcomes. User-centered design of electronic networks, such as videoconferencing, also alleviates the isolation and miscommunication or misunderstanding of what needs to be addressed when working with a patient in a home environment.

Improved Outcomes

By developing educational and competency validation standards for infusion therapy nurses, safe care is maximized and potential for poor patient outcomes is minimized. By promoting infusion therapy as a specialty at the undergraduate nursing levels, potential for newly trained and competent nurses for home infusion may be maximized. Providing a set of criteria and proper training for someone to respond at regional on-call sites could maximize the potential for consistent and safe responses to 24/7 calls from patients and caregivers.
**GAP #7 (G7)
Inconsistent Patient and Caregiver Involvement**

The patient and caregiver are inconsistently involved in the decision making for home infusion therapy. Often, the lack of patient involvement starts in the hospital when the decision is made for the patient to go home with infusion therapy. When patients and caregivers are not involved in the decision-making process, it becomes frightening and potentially dangerous to send patients home with infusion therapy. Keeping them informed, teaching them about the therapy, providing ongoing training, re-educating them as needed, and understanding their home environment and daily schedules are critical for compliance and adherence to the therapy.

**Constraints**

Many hospitals do not think the patient and caregiver would understand infusion therapy. Other times, they are rushed up until the point of discharge and do not have the time to incorporate the patient and caregiver into the discharge planning process. Working with the patient before discharge may not be reimbursed, and therefore not a viable option for the hospital to consider. While at home with infusion therapy, extra visits to the home may not be covered by insurance, even though it can be a safety issue if the patient or caregiver is uncomfortable giving the care, if the home situation changes while on therapy, or if they have developed bad habits when administering the infusion.

**Organizational Techniques**

Make the patient and caregiver part of the interprofessional healthcare team both in the hospital and in the home environment.

**Improved Outcomes**

Educating and teaching patients to keep them informed and skilled in administering the therapy maximizes patient compliance and a positive outcome, and minimizes the risk that the patient is undertrained or not proficient to administer therapy, or underprepared to go home with infusion therapy. Keeping patients involved in their therapy and decision-making maximizes communication.

**GAP #8 (G8)
Inconsistent Coverage from Payers When Sending a Patient Home on Infusion Therapy**

Medicare covers infusion therapy in the hospital, skilled nursing facilities, physicians’ offices, and hospital outpatient departments; it does not cover infusion therapy in the home environment. Most commercial health plans, state Medicaid programs, Tricare, and the Veterans’ Administration cover home infusion therapy and many provide comprehensive coverage under the Medicare Advantage plans. Medicare’s fee-for-service does not cover the full range of services for home infusion. Part B covers a limited number of drugs but does not cover the clinical services. Disposable drug delivery systems (elastomerics) are not billable to Medicare because they do not meet the definition of durable medical equipment; yet they are one of the most frequently used infusion devices in the home. With other commercial payers, elastomerics can be billed as a separate line item or as part of a daily per diem. External infusion pumps are a durable piece of equipment; they are delivered once to the patient’s home and are billed as a one-time purchase or a recurring cycle (e.g., monthly). They can also be billed as a separate line item or as part of a daily per diem and not reimbursed separately. Implanted pumps are placed into the patient before going home and therefore are not charged by the home infusion agency. Costs with implantables are related to supplies, drugs, and the skilled nursing care in addition to the specialized equipment required to refill them. Home healthcare services, including skilled nursing, are covered when the patient meets the homebound status as defined under the Medicare home health benefit. Due to the lack of comprehensive Medicare coverage of infusion therapy in the home, many patients who require intermittent therapy, such as antibiotics, must be admitted to a skilled nursing facility, are given alternate therapy earlier such as a switch to oral medication, are required to change their infusion schedule, or make daily trips to a physician’s
office or outpatient clinic instead of receiving their therapy at home. If admitted to an institution for their care, this may be the only reason they are in the facility and are, otherwise, independent in their care. Third party billing can be time consuming, even waiting for someone’s signature can take a long time.

**Constraints**

Legislation to expand Medicare reimbursement of home infusion therapy supplies and services has been proposed to Congress; changing federal law is a massive effort. There may be two people involved in the reimbursement process: the person who understands eligibility and the person who determines payables. This leads to confusion, and communication is critical. Responses by payers can be extremely slow and can affect the timely start of care, as well as the bottom line of the infusion agency.

**Organizational Techniques**

Billing specialists must be part of the inter-professional healthcare team and they must be knowledgeable about infusion therapy, including what parts of the therapy are eligible and what is covered by each payer.

**Improved Outcomes**

Providing consistent billing practices across insuring bodies maximizes efficiency for the home infusion agency and minimizes the possibility of billing error and non-payment of services.

**GAP #9 (G9)**

Lack of Consistent Reporting of Adverse Events and Outcomes

There is no standard definition of “adverse event” or “adverse outcomes” in home infusion therapy. There is no standard way to report adverse events, and what they mean when they are reported. Many home infusion agencies are not aware of the requirement to report adverse events to the FDA and to the manufacturer—for drugs and for medical devices. They may not be aware of non-regulatory reporting agencies such as the ECRI Institute and the Institute for Safe Medication Practices (ISMP) who provide non-regulatory assistance to promote safe use of medication and medical devices. Pumps, whether designed and used properly or not, are known to cause or contribute to frequent adverse events and problems (ECRI Institute, 2016). The infusion pump comparison found that over medication and under medication are two main causes for concern because the patient is not under direct clinical observation. Occlusion, air-in-the-line, empty reservoirs, infiltration, and skin infection also top the list of major problems found in the home environment of those patients receiving infusion therapy.

**Constraints**

It can be burdensome, especially in federal agencies, to properly report a problem with a medical device or a drug. There are voluntary reporting systems and mandatory reporting systems in place that may not be known to home infusion agencies because of a lack of clarity as to whether or not they should be reporting incidents that occur. Reporting of adverse events and reactions is heavily influenced by the culture of an organization.

**Organizational Techniques**

Establish a just and safe culture to report incidents and encourage reporting of unsafe situations as well as adverse events. Report incidents, including product problems, adverse events, and adverse reactions to the inter-professional healthcare team and, as a group, determine if the incident should be reported to the FDA’s MedWatch program. Ensure that everyone is aware of what needs to be reported and how it needs to be reported. Assign one person on the care team to be responsible for proper reporting of events. Follow
ISMP recommendations that the healthcare professional assess the patient’s vulnerability to programming errors; standardize concentrations and use a single concentration for each drug infusion if possible; set hard minimum concentration limits that require reprogramming; educate staff on concentration and volume; distinguish custom concentrations; use dosages in the drug’s metric weight; match the medication administration record and label to pump settings; verify pump programming and analyze the data that is coming out of the pump. (Smetzer, 2012).

**Improved Outcomes**

By analyzing incidents in the home, the inter-professional team can maximize efficiency to determine what is reportable to regulatory bodies and what could be reported to non-regulatory agencies. By reporting incidents, home infusion agencies will minimize future adverse events or reactions and maximize patient safety through better device design and follow up actions by the manufacturer of the product.

Additionally, by sharing the reports with the agency clinical staff, the agencies will increase their own knowledge base about clinical practices and improvements in patient education that may need to be improved to ensure better patient outcomes.

**GAP #10 (G10)**  
**Inconsistent Communication After the Patient Has Gone Home with Infusion Therapy**

There is inconsistent follow-up and re-education with the patient and caregiver after they have been at home with the infusion therapy. There is inconsistent observation by the home infusion nurse when the patient is undergoing therapy. There are inconsistent methods of communicating with the patient to find out how the therapy is working; personalizing questions to the patient’s individual situation and specific areas of therapy is lacking. There is a lack of consistent questioning by the pharmacist before each delivery of medication and inconsistent calling to the patient to check on them. There is a lack of communication with the home infusion pharmacist when a patient has an interruption in care—they are not notified when the patient is going off therapy and when they are coming back on therapy. Overall, there is a lack of a consistent checklist to catch a broad net of potential problems. Home infusion/pharmacies are, many times, not a part of a regulation or policy that could be helpful when instituting new practices and receiving reimbursement for their implementation.

**Constraints**

Communication is isolated in home infusion. Software and hardware platforms that could be used to enhance and combine home infusion decisions are not used because of lack of availability, cost, training, or because it isn’t considered important enough to do.

**Organizational Techniques**

An inter-professional healthcare team also needs to function in the home infusion agency. This team consists of mostly the same type of people that are on the hospital team. The prescriber, pharmacist, HME provider, home infusion nurse, patient and caregiver, and payment specialist should meet on a regularly scheduled basis to keep all lines of communication open so that everyone is aware of the patient’s progress. Consider adding a home care nurse if the patient is receiving care other than infusion therapy, a nutritionist/dietician, and social worker to the team. The team will ensure that there is no miscommunication or misunderstanding, and that everyone is aware of any risks the home environment is posing for a safe infusion. There should be an ongoing checklist of what needs to be covered at these team meetings which can occur either in-person or virtually. One person needs to be assigned the role of reporting product problems, adverse events, and adverse reactions. Information should be documented in a shared, preferably electronic, folder. Pharmacists should provide means to ensure that patients receive their supplies, equipment, and medication no matter what the environmental circumstances may be. A recently finalized Centers for Medicare & Medicaid Services (CMMS) rule on emergency preparedness provides regulatory input as to what is needed to prepare for and provide healthcare during public health crises or weather-related emergencies such as a tornado, hurricane, earthquake,
or snowstorm (CMMS, 3178-F, 2016). This rule includes a list of applicable sites of care which does not include home infusion therapy/pharmacy. However, it provides relevant information that can be incorporated into existing policy for these agencies.

**Improved Outcomes**

Having an inter-professional healthcare team maximizes the potential for consistent patient care, consistent reporting of adverse events, and ease of billing the patient at the end of the therapy. Having an inter-professional healthcare team supports effective care coordination and communication that includes providing numerous ways in which to deliver medications, supplies, and nursing care in cases of hurricanes, snow, tornadoes, or other extenuating circumstances. Providing alternative ways in which the patient can pay or obtain the medicine and supplies themselves from different locations minimizes the patient's anxiety of not getting required medication and supplies for therapy on a timely basis.

Payment for services is inconsistent. Some insurers pay the patient directly instead of paying the infusion agency. Sometimes, this money does not get to the infusion agency, but is pocketed by the patient. There are delays by insuring companies to reimburse for all services and this leads to inconsistent business and administrative decisions by the infusion agency. Problems can exist when the insurance changes, especially if the treatment crosses calendar years.

**Constraints**

Lack of ability to communicate with all key players in an easy and efficient way. Policies may not be in place to ensure that all parts of the discharge are completed.

**Organizational Techniques**

Discontinuation of therapy becomes a valid part of the home infusion process. A checklist should cover all aspects of pharmacy, follow up appointments, return of the HME, biohazard disposal, and assurance of payment. A patient satisfaction survey should be part of the discharge process; it should be simple, easy to fill out, and easy to submit. It should cover what went well and what needs improvement. Post-discharge reviews of the care provided should be done after a couple of weeks to see if the patient had to be readmitted, and if so, whether something could have been done differently or identified earlier to avoid this situation. Payment for services should be prompt, in full, clear, and direct to the person who is the recipient of the payment; policies should be developed to support this. The patient must be consistently informed of how long they will be on home infusion therapy, how to care for the VAD, and when and where it is to be removed.

**Improved Outcomes**

Communication and a consistent discharge plan from home infusion therapy maximize patient satisfaction, prompt payment for services, and return of HME. A consistent discharge plan minimizes the risk of poor compliance with safe medication disposal and complete return of HME supplies.
This section provides the steps required to implement the organizational techniques described in the previous section that help in overcoming the gaps and constraints preventing many organizations from fully implementing the ‘proposed future state’ process map. The map was shown earlier on page 10, and is reproduced, below.

Infusion Therapy “Future State” Process Map

1. Identify that infusion therapy at home is appropriate
2. Confirm insurance or ability to pay
3. Align inter-professional healthcare team
4. Provide infusion therapy overview for patient and caregiver
5. Coordinate the discharge
6. Discharge the patient
7. Prepare supplies and equipment
8. Prepare medications
9. Deliver medications, supplies and equipment
10. Assess patient, caregiver, equipment, and environment
11. Set-up equipment, and administer medication (if needed)
12. Provide patient and caregiver education
13. Schedule on-going doses, deliveries, and communications
14. Finalize care plan
15. Deliver medications and supplies
16. Administer medications
17. Monitor medication/equipment responses
18. Assess patient during home visits
19. Re-evaluate skill of patient and caregiver
20. Provide on-going education
21. Ensure inter-professional healthcare team collaboration and care coordination
22. Modify therapy as needed
23. Coordinate communications with team and patient
24. Perform patient discharge evaluation
25. Retrieve equipment
26. Dispose of medications and supplies
I. IN-PATIENT SETTING:

1 Identify that infusion therapy at home is appropriate.

As early as possible in the patient’s hospital stay, determine whether infusion therapy will be used in the home upon discharge, so that it will be approved and ready for them prior to discharge.

To accomplish this:

- Determine there is appropriate clinical need that can be addressed by providing infusion therapy at home.
- Verify the likelihood that the patient will be going home on infusion therapy.
- Assess the patient and caregiver and the willingness to safely administer infusion therapy at home.
- Verify that the prescribed therapy can be supported in the home, including: the availability of support services in the area to manage the VAD, laboratory draws, and stability of the drug to reach patient locations.
- Verify the functional limitations of the patient and the caregiver’s availability to be trained and assist with infusions.
- Assemble and inform the inter-professional healthcare team who will be involved with transitioning the patient from the hospital to the home.

These steps contribute to solving the following gaps identified in the previous section: inconsistent discharge planning (Gap1); inconsistent processes for device or pump selection, lack of criteria to ensure the device or pump meets the needs of the patient and their environment (Gap 2).

2 Confirm insurance or ability to pay.

In order to prevent delays in discharge, and confusion when the patient is admitted into home infusion therapy, reimbursement for services and equipment provided by the home infusion agency must be determined as early as possible in the patient’s stay.

To accomplish this:

- Determine financial means to have infusion therapy provided in the home.
- Identify a home infusion provider within the patient’s insurance network.
- Determine coverage for the therapy.
- Confirm insurance coverage for home infusion therapy, patient co-pay, or the patient accepting financial responsibility to pay for the service; inform patient of any available financial assistance programs for the co-pay or personal payment.
- Arrange prior authorization, if required by the payer.
- Ensure payer understands what home infusion therapy is and what it entails.

These steps contribute to solving the following gaps identified in the previous section: inconsistent discharge planning (Gap1); need to embrace new technology for home infusion (Gap 5); inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8).
3 **Align inter-professional healthcare team.**

Establish an inter-professional healthcare team that covers aspects of the patient’s transition back to the home, provides continuity of service, and ensures that the patient’s needs are being met for a safe transition. The team, as defined for this document, consists of clinical and non-clinical members, and should include some or all of the following as indicated by the patient’s status and post-acute care needs: patient and caregiver, case managers, home infusion nurse, prescriber in the hospital and at home, pharmacists who are filling the prescription, reimbursement and billing specialists; and, if possible social workers, nutritionists/dieticians, and the home medical equipment (HME) supplier. The patient and caregiver should be kept informed, and encouraged to participate in team meetings as appropriate. To accomplish this:

- Determine patient-specific constraints.
- Determine known home environment-specific constraints or risk factors and mitigate the risks before discharge.
- Determine caregiver needs.
- Assess caregiver and patient capabilities, abilities, and understanding.
- Determine the needs for the prescription including the type of VAD, if it is safe for home use, the dosage of the medication, the type of device that will be used in the home setting, and supplies needed.
- Allow time for placement of a VAD and catheter tip evaluation prior to discharge, if necessary.
- Develop plans for transitioning the patient from the hospital back to the home.
- Confirm possibility for timely admission into infusion services post-discharge (e.g., plan the discharge on a weekday or non-holiday, if possible).
- Ensure there is a prescriber responsible for the patient’s infusion therapy after discharge.
- Review the stability of the prescribed drug for home infusion to manage potential conflicts with shipping.
- Provide a means of communication that includes the entire team.
- Discuss any potential safety issues in the home environment that could affect visits by the home infusion provider (e.g., unsafe neighborhood).
- Ensure each step is completed, potentially using a checklist or other tracking mechanism.

**These steps contribute to solving the following gaps identified in the previous section:**
- inconsistent discharge planning (Gap 1);
- lack of consistent inter-professional healthcare teams (Gap 3);
- need to embrace new technology for home infusion (Gap 5);
- inconsistent patient and caregiver involvement (Gap 7).

4 **Provide infusion therapy overview for patient and caregiver.**

Educating and informing the patient and caregiver about infusion therapy before discharge is essential for a safe transition from the hospital to the home. In-patient providers can only provide education on basic infusion therapy. Because in-patient services do not provide the care upon discharge, it is important to have home infusion therapy providers also talk with and work with the patient and caregiver before they go home. Note: The Intravenous Nurses Society (INS) standards provide guidance for patient education, and a plan of care for home infusion therapy (Gorski, et al., 2011).

- Provide information for the patient and caregiver about the home infusion provider.
- Discuss the home environment with the patient and caregiver (presence of running water, electricity, refrigerator, backup power, where to administer the infusion).
- Instruct the patient and caregiver on the VAD, including care and maintenance of the device and signs and symptoms of complications to report to the home infusion nurse.
Instruct the patient and caregiver on the prescribed infusion therapy, including how and when it will be administered.

Instruct the patient and caregiver on the type of infusion pump to be used in the home.

Instruct the patient and caregiver on potential medication side effects or adverse reactions.

Instruct the patient and caregiver on any activity limitations related to the VAD/infusion therapy and how to protect during activities of daily living, including bathing.

Instruct the patient and caregiver on what to do in emergent situations (who to call, what to do if….).

Answer any questions the patient and caregiver may have.

Review the billing and reimbursement for home infusion therapy with the patient and caregiver.

Arrange home visits with the patient and caregiver.

These steps contribute to solving the following gaps identified in the previous section: inconsistent discharge planning (Gap1); inconsistent teaching of the patient and caregiver while in the hospital (Gap 2).

Coordinate the discharge:
A coordinated discharge helps ensure that all post-hospitalization needs of the patient and caregiver are met before the patient transitions back to the home. This reduces anxiety on the part of the patient and caregiver and gives them and the home infusion provider control over the transition into the home. The discharge coordinator should know the patient and caregiver’s circumstances at home.

Obtain orders from the prescriber of the home infusion service.

Ensure all members of the inter-professional healthcare team have placed their information into the patient’s medical record.

Ensure that all members of the inter-professional healthcare team are in agreement on the discharge date and that a home infusion provider is available for the first home visit.

Plan to convert the patient to the home-based infusion in the hospital for critical infusions such as with inotropes or opioid analgesics.

Provide all appropriate medical records to the home infusion provider for care plan development.

Obtain the final orders for the home infusion prescription and provide to the home infusion provider including the medication, number of doses or length of therapy, flushes for catheter care, nursing orders if applicable, a document validating appropriate placement of the VAD, all medications the patient is taking, all therapies, laboratory test orders, and other therapies that are prescribed.

Arrange transfer from hospital back to the home.

Allow time for the home infusion provider to prepare the prescription.

Include an order for the nurse to remove the VAD at the end of the infusion therapy or obtain orders to maintain catheter patency after the infusion is complete and before the patient is seen by a prescriber.

Obtain a PRN (pro re nata, as needed) order for thrombolytic agents in case of a VAD occlusion.

Determine if the patient needs assistance such as a voucher for reimbursement for transportation home.

These steps contribute to solving the following gaps identified in the previous section: inconsistent discharge planning (Gap1); workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent patient and caregiver involvement (Gap 7).
Discharge the patient.
An effective transition from one care site to another is important to ensure the safety of the patient and that everything has been coordinated for uninterrupted care.

- Provide and review the discharge instructions with the patient and caregiver.
- Verify that the patient and caregiver understand the instructions including asking them questions, letting them ask questions, and observing return demonstrations.
- Provide names, phone numbers, the on-call 24/7 telephone contact, and other necessary contact information of the home infusion provider, the pharmacy, the HME supplier, billing and reimbursement services, and follow up orders and appointments.
- Inform the home infusion provider when the patient received their most recent infusion in the hospital and provide any changes or updates that occurred immediately prior to discharge.
- Ensure each step is completed, potentially using a checklist or other tracking mechanism.
- Inform the inter-professional care team when the patient has been discharged from the hospital.
- Ensure that discharge practices comply with applicable federal laws, hospital policy, and accrediting standards.

These steps contribute to solving the following gap identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6).

II. PATIENT TRANSITION AND ADMISSION TO HOME INFUSION

Prepare supplies and equipment:
Preparing supplies and equipment to ensure they are as prescribed and ready to be sent to the home is important to ensure continuity of therapy and that everything is ready before the patient comes home.

- Review and validate the prescription.
- Confirm that the infusion therapy device is designed, tested, and labeled for use in the specific home environment (i.e., match the user to the device and to the environment).
- If the device is not designed, tested and labeled for use in the home environment, document rationale for using it or select a more appropriate device.
- Check to see that the pump has been maintained, cleaned, and calibrated within regulations, guidelines and laws.
- Prepare the equipment based on medication to be infused, the patient and caregiver’s ability to operate the device, and what is reimbursed by the payer.
- Assemble the initial inventory of supplies and equipment to be sent to the home, per policy.
- Determine the need for an emergency kit and supply this if needed and appropriate for the patient and prescribed therapy (e.g., anaphylaxis kit).
- Prepare the packaging of supplies and equipment to maintain patient confidentiality, biohazards, and appropriate handling for environmental conditions.
- Notify the infusion company or the HME supplier for pump delivery, if needed.
- Ensure that the patient and caregiver are informed of the supplies and equipment coming to the home.
- Document information in a shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: inconsistent processes for device or pump selection, lack of criteria to ensure the device or pump meets the needs of the patient and/or their environment (Gap 4).
Prepare medications:
Appropriate medication preparation is essential to ensure continuity of care.

- Obtain and review the complete and validated prescription from the provider (order for the medication, number of doses or length of therapy, flushes for catheter care, and laboratory test orders).
- Review the patient’s complete medication list and check for possible drug allergies or interactions.
- Clarify prescription information that is unclear or missing and reconcile any issues with other medications the patient is taking.
- Compound the medication, if needed, following sterile procedures.
- Set up the time of delivery to the patient’s home with input from the caregiver.
- Confirm that an appropriate individual will be at the home to receive the medications that will be delivered and store them properly.
- Review the patient-specific, caregiver-specific, and environment-specific constraints and ensure that known risks have been mitigated.
- Review the reimbursement and payer information for the patient.
- Prepare the initial inventory to be sent to the home that is needed, per policy.
- Prepare the packaging of the medication and supplies to maintain patient confidentiality, biohazards, and appropriate handling for environmental conditions.
- Contact the HME supplier, if needed, to set up the time for delivery to the home.
- Document all information in a shared patient infusion or medical record, preferably an integrated electronic medical record if available.

These steps contribute to solving the following gap identified in the previous section: inconsistent discharge planning (Gap1).

Deliver medications, supplies and equipment:
Accurate, timely, and safe delivery of supplies, medication, and equipment is critical for safe and continual care for the patient in the home. Lack of continuity can lead to increased patient and caregiver anxiety, missed infusion doses, deterioration in the patient’s condition, extra expenses, and poorly stored or undelivered products for the infusion therapy.

- Know the shipping requirements for each package being delivered to the home.
- Recognize and manage any possible damage to the packaging and/or contents before delivery; mitigate any risks posed by poor packaging.
- Ensure that the medication, supplies, and equipment are delivered and received in a timely manner in order to avoid interruptions in therapy.
- Provide patient-specific drug information that is understandable by a lay person, including storage and stability of the drug, and measuring, reconstituting, or adding other ingredients to the medication before infusion therapy starts.
- Provide patient-specific supplies and equipment information that is understandable by a lay person (written at a 6th grade reading level and preferably bulleted and/or with illustrations large enough to be seen and easily followed) including how to set up the medication on the device (if used), alarms, troubleshooting, and necessary supplies to operate and maintain the device safely.
- Ensure that any recalls or safety notifications for the device being used have been appropriately addressed.
Provide contact information and instructions for the patient to report any problems with the medication, supplies, and equipment that was delivered.

Document all delivery information in a shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6).

10 **Assess patient, caregiver, equipment, and environment:**
Initial assessment of the patient, caregiver, equipment, and environment provides a baseline from which to work when providing the infusion therapy.

- Perform a comprehensive assessment.
- Perform a medication reconciliation.
- Inform other members of the inter-professional healthcare team about anything needing immediate attention.
- Evaluate the storage options in the home for the medications, supplies, and equipment to ensure they are suitable for the therapy to be provided and if any modifications will be needed.
- Assess the home for presence of safety issues and mitigate the risk as possible.
- Assess the patient and environment for infection control risks and mitigate as possible.
- Determine the best location in the home to administer the infusion.
- Decide on the best schedule, based on the family's activities, current administration schedule, availability of caregiver and/or nursing support, etc.) to administer the infusion.
- Establish with the patient and caregiver the most effective way to communicate that is secure and HIPAA-compliant (in-person, telephone calls, email, videoconferencing).
- Provide a 24/7 phone number for assistance.

- If feasible, provide a means of telecommunication including video imaging to assess patient status from a remote location; this can take the place of a home visit in some instances.
- Document any telecommunication information and all other information in a shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section: inconsistent patient and caregiver involvement (Gap 7); inconsistent communication after the patient has gone home with infusion therapy (Gap10).

11 **Set-up equipment, and administer medication (if needed):**
Setting up the equipment for the patient and caregiver provides them a visual representation of what to do and allows for them to ask clarifying questions.

- Validate the prescription with another member of the inter-professional healthcare team for high risk infusions.
- Review all medications, supplies, and equipment with the patient and caregiver.
- Review all instructions for use; determine if the patient and caregiver understand the instructions for use.
- Demonstrate step-by-step instructions when first setting up the equipment
- Point out areas of special importance for safety that the patient and caregiver should remember (e.g., if needed, always clamp the line when not in use).
- Demonstrate how to check the prescription label, the prescription order, the pump check sheet, and the settings on the device.
- Prepare the medication for administration, including placement on the pump when used.
- Prepare the pump or other method of administering the infusion.
- Prepare the patient to receive the medication.
Observe patient while medication is infusing for any signs of adverse reactions to the medication or the infusion.

Document all information in a shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent communication after the patient has gone home with infusion therapy (Gap 10).

Provide patient and caregiver education:
Patient and caregiver education, including observation of return demonstrations, is critical to a successful and safe infusion therapy in the home. Without appropriate education to the patient and caregiver, there is an increased risk for adverse events, non-compliance, and possible readmission to the hospital. This is one of the most critical steps in the process map.

- Use teaching strategies that promote the patient and caregiver’s ability to learn including videos, checklists, handouts, and audios.
- Choose handouts that are easy-to-read, large font for short distance reading, and posted to allow for the ability to review regularly.
- When feasible and necessary, teach procedures for infusion therapy in small sections to maximize learning and recall and possibly commit to memory.
- Review the instructions for the medication and delivery with the patient and caregiver, clarifying and guiding the learner as necessary through the process.

These steps contribute to solving the following gaps identified in the previous section: need to embrace new technology for home infusion (Gap 5); workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent communication after the patient has gone home with infusion therapy (Gap 10).

Schedule on-going doses, deliveries, and communications:
Keeping a schedule to ensure the infusion therapy continues uninterrupted is important for patient adherence to the prescribed therapy.
Communicate with the pharmacy to ensure 24-hour access to agencies providing nursing services and determine that the scheduled times for administration are compatible with everyone who is involved during the infusion administration.

Communicate with the home infusion prescriber to ensure 24-hour access to their services.

Work with the patient and caregiver to determine their routines and best times for the infusion.

Determine when an appropriate person will be at home to accept delivery of medications and supplies; document alternative arrangements if needed.

Ensure the patient or caregiver is able to verify medication deliveries with the correct name and medication.

Document all information in a shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: inconsistent communication after the patient has gone home with infusion therapy (Gap10).

Finalize care plan:
A patient-specific care plan with requirements determined by law, accreditation bodies, and agency policy is necessary for ongoing communication with everyone on the inter-professional care team and to promote positive patient outcomes.

Include patient needs, goals, and expected outcomes; incorporate their input into the plan of care.

Incorporate specific care plan information from other inter-professional healthcare team members or provide access to the patient infusion or medical record to provide their input.

Develop the plan with specific objective and subjective monitoring and the frequency of monitoring.

Provide information on the care plan in compliance with laws, regulatory agencies, accreditation bodies, reimbursement, and agency policy.

Ensure that information on the care plan is available for other members of the inter-professional healthcare team (this could be an electronic health record or a mobile app that meets privacy and confidentiality regulations, policies, and accrediting standards, if this technology is available).

Communicate to all inter-professional healthcare team members that the care plan is available and where it is located.

These steps contribute to solving the following gaps identified in the previous section: inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8); inconsistent communication after the patient has gone home with infusion therapy (Gap10).

III. ON-GOING PATIENT CARE AND SERVICES

Deliver medications and supplies:
Providing on-going delivery of supplies and medications at a known time interval provides security for the patient and caregiver and allows for uninterrupted therapy.

Check and determine patient’s current rate of supplies used for each therapy administration to ensure sufficient supply delivery.

Provide timely responses to requests for drug or device information.

Inventory items in the home to avoid excessive accumulation of supplies and medications.

Investigate if supplies and equipment are not being used to assess potential non-compliance or possible reuse.

Modify the medications, supplies, or equipment if needed.
Adjust the care plan if medications or supplies are changed.

Assess for any new risks with a change in medication, supplies or equipment and mitigate the risk before the change.

Ensure the medications and supplies are delivered to and received by a person at the house.

Inform all members of the inter-professional healthcare team of any changes or modifications and provide the information in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section: lack of consistent inter-professional healthcare teams (Gap 3); inconsistent processes for device or pump selection, lack of criteria to ensure the device or pump meets the needs of the patient andlor their environment (Gap 4).

Administer medications:
This provides assurance that the correct medication is going in the right patient, in the right delivery and dosage, at the right time, and provides for positive patient outcomes.

Check all medication prescriptions before each infusion.

Follow agency protocol and infusion standards for aseptic administration of the medication.

Set up and access the line and administer the infusion safely via the administration method (e.g., gravity, elastomeric, electronic infusion device).

Properly dispose of supplies after the infusion.

Document all medication administration steps in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: lack of consistent reporting of adverse events and outcomes (Gap 9).

Monitor medication/equipment responses:
This process occurs after the patient or caregiver has administered the medication and the procedure is ended. This process is ongoing throughout the infusion therapy administration schedule in the home environment and monitoring frequency is dependent upon the home infusion nurse and interactions with the patient and caregiver.

Communicate with the patient and caregiver to find out if there are any issues when setting up the infusion, administering the infusion, or stopping the infusion (in-person, phone, email, videoconferencing).

Check the pump for accuracy of dose programmed, functionality, and power or battery.

Inventory supplies to ensure there are sufficient supplies and that they are being used per instructions.

Monitor the patient for side effects or adverse reactions to the medication or solution.

Assess the patient for signs of VAD-related complications and intervene per protocol if it occurs.

Provide information on the patient infusion or medical record for any observable risk or potential for harm; personally inform a member of the inter-professional healthcare team for any issues that may affect them directly, such as safety concerns.
Report any adverse reactions or events that occur with the device or the medication to the home infusion agency and the HME supplier, if applicable.

Report any product problems that occur with the device, catheter, infusion set, or supplies to the home infusion agency.

If feasible, provide a means for the patient or caregiver to send in images of a wound, skin, etc., to allow for remote monitoring and quickly intervene, if needed.

Instruct the patient and caregiver to regularly communicate questions or concerns with the members of the inter-professional healthcare team and to verify the communication method.

Document all monitoring information in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: lack of consistent reporting of adverse events and outcomes (Gap 9).

Assess patient during home visits:
This is typically done by the home infusion nurse; however, the prescriber could make home visits, and at times, pharmacists make home visits. This depends on the agency and policies in place, and individual clinician professional practice limitations.

Perform comprehensive assessment of the patient per policy including their response to therapy, medication reactions, over or under dosing, skin integrity, and signs of infection.

Review the patient infusion or medical record including notes from other members of the inter-professional healthcare team.

Contact other team members for clarification, if needed.

Obtain specimens for any laboratory work according to standards, laws, and policy.

Send laboratory specimens to appropriate laboratory facility.

These steps contribute to solving the following gaps identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6); lack of consistent reporting of adverse events and outcomes (Gap 9).

Re-evaluate skill of patient and caregiver:
Continual assessment of the patient and caregiver’s skills to safely administer the infusion are essential for compliance and positive patient outcomes.

Observe the patient and caregiver’s skill when setting up the infusion, administering the infusion, and stopping the infusion in a safe and correct manner.

Evaluate the patient and caregiver’s ability to properly administer the therapy and that they are compliant with the orders, plan of care, and process as taught to them; note if there are any environmental, physical, or cognitive stressors, or changes since the admission/baseline assessment.

Verify that doses of medication have been administered by reviewing the pump log, if available.

Evaluate patient and caregiver compliance to infection prevention and control procedures; review the procedures with the patient and caregiver, if needed.

Re-evaluate the patient and caregiver’s understanding and ability to self-manage the therapy; determine if a substitute caregiver needs to be trained to administer the therapy.
Determine if more visits are needed for re-education; obtain authorization for reimbursement or agreement to pay by the patient.

Document any changes in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

*These steps contribute to solving the following gaps identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent patient and caregiver involvement (Gap 7); lack of consistent reporting of adverse events and outcomes (Gap 9); inconsistent communication after the patient has gone home with infusion therapy (Gap 10).*

Provide on-going education:
Continual education for the patient and caregiver provides for redundancy, reinforcement, clarity, and the ability to retain information when repeated. It supports compliance and positive patient outcomes.

- Instruct patient and caregiver on new medications and possible interactions with current medications being taken.
- Re-educate the patient and caregiver on any noted issues with the environment and mitigate risk factors that could affect a safe administration of the infusion.
- Use teach-back method to evaluate the patient and caregiver to mitigate safety risks; request and observe a return demonstration if needed.
- Provide clear user-friendly and appropriate material for additional information on medications and equipment being used.
- Solicit feedback from the patient and caregiver regarding any questions with the infusion therapy, medications, or learning issues they may have.

If feasible, use telehealth communications such as videoconferencing if unable to access the patient and caregiver physically.

Instruct the patient and caregiver about appropriate actions to take if a medication or treatment reaction occurs when a healthcare professional is not present.

Document the patient and caregiver’s response to teaching in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

*These steps contribute to solving the following gaps identified in the previous section: workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent patient and caregiver involvement (Gap 7); lack of consistent reporting of adverse events and outcomes (Gap 9); inconsistent communication after the patient has gone home with infusion therapy (Gap 10).*

Ensure inter-professional healthcare team collaboration and care coordination:
On-going communication between the inter-professional healthcare team and with the patient and caregiver is essential to ensure that the therapy is being administered safely, and positive patient outcomes are achieved. The team should determine how often to meet on a scheduled basis.

- Include all professionals who work with the patient on an ongoing basis (e.g., nurse, pharmacist, prescriber, aide, social worker, therapists, HME supplier, billing and reimbursement specialists, nutritionist/dietician) and the patient and caregiver.
- Conduct inter-professional healthcare team meetings on an established schedule to ensure the care plan is being followed and that lines of communication and documentation are open.
Invite the patient and caregiver to meetings as needed to keep them apprised of new information and to ensure they are participating in the patient's plan of care.

Communicate any changes that occur and document them in the shared patient infusion or medical record (e.g., new job, new insurance, decreased willingness to administer infusion at home), preferably an integrated electronic medical record, if available.

Communicate any changes that occur and document them in the patient's home on the care coordination "soft chart".

Use telehealth services to provide real time video images of skin integrity, wound healing, signs of infection, or to virtually work with each other in lieu of a conference call or physically in a conference room, if available.

These steps contribute to solving the following gaps identified in the previous section: need to embrace new technology for home infusion (Gap 5); workforce shortages, training needs, and other concerns facing the industry (Gap 6); inconsistent patient and caregiver involvement (Gap 7); inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8); inconsistent communication after the patient has gone home with infusion therapy (Gap 10).

Modify therapy as needed:
Therapy modifications may be required in order to meet patient individualized needs according to diagnoses, equipment availability, and/or insurance requirements.

- Communicate changes or modifications in dosage, administration route, and time.
- Communicate any new equipment or supply changes and ensure these are noted on the patient's infusion or medical record.
- Communicate any changes in billing and reimbursement.

Verify that modified therapy is programmed and being administered.

Perform verification of any modifications to the therapy specific to agency policy.

Document all changes in the shared patient infusion or medical record and verify that the inter-professional healthcare team is aware of the changes; use an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section:
- inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8);
- inconsistent communication after the patient has gone home with infusion therapy (Gap 10).

IV. DISCONTINUATION OF PATIENT THERAPY

Coordinate communications with team and patient:
Proper care coordination for a safe and accurate discharge of the patient from infusion therapy is important for team members to ensure the patient's needs, goals, and outcomes have been addressed.

- Evaluate the patient's status to determine if the goals of therapy have been met.
- Discuss, with all team members, the end of the patient's therapy, preferably in advance of the day or days before it is discontinued.
- Determine the date and time of the last infusion.
- Arrange for support of VAD maintenance and supplies if the infusion line is to remain in place after the infusion therapy has ended.
- Arrange for removal of the VAD, including date, time, and location for removal.
- Determine when the HME supplier can pick up the equipment, if applicable.
Determine when the healthcare professional from the inter-professional healthcare team will meet with the patient.

Determine any issues with billing and reimbursement.

Determine the date to stop regular deliveries of supplies and medications.

Determine if other disciplines that are involved with the patient at home are continuing with their services (such as therapists, home care agencies or social services); notify them that the infusion therapy will be ending and when.

Document discharge planning, including whether or not the patient’s and caregiver’s goals have been met, in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section: inconsistent patient and caregiver involvement (Gap 7); inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8); inconsistent communication after the patient has gone home with infusion therapy (Gap10); lack of making the discharge process from home infusion a valid part of the process (Gap11).

Perform patient discharge evaluation:
A proper discharge tells the story of the patient’s care and service while receiving home infusion therapy. It also provides for accurate billing and endpoints for the patient’s therapy.

Evaluate for therapy effectiveness and patient status.

Document why the therapy is being discontinued (e.g., achievement of goals, deceased, non-adherence).

Discuss follow up visits and appointments or other necessary communications with the patient and caregiver (e.g., removal of the VAD)

Provide instructions for self-care and use of oral medication to complete a course of therapy, if applicable.

Provide information for billing and reimbursement questions that may occur post-discharge.

Assess patient’s and caregiver’s understanding of discharge instructions.

Provide the patient and caregiver with an easy-to-follow patient satisfaction survey and provide them with the information as to where to send it (this is for continual process improvement purposes).

Use a discharge checklist to ensure all items for a proper discharge are completed per policy, standards, or law.

Develop a post-discharge review to include any readmissions, preventable problems, changes in the home, and verification of being paid by the patient or payer.

Document all discharge planning and actions in the shared infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gaps identified in the previous section: inconsistent coverage from payers when sending a patient home on infusion therapy (Gap 8); inconsistent communication after the patient has gone home with infusion therapy (Gap10).
Retrieve equipment:
Equipment can be difficult to retrieve post-therapy and the patient could incur out-of-pocket expenses for loss or damage to the equipment.

☐ Include the name and type of equipment on the discharge checklist.
☐ Know where the equipment is stored until pickup and if it needs maintenance.
☐ Determine if there is a backup piece of equipment in the house and that it is part of the equipment return.
☐ Determine how the device is to be returned; the HME supplier picks it up or there is a return mailing box, suitable packing material, and return label.
☐ Determine if any equipment is disposable and can be discarded in household trash.
☐ Determine if the equipment is damaged or requires extra servicing beyond normal maintenance (e.g., needs a new battery).
☐ Use a checklist to ensure that all required items are removed from the home.
☐ Document that all equipment is either disposed of or returned, per policy, in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: inconsistent communication after the patient has gone home with infusion therapy (Gap10).

Dispose of medications and supplies:
Proper disposal of medications is essential when there are narcotics in the patient’s possession and to prevent contaminating the environment.

☐ Follow agency and state protocol for disposal of medications, sharps waste, and biohazardous waste.
☐ Instruct patient on what to do with unused supplies
☐ Inform pharmacy when medications and supplies are disposed of; include how and when they were disposed of.
☐ Document the disposal of the medication, per policy, in the shared patient infusion or medical record, preferably an integrated electronic medical record, if available.

These steps contribute to solving the following gap identified in the previous section: inconsistent communication after the patient has gone home with infusion therapy (Gap10).
TACTICAL DISCUSSION
Product Design and Health IT

The future state of infusion therapy not only requires the above discussed “future state” standardized process for day-to-day transition of care to the non-clinical environment, it also requires industry-wide consideration of product design and advancements in health information technology. The following tactical considerations include factors that support multiple sections of this infusion therapy process guide and address multiple gaps.

Product Design

Device Design and Infusion Pump Selection: Manufacturers of infusion pumps need to follow available guidance and standards to design and test devices intended for use in the home environment by a lay person (CDRH guidance Designing Devices Intended for the Home Environment, 2014). Infusions devices need to be developed that eliminate the leading medical device errors experienced in all care settings:

- Input error based on misperception - the user misperceives data displayed on a medical device and performs an incorrect action based on that misperception
- Mistakes - the user correctly perceives the data but forms and carries out an incorrect intention
- Execution error or slip - the user correctly perceives the data and forms the correction intention but performs an incorrect action
- Endogenous error - errors that arise from processes internal to the user of which the person might not even be aware
- Exogenous error - errors that arise from processes external to the user, including errors of omission, insertion, repetition, and substitution

When choosing and purchasing devices, HME suppliers and pharmacists must look to those devices which have been properly designed for use in the home. Billing and reimbursement should focus on reimbursing only for these home-use-designed-pumps in a phased-in approach. The Committee on the Role of Human Factors (NRC, 2011) suggested that accreditation bodies review the types of infusion pumps designed for the home, as well as reviewing their current standards, in order to incorporate the need to have only pumps that are designed and tested for the home.

Human Factors

Human factors methods are recommended for the infusion therapy process, as well as product design. Human factors methods should be involved in systems evaluation, such as the process advised for home infusion therapy. Human factors focuses on the principle of centering the product design process on the person or persons in the system. It has been shown to increase user safety, performance, efficiency and effectiveness, cost effectiveness, and user satisfaction. Human factors, with user-centered design, focuses on user needs, task analysis, activity flows and environments. It is a cyclical iterative process, and not a linear one (i.e., results obtained in one design step not only influence future steps, but can cause the designer to repeat, or reiterate, previous design steps). It is a continual feedback mechanism. (NRC, 2011, AAMI/ANSI HE-75, ISO/IEC 62366).

Adverse Outcomes

All infusion agencies need to develop a strong reporting system for adverse events and product problems, and follow regulatory requirements for reporting device and drug product problems. A lack of consistent capturing of clinician and patient issues while undergoing infusion therapy can lead to continual product problems and adverse outcomes with no decisions on risk mitigation. By meeting regularly with the inter-professional healthcare team, while the patient is undergoing
infusion therapy in the home, adverse events, adverse reactions, and product problems can be addressed and reported to the proper authorities. Having one person responsible for assuring these reports are written and reported properly can mitigate risk through better product design, better labeling with warnings and cautions, and remedial actions that may have to be taken for poor quality products.

**Health Information Technology**

Incorporating Technology: Home infusion agencies need to evaluate newer forms of technology such as mobile apps, telehealth, smart pumps, electronic health records, and interoperable equipment. These technologies can enhance continuity of care, allowing for faster responses to potential emergencies in the patient’s home and improved clinical decisions through sharing of health data points.

Healthcare technology is evolving rapidly in the areas of wearables, apps, and remote monitoring. By 2018, around 70% of the world’s healthcare organizations are predicted to invest in patient technology (Kopf, 2016). By using certain data points transmitted in newer technology, infusion therapy nurses and other healthcare providers can monitor what is happening with an individual patient and combine that information with data points from similar patients. Information Technology (IT) experts predict that, in the near future, ongoing monitoring of health data points can lead to better clinical decisions and improved patient outcomes (Lynch, 2015). With remote sensing and online videoconferencing, virtual visits are available and could become an adjunct to regular home visits, provided payer reimbursement keeps pace with technological alternatives. A priority for designers of medical devices and apps is to focus on developing a platform that integrates patient, device, caregiver, and healthcare professional so that each is continually informed, decreasing the chance of emergencies or unanticipated health crises. Human factors must be integrated into the design phases for the end user to determine when there is too much information, if it is too public, too complex, or unusable (NRC, 2011). Shared standards for this type of data exchange, including privacy and assurance of accurate data transmission, need to be promoted and developed. Payers need to determine how they should be reimbursing for these types of visits and set a standard across the board. (Topol, 2012). Patients should adopt new technology as long as they value its use, are well trained, can rely on the information that comes out of the product, and are confident their data remains private.

**Health Information Technology**

Infusion therapy agencies must incorporate available health information tools to the extent possible, including the six types determined by the Office of the National Coordinator for Health Information in 2008: electronic medical record, electronic health record, personal health record, health information exchange, health information organization, and regional health information organization. These tools are included in the Federal Health IT Strategic Plan for 2015-2020, which uses an interoperability road map to advance secure and interoperable health information. (ONC, 2014). One or all of these types of technology could influence information technology in home infusion therapy. Among disparate products and organizations, this type of system makes the right data available to the right people at the right time, allowing for meaningfully use. Health IT could lead to better collection of health information and faster interventions that would in turn lead to better patient outcomes. Hospitals, home infusion agencies, and inter-professional healthcare teams are encouraged to review these six types of technologies and to develop policy and protocols based on their definitions (see glossary) and individual applicability.
Telehealth

Home infusion agencies must consider incorporating telehealth into their processes to the extent that the technology demonstrates value in this patient population, and can be reimbursed. Telehealth has seen advances in the past few years for home care including tele-diagnostics. Some infusion therapy agencies already depend on telecommunications to assist patients in remote locations to view wound healing, assess skin integrity, patient symptoms, and view patients and caregivers administering therapy. Medicare has historically provided limited coverage for telehealth services, however in 2015, Congress put together a working group policy document to find out how they could increase access to telehealth services across Medicare, including Medicare Advantage. Congress states “it is safe to assume that telehealth will continue to be integrated into new payment and care delivery models in support of the shift from fee-for-service to fee-for-value” (Jackson Jr., 2016). Mobile health (mHealth) another newer term, builds on telehealth by turning mobile devices into healthcare delivery and assessment tools. It is also used for better patient outcomes by monitoring their health status, diagnosing and treating medical conditions, and assessing what can lead to changes in health patterns.

By accessing and using the data that comes in on mobile apps, inter-professional health teams could potentially assess problems more quickly, and intervene more rapidly. Harry Greenspun from Deloitte was asked if consumers are ready for tech-enabled home health (Garvin, 2016). He stated the barriers to telehealth are not necessarily technology-related, but rather they are based on incentives. As more and more providers find an incentive to use telehealth services, consumers will find it easy to use and it will become incorporated into the healthcare system. Smart apps can perform many health-related tasks as well. It can be customized to the user with no need to do any programming; rather, the data is put in by the healthcare professional from the existing library of pre-programmed information. This reduces the margin of programming error considerably. The big driver for the adoption of home health information technology is the shift to value-based care. This focuses industry and healthcare organizations on health, prevention, and wellness. By focusing on this, it will require everyone to share information, coordinate care, engage consumers, and analyze data in new ways.
CONCLUSIONS AND NEED FOR RESEARCH

Having a process guide to follow when a patient goes home with infusion therapy provides a consistent approach to safe patient transitions from the hospital back to the home. This guide could be incorporated into both regulatory and non-regulatory systems, including accreditation standards, reimbursement models, and practice standards. Hospitals and home infusion agencies can use this guide to determine best practices within their current model, identify potential gaps and constraints, and make the necessary adjustments or changes to bring their agency into alignment with this “future state.”

Considerations for device design and health information technology should help an agency or hospital align their best practices to the process guide and help eliminate any gaps in their current policy or practice. Understanding that not every demographic area in the United States can acquire or afford the most updated technologies, including health IT and infusion pumps, nor have separately identified personnel on workforces to accomplish all the tasks, we believe that everyone can work with the proposed process guide and subsequent recommendations to develop a system that works for their particular area and meets all of the jobs (or roles) identified within the mapping.

Research

In addition to the recommendations, the AAMI Foundation team identified research needs that could further improve positive patient outcomes, prevent readmissions, and provide data for better quality of care in the home while the patient is receiving infusion therapy. Pilot programs on a small scale, funding from payers, or funding from research organizations or device manufacturers, especially those focusing on newer technology in the home environment, could support these research needs.

Remote Monitoring

Remote monitoring of patients on home infusion therapy is being done to a small extent—it occurs more in remote settings, such as Alaska, than in larger urban areas. Minimal research has been done to understand how well remote monitoring could help prevent adverse outcomes or readmissions. Research needs include assessing the different types of remote monitoring including video conferencing, use of smart pumps that send in information or alerts to the healthcare professional on a scheduled basis, and the use of interoperable equipment that keeps tabs on more than just the infusion but rather gives a more holistic impression of the patient. Other questions in research such as this would be to ask the patient if they are willing to give up some privacy in order to be able to share their data in real time because a healthcare professional could be accessing their equipment and stored data.

Measuring Cost Effectiveness

Studying cost effectiveness when administering home infusion therapy could be beneficial as a tool to demonstrate any savings in comparison to other methods of providing infusion therapy. For physicians who participate in shared savings or bundled payments arrangements, the extra time spent working with home infusion agencies can be financially beneficial. Shared savings programs value treating patients in the most appropriate location with the most cost-effective medication and treatment. Value-based and bundled arrangements award the prescriber for better outcomes of care with premium payments. Long-range studies should be done to evaluate cost savings with patient outcomes.
Test Infusion Devices

Testing of all, or the majority of, infusion devices that are being used in the home should be done by independent organizations to ascertain whether they follow the International Standard for electrical home medical equipment and also to see if they follow the FDA’s guidance on designing devices intended for use outside of a clinical environment. *(FDA/CDRH guidance on Design Considerations for Devices Intended for Home Use, 2014)*. Manufacturers who follow the standard and guidance should ensure they have covered all aspects of designing a device to be operable in many environmental conditions by many different types of operators with varying skills and limitations and should perform pilot tests to ascertain a return on investment once the pumps are placed into the market.

Data Quality

As more healthcare is delivered through the telehealth systems and mHealth systems, data quality should be studied for accuracy, privacy, and completeness. There are potential errors when data is being transmitted, e.g., devices may degrade the quality of an image or other information in order to conserve a battery. Privacy of information, feedback to ensure the data sent is what is received, and determining what type of data needs to be shared, are all important aspects of research into this field. This can be done in conjunction with home infusion agencies or independently.

Home Infusion therapy is a growing industry and has demonstrated how it can provide positive patient outcomes, safer care, and be affordable. With a consistent mapping process from hospital back to the home that is accepted into practice, it can become the best alternative to provide a safe, consistent, affordable, preferable, and effective environment for patients to receive infusion therapy.
An Anecdotal Interview

The following interview illustrates the experience of a patient in one region of the U.S. who received home infusion. Though the information is anecdotal, and some questions were not asked, the patient’s experience demonstrates why a solid mapping process and proper transitioning back to the home could prevent some of the unfortunate issues she encountered, and reinforce the positive things that occurred.

Lori is a 57-year-old woman living in a small Midwest town with her husband, Joe. She has been married for 30 years and has two adult children who live nearby. Lori had a hip replaced in June and, two weeks later, had another surgery for a fractured femur. She developed an infection in her hip within a week of the second surgery and was essentially immobile. Joe was Lori’s caregiver. He is employed in a small town about 30 minutes from their home. The author visited Lori later that summer and discussed the infusion experience with her. Lori’s story is not a reflection on the home infusion industry as a whole. It should be noted that her home infusion experience was a success; that is, it met the goals for the infusion therapy. She did not have to be re-hospitalized, nor did she have to extend her infusion therapy or have a change in any of the initial care plan. Her infection resolved after this therapy was over.

The following is the interview with Lori:

Q: “Lori, why did you have home infusion prescribed for you?”
A: “Because I had an infection in my hip after my second surgery.”

Q: “When did you learn you were going home with medication and a way to get it in (that is, the infuser or pump)?”
A: “While I was in the hospital, the doctor told me.”

Q: “At what point in the hospital were you involved in the decision making to go home with this therapy?”
A: “I wasn’t involved in the decision making.”

Q: “When did they decide what type of infusion catheter you were going to get (picc, central line, etc.)? And did you get input on what arm to put it in?”
A: “It was decided that since I had to have it done intravenous for a few weeks, I had to have it done. I wasn’t given a choice in the arm or anything else.”

Q: “When did Joe actually get involved with understanding about infusion therapy—at home or in the hospital?”
A: “At home.”

Q: “What type of education did you receive on the picc line in the hospital?”
A: “There were two women that came and talked to me about it and showed me how to do it when I got home.”

Q: “What type of education did you receive on the type of infusion therapy you were going to receive in the home?”
A: “The same two women explained things.”

Q: “Did they tell you that you were going to get these elastomeric infusers? Did they show you what they looked like and how they were used?”
A: “Yes, these women explained it to me.”

Q: “Were you aware if your insurance company paid for home infusion and how much they would pay?”
A: “Nothing was said about insurance when I was in the hospital.”
Q: “Did you have a choice in the home infusion (or home care) agency that you could use?”
A: “No, I was not given a choice.”

Q: “Where did the supplies and equipment come from?”
A: “An infusion therapy place out of Eagan.”
(Interviewer’s Note: About 75 miles from the patient’s home)

Q: “Where did the medication come from?”
A: “The same place.”

Q: “How did the supplies arrive at home? Was someone there to receive them? Did someone make sure you would be there?”
A: “UPS delivered it to the house and they dropped it off at the front door. I was at home but couldn’t go to the door. Joe was at work. No one checked with us to see if anybody would be home to get it from the front porch. I had to call my neighbor to see if they were at home to come over and pick up the supplies on the front porch and bring them inside. They were at home and picked up the package on the front stoop.”

Q: “How did the medication arrive at home? Was someone there to receive it? Did someone make sure you would be there to receive it?”
A: “The medication was delivered the same way.”

Q: “When did the nurse first come to the home? At the scheduled time or at a different time?”
A: “She came on Sunday morning about 8:30. That was the time we were told she was coming.”

Q: “Did the home infusion nurse or someone from the home care agency visit with you while you were still in the hospital?”
A: “No one came from the home infusion agency to see me when I was in the hospital.”

Q: “Were you given a choice as to what time of day would work for you to give the infusion?”
A: “It was supposed to be at the same time it was done in the hospital. But then it got changed to later in the day because it wasn’t ordered when I left the hospital.”

Q: “How many visits did it take before Joe felt comfortable doing the infusion? Were you allowed just a certain number of visits by the home infusion nurse?”
A: “The home healthcare nurse was the one that showed Joe how to do it. She just came once and that was it. No checking back to see how it was going from that particular nurse.”

Q: “Did the nurse leave instructions behind for Joe to follow?”
A: “Yes, there were instructions that Joe followed the first few times to make sure he was doing it right. I had also watched the nurses when I was in the hospital.”

Q: “What did they tell you to do in case of an emergency, like air in the catheter line or a sign of infection around the infusion site?”
A: “Nothing was said if we had an emergency. I guess we would have just gone into the emergency room at the hospital since we don’t live that far from the hospital.”

Q: “How often did the next round of supplies and medication come? Did someone call you to say they were coming?”
A: “When the supplies were delivered, it was for 5 days at a time. I believe that the next supplies would come on the 5th day. No one called to say they were coming. The home health nurse called once to check when it was coming because the 4th of July was in there. I just wanted to make sure to know it was covered over the holiday.”
Q: “What kind of instruction did you receive on infection control in the home (e.g., no pets around the infusion, covering the infusion site during showers, etc.)?”
A: “When I was in the hospital, I was told it had to be covered when I took a shower. Nothing was said about pets. But, we just made sure our cats weren’t near me when it was getting done.”

Q: “What kind of instruction did you receive to keep the supplies safe and sterile (e.g., do not put in direct sunlight)?”
A: “We just kept them in another room away from the cats and kept the door closed. Didn’t have any instructions on how to keep it sterile.”

Q: “What kind of instruction did you receive on caring for the medication?”
A: “The box with the supplies said it needed to be kept in the fridge, so that’s what we did.”

Q: “Were one or both of you involved in team meetings at the hospital? (e.g., case worker, physician, pharmacist, discharge nurse, insurance person)?”
A: “It was just me and it was only the doctor who came and talked to me about it. No one else came in.”

Q: “Were one or both of you involved in any team meeting after you came home from the hospital? (e.g., home infusion nurse, insurance person, physician, pharmacist, etc.)?”
A: “We never had any meetings with anyone after I got home.”

Q: “How often did the nurse come after Joe received training on how to give the infusion?”
A: “No nurse came after the first day except to draw blood. She asked Joe how it was going at one time or another.”

Q: “Did you receive any additional training or have any observation done by the nurse after a couple of weeks on the infusion?”
A: “Nothing.”

Q: “Did they ask Joe to do a return demonstration to show that he understood what he was supposed to do?”
A: “The gal didn’t have Joe do anything.”

Q: “What types of phone calls did you receive to ensure things were going smoothly in the home? Who were they from? The pharmacist, the nurse, the doctor?”
A: “No one ever called to see how things were going.”

Q: “Would it have been helpful for you if someone had Skyped or did some type of video conferencing with you just to check up on you?”
A: “I feel that would have helped if someone called and had a conference call or Skyped us to see how things were going.”

Q: “How did you get discharged from the home infusion therapy? Who picked up the extra supplies? Who took out the picc line?”
A: “I had to go to Rochester to the main clinic twice for a consultation with the infection control people. The home health nurse would draw my blood and they monitored my results and they determined after 4 weeks that I could have the picc line out. So they took the picc line out while I was there.” (Interviewer’s Note: Rochester is about 30 miles from the patient’s home).

Q: “Did someone ask you about how satisfied you were with the therapy?”
A: “No one asked me anything.”

Q: “Was there anything you shared electronically or over the phone with your healthcare provider? Or was it all done on paper?”
A: “I didn’t share anything.”

Q: “Is there anything else you want to add that you can think of? Something amusing? Something dangerous? Out of line? Do you recommend someone go home with infusion therapy versus having it done in the hospital or a clinic? What could be done better? What was done well? How would you change things if you could?”
A: “It was an experience I hope I never have to do again. It was nice to have it done at home because at that point I didn’t have to go anywhere to have it done. But I feel if I was more mobile, I would rather have had it done at the hospital or the clinic. Joe had to take time off work to come home and do it. It is what it is. I survived.”
ISMP Incidents

*ISMP Incidents noted in the Medication Safety Alert bulletin June 18, 2015, Vol 20, Issue 12*
https://www.ismp.org/newsletters/acuteCare/showArticle.aspx?id=111

The following incidents reported in the ISMP newsletter are isolated incidents with home infusion. This does not mean home infusion is unsafe; these incidents are for educational purposes only and do not reflect on the home infusion industry as a whole. Rather, the reports demonstrate that errors do occur and we can all learn from these errors. An infusion therapy process map that follows defined processes for home infusion, and the ability to work with medical device manufacturers to test and validate their products, can help decrease these types of incidents.

**INCIDENT:** A patient was to receive 4,000 mg of fluorouracil by IV infusion at 2 mL/hour over 4 days and accidentally received the entire 4-day dose in less than 1 hour. The error was caused by a mix up between an elastomeric infusion pump that infuses 2 mL per hour with one that infuses 250 mL per hour. The pump, used mainly in the home, is available in 19 different volume and flow rate combinations for short- and long-term infusions. The pumps are packaged in outer cartons with labeling that is almost identical. The pharmacy either did not know there was a difference between the pumps or did not see the infusion rate because it was printed in very small type on the front of the package in 4 different locations. On the day the infusion started, the patient also had a radiation appointment and the nurse at the clinic realized there was no volume left in the infuser. The patient was admitted to the hospital and the antidote was given there.

**HOW DID THIS HAPPEN?:** The manufacturer uses color to differentiate between the different flow rates; however, the 2mL/hour and the 250 mL/hr. shared the same color coding—one was meant for long-term infusion and the other for short-term infusion, as the manufacturer believed that the two pumps would remain separated from each other. Also, the pharmacy was notified of a shortage with their usual chemotherapy elastomeric pumps and ordered this pump as a back-up. Unfamiliarity with this pump also contributed to the incorrect pump being used. It was not noted whether or not there was verification of the dose with the type of pump being used.

**CORRECTIONS:** The company responded immediately to the notification and changed their labeling with larger fonts to make the infusion rate stand out more boldly. A yellow sticker with the infusion rate was added to the carton to catch the user’s eye. Another suggestion to the company was to relocate the infusion rate label on the tubing closer to the pump making it more visible when holding the pump in your hand.

**INCIDENT:** A 43-year old woman received a dose of fluorouracil that was administered over 4 hours instead of 4 days. Two nurses miscalculated the infusion rate, forgetting to divide the daily dose by 24 hours. The pharmacy label was also misleading in that it listed mL/ day rate of the infusion first and then the mL/hour rate. The nurses saw the 28.8L/24 hours and believed their calculations for an hourly rate were correct. When the patient called to report that the entire dose had infused in 4 hours, she did not receive prompt treatment for the overdose. She visited the clinic the next day but was treated and discharged because there were no beds available in the local hospital. She was admitted the following day and died 22 days after the overdose from hemodynamic collapse and multi system organ failure.

**HOW DID THIS HAPPEN?:** Multitasking, a failed independent double-check system, not using a smart pump, confusing choices when programming the pump, and a review screen that did not include the duration of the infusion all contributed to the incident.

**CORRECTIONS:** Follow established protocols per pharmacy practice standards and internal policy. Prescribe clearly, review chemotherapy certification processes, use pumps with safeguards, provide education and validate competencies, enhance independent double checks, standardize how key information on pharmacy labels are displayed, and teach patients about the drug, pump, and what to look for if there is a problem.
A – D
No entries

E

eHealth: The American Telemedicine Association (ATA) defines eHealth, a term used mostly in Europe, as an umbrella terms to include telehealth, electronic medical records, and other components of health information technology.

Electronic health record (EHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one healthcare organization.

Electronic medical record (EMR): An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one healthcare organization.

F – G
No entries

H

Health information exchange (HIE): The electronic movement of health-related information among organizations according to nationally recognized standards.

Health information organization: An organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

Home: A location, other than a hospital or other clinical facility, where healthcare professionals are continually present, in which the patient receives medical care.

Home infusion pharmacy: The American Society of Health-System Pharmacists (ASHP) defines a home infusion pharmacy as a licensed pharmacy that prepares and dispenses parenteral sterile medications directly to a patient, pursuant to a valid individual prescription and in individualized doses.

Home infusion service providers: The American Society of Health-System Pharmacists (ASHP) defines home infusion service providers as “an organization that continues or completes a patient’s parenteral medication in the home or alternate site after the patient is released from a hospital or other facility. They may offer nursing or other services in addition to pharmacist care.”

I

Inter-professional Care Collaboration: Defined by the Intravenous Nursing Society Standards as a cooperative approach to patient care that depends upon the overlapping knowledge, skills, and abilities of each professional team member.

Interoperability: As defined by the Institute of Electrical and Electronics Engineers (IEEE), as the ability of a system to exchange electronic health information with and use electronic health information from other systems without special effort on the part of the user.

J – K
No entries

L

Lay: Term referring to nonprofessional or professional without relevant specialized training; e.g., lay operator, lay responsible organization.

M

Mobile health: Another newer term when it comes to advances in technology that builds upon telehealth by turning mobile devices into healthcare delivery and assessment tools. It is used for better patient outcomes by monitoring their health status, diagnosing and treating medical conditions, and assessing what can lead to changes in health patterns. By accessing and using the data that comes in on mobile apps, inter-professional teams can quickly assess problems and intervene more rapidly.

N – O
No entries
Glossary

P

Personal health record (PHR): An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

Prescriber: A person who gives directions, either orally or in writing, for the preparation and/or administration of a medicine or a treatment.

Q

Regional health information organization: A health information organization that brings together healthcare stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

R

No entries

S

No entries

T

Telediagnosing: As defined by the Farlex Medical Dictionary, the detection of disease by evaluation of data transmitted to a receiving station, a process normally involving patient-monitoring instruments and a transfer link to a diagnostic center at some distance from the patient for the transfer of diagnostic data, consultations, and images.

Telehealth: The National Telehealth Policy Resource Center defines telehealth as a collection of means and methods for enhancing healthcare, public health, and health education delivery and support through the use of telecommunications technologies. This term is more commonly used because it describes a wide range of diagnosis and management, education, and other related fields of healthcare. These include, but are not limited to, dentistry, counseling, physical and occupational therapy, home health, chronic disease monitoring and management, disaster management, and consumer and professional education. The federal Health Resources & Services Administration (HRSA) states that telehealth is “the use of electronic information and telecommunications technologies to support long-distance clinical healthcare, patient and professional health-related education, public health and health administrations.

Telemedicine: The American Telemedicine Association (ATA) defines telemedicine as the use of medical information exchanged from one site to another via electronic communications to improve a patient’s clinical health status. It includes such applications and services as two-way video, email, smart phones, and wireless tools. The ATA has considered the two terms “telemedicine” and “telehealth” to be interchangeable; however, others may argue that telehealth is a broader term that can include non-clinical services as well.

Telepharmacy: The delivery of pharmaceutical care via telecommunications to patients in locations where they may not have direct contact with a pharmacist. It includes drug therapy, monitoring, patient counseling, prior authorization, and refill authorization for prescription drugs, and monitoring of formulary compliance with the aid of tele- or video-conferencing. Remote dispensing of medication by automated packaging and labeling systems are also part of this.

Transition: The National Association of Clinical Nurse Specialists (NACNS) defines this as the movement of a patient between healthcare locations, providers, or different levels of care within the same location as patient conditions and care needs change. Specifically, they can occur:

1. within settings; e.g., primary care to specialty care, or intensive care unit (ICU) to ward
2. between settings; e.g., hospital to sub-acute care, or ambulatory clinic to senior center
3. across health states; e.g., curative care to palliative care or hospice, or personal residence to assisted living
4. between providers; e.g., generalist to a specialist practitioner, or acute care provider to a palliative care specialist.

Transitions of care: A set of actions designed to ensure coordination and continuity. They should be based on a comprehensive care plan and the availability of well-trained practitioners with current information about the patient’s treatment goals, preferences, and health or clinical status. They include logistical arrangements and education of patient and family, as well as coordination among the health professionals involved in the transition.

U – Z

No entries
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Following are accreditation bodies used in home infusion therapy:

**Accreditation Commission for Healthcare (ACHC)**

ACHC is a non-profit healthcare accrediting organization. It represents an alternative to The Joint Commission and the Community Health Accreditation Program. ACHC was established in 1985 by home care health providers to create an accreditation option which was more focused on the needs of small providers. The process began in Raleigh, North Carolina, where the group incorporated in August 1986. The first accredited organization was awarded certification in January 1987. ACHC began offering services on a national level in 1996. Today, ACHC offers seven accredited programs, three of which are CMS approved (Home Health, Hospice, and DMEPOS).

**Center for Pharmacy Practice Accreditation (CPPA)**

The Center for Pharmacy Practice Accreditation (CPPA) is a partnership established by the American Pharmacists Association (APhA), the National Association of Boards of Pharmacy (NABP), and the American Society of Health-System Pharmacists (ASHP) to oversee accreditation of pharmacy practice sites. CPPA develops and implements comprehensive programs of pharmacy practice site accreditation and manages the process leading to the use of consensus-based standards for pharmacy practice accreditation.

**Community Health Accreditation Program (CHAP)**

CHAP is an independent, nonprofit accrediting body for home and community-based healthcare organizations. In 1965, CHAP was the first to recognize the need and value for accreditation in community-based care. CHAP is the oldest national, community-based accrediting body with more than 9,000 agencies currently accredited nationwide. Through “deeming authority” granted by the Centers for Medicare & Medicaid Services (CMS), in 1992, CHAP has the regulatory authority to survey agencies providing home health, hospice, and home medical equipment services to determine if they meet the Medicare Conditions of Participation and CMS Quality Standards.

**Healthcare Quality Association on Accreditation (HQAA)**

The Healthcare Quality Association on Accreditation (HQAA) is a US not-for-profit healthcare accrediting body and is an alternative to the Accreditation Commission for Healthcare and The Joint Commission. The organization provides an accreditation option specifically designed for durable medical equipment (DME). HQAA was developed following passage of the Medicare Modernization Act of 2003. It has been awarded Medicare deeming status for DME accreditation.

**National Association of Boards of Pharmacy (NABP)**

The National Association of Boards of Pharmacy (NABP) is an international association that assists licensing boards in developing, implementing, and enforcing uniform standards relating to pharmacies. The NABP membership includes two Australian states and nine Canadian provinces, in addition to the fifty states of the US, the District of Columbia, and three U.S. territories. Part of the NABP’s work includes standardized tests to aid in licensing, such as the Multistate Pharmacy Jurisprudence Examination and the North American Pharmacist Licensure Examination (NAPLEX).
The Compliance Team (TCT)

The Compliance Team Inc. (TCT) is a US for-profit organization which runs the “Exemplary Provider” accreditation programs, a US-based alternative to The Joint Commission. In 2006 TCT was formally granted national deeming authority by the Centers for Medicare & Medicaid Services as an accrediting body for all type of durable medical equipment (DME) including respiratory, mobility, wound care, orthopedic, prosthetics, orthotics, diabetic, ostomy, and incontinence supplies. DME point of service (DMEPOS) providers include pharmacy, home care, podiatrists and orthopedic surgeons. The Compliance Team has accredited approximately 5,000 DMEPOS providers in the USA and Puerto Rico.

The Joint Commission (TJC)

TJC is a nonprofit organization that accredits more than 21,000 healthcare organizations and programs in the United States. There is also an international branch that accredits medical services around the world. A majority of state governments recognize TJC accreditation as a condition of licensure and receipt of Medicaid and Medicare reimbursements.

URAC

URAC is a nonprofit organization that promotes healthcare quality through the accreditation of organizations involved in medical care services. URAC accredits healthcare organizations–including health plans (HMOs, PPOs, etc.), healthcare management organizations (disease management, case management, patient centered medical homes, health call centers, etc.), health websites, and telehealth. Accreditation standards for URAC programs are developed by independent experts, relying on advisory committees of experts in healthcare delivery. After internal discussion, the organization makes them available for public comment, refines them further based on comments, and then passes them to URAC’s independent advisory group for approval. URAC’s board of directors gives final approval of accreditation standards. Founded under the name Utilization Review Accreditation Commission in 1990, the name was shortened to the acronym URAC in 1996 when it began accrediting other types of organizations such as health plans, pharmacies, and provider organizations.
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