**Implementation Priorities for Integrating the Healthcare Enterprise (IHE)**

**Nursing Subcommittee**

**White Paper to support the uptake of Patient Plan of Care and eNursing Summary Profiles**

**Prepared by the IHE Patient Care Coordination Nursing Subcommittee**

**May 3, 2012**

**Introduction**

Patient care is complex and often involves many facets of the healthcare delivery system. Communication is imperative to streamline care processes that may result in decreased cost and improved quality. The services that nurses provide in any care setting are key components of patient care. It is imperative that components of nursing care provided are efficiently communicated to other care providers as well as to the patient themselves. This white paper will discuss how the IHE Patient Plan of Care (PPOC) and eNursing Summary (eNS) profiles support the benefits for exchanging nursing data~~.~~

It will explain the use of the Nursing Process to define the data that is used to support the exchange of clinical information. It will summarize the differences between the PPOC and eNS, explaining the overarching use of both profiles. It will identify issues with each profile and attempt to recommend changes to support adoption. Furthermore, it will define use cases to support the need for the exchange of nursing data and identify future work that is needed.

**Open Issues**

1. Future work is needed for assessment documentation profiles. This work will need to be aligned with HL7 assessment tools – CARE, OASIS, MDS3.0 (US Medicare Assessments). In the United States (US), the Center for Medicare and Medicaid Services (CMS) requires Nursing Homes and Home Health Agencies to respectively complete the Minimum Data Set version 3 (MDSv3) and the Outcome and Assessment Information Set version C (OASIS-C) at prescribed intervals during each patient’s/individual’s stay and that these providers electronically transmit these assessment s to other providers and for payment. However, transmission formats are not interoperable (i.e., they do not adhere to accepted health IT formats and content standards). Currently, the lack of interoperable content and exchange standards limits the reuse of assessment content.

**Overview**

Globally, the healthcare system is highly fragmented. The Institute of Medicine report on healthcare, suggests the US healthcare system does not make the best use of its resources. It is a highly splintered delivery system resulting in unnecessary duplication of services with long waiting times and delayed services.[[1]](#footnote-1) Such fragmentation in care, often results in higher cost with decreased quality. As the population ages, an increasing number of patients will need to access the healthcare system across all care settings. An increase in patient healthcare needs will therefore result in increased cost.

The Joint Commission, in 2005, analyzed three thousand adverse events. Communication was the contributing factor in 70% of these events. Communication breakdowns during transitions of care for one hundred and forty patients accounted for a 50% error rate. This study in conjunction with the work of the Institutes for Healthcare Improvement and other research, acknowledged the serious need for improvement[[2]](#footnote-2). To ensure consistent information, accurate and concise communication must be present during patient care transitions or “hand-offs”. Care transitions, or “hand-offs” usually occur multiple times each day in a hospital and at every change of care setting.

Patients may receive disjointed care when moving between healthcare settings. Fragmentation can increase hospital re-admissions. According to claims data reported for Medicare beneficiaries in 2003-2004, 19.6% of re-hospitalizations occur within 30 days after discharge. This translated into $17.4 billion dollars in hospital payments from Medicare in 2004[[3]](#footnote-3). Accordingly, it was shown that patients who received patient-centered nursing interventions after transitioning from an inpatient setting to an outpatient setting were 50% less likely to be re-admitted[[4]](#footnote-4).

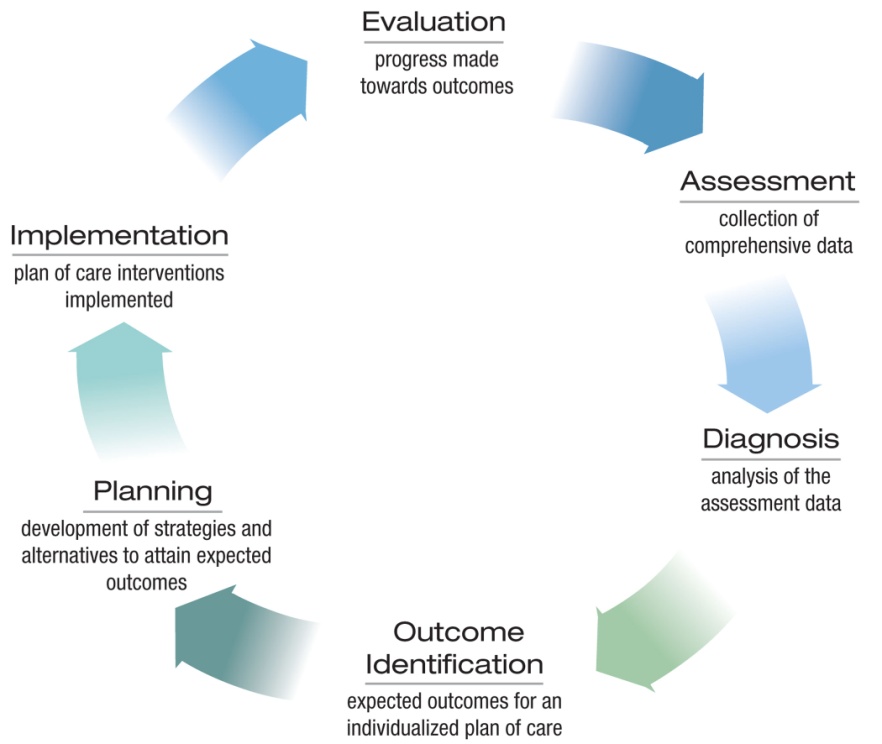
A key component of the patient transition in the healthcare delivery system is between acute and home/hospice care settings. In the United States (US) Medicare system, there are 33,000[[5]](#footnote-5) homecare providers delivering care to approximately 12 million[[6]](#footnote-6) individuals each year due to acute illness, chronic long-term health conditions, permanent disability, or terminal illness. The use of homecare services assists in the reduction of healthcare cost by preventing acute care admissions and re-admissions. In 2009, it was reported that Medicare patients with diabetes, chronic obstructive pulmonary disease (COPD), or congestive heart failure(CHF) who used home healthcare services within 3 months of being discharged from a hospital cost the Medicare program $1.71 billion less and had 24,000 fewer hospital re-admissions.[[7]](#footnote-7)

The delivery of quality homecare nursing service is dependent upon the collaboration and sharing of health information among various health care providers across the continuum of care. Information sharing between care providers in physician practices and acute care settings with homecare and hospice nurses will be critical in advancing care coordination efforts, reducing costs and improving healthcare transitions. Transitioning between care settings is complex and requires efficient “real time” and ongoing communication from care systems that have varying processes, expectations and perspectives[[8]](#footnote-8). To assist in alleviating partitioned health care, patient care needs should be communicated effectively and efficiently as patient’s transit across care settings. This is essential in reducing the risk of harm and decreasing cost. Information sharing across the continuum of care is critical in advancing the coordination of care efforts, reducing costs and improving healthcare transitions.

**Nursing Process**

The Nursing Process is used across care settings where nurses practice. It encompasses all significant actions taken by registered nurses forming the foundation of the nurse’s decision making. It includes the components of assessment, diagnosis, outcomes identification, planning, implementation and evaluation. Nurses use the Nursing Process to evaluate and determine if nursing interventions that are implemented have achieved the desired outcome for the patient’s plan of care. This process creates data that can be exchanged between care settings to support the ongoing plan of care for the patient. As the patient transitions through the health care system, care plan data are modified and need to be communicated. Not only does the data support a continuum of care for the patient, it also provide a source of knowledge for care providers which increases efficiency for the care process, improves care quality and decreases the cost of care across care settings.

During the assessment phase, the registered nurse collects detailed data pertinent to the patient’s health needs. The data are then analyzed to determine the diagnosis or problem. The nurse identifies expected outcomes for an individualized care plan for the patient and family (Figure 1). The plan is established and /or updated with strategies and alternative care choices to attain the expected outcomes. The registered nurse and the allied healthcare team implement the identified plan with ongoing evaluation of progress towards the attainment of the identified outcomes.

**Figure 1.** The Nursing Process Generates the Nursing Care Plan

**Communication**

The components of the Nursing Process are ongoing as long as the patient is obtaining nursing care. As the patient moves across care setting, the patient’s plan of care needs to be collaborated and communicated with the patient, family and all providers. Currently, the nursing care plan is developed by the nurse and not electronically shared with other providers. Other care providers involved with the patient’s care develop their own care/treatment plan (Figure 2). Communication about the patient’s care needs is usually exchanged verbally between all providers. Each discipline develops its own care/treatment plan document which is not currently electronically shared.

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**Figure 2. Nursing Communication**

As the patient moves across care settings, the patient’s plan of care needs to be collaborated and communicated to the patient and other care providers. Each disciplines plan of care should be incorporated into one Plan of Care for the patient (Figure 3). Future work on the PPOC should expand the care plan from only being nursing focused to being an interdisciplinary plan of care where all disciplines that care for the patient are able to communicate their plan of care, problems, interventions and goals/outcomes, for the patient.



**Figure 3**. **Collaborative Communication**

**Summary of PPOC and eNS Profile Findings**

The following defines the purposes of both PPOC and eNS profiles. Currently the profiles do not clearly describe when and how each profile should be used. This leads to difficulty with adoption and implementation. The PPOC and eNS profiles support the data collection and exchange of information between HIT systems and applications which are used to manage patient care. Systems often include decision support capabilities, using evidence-based guidelines for care of patients. Often ad-hoc data gathering is used to collect information from many different sources to populate data warehouses (repositories). The data are then used to support and manage care for different patient populations. In order to manage patient care using the different systems, numerous data points are routinely gathered. The data gathered vary based upon the data collected by the nurse for the patient’s condition/problem at a specified point in time. Data elements gathered by the nurse may include those that are included in the PPOC and eNS profiles (Table 1):

**Table 1. PPOC and eNS Profile Comparison**

|  |  |
| --- | --- |
| **eNS Data Elements** | **PPOC Data Elements** |
| **Allergies and Other Adverse Reactions** | **Allergies and Other Adverse Reactions Section** |
| Allergies |  |
| **Advance Directives**   * Code Status | **Advance Directives Section (text)** |
| **Assessment**   * Cognitive Abilities * Health Assessment * Level of Consciousness * Special Needs * Wound | **Assessments**   * Glasgow Coma Scale Total * Motor * Level of Responsiveness * Pain Severity * Comment Field |
| **Active Problems**   * Complications | **Active Problems** |
| **Chief complaint** |  |
| **Hospital Admission Diagnosis**   * Admission Diagnosis |  |
| **Discharge Diagnosis** |  |
| **Header Modules**   * Date/time of report * Demographics * Nurse Report Give/Receive Signature * Physician(s) Name * Primary Language | **Header (through inheritance from IHE Med Summary)** |
| **Medical Devices** (history of medical device use)   * Devices |  |
| **Diet and Nutrition** |  |
| **Intake and Output**   * Fluid Management |  |
| **Procedures and Interventions**   * Isolation * Mobility/Fall Risk * Procedure | **Procedures and Interventions** |
| **Coded Results**   * Lab Values |  |
|  | **Coded List of Surgeries Section** |
| **Medications**   * Medications | **Medications Administered** |
| **Pain scale assessment section**   * Pain | **Functional Status Assessment**   * Pain Scale Assessment * Geriatric Depression Scale * Braden Score Assessment * Minimum Data Set (physical functioning and structural problems) |
| **Provider Orders**   * Order List * Oxygen * Activity Restriction | **Provider Orders** |
| **Vital Signs** | **Vital Signs** (Included in Physical Exam) |
| **Care Plan** | **Treatment Plan** |
| **Care Plan**   * Precautions * Mobility/Fall Risk |  |
|  | **Physical Examination**   * Vital Signs * Visible Implanted Medical Devices * General Appearance and Specific Body Anatomical Areas |
|  | **Immunizations Section** |
|  | **Review of Systems** |
|  | **Social History** |
|  | **Family History** |
|  | **History of Past Illness Section** |

The PPOC profile was developed to incorporate all steps of the Nursing Process and be the overarching Plan of Care for the patient. It was not intended to be used as a transition of care document even though it should accompany the patient when transitioning to another care setting. The eNS profile was developed to serve as a template for a transition of care document. Both profiles share some of the same data elements such as: assessments, vital signs, advance directives, medications, active problems. Some of the data elements in both profiles use the exact data element term and have the exact template I.D. Sometimes the data element terms are named differently, but share the exact IHE template ID. This is demonstrated in the table below:

**Table 2. Different Data Element Term Names with Same Template ID**

|  |  |  |  |
| --- | --- | --- | --- |
| PPOC Data Element | PPOC Template ID # | eNS Data Element | eNS Template ID # |
| Treatment Plan | 1.3.6.1.4.1.19376.1.5.3.1.3.31 | Care Plan | 1.3.6.1.4.1.19376.1.5.3.1.3.31 |

In both the PPOC and eNS profiles there are instances when both profiles have the same data element term, but the data elements have different template IDs. This situation requires modification of the data element terms.

The example below demonstrates that Advanced Directives in PPOC is aggregating text data and the Advanced Directives in eNS is aggregating coded data. Both PPOC and eNS need the option to aggregate either coded or text Advanced Directives data. Identification of these issues in the PPOC or eNS profiles requires a change proposal to be sent to the IHE PCC Committee.

**Table 3. Same Data Element Term Name with Different Template ID**

|  |  |  |  |
| --- | --- | --- | --- |
| PPOC Data Element | PPOC Template ID # | eNS Data Element | eNS Template ID # |
| Advanced Directives (text) | 1.3.6.1.4.1.19376.1.5.3.1.3.34 | Advanced Directives (coded) | 1.3.6.1.4.1.19376.1.5.3.1.3.35 |

Also, within the PPOC or eNS profiles, there are data elements that are not present in one profile but present in the other. Where applicable, it is necessary to ensure that the templates enable the capture of applicable data as needed. These examples are displayed below:

**Table 4. Data Element Not Present in One of the Profiles**

|  |  |  |  |
| --- | --- | --- | --- |
| PPOC Data Element | PPOC Template ID # | eNS Data Element | eNS Template ID # |
| Immunizations | 1.3.6.1.4.1.19376.1.5.3.1.3.23 |  |  |
|  |  | Diet and Nutrition | 1.3.6.1.4.1.19376.1.5.3. 1.1.20.2.2 |
|  |  | Intake and Output | 1.3.6.1.4.1.19376.1.5.3.1.1.20.2.3 |
| Social History | 1.3.6.1.4.1.19376.1.5.3.1.3.16 |  |  |
| Family History | 1.3.6.1.4.1.19376.1.5.3.1.3.14 |  |  |

When transitioning a patient to another care area, some data elements are not always needed. An example would be when the patient is being transferred to the Radiology area for a femur x-ray as compared to when the patient is being transitioned from a nursing unit to the Operating Room area. The patient’s social history of alcohol or prescription/recreational drug use is important for intra-operative and post-operative care. The patient’s family history related to anesthesia tolerance or reaction is important for the patient’s assessment of malignant hyperthermia in the operating room area. Whereas the Radiology area may be focused on information relevant to the actual x-ray procedure and not the patient’s social or family history.

The data elements Diet and Nutrition and Intake and Output (I&O) are not present in the PPOC profile but are in the eNS because the eNS provides data about the patient’s condition at a specific point in time of care for the transition of care. The data elements Diet and Nutrition and I&O will change over a care episode, but the discharge diet can remain permanent, such as a low sodium diet for a congestive heart failure patient. Therefore, to ensure continuity of care for the patient the data elements Diet and Nutrition and I&O will need to be added to the PPOC profile.

**Table 5. Data Elements Present in eNS Not Appearing in PPOC are Present as a Subsection in PPOC**

|  |  |
| --- | --- |
| **PPOC Data Element** | **eNS Data Element** |
| **Physical Exam**   * Visible Implanted Medical Devices | **Medical Devices** |

The example above (Table 1) demonstrates that even though the PPOC and eNS aggregate data for medical devices, they are not aggregating the same data. In Table 2 demonstrates the template ID for the Medical Devices data element in PPOC is for Visible Implanted Medical Devices that contains a description of the medical devices apparent on physical exam that have been inserted into the patient, internal or partially external (i.e., pacemaker). The template ID for Medical Devices in the eNS profile is for medical devices in a narrative text describing the patient history of medical device use (i.e., home glucometer use). Both of these are valid and important to each profile. The PPOC will require the addition of the Medical Devices template ID that refers to the patient’s use of a medical device to allow the data to be aggregated and shared by both the PPOC and the eNS profile and eNS will need Visible Implanted Medical Devices data element added to its list.

**Table 6. The Medical Device Data Element in the PPOC and eNS Profiles Appear the Same, but are Aggregating Different Data**

|  |  |  |  |
| --- | --- | --- | --- |
| **PPOC Data Element** | **PPOC Template ID #** | **eNS Data Element** | **eNS Template ID #** |
| Physical Exam:  **Visible Implanted Medical Devices** - | 1.3.6.1.4.1.19376.1.5.3.1.1.9.48 (i.e., pacemaker) | **Medical Devices** | 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.5 (i.e., home glucometer use) |

Both the eNS and PPOC profiles inherit from the IHE Medical Summary which uses the HL7 Clinical Document Architecture (CDA) Release 2 Care Record Summary (CRS) as its base standard. The Continuity of Care Document (CCD), a collaborative result between CDA and the Continuity of Care Record (CCR), specifications describes the constraints in the CCD. The CCD is intended to specify the semantics of a patient summary document for exchange at a single point in time. However, this limits the data it collects and exchanges for clinical care of a patient. Many of the data elements present in both the eNS and PPOC IHE profiles are present in the CCD, however, data elements such as intake and output and IV fluids administered are typically documented during transient episodes of care and are not represented in CCD. These data elements are essential clinical data elements needed when transitioning a patient from care setting to care setting. The eNS and PPOC profiles expand the CCD to accommodate nursing data needs. The PCC IHE Nursing Sub-committee recommends the use of SNOMED-CT and LOINC where needed as the base nomenclature for data exchange. Nursing code sets that are in use should be mapped to SNOMED-CT when applicable.

Some additional data element issues were discovered with the eNS profile. For instance, all the data elements were identified as being “required” (R) to be documented or exchanged. As with the example above about Diet and Nutrition or I&O, all data elements are not always required to be captured or exchanged. Therefore, all of the data elements in the eNS profile should not be required with each transition of care. A change proposal to change some of the R data elements to R2 (required if data are available) will be performed. Both the PPOC and eNS profiles lack a data element to capture patient education or patient instructions. If the data are not being captured in PPOC or in eNS, then the data are not available to be exchanged from care setting to care setting. Future work for the PPOC and eNS profiles will be to add a data element for Patient Education.

Both the eNS and PPOC profiles inherit from the IHE Medical Summary which uses HL7 Clinical Document Architecture (CDA) Release 2 and Care Record Summary as its base standard. The Continuity of Care Document (CCD) specification describes the resulting constraints. The CCD is intended to specify the semantics of a patient summary document for exchange. Many of the data elements found in both the eNS and PPOC are present in the CCD. CCD is used to specify patient summary document for exchange at a single point in time. Elements such as intake and output and IV fluids administered are typically documented during episodes of care and are not represented in CCD. However, it is needed when transitioning a patient from care setting to care setting. The PCC IHE Nursing Sub-committee recommends the use SNOMED-CT where needed as the base nomenclature. Nursing code sets that are in use should be mapped to SNOMED-CT when applicable.

Refer to Appendix A

Nurses consistently document the care they provide to patients. This documentation is used to support healthcare decision making processes across all care disciplines within the healthcare system. As the patient transits within and across care settings and between care providers, nursing care needs to be effectively communicated. The patient and caregivers are integral participants in the care delivery process. It has been proven that patients who actively participate in their healthcare decision making processes have better outcomes. Therefore, documented nursing care also needs to be communicated to patients and their caregivers.

The PPOC Profile supports the ***electronic collection of data used to support and manage patient care within and between HIT systems***. The content structure in the profile is based on data elements used in the Nursing Process to support the nursing plan of care. Use of the Nursing Process ensures the capture of data used for nursing documentation to support effective communication of the nursing plan of care between caregivers. As patients transition across care settings it is imperative to support the ongoing coordination, collaboration and continuity of care needed between the patient and providers. This is accomplished by following a well-documented plan of care. In order to prevent disjointed care provision, the patient’s plan of care needs to be shared with all care providers. For example, when a patient is admitted to the hospital from home and is subsequently discharged to home care or a skilled nursing facility, their documented plan of care needs to be electronically exchanged and maintained so that consistency in care is provided.

The eNS Content Profile develops data sets that are used in a specific clinical environment to provide safe and effective ***communication during transitions of care ensuring continuity of care during hand-offs and as the patient transits within and across care settings***. These data sets enable processes that direct care nurses use to communicate clinical care from one care provider to another at any point in time. The data are collected and then used to communicate care processes that would improve care coordination as the patient transitions across care settings. For example, when a patient transitions within or across a care setting, ongoing patient care needs and any immediate pertinent changes have to be communicated to the next care provider. As the transition of care or ‘hand-off’ occurs, the eNS can be used to communicate this change. The eNS provides the template to provide up-to-date information regarding the patient’s care, treatment and services, recent changes in condition, and any anticipated changes. Improved documentation of care supports the continuity of care. In the United States in 2005, The Joint Commission identified 70% of the sentinel events reported were caused by communication problems with at “least half of the communication breakdowns occurring during hand-offs."[[9]](#footnote-9)

Furthermore, the American Recovery and Reinvestment Act of 2009 stipulates healthcare providers need to show that they are using certified EHR technology in ways that can be measured significantly in quality and in quantity. The Centers for Medicare and Medicaid Services (CMS) Incentive Program supports payments to healthcare providers that demonstrate meaningful use of certified EHR technology.[[10]](#footnote-10) This includes the Meaningful Use (MU) of certified EHR technology for electronic exchange of health information to improve quality of health care and to submit clinical quality and other measures.[[11]](#footnote-11) As healthcare providers, nurses need the ability to submit nursing data for clinical quality and other measures as well as the exchange of nursing data. Use of the PPOC and eNS profiles enables the support of the following MU health outcomes policies.

* Improving quality, safety, efficiency, and reducing health disparities
  + Calculate and Transmit CMS Quality Measures - This includes assessment and intervention data that nurses document at the point of care. Examples include asthma assessment and intervention, smoking cessation assessment and interventions, blood pressure measurements, etc.
* Engage patients and families in their health care
  + Electronic Copy of Health Information/Discharge Instructions – enables the ability to include nursing diagnosis, assessment, interventions and goals in the patient’s health information that is provided to them.
  + Clinical Summaries for each office visit – enables nurses to include nursing diagnosis, assessment, interventions and goals in the patient clinical summary.
* Improve care coordination
  + Exchange Key Clinical Information – enables nurses to share nursing data such as nursing diagnosis, assessment, interventions and goals.

The American Health Information Community (AHIC) Consultations of Care Detailed Use Case includes nursing care as a key component of clinical information for sharing in a standard manner during consultations of care. The AHIC Consultation of Care Detailed Use Case stipulates transfer of care and it focuses on providing patient information needed by clinicians to accomplish a transition in care from one care setting to another. The primary focus is on transitions between acute, long-term care, nursing facility, rehabilitation facility, home healthcare, and other inter-organizational locations.[[12]](#footnote-12)

The US Standards and Interoperability (S&I) Framework is a set of integrated functions, processes, and tools being guided by the healthcare and technology industry to achieve harmonized interoperability for the exchange of healthcare information. The S&I Initiative focuses on a single challenge with a set of value-creating goals and outcomes that will enhance efficiency, quality and effectiveness of the delivery of healthcare through the development of content, technical specifications and reusable tools and services.[[13]](#footnote-13)

As nurses care for patients, they consistently document the care that is provided along with the patient’s reaction to the care that is received. This data can be measured to demonstrate the meaningful use of certified EHR technology supporting MU requirements for electronic exchange of health information to improve quality of health care and to submit clinical quality and other measures. The PPOC and eNS profiles can be used to capture and exchange patient data satisfying MU requirements. For now, the eNS and PPOC is used to communicate nursing care. In the future they may be used as a foundation for the communication of care provided by all healthcare disciplines (refer to Figure 3). This would support the framework for the patient’s longitudinal care plan put forth by the S&I Longitudinal Care Plan Work Group.[[14]](#footnote-14)

**Stakeholders**

1. **Healthcare Facility (Ambulatory Care, Acute Care, Long-Term/Home Care):**

Patient (family, medical power of attorney)

Clinician (primary care provider, specialist (Orthopedic, Cardiologist, etc.))

Nurse within Specific Care Setting (data creator)

Clerical Staff (administrative staff)

1. **Non-Nursing Departments:**

Dietary Department

Laboratory Department

Occupational Health Department

Physical Therapy Department

Pharmacy Department

Radiology

1. **Consumer:**

Nurse within Specific Care Setting

The following systems and technical actors are involved in providing data for the development of and the exchange of nursing data:

* Healthcare Facility’s Electronic Health Record System (EHR-S)
* Specialist’s Electronic Health Record System (EHR-S)
* Personal Health Record System (PHR-S)
* Laboratory Information Management System (LIMS)
* Pharmacy Information Management System (PIMS)
* Dietary Information Management System (DIMS)
* Occupational Health Information Management System (OHIMS)
* Physical Therapy Information Management System (PTIMS)
* Radiology Information Management System (RIMS)

**Technical Actor Definitions:**

Technical actors are information systems or components of information systems that produce, manage, or act on information associated with operational activities in the enterprise.

Content Creator

The Content Creator actor is responsible for the creation of content and transmission to a Content Consumer.

Content Consumer

A Content Consumer actor is responsible for viewing, import, or other processing of content created by a Content Creator Actor.

Clinical Data Consumer

A Clinical Data Consumer actor makes use of clinical patient data.

Clinical Data Source

A Clinical Data Source actor maintains patient information about vital signs, problem and allergies, results from diagnostic tests (e.g., Lab, Imaging, or other test results), medications, immunizations or historical or planned visits and procedures.

Nursing Care Plan Manager

The Nursing Care Plan Manager actor is responsible for supporting the management of the nursing care of patients with respect to the specific episode of care. It gathers information about the nursing care provided and current health status of the patient. A Nursing Care Plan Manager actor may be designed for management of a single episode of care, such as management of a total knee replacement, or may be a general purpose system supporting management of multiple conditions such as diabetes, hypertension.

Nursing Care Plan Stored Query Database (Query Data Bank)

The Nursing Care Plan Stored Query Database (Query Data Bank) is a new actor introduced in this White Paper that is responsible for storing standardized queries.

Nursing Care Plan Management (NCPM) Query Consumer

The Nursing Care Plan Management (NCPM) Query Consumer actor is responsible for requesting standardized stored queries from the Stored Query Database.

Nursing Care Plan Analyzer/Aggregator

The Nursing Care Plan Analyzer/Aggregator actor is a system that assembles nursing data from patient clinical records in accordance with the IHE PPOC definitions, and provides reports of nursing data to the eNS profile.

Value Set Consumer

The Value Set Consumer actor retrieves Resolved Value Sets based on its OID and possibly its version if the latter is available.

Value Set Repository

The Value Set Repository actor provides Resolved Value Sets.

**IHE Transactions**

Nursing Terminology

XPHE, EDR, XDS-MS profiles

XDS/XDR/XDM Cross-Community and Cross-Enterprise Document Sharing

PIX Patient Identity Cross Reference

PDQ Patient Demographics Query

ATNA Audit Train and Node Authentication

CT Consistent Time

XD-Lab profile, XDC-I profile, XDS

XDW Cross-Enterprise Document Workflow

**Use Case**

The intent of the use case is to demonstrate the following:

1. Nurses need the ability to communicate the care they provide to patients directly with other nurses just like physicians communicate directly with each other.
2. Physicians and mid-level providers need to know the patient’s response to treatment as nurses provide and document care.

A 70 year old male (Bob Newmoon) is admitted to a hospital unit after presenting to the Emergency Department (ED) with productive cough, acute rib pain, increased work of breathing, decreased lung sounds bilaterally, pulse oximetry saturation of 88%, temperature of 39°degrees Celsius (102.2° degrees Fahrenheit), heart rate of 108, and blood pressure of 156/88. Chest x-ray done in ED showed bilateral lower lobe and right middle lobe infiltrates. Medical diagnosis is pneumonia.

Upon admission to the unit, the nurse reviews the ED documentation regarding care delivery, clinician orders, labs, x-rays, and any other available data. An assessment is completed by the nurse. With assessment and information obtained in the ED, the nurse determines issues (nursing diagnosis), expected outcomes, recommended interventions and evaluation criteria.

**Use Case Actors:**

* Patient – Bob Newmoon
* Patient Caregiver
* ED Nurse – B. Well, RN
* ED Physician – Dr. Planner
* ICU Nurse – I. Culler, RN
* OR Nurse – O. Roberts, RN
* Med-Surg Nurse – L. Better, RN
* Home health Nurse – H. Holder, RN

The following summarizes the content of Bob’s care along with the individual providers’ plan of care. ***In the current care environments today, data highlighted in gray are highly likely to be omitted during care transitions.***

**Dr. Planner (ED Physician) Medical Plan of Care**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider |
| Pneumonia (ICD 9 486, ICD10 J18.9) | Short term goal: Acute care admission  Long term goal: Free of pneumonia | Treat symptoms and disease | Orders include admission, therapies, and tests | Ongoing assessment | Dr. Planner (PCP) |

**Ms. B. Well, RN (ED Nurse) Nursing Plan of Care [PPOC]**

As a result of her nursing assessment, nurse B. Well discovers that Bob’s wife recently died. He lives alone and has been having difficulties coping. His appetite is poor and he is unable to prepare appropriate meals for himself.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Respiratory assessment | Impaired Gas Exchange | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | Respiratory interventions | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by nasal cannula at 2 liters to maintain saturation above 92%. | Pulse Oximetry is measured at 85 % when dangling on side of bed | B. Well, RN | Assessment  Provider Orders  Vital Signs |
| Pain assessment | Pain | Pain maintained within the patient’s comfort threshold (0-3) on oral medications | Pain interventions planned. | Splinting of chest with pillow to reduce pain with cough.  Pain medication administered PRN as ordered.  Relaxation modalities implemented | Pain when coughing is reported by patient to be greater than 8 on pain scale with oral pain medications. | B. Well, RN | Pain Scale Assessment |
| Emotional and coping assessment | Difficulty Coping with Grief Responses | Engage in normal grief work: Work through grief process, discuss reality of losses, use nondestructive coping mechanisms,  and discuss positive and negative aspects of the loss | Promote trust | Show empathy and caring, demonstrate respect  for his culture and values, offer support and reassurance, be  honest, engage in active listening | Increased verbalization about his wife. | B. Well, RN | Assessment  Patient Instructions  Social History |

**Ms. B. Well, RN (ED Nurse) Nursing note [eNS]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | | Plan | | Implement Intervention | | Evaluation | | Provider | | IHE Profile Template Section |
| Productive cough, decreased lung sounds bilaterally,  Noted patient complaining of slight chest tightness [at 2240], IV antibiotics received at 2200]; pulse oximetry saturation of 94%, temperature of 38.5 degrees, heart rate of 100, and blood pressure of 150/80 [at 2300]. | Impaired Gas Exchange | | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | | Respiratory interventions planned. | | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by 50% face mask to maintain saturation above 92%.  Suctioned Qhr and prn  Continuous O2 saturation monitoring  IV antibiotics administered | | Respiratory rate regular | | B. Well, RN | Assessment  Provider Orders  Medication Administration |

**Current Environment**

The medical plan of care is documented in the ED (Dr. Planner's) EHR system, which is not integrated with the nursing documentation system.  Dr. Planner and nurse B. Well would have to navigate between systems to obtain the information they need because the data are in two disparate systems.  Today, communication between the provider and the nurse regarding the patient’s care is usually done verbally or via paper records. Typically, the provider will receive verbal updates during rounds or when the nurse initiates discussion or is asked about the patient progress. Often information from the nurse to the provider may be passed down from a previous nurse after shift changes or ‘hand-offs’ have occurred. Use of this process can lead to missed, forgotten or neglected information resulting in a delay of care.

**Future Environment**

Because data are shared between Dr. Planner’s application and the nursing documentation system using the eNS and PPOC profiles, Dr. Planner is able to make more informed decisions in real time because the nursing data are easily accessible. Based on the nursing documentation, he determines in a timely manner that Bob is having an allergic reaction to the antibiotic that is currently ordered. Dr. Planner documents Bob’s allergy and orders a different antibiotic. The use of the eNS and PPOC can facilitate real time use of data as patients respond to the care they receive. Workflow processes can be integrated in such a way that as nurses care for patients and document the care they are giving, providers can be made aware of the patients’ responses.  The intent is not to push nursing data into the providers documentation, but to use predetermined workflow ‘rules’ to inform the provider about what is going on with the patient in real time.

**Ms. I. Culler, RN (ICU Nurse) Nursing Plan of Care**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Respiratory assessment | Impaired Gas Exchange | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | Respiratory interventions planned. | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by 50% face mask to maintain saturation above 92%.  Pulmonary toiletry implemented | Pulse Oximetry is measured at 95 % when sleeping but decreases to 88% with exertion. | I. Culler, RN | Assessment  Provider Orders  Vital Signs |
| Pain assessment | Pain | Pain maintained within the patient’s comfort threshold (0-3) on oral medications | Pain interventions planned. | Splinting of chest with pillow to reduce pain with cough.  Pain medication administered PRN as ordered.  Relaxation modalities implemented | Pain when coughing is reported by patient to be greater than 5 on pain scale with oral pain medications. | I. Culler, RN | Pain Scale Assessment |
| Skin assessment | Impaired skin integrity | Maintain skin integrity | Alleviate pressure on affected area | Reposition Q2hrs, air mattress use | 5 cm reddened area on left hip | I. Culler, RN | Assessment |

**Current Environment**

When Dr. Planner prepares a transfer of care clinical summary, this information can be faxed or sent electronically to the hospital EHR. Upon admission to the hospital, nurse I. Culler is the admitting nurse that assumes Bob’s care. Nurse I. Culler reviews Dr. Planner plan of care and incorporates it into her nursing care process. Continuing to follow the Nursing Process, she performs her initial assessment and formulates a nursing care plan. Nurse I. Culler receives a verbal report from nurse B. Well. She may receive a copy of the ED triage notes. She does not receive nurse B. Well’s nursing plan of care nor does she receive nurse B. Well’s documented nursing notes. Due to the lack of information sharing, nurse I. Culler is not aware of Bob’s wife death and his difficulty coping. Neither does she receive nurse B. Well’s detailed intervention or evaluation data.

**Future Environment**

The EHRs nurse B. Well and nurse I. Culler use are interoperable. Use of the eNS and PPOC profiles provides the opportunity for the direct sharing of nursing data. Nurse I. Culler receives the ED nursing documentation in real time and is able to complete an appropriate plan of care for Bob based on his current condition and past responses to care.

**Ms. I. Culler, RN (ICU Nurse) Nursing note [eNS]**

During his stay in the ICU, Bob’s respiratory status declines. He is transferred to the operating room/operating theater (OR) for a tracheostomy. Bob’s immediate care needs are documented and reported to the OR nurse by nurse I. Culler.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Copious amounts of yellow sputum, increased work of breathing, decreased lung sounds bilaterally, pulse oximetry saturation of 88%, temperature of 39 degrees Celsius (102.2 degrees Fahrenheit), heart rate of 108, and blood pressure of 156/88. | Impaired Gas Exchange | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | Respiratory interventions planned. | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by 50% face mask to maintain saturation above 92%.  Suctioned Qhr and prn  Continuous O2 saturation monitoring | De-saturation to 88% when positioned on left side.  Increased work of breathing when agitated. | I. Culler, RN | Assessment  Provider Orders  Vital Signs |
| Acute left sided chest wall pain. | Pain | Pain maintained within the patient’s comfort threshold (0-3) on oral medications | Pain interventions planned. | Pain medication administered Q1-2 hrs prn.  Repositioned to promote comfort.  Encourage verbalization |  | I. Culler, RN | Pain Scale Assessment |

**Current Environment**

The ICU nursing documentation system is not integrated with the OR nursing documentation system. Because the data are in two different systems, information is exchanged via verbal report from nurse I. Culler to nurse O. Roberts. Nurse O. Roberts may receive Bob’s ICU paper flow sheet with documented recent hemodynamics, but the exchange of information verbally or on paper may result in information being missed and consequently neglected or forgotten leading to inadequate care. Data such as Bob’s ability to ambulate or functionally move from a stretcher to the OR table may not be communicated which could lead to an increased risk of skin integrity damage when transferring him from his ICU bed to the OR table if the proper method of transfer is not used. Also, if his past procedures are not communicated, there is a risk of electrical injury/burn that might occur in the OR if the dispersive electrode pad is placed on his femur which has an implanted femoral rod. The possible electrical injury sustained in the OR can result in a need for additional treatments and cause Bob additional pain.

**Future Environment**

The EHRs nurse I. Culler and nurse O. Roberts used are interoperable. Use of the eNS and PPOC profiles provide the opportunity for the direct sharing of nursing data. Nurse O. Roberts receives the ICU nursing documentation in real time and is able to prevent further skin integrity breakdown to Bob’s hip by ensuring proper transfer and positioning during his procedure and the proper placement of the dispersive electrode pad. Furthermore, the OR nursing documentation is shareable with the ICU nursing documentation system resulting in promoting collaborative patient care. Bob returns to the ICU post tracheotomy.

**Ms. O. Roberts, RN (OR Nurse) nursing documentation [eNS]**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Skin assessment | Impaired Skin Integrity | Maintain skin integrity | Alleviate pressure on affected area | Reposition Q2hrs, air mattress use | 5 cm reddened area on left hip | O. Roberts, RN | Assessment  Plan of Care |
| Post-surgical assessment | At Risk for Infection | Free of surgical site infection | Infection prevention measures | Administer antibiotics as ordered, Trach care, routine VS | Trach site intact without bleeding, or redness | O. Roberts, RN | Provider Orders  Medication Administration |

Bob is later transferred to the medical-surgical floor.

**Ms. L. Better, RN (Med-Surg Nurse) Plan of Care**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Respiratory assessment | Impaired Gas Exchange | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | Respiratory interventions planned.  Discharge planning initiated | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by nasal cannula at 2 liters to maintain saturation above 92%. | De-saturation to 88% with ambulation greater than 20 feet | L. Better, RN | Assessment  Provider Orders  Vital Signs |
| Skin assessment | Impaired skin integrity | Maintain skin integrity | Wound care as ordered  Ostomy nurse consultation  Discharge planning initiated | Reposition Q2hrs; air mattress use; BID wet-to-dry dressing changes | Stage 3 decubitus - 7 cm wide, 1.5 cm deep wound on left hip with moderate amount of yellow ischar. | L. Better, RN | Assessment |

**Current Environment**

The ICU nursing documentation system, the OR nursing documentation system and the medical-surgical nursing documentation systems are not integrated. Nursing care continues to be shared verbally and/or on paper even when the patient receives care within the same care setting. Exchange of information verbally or on paper, results in information being missed and consequently neglected or forgotten. Bob’s wound may have deteriorated due to the disjointed manner in which nursing data are communicated. The OR nurse was not aware of the stage one decubitus ulcer on Bob’s hip therefore not ensuring appropriate positioning during the tracheotomy leading to worsening skin impairment.

**Future Environment**

The EHRs that are used while the patient receives care are interoperable. Use of the eNS and PPOC profiles provides the opportunity for the direct sharing of nursing data by all nurses who provide care for the patient. All the nurses involved in Bob’s care receive nursing documentation in real time and are able to prevent further skin impairment to Bob’s hip resulting in improved outcomes.

Upon discharge from the hospital, Bob’s care is transferred to the care of his primary care provider. He also needs home health nursing services to evaluate his use of home oxygen therapy.

**Ms. H. Holder, RN (Home health Nurse) Initial Admission Care Plan**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Assessment | Problem | Expected Outcomes (Goal) | Plan | Implement Intervention | Evaluation | Provider | IHE Profile Template Section |
| Respiratory assessment | Impaired Gas Exchange | Maintenance of oxygen saturation at 95% on room air by pulse oximetry when ambulating | Respiratory interventions planned.  Home O2 therapy | Elevation of head of bed 30 to 45 degrees.  Humidified oxygen by nasal cannula at 2 liters to maintain saturation above 92%. | De-saturation to 88% with ambulation greater than 20 feet | H. Holder, RN | Assessment  Provider Orders  Vital Signs |

**Current Environment**

The medical plan of care is documented in the hospital EHR system but is not integrated with the nursing documentation system. Bob’s PCP receives his discharge summary from the hospital. Nursing data are not included. The hospital discharge planner faxes a request for home health services based on Bob’s need for home oxygen therapy. The initial home health orders focus on Bob’s respiratory needs. None of Bob’s other nursing problems are communicated to the home health nurse. Omitted problems include wound care needs, pain issues, ineffective coping and issues with grief. Bob is soon readmitted to the hospital.

**Future Environment**

Use of the eNS and PPOC profiles provides the opportunity for the direct sharing of nursing data by all nurses who provide care for the patient**.** The PPOC and eNS profiles should be exchanged electronically when a patient is transitioned from care setting to care setting, e.g. ambulatory care to the acute care setting or from the acute care setting to rehab or home care (refer to Figure 4). The exception for electronic exchange of the PPOC profile may be when only the eNS profile is needed, e.g. within the various nursing departments in the acute care setting**.**

**Recommendations:**

The purpose of the eNursing Summary Profile is to create an interoperable summary of nursing related data that communicates the ongoing patient care needs to another care provider. The profile develops data sets related to a specific clinical environment as a process to create safe, effective communication. To this end, recommendation is made to use this profile to communicate patient care data that has occurred supporting consistency in care provision and reducing redundancy.

The PPOC Profile provides a mechanism to capture and electronic exchange data related to creating and managing individualized patient care between and among HIT systems. This is a content profile containing data relating to the continuity of care for the patient. Recommendation is made to use this profile to support a prospective view of the care that will be provided to the patient such as planned care.

Clearly defining the use of both profiles will decrease ambiguity. However, by defining the meaning of use for the two profiles, it is important to emphasize the need to maintain important clinical context when the profiles are implemented. If the PPOC contains planned medications without the list of patient problems or allergy history, it is likely to result in the loss of clinical context. If the eNS contains procedure and intervention data without problem data, it will produce clinical ambiguity as to the indication for the interventions that occurred. Maintaining clinical context supports CDA principle of wholeness as well as the need to exchange, import and display data useful to the clinician. Secondly, if the PPOC and eNS profiles are exchanged separate of each other, it is important that the data provided in each profile is sufficient to convey clinical meaning.

To support and maintain adequate clinical context, the following profile changes are recommended.

1. Advanced Directives – Allow option to capture as either text or coded in both PPOC and eNS
2. Medications – Allow medication administered (1.3.6.1.4.1.19376.1.5.3.1.3.21) in eNS and Medication (1.3.6.1.4.1.19376.1.5.3.1.3.19) in PPOC
3. Visible Implantable Medical Device (1.3.6.1.4.1.19376.1.5.3.1.1.9.48) and History of Medical Device Use (1.3.6.1.4.1.19376.1.5.3.1.1.5.3.5) needed in both eNS and PPOC
4. Diet and Nutrition (1.3.6.1.4.1.19376.1.5.3.1.1.20.2.2) add to PPOC
5. Intake &Output (1.3.6.1.4.1.19376.1.5.3.1.1.20.2.3) add to PPOC
6. Chief complaint (1.3.6.1.4.1.19376.1.5.3.1.1.13.2.1) add to PPOC
7. Hospital Admission Diagnosis (1.3.6.1.4.1.19376.1.5.3.1.3.3) add to PPOC
8. Discharge Diagnosis (1.3.6.1.4.1.19376.1.5.3.1.3.7) add to PPOC



**Figure 5. Proposed Flow of Nursing Data**

**Conclusion**

The PPOC and the eNS profiles support the exchange of information between nursing HIT systems and non-nursing HIT systems and applications used to manage care for patients. The systems often include decision support capabilities and evidence-based guidelines for care of patients. They often use ad-hoc data gathering to collect information from many different sources to populate data warehouses (repositories), which are used to support and manage care for different patient populations. In order to manage patient care using the different systems, numerous data points are routinely gathered. The data gathered vary based upon the data collected by the nurses during the Nursing Process for the patient’s condition/problem being managed.

The PCC IHE Nursing Sub-committee completed a survey identifying data elements used in data capture and data exchange to support nursing reports or “hand-offs.” Results of the survey represented nurses from various care settings. The nurses were from all fifty states in the United States and fifty-one international countries. Fifteen percent of the nurses surveyed used EHRs in their day-to-day practice. Forty-seven percent used a combination of paper and EHRs. Three percent of the EHRs were developed by vendors; sixty one percent were home-grown systems.  Three percent of the EHRs shared nursing data electronically. Sixty-two percent shared nursing data through a combination of paper and electronic capabilities. Thirty-three percent of the EHRs could generate reports from nursing data that were captured. Sixty-two percent of the EHRs could not export data outside of their health system electronically. Ninety percent of nurses agreed that nursing data should be shared across care settings and health systems.

The advantages of exchanging nursing data include: the immediate provision of information which affects healthcare decision making across all care disciplines; promoting an increase in the quality of care; and improved care coordination. Nursing documentation can be efficiently shared with patients thus directly supporting patients’ involvement in their care. More efficient “hand-offs” between care providers (within and across care settings) prevents the redundancy in care which results in increased healthcare costs and improved care quality. Nursing data can be used to meet MU requirements such as quality reporting, engagement of patient and families in their care, and improvement of care coordination.

There are advantages to vendors that are committed to adopting the PPOC and eNS profiles. It will enable the provision of applications across all care settings in which nurses work to become interoperable. Nurses are often involved in the decision making process when it comes to purchasing healthcare information technology applications. Nurses would look favorably on applications that can capture and share nursing data within and across the care settings in which nurses practice. Nurses, as patient advocates, support tools that promote and assist in the provision of care that prevents harm and ensures patient safety. Nurses are the primary deliverers of direct patient care and spend at least one-third of their time documenting care. By deploying functionality, EHR vendors can develop applications that can enable efficiency in healthcare. Better use of healthcare resources and improvement in patients’ response to care is supported. Current lack of vendor adoption in this area leaves a huge opportunity to become the market leader.

Adoption of the PPOC and eNS content profiles is paramount in providing effective communication of nursing care. Nurses consistently document the care they provide to patients. This documentation is used to support healthcare decision making processes across all care disciplines within the healthcare system and to communicate with patients and caregivers. Technology systems that provide the capability for the documentation and exchange of clinical data need to support the inclusion of nursing data. This includes enabling the exchange of data with the patient, with the personal healthcare record (PHR), between care providers, with the EHRs, and with data repository systems such as registries and Health Information Exchange (HIE) systems.

**Future Work**

**Nursing Workflow**

The Cross-Enterprise Document Workflow ([XDW](http://www.ihe.net/Technical_Framework/upload/IHE_ITI_Suppl_XDW_Rev2-1_TI_2011-10-03.pdf)) profile enables profile participants to manage and track tasks related to patient-centric workflows for the health professionals and patients they support. XDW builds upon the sharing of health documents provided by other IHE profiles such as the Cross-Enterprise Document Sharing ([XDS](http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev8-0_Vol3_FT_2011-08-19.pdf)), adding the means to associate documents conveying clinical facts to a patient-specific workflow. The eNS and PPOC profiles can enable the ability to utilize the XDW profile to manage and track workflows that can be shared between care providers.

Nurses consistently document and use the Nursing Process to evaluate and determine if nursing interventions achieve the desired patient outcomes based on the patient’s plan of care. A key example is medication management. The patient is ordered or prescribed a medication (antihypertensive). Following the Nursing Process, the nurse assesses the patient’s need for the medication (measures BP). If the patient is hypotensive, the nurse makes a nursing diagnosis (decreased BP) and decides to hold the antihypertensive order to achieve a better outcome (outcome identified). The nurse’s plan includes reassessing the patient’s BP in an hour (plan) and implements safety protocols in case the patient deteriorates further (implementation). The nurse reevaluates the patient in an hour (evaluation).  The XDW workflow process could include ‘informing’ the provider of the held medication when the patient’s BP is low so the provider can take an action.

Another area of use for the XDW is in facilitating the exchange of health information among physicians and hospital with long-term /post-acute care (LTPAC) providers, including nursing homes (NHs) and home health agencies (HHAs). A key example is the provision of homecare services. The delivery of quality homecare services is dependent upon the collaboration and sharing of health information among various health care providers across the continuum of care. Typically, the homecare provider provides services to the patient as referred by the physician. During an episode of care, the homecare provider and the physician exchange information about the patient as the patient’s condition and response to care changes and evolves. The XDW can support the exchange of information beginning with the referral for homecare services; homecare assessment, plan and goal; services provided by the homecare provider; physician review and approval.

**Patient Care Goals**

As nurses plan patient care, it is imperative that specific and measurable goals are identified. The eNS and PPOC profiles contain a plan section in which the data structure can be used to associate goals that are planned for specific observations. The ability to indicate placement in time can be accomplished using the mood of an act in HL7 Version 3.[[15]](#footnote-15) The intended or proposed observations are assigned observation requests in goal (GOL) or proposal (PRP) mood. Once the goal is met, it is placed in an event (EVN) mood. For example, a patient may have a goal to reduce smoking to less than one pack per day within one month. The nursing intervention may include smoking cessation instructions. In the plan section, the nurse may include “smoking cessation” as an intended or proposed observation. Upon initiation of the plan, the smoking cessation may be in goal mood. After applying the intervention and the patient is successful in meeting the goal, the smoking cessation is placed in event mood. Although the data structure may capture the ‘mood’ of the observation, it is often imperative that nurses know the defined target of measure to be achieved and the result of a specific goal. To this end, future IHE work may include defining the results of care goals along with associated attributes.

**GLOSSARY**

**Appendix A**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CCD Data Element** | **CCD Template ID Number** | **PPOC Data Elements** | **PPOC Template ID Number** | **eNS Data Elements** | **eNS Template ID Number** |
| **Alerts** | 2.16.840.1.113883.10.20.1.2 | **Allergies and Other Adverse Reactions Section** | 1.3.6.1.4.1.19376.1.5.3.1.3.13 | **Allergies and Other Adverse Reactions**   * Allergies | 1.3.6.1.4.1.19376.1.5.3.1.3.13 |
| **Advanced Directives** | 2.16.840.1.113883.10.20.1.1. | **Advanced Directives Section** (text) | 1.3.6.1.4.1.19376.1.5.3.1.3.34 | **Coded Advance Directives**   * Code Status | 1.3.6.1.4.1.19376.1.5.3.1.3.35 |
|  |  | **Assessments**   * Nursing Assessment Battery   - Pain Severity,  - Glasgow Coma Scale,  - Motor,  - Level of Responsiveness, - Comment | 1.3.6.1.4.1.19376.1.5.3.1.1.13.2.4 | **Assessments**   * Cognitive Abilities * Health Assessment * Level of Consciousness * Special Needs * Wound | 1.3.6.1.4.1.19376.1.5.3.1.1.13.2.4 |
| **Problems** | 2.16.840.1.113883.10.20.1.11 | **Active Problems** | 1.3.6.1.4.1.19376.1.5.3.1.3.6 | **Active Problems**   * Complications | 1.3.6.1.4.1.19376.1.5.3.1.3.6 |
| **Chief Complaint** |  |  |  | **Chief Complaint** | 1.3.6.1.4.1.19376.1.5.3.1.1.13.2.1 |
| **Hospital Admission Diagnosis** |  |  |  | **Hospital Admission Diagnosis**   * Admission Diagnosis | 1.3.6.1.4.1.19376.1.5.3.1.3.3 |
| **Discharge Diagnosis** |  |  |  | **Discharge Diagnosis** | 1.3.6.1.4.1.19376.1.5.3.1.3.7 |
| **Header Content Module** | 2.16.840.1.113883.10.20.3 (CDA Header) |  |  | **Header Module**   * Language Communication * Employer/School Contacts * Pt Contact * Pharmacy | 1.3.6.1.4.1.19376.1.5.3.1.2.1  1.3.6.1.4.1.19376.1.5.3.1.2.2  1.3.6.1.4.1.19376.1.5.3.1.2.4  1.3.6.1.4.1.19376.1.5.3.1.2.3  1.3.6.1.4.1.19376.1.5.3.1.2 |
|  |  |  |  | **Date/Time of Report** |  |
|  |  |  |  | **Demographics** |  |
|  |  |  |  | **Nurse Report Give/Receive Signature** |  |
|  |  |  |  | **Physician(s) Name** |  |
|  |  |  |  | **Primary Language** |  |
| **Medical Equipment** | 2.16.840.1.113883.10.20.1.7 |  |  | **Medical Devices**   * Devices | 1.3.6.1.4.1.19376.1.5.3.1.1.5.3.5 |
| **Discharge Diet** |  |  |  | **Diet and Nutrition** | 1.3.6.1.4.1.19376.1.5.3. 1.1.20.2.2 |
| **Intake and Output** |  |  |  | **Intake and Output** | 1.3.6.1.4.1.19376.1.5.3.1.1.20.2.3 |
| **Intravenous Fluids Administered** |  |  |  | **Fluid Management** |  |
| **Procedures** | 2.16.840.1.113883.10.20.1.12 | **Procedures and Interventions** | 1.3.6.1.4.1.19376.1.5.3.1.1.13.2.11 | **Procedures and Interventions**   * Isolation * Mobility/Fall Risk * Procedure | 1.3.6.1.4.1.19376.1.5.3.1.1.13.2.11 |
| **Results** | 2.16.840.1.113883.10.20.1.14 |  |  | **Coded Results** | 1.3.6.1.4.1.19376.1.5.3.1.3.28 |
| **Coded Results** |  |  |  | **Lab Values** |  |
| **Coded List of Surgeries** |  | **Coded List of Surgeries** | 1.3.6.1.4.1.19376.1.5.3.1.3.12 |  |  |
| **Medications** | 2.16.840.1.113883.10.20.1.8. | **Medications Administered** | 1.3.6.1.4.1.19376.1.5.3.1.3.21 | **Medications** | 1.3.6.1.4.1.19376.1.5.3.1.3.21 |
| **Functional Status** | 2.16.840.1.113883.10.20.1.5 | **Functional Status Assessment** | 1.3.6.1.4.1.19376.1.5.3.1.1.12.2.1 |  |  |
|  |  | **Pain Scale Assessment** (in Functional Status Assessment) | 1.3.6.1.4.1.19376.1.5.3.1.1.12.2.2 | **Pain Scale Assessment Section**   * Pain | 1.3.6.1.4.1.19376.1.5.3.1.1.12.2.2 |
|  |  | **Provider Orders** | 1.3.6.1.4.1.19376.1.5.3.1.1.20.2.1 | **Provider Orders**   * Order List * Oxygen * Activity Restrictions | 1.3.6.1.4.1.19376.1.5.3.1.1.20.2.1 |
| **Vital Signs** | 2.16.840.1.113883.10.20.1.16 | **Vital Signs** (included within Physical Exam) | 1.3.6.1.4.1.19376.1.5.3.1.3.25 | **Vital Signs** | 1.3.6.1.4.1.19376.1.5.3.1.3.25 |
| **Plan of Care** | 2.16.840.1.113883.10.20.1.10 | **Treatment Plan** | 1.3.6.1.4.1.19376.1.5.3.1.3.31 | **Care Plan**   * Precautions * Mobility/Fall Risk | 1.3.6.1.4.1.19376.1.5.3.1.3.31 |
|  |  | **Physical Exam** | 1.3.6.1.4.1.19376.1.5.3.1.1.9.15 |  |  |
| **Immunization** (current and history) | 2.16.840.1.113883.10.20.1.6 | **Immunization Section** | 1.3.6.1.4.1.19376.1.5.3.1.3.23 |  |  |
|  |  | **Review of Systems** | 1.3.6.1.4.1.19376.1.5.3.1.3.18 |  |  |
| **Social History** | 2.16.840.1.113883.10.20.1.15 | **Social History** | 1.3.6.1.4.1.19376.1.5.3.1.3.16 |  |  |
| **Family History** | 2.16.840.1.113883.10.20.1.4 | **Family History** | 1.3.6.1.4.1.19376.1.5.3.1.3.14 |  |  |
| **Problems** (all pertinent current and historical problems) | 2.16.840.1.113883.10.20.1.11 | **History of Past Illnesses Section** | 1.3.6.1.4.1.19376.1.5.3.1.3.8 |  |  |
| **Patient Instruction** | 2.16.840.1.113883.10.20.1.49h  2.16.840.1.113883.10.20.1.43 |  |  |  |  |

1. Institute of Medicine *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington D.C.: National Academies Press. 2001 [↑](#footnote-ref-1)
2. JCAHO. Improving Handoff Communications: Meeting National Patient Safety Goal

   2E. *Joint Perspectives on Patient Safety.* 2006;6(8):9-15 [↑](#footnote-ref-2)
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