CDAR2\_IG\_PATSUMRNP R1\_INFORM\_2017MAR



**HL7 CDA® R2 Implementation Guide:**

**Clinical Summary Relevant and Pertinent Data,**

**Release 1**

March 23, 2017

**HL7 Informative Ballot**

**Sponsored by:
Structured Documents Work Group**

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Acknowledgments

Many thanks are due to Dr. Holly Miller, Dr. Russell Leftwich, and Robert Dieterle, for designing the short survey, to Robert Dieterle for performing the quantitative analysis of the short survey results that produced many tables and charts in this document, and to Keith Boone for performing the analysis of the long survey results.

Besides the authors, the following persons (listed alphabetically by first name) participated in at least one RnP meeting, and we thank them for their interest and participation: Ann Phillips, Barbara Hillock, Benjamin Flessner, Brett Marquard, Brian Ahier, Bonnie McAllister, Chris Brown, Corey Spears, Darrell Woelk, David DeRoode, David Pyke, Diana Behling, Diana Dodd, Dianne Reeves, Didi Davis, Donna Quirk, Elitsa Evans, Emma Jones, George Cole, Holly Miller, Jill Devrick, John Snyder, Joseph Lamy, Juggy Jagannathan, Julia Skapik, Jyothi Mallampalli, Lenel James, Leslie Kelly Hall, Lindsey Hoggle, Lisa Nelson, Mark Pilley, Mark Roche, Matthew Rahn, M’Lynda Owens, Reid Gelzer, Russell Leftwich, Scott Robertson, Serafina Versaggi, Thomson Kuhn, Vinayak Kulkarni, Virginia Lorenzi, Zach May, and Zach McQuiston. We very much appreciate the American Medical Association (AMA), American Academy of Family Physicians (AAFP), and the American Hospital Association (AHA) for their support of this project, by surveying their memberships.

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# Introduction

## Purpose

This “Relevant and Pertinent” guide is primarily focused on improving the relevance and pertinence of C-CDA documents as experienced by the clinician, which means as displayed or “rendered.” Other guides, including the C-CDA Companion Guide, focus mainly on the structured content. This is an informative document providing principles for development, and guidance on what information should and should not be present and appropriate in both coded clinical statements (entries) and narrative content in an automatically generated clinical summary (e.g., CCD, Discharge Summary, Referral Note, Consultation Note, etc.). It does not create new templates or models, but simply explains how to use existing Consolidated CDA (C-CDA) templates.

## Audience and How to Use This Document

This document is called an “implementation guide” but does not contain formal conformance statements such as those found in Consolidated CDA. However, it is intended to provide **guidance** to those who **develop/implement** clinical summaries, such that they enhance their software as required to be more relevant and pertinent to their target audience.

* **Primary Audience: Developers and Implementors of EHRs and other systems that generate, render or consume clinical summary information, including C-CDA documents but also FHIR documents.**
	+ EHR developers should use this guidance document to better understand the preferences and experiences of those who receive clinical summaries.
		- Developers of *inpatient* EHRs should pay special attention to [**4.1.4**](#Hospital)**,** which focuses on documents generated after hospital discharges.
		- Developers of *ambulatory* EHRs should pay special attention to [**4.1.5**](#Ambulatory), which focuses on documents generated after ambulatory visits.
		- All EHR developers should read all other sections.
	+ As a result, developers can enhance their C-CDA generation and/or rendering capabilities to better satisfy their users. “Default” settings should be adjusted to more closely match user preferences.
	+ While C-CDA 2.1 was not the current version as of the time of the survey, the recommendations in this document apply to any version of C-CDA going forward.
	+ Furthermore, besides the default settings, we encourage developers to offer the capability to tailor the contents of generated C-CDA documents, and to adjust the rendering of C-CDA documents that are received.
	+ The findings and recommendations were based on clinicians’ experiences with CDA documents, but also are applicable to HIT software that generates clinical summary information even if it is not formatted as CDA, e.g., FHIR documents or query responses.
* **Healthcare professionals and other generators and receivers/users of clinical summary documents**
	+ Healthcare professionals who generate clinical summaries are encouraged to leverage their system’s capabilities to tailor the contents to best meet the needs of their intended recipients
	+ Healthcare professionals are also encouraged to provide direct and specific feedback to the suppliers of their EHRs, to help them understand the importance of improving the generation and rendering of C-CDA clinical summaries, according to the findings and recommendations of this Guide.
	+ See the [Appendix: C-CDA Display and Clinician View](#_APPENDIX:_C-CDA_DISPLAY) for a brief tutorial of the relationship between what clinicians “see” (the rendered narrative text in a C-CDA document) and the technical composition of C-CDA header and entries (XML, including structured coded data) .
* **Policy Makers**
	+ This Guide provides some suggestions for ONC to consider in future regulations or guidance that it may issue.
	+ CMS and other policy making organizations may also use the RnP findings as they develop incentive programs and other initiatives to encourage meaningful information exchanges that deliver higher provider satisfaction.
* **Patients and other persons** who generate C-CDA clinical summaries.
	+ If patients have access to HIT systems (e.g., Patient Portals or Personal Health Records) that can create C-CDA documents to send to healthcare professionals, they should likewise strive to create relevant and pertinent content in those documents, so that clinicians will find them useful.
	+ Patients as *receivers* of clinical summaries are out of scope, because the survey was sent only to providers. Patients are likely to receive the same clinical summary content in the documents that they view, download, and transmit (VDT provisions of certification and meaningful use). While patient preferences were not captured in this RnP survey, however, see the last article in the References chapter which discusses a patient survey. Patient advocacy organizations may wish to provide input to EHR developers regarding how the changes advocated in this Guide will make VDT documents more useful for patients as well as providers.

## Organization of the Guide

This document provides

* **Chapter 1 –** Introduction
* **Chapter 2** **–** Executive Summary
* **Chapter 3 –** Method (how the surveys were created and administered)
* **Chapter 4 –** Results, Interpretation, and Recommendations (detailed)
* **Chapter 5 –** Conclusions and Recommendations (summarized)
* References, Glossary, and Appendix
* The original Short Survey and Long Survey questions are included in the ballot package as separate documents

## Contents of the Ballot Package

The following files comprise this ballot package:

Table 1: Contents of the Review Package

|  |  |  |
| --- | --- | --- |
| Filename | Description | Standards Applicability |
| CDAR2\_IG\_PATSUMRNP R1\_I1\_2017JAN.pdf | This document | Informative |
| RnP\_Short\_Survey\_ Transition of Care (ToC) Document V9.0 9-16-2015.pdf | The original short survey (not ballotable) | Informative |
| RnP\_LongSurvey.pdf | The original long survey (not ballotable) | Informative |

# Executive Summary

Motivation for RnP came from a combination of public and private testimony from physicians and physician organizations, regarding dissatisfaction with the documents that were being received during the first and second phases of the Meaningful Use Program. See the [References (Chapter 6](#_Content_of_the)) in this guide for testimony and presentations that led up to the RnP project. However, most of the feedback was very general. Criticisms of documents were expressed in terms such as “bloated,” “too large,” “unusable” or “hard to find what I need,” but without enough specifics to enable developers to address the issues. Nevertheless, the issue was acknowledged by providers, vendors and government alike, and also by HL7, the organization that created the Consolidated CDA standard that is now used for summary documents. HL7 thus approved a project to conduct a survey, and analyze the results, to identify *specifically* where the problems lie and to recommend how they could be addressed by EHR developers.

## Background

The Continuity of Care Document (CCD) Release 1.0 and its successor, version 1.1 found in the C-CDA specification, are required under the ONC Certification rules (2011, 2014, and 2015 editions) and CMS Meaningful Use regulations (Stages 1, 2, 3) in the US. Many organizations have opted to automatically generate these documents without human intervention.  As a result, some organizations and software products are generating CCD or other CDA documents that may span dozens of pages even for simple cases, making such documents unusable for their intended purpose.

## Method

We reached out to clinical professional societies, provider organizations and other organizations to present the project, gather feedback, develop recommendations, and review results. We proposed RnP as an opportunity to let their voice be heard and have a positive effect on the EHRs that they use. We executed this process with multiple organizations in order to gather the best possible recommendations. Participation was open to any organization that showed interest and commited to meeting the project requirements and schedule.

Clinicians who answered the RnP survey presumably answered the questions based on their experience receiving and reading/viewing the human readable text in transitions of care (ToC) documents, based on the *rendering capabilities provided by the EHR*, whether on a computer screen or printout.

The guidance delivered in this document is structured in a way that much of it could be automatically tested for conformance against coded and structured data, but also could be applied to narrative sections. It is assumed that most respondents to the survey formed their opinions by reading the documents as rendered on screen or paper. More details on the method are covered in section 3. See also the Appendix for examples of what clinicians see.

## Conclusions and Recommendations

Based on the survey responses, we have several overarching conclusions and recommendations, which are summarized in section 5.1 and explained in more detail (with many tables of supporting data) in sections 4.1.4, 4.1.5, and 5.2.

* **Document Creators**
	+ **Include the narrative summary of the patient story in one or more content sections**. Most of these have often been omitted in clinical summaries.
	+ **Provide the capability for users to modify content of generated C-CDAs to adjust for context, which includes the patient’s clinical case, the intended purposes and recipients of the document, and provider preferences such as by specialty.** Consider the nuances of which data various groups of clinicians consider most valuable and least valuable. In addition to clinical context and recipient specialty, other important factors in determining relevance are: **status** (active/current are preferred vs. resolved or no longer active), **time** (recent data are preferred vs. historical), and **novelty** (new or changed vs. confirmatory).
	+ **Clearly display medications:** for hospital discharges, distinguish discharge medications, admission medications, and medications administered; for ambulatory visits, distinguish among active, newly prescribed, and discontinued medications, and provide reason for discontinuation.
* **Document Consumers:**
	+ **Provide better tools such as flexible rendering, filtering, and incorporation features for receivers of documents.**

Design of the **user experience** for providers should be guided by relevance. While the RnP project began under the assumption that **creators of C-CDA** should be more selective in what they automatically generate, the survey results led us to focus attention also on document generating systems offering the capability for clinicians to include more or less information based on clinical judgment and context.

We have also offered recommendations for policymakers including ONC to consider, such as allowing more C-CDA document types besides CCD and Referral Note for ambulatory transitions of care, and to focus more attention on the rendering, filtering and incorporation features of systems that receive documents.

In conclusion, clinical summaries using Consolidated CDA are and will continue to be a major vehicle for exchanging information among clinicians[[1]](#footnote-1) but there is much room for improvement. Other projects such as the C-CDA 2.1 Companion Guide will improve the technical correctness and consistency of C-CDA documents. EHR and other HIT developers, by following the recommendations of RnP in addition to the Companion Guide, have an opportunity to remove barriers that clinicians have experienced in trying to use clinical summary documents to date. As these barriers are removed, and as gaps in needed information are filled, clinician satisfaction and productivity should increase. As clinicians increasingly find C-CDA documents helpful to inform their clinical decision making, the ultimate benefits should accrue to the patients for whom the clinicians provide care. And RnP recommendations will remain applicable to FHIR-based exchanges even as they complement C-CDA documents.

# Method

## Created Short Survey and Long Survey (Interview)

The “Short” survey was a web-based, anonymous, self-administered questionnaire aimed at individual clinicians who participate in transitions of care. The goal is to gain clearer understanding of where the problems lie. The structured multiple-choice answers were intended for quantitative analysis, with hopes of hundreds or even thousands of responses. The surveys were designed by Robert Dieterle with two practicing physicians, Dr. Holly Miller and Dr. Russell Leftwich. They were reviewed internally by the project team, and then with several clinical stakeholders who gave a “test drive” before the surveys were finalized.

In November, 2015, the short survey links were sent out to American Medical Association (AMA), American College of Physicians (ACP), American Academy of Family Practitioners (AAFP), American Hospital Association (AHA), Many other organizations were asked to participate, as documented on the RnP project Wiki, but they were unable to participate in a mass survey. The deadline was originally mid-December, was was extended to January, 2016.

## Long Survey (Interview)

The Long Survey (Interview) was intended for a single consensus group convened by an organization for purposes of representing an organizational view. In addition to some multiple-choice questions, it also included some free form answers intended for qualitative analysis, and gathered some ideas on possible solutions. It was not a self-service questionnaire, but was a moderated discussion led by a project team member. Because the numbers of participants was relatively small, we did not attempt to draw statistical conclusions from this survey, but instead used it to gain insight into the findings from the short survey.

Long Survey results were received from 13 provider organizations and/or professional societies, spanning a broad variety of both inpatient and ambulatory settings and specialties.

Scope of Surveys: Transitions of Care (ToC)

There are two primary types of transitions of care about which the survey asked.

1. **Hospital Discharge.** Patient is discharged from a hospital, and transitions to an ambulatory provider, e.g., the PCP or a specialist who admitted the patient, or (less commonly) to another hospital.[[2]](#footnote-2) A document is sent from the hospital to the ambulatory provider. The specifics are not known from the survey, but we assume that ambulatory specialists or PCPs responding to the survey are thinking of those instances when they received a ToC document directly from the hospital. If the context is hospital-hospital transfers, more detail would generally be required, such as active orders, level of care required, and complete vitals and test results.
2. **Ambulatory ToC.** Patient transitions from ambulatory provider 1 to ambulatory provider 2, or (less commonly) to a hospital. A document is sent from ambulatory provider 1 to provider 2. This may be the result of a referral from provider 1 to provider 2, may be the “closing of the referral loop” where provider 1 sends a ToC document to provider 2 after a consultation, or may be some other unspecified transition. The data to distinguish these types of transitions is not available in the survey, so all ambulatory transitions are grouped together.

Hospital Discharge vs Ambulatory ToC preferences and experiences are different enough that we discuss the results for each separately.

For type of ToC, we first describe providers’ **preferences** for what they would like to receive, and then we discuss their **experience** of what they actually receive. We infer that satisfaction will increase to the extent that preferences are met in actual experience, and that satisfaction will decrease to the extent that preferences are not met.

Limitations of Method and Scope of Interpretations

Sometimes the survey answers can be reported without interpretation, i.e., the results speak for themselves and can help our target audience simply by giving them the facts. There are other times, however, when some degree of interpretation, or “reading between the lines” is necessary to arrive at meaningful recommendations. For example, there may be a difference between preferences and experience, but the specific factors are hard to know with certainty. In writing this report, we distinguish between those recommendations based on the actual **facts**, and others based on our **interpretation** of what were **probably** contributing factors. We use our collective experience, and the wisdom of our reviewers, to assist in these interpretations and recommendations, and will explain where we make plausible interpretations or recommendations that were not directly stated in the survey data.

To give an example of where interpretation is needed, consider the following: a high percentage of providers said that they were “missing important information for patient care” in the ToC documents from hospital discharges. But what specific data were they missing? That was not specifically asked, though a few wrote free-form comments. However, we do know what data was required in Certification and Meaningful Use Stage 1 and Stage 2 regulations. So the “missing information” was probably something outside of the MU-required data set. We can then analyze which sections of data were not normally included in the most common ToC documents (CCD), and narrow down the range of possibilities for missing information.

Meaningful Use, Certification, and Document Types

Although the survey did not ask providers which specific CDA document types they received (because we thought many would not know),[[3]](#footnote-3) **we believe that the vast majority of documents were those required for ONC certification (2011 edition or 2014 edition).** More specifically, we can infer that most of them were **Continuity of Care Documents (CCD), either constrained by HITSP C32 specification (for MU1), or by C-CDA 1.1 (MU2)**. At the time the survey was taken in late 2015, based on CMS attestation statistics[[4]](#footnote-4), only a small percentage of providers (57Kout of 357K, or about 16% of those registered for MU) had attested to MU2, therefore over 80% were operating under MU1. Most of those were probably receiving C32 CCD (in MU1 there originally was no C-CDA and no option to send other document types other than CCR or CCD). [[5]](#footnote-5)

To state it differently, we believe that a very low percentage of the documents received by the survey respondents were non-CCD document types such as Discharge Summary, Referral Note, Consultation Note, Progress Note, History and Physical, Continuity of Care Record (CCR), or other.[[6]](#footnote-6)

Under these very plausible assumptions, it is possible that most CCDs lacked a narrative summary of the hospitalization, because such narrative sections are not part of the CCD document type definition, and most developers would have conformed to the standard definition as enforced by CCD certification/validation tests.

A potential follow-up survey could statistically analyze the actual documents generated in transitions of care, or simply ask vendors which documents they generated. But it is highly probable that we would not find a significant volume of other documents besides CCDs, so such a survey might expend much effort only to reinforce our current conclusion. Another survey is not planned, because the results woud most likely be too late to have a significant impact on EHR development.

The documents may have come from “push” messages shortly after completion of a visit or hospitalization, because of the Meaningful Use incentives to push ToC documents using Direct messaging, but they may also have come from queries to document registries. The transport method was not asked on the survey, and is immaterial to the conclusions about relevance. However, we recognize that when documents are “pushed” the sender can consider the preferences of the intended recipient, whereas if the document is published to a registry without having a specific recipient, it is difficult to modify the content accordingly.

# Results, Interpretation, and Recommendations

## Short Survey Results

Cohort that Responded

The short survey was distributed to a large number of individual providers through professional societies and provider organizations. The total number of responses is summarized below. We aggregated into “other” the responses from individuals or organizations with a number of responses less than 10.

Participant Demographics

Table 2: Summary of Participation

|  |  |
| --- | --- |
| **Organization** | **Responses** |
| **American Academy of Family Physicians** | 103 |
| **American Hospital Association** | 34 |
| **American Medical Association** | 433 |
| **Other** | 43 |
|  **Total** | 613 |

**Overall, 613 physicians completed the short survey.[[7]](#footnote-7)**

We requested some basic provider and practice demographic information from each of the respondents to enable us to evaluate the applicability of the responding cohort to the overall provider population. These demographics included: 1) practice location (urban, suburban and rural), indication of specialty (based on the published AMA list), 2) practice type based on self-identification of the practice makeup (primary care, specialty, multispecialty, hospital based, skilled nursing facility and ownership and 3) practice size and payer mix. It should be noted that the respondents were allowed to select more than one practice type. The results are summarized in tables 3, 4, and 5.

Table 3: Practice Locations

|  |  |  |  |
| --- | --- | --- | --- |
| **Practice Location** | **Responses** | **%** | **% US Pop** |
| **Urban** | 208 | 35% | 26% |
| **Suburban** | 269 | 46% | 53% |
| **Rural** | 111 | 19% | 21% |
| **Not Practicing** | 25 |  |  |

Note: % of US Population is based on self-declaration in US survey

Table 4: Participation by Specialty

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Specialty** | **Count** | **Specialty** | **Count** | **Specialty** | **Count** |
| Allergy/Immunology | 13 | Neurological Surgery | 1 | Plastic Surgery | 2 |
| Anesthesiology | 7 | Neurology | 9 | Preventive Medicine | 0 |
| Cardiology | 11 | Obstetrics/Gynecology | 19 | Psychiatry | 33 |
| Dermatology | 42 | Oncology(Cancer) | 14 | Radiology | 4 |
| Emergency Medicine | 22 | Ophthalmology | 32 | Surgery | 12 |
| Endocrinology | 12 | Orthopedics | 27 | Urology | 4 |
| Family/General Practice | 171 | Otolaryngology | 8 | Other | 39 |
| Geriatrics | 7 | Pathology | 0 | Blank | 25 |
| Internal Medicine | 70 | Pediatrics | 22 |  |  |
| Medical Genetics | 0 | Physical Medicine & Rehab | 7 |  |  |

**OTHER**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Clinical Informatics | 2 | med/peds | 1 | Pharmacy | 1 |
| Family Medicine | 3 | Medical Acupuncture | 1 | Plastic Surgery | 1 |
| Gastroenterology | 11 | Nephrology | 3 | Pulmonary | 4 |
| hospice / palliative | 1 | occupational medicine | 1 | Radiation Oncology | 1 |
| hospitalist | 1 | Otolaryngology | 1 | Rheumatology | 1 |
| Infectious Diseases | 1 | Palliative Medicine | 3 |  |  |
| Intensive Care Medicine | 1 | Pediatric Neurology | 1 |  |  |

Table 5: Responses by Practice Type

|  |  |
| --- | --- |
| **Practice Type** | **Count** |
| Ambulatory Primary Care: Hospital owned or Integrated Delivery Network | 110 |
| Ambulatory Specialty Care: Hospital owned or Integrated Delivery Network | 63 |
| Hospital based | 124 |
| Skilled Nursing Facility | 20 |
| Unaffiliated Multi-specialty group | 33 |
| Unaffiliated Primary Care Practice | 132 |
| Unaffiliated Specialty Care Practice | 177 |
| Blank | 25 |

Note: Respondents may indicate more than one practice type

Table 6: Responses by Practice Size and Patient/Payer Mix



**EVALUATION OF THE RESULTS**

1. Practice location distribution matches the US population distribution
2. Primary care and all relevant (based on planned use of ToC documents) specialties are represented
3. All practice types (IDN/Hospital/Unaffiliated) are represented
4. Response by practice size represents solo to >20 provider practices
5. All payer types are represented

**SUMMARY**

The cohort of respondents to the short survey are not heavily skewed toward any practice location, specialty, practice type practice size and payer mix.

#### Participant Length of EHR Use

The participating physicians were asked to indicate the number of years (<1, 1-3, 3-8, > 8) they have used an Electronic Health Record (EHR). The results were analyzed based on declared practice size (see table 6). The resulting analysis is presented in Table 7 below.

Table 7: EHR Use by Practice Size

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Solo** | **2-5** | **6-10** | **11-20** | **> 20** | **Total** | **% using** |
| **< 1 year** | 4 | 6 | 3 | 3 | 1 | 17 | 3% |
| **1-3 years** | 21 | 24 | 12 | 8 | 4 | 69 | 13% |
| **3-8 years** | 30 | 76 | 47 | 26 | 41 | 220 | 41% |
| **> 8 years** | 24 | 64 | 40 | 29 | 74 | 231 | 43% |
| **No EHR** | 28 | 13 | 1 | 1 | 2 | 45 |  |
| **Blank/NA** |  |  |  |  |  | 31 |  |

**RESULTS**

1. 84% of the respondents indicate using an EHR for 3 or more years
2. 43% of the respondents indicate using an EHR for over 8 years
3. Smaller practices (< 5 physicians) indicate no EHR use more frequently than for larger (6 or greater) practices.

**SUMMARY**

All practice sizes indicate a significant experience in EHR use and over 84% of all physician indicate experience for three or more years. This provides a population of experienced EHR users that are responding to the remainder of the survey.

Experience with Transitions of Care (ToC) Documents

The survey request information on the current experience in and future plans to send and receive ToC documents.

#### Experience Exchanging ToC Documents

Table 8: Experience Exchanging ToC Documents

|  |  |  |
| --- | --- | --- |
|  | **Sending** | **Receiving** |
| **No Plans / None** | 198 | 32% | 313 | 53% |
| **In next 12 months** | 117 | 19% |  |  |
| **< 12 months** | 110 | 18% | 127 | 22% |
| **> 12 months** | 163 | 27% | 148 | 25% |
| **Blank** | 25 |  | 25 |  |

**RESULTS**

These results show that only about 47% of the respondents had actual experience receiving ToC documents electronically, about 25% for more than a year, and 22% for less than a year. Nevertheless, since most of the questions asked about preferences for what data providers wanted to see, we include **all** responses in most of our analysis. Even if providers have received only paper documents (e.g., discharge summaries, FAXed records), their opinions about what is important are still valuable.

**SUMMARY**

We compared the results of those with experience with ToC documents (the 47%) vs those without experience, and found that there were not major differences in their preferences, as indicated in Tables 16 and 25. We did other comparisons of “experience vs without experience” groups that also showed no major differences, but in the interest of brevity did not include them all in this document.

#### Experienced Volume of ToC Documents

To understand provider experience with Transitions of Care (ToC) documents, we requested the respondents to identify the average number (None, 1-5, 6-10, 11-20, >20) of each type / source of document (Hospital Discharge, Referral Request, Consult, Home Health, Long Term Care / SNF, Behavioral Health) received per month. The results are shown in Table 9 below.

Table 9: Experience: Volume of ToC Documents Received/Month

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **None** | **1-5** | **6-10** | **11-20** | **>20** | **Blank** | **% any** |
| Hospital Discharge | 200 | 125 | 110 | 62 | 75 | 41 | 65 % |
| Referral Request | 282 | 114 | 48 | 40 | 66 | 63 | 49 % |
| Consult | 194 | 114 | 77 | 74 | 100 | 54 | 65 % |
| Home Health | 327 | 94 | 49 | 43 | 33 | 67 | 40 % |
| Long Term Care / SNF | 378 | 99 | 28 | 18 | 17 | 73 | 30 % |
| Behavioral Health | 377 | 114 | 32 | 10 | 10 | 70 | 31 % |

% excludes any blank responses

**RESULTS**

To read this table, note that the numbers in each cell are not the “volume of ToC documents received” but rather the number of respondents in each cell. The volumes per month are the column headers. So for example, for Hospital Discharge documents, 200 respondents said they do not receive any Hospital Discharge documents per month. 75 respondents said they receive more than 20 Hospital Discharge documents per month. Similarly, 114 respondents said they receive 1-5 Referral Request documents per month.

The most often received documents came from Consultations and Hospital Discharges. Not surprisingly, there were far fewer documents received from Long Term Post Acute Care (LTPAC), Behavioral Health, and Home Health settings, since those are known to have less EHR usage. What is slightly surprising is the fact that only 49% received ToC documents from a referral request. The numbers in this table are far less than the 613 respondents, since about half the respondents did not have actual experience receiving ToC documents electronically.

**SUMMARY**

There was a reasonable balance among documents from hospital discharges, ambulatory consultations, and ambulatory referrals. LTPAC and Behavioral health were received much less often, but still are an important part of the transitions that occur. It is generally known that EHR penetration in LTPAC and Behavioral Health is less than in hospitals and ambulatory practices. Furthermore, the exchange of ToC documents was increased by Meaningful Use incentives, but those incentives did not apply to LTPAC and Behavioral Health settings.

Overall Results

#### Incorporation of Documents

Table 10: Experience Incorporating Documents

|  |  |  |
| --- | --- | --- |
|  | **Count** | **%** |
| Personally Incorporate some discrete clinical data | 178 | 30 % |
| Someone in practice is assigned to incorporate | 129 | 22 % |
| EHR automatically incorporates discrete clinical data | 84 | 14 % |
| Review ToC as a document only | 299 | 51 % |

Notes: 1) respondent may select more than one answer

2) % is of the 588 respondents

**RESULTS**

1. Over half (51%) of the respondents review the ToC as a document
2. Incorporation of specific data into the clinical record is done by a combination of the physician (30%), their staff (22%) or the EHR technology (14%)

**SUMMARY**

It is noteworthy that, despite difficulties such as lack of automated incorporation of data from ToC documents, a significant percentage of respondents are at least trying to incorporate data into their EHR, either personally or through staff. If the recommendations of this report are followed, coupled with EHRs providing improvements in C-CDA rendering and incorporation tools, we expect that the experience with incorporation will improve.

#### General Issues

Table 11: General Issues

|  |  |  |
| --- | --- | --- |
|  | **Count** | **%** |
| No Issues | 49 | 8 % |
| Too Much Information (I want to receive less) | 297 | 51 % |
| Information that I need is missing | 181 | 31 % |
| Organization or structure makes it difficult to use | 311 | 53 % |
| Needs summary | 285 | 48 % |
| I do not receive them in a timely fashion | 187 | 32 % |

Notes: 1) respondent may select more than one answer

2) % is of the 588 respondents

**RESULTS**

1. 51% say there is too much information
2. 31% say that needed information is missing
3. 53% say organization makes it difficult to use
4. 48% say it needs a summary
5. 32% did not receive the ToC in a timely fashion

**SUMMARY**

Based on the responses, we can reach two general conclusions: **1) the information provided needs to be more selective (see answers to later questions) and better organized and 2) required information is frequently missing and the documents are not received in a timely fashion.**

#### Clinical Judgment Based on Context

The following sections contain many statistics (percentages, averages, etc.) about preferences, experiences, and “value” of data sections as perceived by the respondents. Developers should realize that not every situation is “average.” There are complexities of each **patient’s clinical case** (e.g., history, condition, preferences), and the needs of different **recipients** of the data (e.g., specialty, clinical setting/department), and the **type of ToC** (e.g., referral, transfer). All these variables that affect relevance can be considered the “context” of a ToC.

Automatic generation of documents may use averages to help them come as close as possible to “a sensible default” setting, but cannot be expected to have an experienced clinician’s judgment. A clinical detail that is life-saving in one clinical case, may be irrelevant in thousands of other clinical cases.EHRs must provide flexibility to allow clinicians to add, remove, and modify contents to accommodate the unique context of each ToC. Data that suggest or require action or attention on the part of the recipient are pertinent.

Some of the tables below will show some types of data as having a higher “value” than other sections, by and large, for a cross-section of providers. But just because a section received a low score does not necessarily mean it should always be excluded. Clinical judgment should still be applied to make the decision.

* Here are a few examples where the **patient’s clinical case** may elevate the importance of certain sections.
	+ *Social History Section.*Past substance abuse problems, discharged on narcotic pain medications, would be relevant, as would being unemployed/uninsured and unable to pay for medications.
	+ *Medical Equipment Section.* An implanted device that affects the ability to perform future imaging or surgical procedures would be important.
	+ *Family History Section.* A combination of diseases within a single family (e.g., heart disease and diabetes) may hold important clues to a patient’s risk of disease and suggest lifestyle changes and screening tests.[[8]](#footnote-8)
	+ *Discharge Diet Section.* Diet is very important for a diabetic patient.
* Examples of the impact of the **recipient’s specialty**. Immunizations for a patient with chronic respiratory conditions is important to a respiratory specialist; discharge diet for diabetic patient with poor glycemic control is important to a diabetologist.
* Examples of the **type of ToC**. If the ToC is from a consultant back to the referring provider, only the current visit information is needed. If the ToC is a transfer from one primary care provider to another (as occurs during a patient relocation or change of insurance coverage), or from one hospital to another hospital, a more comprehensive ToC document is needed.

Transitions of Care from Hospital Discharges

#### Preference vs Experience

Table 12: Preferences for ToC from Hospital Discharge

Indicate your preference for Hospital Discharge ToC documents:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Prefer** | **Neutral** | **Disagree** |
| Limited Information from current hospitalization | 63 % | 20 % | 16 %  |
| Same information as traditional discharge summary | 80 % | 13 % |  7 %  |
| All information from the current hospitalization | 18 % | 19 % | 62 % |
| All information from all hospitalizations | 11 % | 18 % | 70 % |

Notes: 1) Prefer includes Strongly Prefer, Prefer

 2) Disagree includes Disagree and Strongly Disagree

 3) average of 538 respondents

Table 13: Experience with ToC from Hospital Discharge

Indicate the percentage of Hospital Discharge ToC documents that have the following:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **None** | **<50 %** | **>50 %** |
| Limited Information from current hospitalization | 19 % | 48 % | 32 % |
| All information from current hospitalization | 26 % | 44 % | 30 % |
| All information all hospitalizations | 59 % | 31 % | 10 % |
| Missing Important information for patient care | 10 % | 44 % | 46 % |

Average of 429 respondents. Excludes blank and N/A responses.

First, we compare the survey respondents **preferences** vs their **actual experiences.**

**DESCRIPTION**

Despite the “Hospital” in the title, these results represent mostly the experience of ambulatory providers who received documents FROM hospital discharges of their patients, more so than experiences of hospital providers. Less than 20% of the responses were from hospital-based physicians, as described earlier in the analysis of the demographics of respondents.

The key point is that **providers want a SUMMARY and ”LIMITED Information from current hospitalization.”** The word “current” is really best described as “at the time of discharge from that hospitalization” (since the patient is no longer in the hospital when the ToC document is received). A strong preference (80%) was expressed in favor of “traditional discharge summary” which is what the C-CDA Discharge Summary represents: it includes a narrative summary of hospital course, as well as structured data. However, per the preceding General Discussion: Approach and Limitations, it’s very unlikely that providers received Discharge Summaries instead of CCD.

The last two questions indicate strong preferences for not “all” information from latest hospitalization or certainly not ALL hospitalizations. That would be far too much information.

Comparing the table of experience vs the preferences, we see that there is a mix of “too much information” but also “missing information.”

* **Too much information in general.** All information from current hospitalization, or all info from all hospitalization, is received much of the time (40% say they receive these more than 50% of the time), despite only 18% saying they wanted all info from latest, and only 11% saying they wanted all info from all hospitalizations.
* **Yet not enough of some kinds of information.** On the other hand, even though some are receiving what they prefer (limited info from latest hosp), the information may be TOO limited, because 46% of respondents say that they are “missing important information for patient care” more than 50% of the time.

**INTERPRETATION**

How can proper balance be struck between “too much” and “not enough?” First, we need to understand what this “missing information” is. It is well known that US-realm certification drove vendors to develop documents that “passed the test” of required information, and that many EHRs did not include sections that were not required by CCD or certification (see section 3.5).[[9]](#footnote-9) Based on the 48% of respondents (Table 11) raising the general issue that the document “Needs summary” we infer that the “patient story” (what happened to the patient) in the **Hospital Course**[[10]](#footnote-10)section of a Discharge Summary is often missing, and that instead, there may be too much irrelevant detail from the latest and/or previous hospitalizations.

Similarly, **Chief Complaint** (or Chief Complaint/Reason for Visit), **History of Present Illness**, and **Hospital Consultations** are all highly valued sections, each typically narrative summaries. History of Present Illness is complementary to Hospital Course because it describes what *led up to* the hospitalization, rather than what happened during it. While parts of **Plan of Treatment** are in the CCD definition, Hospital Course, Chief Complaint, Reason for Visit, History of Present Illness, and Hospital Consultations, are neither part of the CCD definition, nor in the common MU data set or MU1 C32 requirements. Any of them *may* be added to a CCD document, since “open templates” allow addition of sections to documents that do not include them in their definition. However, it is unlikely that these sections *actually* are added in most CCDs.

#### Value of Data from Hospitalizations

See the tables below for details of respondents’ perception of “value.” **It is significant that probably four of the top 12 value sections, ones that tell the patient story, are often not included in the ToC documents that are usually sent.**

Table 14: Value of Sections from Hospital (Discharge Summary, CCD)
– Percentage Considered “Valuable” or “Necessary”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Valuable | Section | Valuable | Section | Valuable |
| Admission Diagnosis | 80 % | Family History  | 29 % | Payer Information  | 29 % |
| Advance Directives | 56 % | Functional Status  | 59 % | Plan of Treatment  | 85 % |
| Allergies / Intolerances | 80 % | History of Past Illness  | 49 % | Problems | 79 % |
| Encounters | 47 % | History of Present Illness  | 82 % | Procedures  | 86 % |
| Chief Complaint / RfV | 85 % | Hospital Consultation  | 84 % | Results  | 89 % |
| Discharge Diagnoses | 90 % | Hospital Course  | 79 % | Review of Systems  | 28 % |
| Discharge Diet | 37 % | Immunizations  | 48 % | Social History  | 36 % |
| Discharge Instruction  | 64 % | Medical Equipment  | 36 % | Vital Signs  | 52 % |
| Discharge Medications  | 92 % | Mental Status  | 58 % |  |  |

Notes: 1) Valuable includes Valuable and Necessary Responses

 2) average of 583 respondents

 3) Green highlighting indicates narrative sections that are not required in CCD but were of high value to respondents.

Table 15: Value of Sections from Hospital (Discharge Summary, CCD)
– Weighted Average Score

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Section | Value  | Section | Value | Section | Value |
| Admission Diagnosis | 2.2 | Family History  | 1.1 | Payer Information  | 1.0 |
| Advance Directives | 1.6 | Functional Status  | 1.6 | Plan of Treatment  | 2.3 |
| Allergies / Intolerances | 2.2 | History of Past Illness  | 1.5 | Problems | 2.1 |
| Encounters | 1.5 | History of Present Illness  | 2.1 | Procedures  | 2.3 |
| Chief Complaint / RfV | 2.3 | Hospital Consultation  | 2.2 | Results  | 2.3 |
| Discharge Diagnoses | 2.6 | Hospital Course  | 2.1 | Review of Systems  | 1.1 |
| Discharge Diet | 1.2 | Immunizations  | 1.5 | Social History  | 1.2 |
| Discharge Instruction  | 1.8 | Medical Equipment  | 1.2 | Vital Signs  | 1.6 |
| Discharge Medications  | 2.6 | Mental Status  | 1.6 |  |  |

Respondents were asked on a four point scale about the value of specific categories of information (these correspond to Consolidated C-CDA sections, though respondents were not expected to know that). The possible answers for each category were “No Value (=0),” “Limited Value” (=1), “Valuable” (=2), and “Necessary” (=3). Table 14 above summarizes the percentage who chose either “valuable” or “necessary.” Table 15 represents the same data as a weighted average, which is a way of representing the data on the previous table as a single number, giving higher weight to “necessary” than “valuable” (whereas both were added together to yield the percentage in the previous table). The maximum possible value of weighted average = 3.0. Scores above 2.0 can be considered high value (valuable to necessary).

Table 16: Value of Sections from Hospital Discharge – Rank Ordered

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Section | All | Exp |  | Section | All | Exp |  | Section | All | Exp |  |
| Discharge Medications  | 92% | 94% |  | Allergies / Intolerances | 80% | 81% |  | Immunizations  | 48% | 57% |  |
| Discharge Diagnoses | 90% | 92% |  | Hospital Course  | 79% | 81% |  | Encounters | 47% | 42% |  |
| Results  | 89% | 90% |  | Problems | 79% | 83% |  | Discharge Diet | 37% | 41% |  |
| Procedures  | 86% | 89% |  | Discharge Instruction  | 64% | 68% |  | Medical Equipment  | 36% | 41% |  |
| Chief Complaint / RfV | 85% | 85% |  | Functional Status  | 59% | 58% |  | Social History  | 36% | 34% |  |
| Plan of Treatment  | 85% | 89% |  | Mental Status  | 58% | 60% |  | Family History  | 29% | 27% |  |
| Hospital Consultation  | 84% | 86% |  | Advance Directives | 56% | 60% |  | Payer Information  | 29% | 24% |  |
| History of Present Illness  | 82% | 84% |  | Vital Signs  | 52% | 53% |  | Review of Systems  | 28% | 24% |  |
| Admission Diagnosis | 80% | 82% |  | History of Past Illness  | 49% | 49% |  |  |  |  |  |

Notes: 1) Percentage include responses of Necessary and Valuable

 2) All is an average of 583 respondents, Exp is based on the 263 with ToC experience

 3) Stop light coding is based on responses – green: highly relevant, yellow: relevant, red: less relevant

Table 16 rearranges the data from previous tables, to show the sections in order from high to low perceived value. There were no major differences in results between respondents who had actually received ToC documents electronically, and those respondents who had not.

Note that some data sections may be valuable to the provider, even necessary, but may not have been deemed important *to obtain from ToC documents* because it is gathered another way. For example, Payer information is almost always gathered directly from the patient and reverified frequently in person, rather than relying on prior providers for it.

It is unlikely that most of the “low value” sections (red) are included in typical ToC documents, since none of them are required by MU or certification, except for smoking status in the Social History Section. Family History is often collected, and may be present if available.

**RECOMMENDATIONS**

1. **Include a narrative summary of the patient story**, using Hospital Course plus one or more of the following sections for which information is available: Chief Complaint, Chief Complaint and Reason for Visit, History of Present Illness, Hospital Consultations, and Plan of Treatment.
2. **Consider generating the C-CDA Discharge Summary** for hospital discharges, as an alternative to CCD.
3. **Avoid including detail from prior hospitalizations, and include only the relevant data from the current hospitalization.**

#### Amount of Data from Hospitalizations

##### Current Hospitalization

Table 17: Preferred Amount of Data from Current Hospitalization

Please indicate the scope of information you wish to receive for each category.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Section** | **Last Only** | **First/Last** | **All for x days** | **All** |
| Functional Status | 51 % | 32 % |  9 % |  8 % |
| Hospital Studies/Results | 21 % | 30 % | 14 % | 39 % |
| Plan of Treatment | 51 % | 14 %  | 11 % | 25 % |
| Procedures | 17 % |  7 %  |  9 % | 67 % |
| Results | 22 % | 29 % | 13 % | 35 % |
| Review of Systems | 62 % | 24 % |  6 % |  8 %  |
| Vital Signs | 47 % | 33 % | 11 % | 10 % |

Average of 556 respondents

**DESCRIPTION**

This question asked about certain sections which contain data with the potential to be voluminous or repetitive. There were significant differences in some:

* Procedures (probably meaning surgical procedures) were deemed significant enough that 67% of respondents wanted to receive all procedures.
* For Functional Status, Plan of Treatment, and Review of Systems, if they are done multiple times during a hospitalization, most providers generally wanted to receive only the last one, or the first and last, though 25% of providers wanted “all” of the plans of treatment.

**INTERPRETATION**

These data inform us, in more detail, of what providers mean when they prefer “limited data from current hospitalization.” They want more of some types of data than others, especially Procedures.

**RECOMMENDATIONS**

1. **Consider the above preferences for the amount of data to include in each section**, since most providers wanted a summary of the most recent hospitalization, not all details. Note that while it is necessary to include the entire Common Clinical Data Set[[11]](#footnote-11) in every document for certification purposes, it is *not* required that every document sent in day-to-day use contain the entire CCDS, so it is permissible to send less if data are not available or not relevant, in order to make the document more usable.
2. **Strongly consider including all procedures done during the hospitalization.** However, we clarify that “procedures” was probably assumed by respondents to mean surgical or *invasive* procedure procedures, and not to include routine things such as insertion of an I/V line which technically can be considered a procedure but is probably not of interest to most providers. See also 4.1.4.3.2 for guidance on procedures from prior hospitalizations.

##### Prior Hospitalizations

Table 18: Preferred Amount of Data from Prior Hospitalizations

Please indicate the information you wish to receive for each category for each prior hospital stay.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Section** | **Last Only** | **First/Last** | **All for x days** | **All** | **None** |
| Functional Status | 40 % | 12 % |  7 % |  4 % | 37 % |
| Hospital Studies/Results | 29 % | 14 % | 9 % | 17 % | 31 % |
| Plan of Treatment | 41 % | 10 %  | 8 % | 10 % | 31 % |
| Procedures | 27 % |  7 %  | 7 % | 30 % | 29 % |
| Results | 34 % | 13 % | 9 % | 14 % | 30 %  |
| Review of Systems | 32 % | 12 % | 4 % |  4 %  | 48 % |
| Vital Signs | 34 % | 15 % | 6 % | 5 % | 40 % |

Average of 551 respondents

**DESCRIPTION**

Most providers said they did not want information from prior hospitalizations, but preferred “limited information from current hospitalization.” Because over 80% of providers wanted “the traditional discharge summary,” which is not likely to have data from prior hospitalizations, this table only applies for approximately 20% of the time, when providers want data from more than one hospitalization.

**INTERPRETATION**

Procedures stand out as the one category of data where all historical procedures might be more desirable than for other categories of data, but it is still only 30% who want “all.”

**RECOMMENDATIONS**

1. **Since most providers wanted a summary of the current hospitalization, not all details, consider the above preferences when deciding what to include.** If anything earlier than the latest hospitalization is included, be parsimonious and consider the volume.
2. **Consider including historical procedures and even procedures done long ago, if major and/or pertinent to the treatment being given now.** For example suppose the current procedure is Right Lower leg amputation. If the patient had a Left lower leg amputation 5 years ago, realizing that the patient is now a bilateral lower extremities amputee will affect discharge planning and care provision. As another example, consider a patient scheduled for Cardiac surgery, who is a repeat CABG (patient s/p CABG 3 years ago). Hemodynamic stability needs to be considered as part of cardiac rehab planning and care.

#### Differences depending on Specialty

The above three recommendations are applicable regardless of whether the respondent is in Primary Care, Internal Medicine, or specialty care. However, there are a few interesting nuances from the survey results, shown in two views below, first as percentages, and then as weighted averages.

Table 19: Value of Sections from Hospital Discharge
– Differences by Specialty -- Percentage Considered “Valuable” or “Necessary”

Please indicate for each category of information the value to your practice from Hospital Discharge ToC documentation

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** |
| Admission Diagnosis | 85% | 84% | 74% | Family History  | 30% | 15% | 29% | Payer Information  | 17% | 21% | 38% |
| Advance Directives | 61% | 69% | 47% | Functional Status  | 61% | 66% | 50% | Plan of Treatment  | 90% | 96% | 78% |
| Allergies / Intolerances | 79% | 81% | 80% | History of Past Illness  | 40% | 41% | 56% | Problems | 89% | 88% | 71% |
| Encounters | 38% | 40% | 52% | History of Present Illness  | 84% | 78% | 81% | Procedures  | 89% | 90% | 82% |
| Chief Complaint / RfV | 86% | 81% | 84% | Hospital Consultation  | 90% | 88% | 77% | Results  | 90% | 91% | 84% |
| Discharge Diagnoses | 95% | 90% | 86% | Hospital Course  | 85% | 84% | 73% | Review of Systems  | 25% | 28% | 27% |
| Discharge Diet | 48% | 46% | 24% | Immunizations  | 68% | 69% | 26% | Social History  | 34% | 32% | 35% |
| Discharge Instruction  | 73% | 81% | 52% | Medical Equipment  | 49% | 49% | 21% | Vital Signs  | 56% | 61% | 45% |
| Discharge Medications  | 96% | 99% | 88% | Mental Status  | 61% | 65% | 53% |  |  |  |  |

 Notes: Average of 573 respondents (PC= 205, IM= 68, SC= 275)

 PC – Primary Care, IM = Internal Medicine and SP = Specialty Care

Table 20: Value of Sections from Hospital Discharge
– Differences by Specialty – Weighted Average Score

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** |
| Admission Diagnosis | 2.4 | 2.4 | 2.1 | Family History  | 1.1 | 0.9 | 1.1 | Payer Information  | 0.8 | 0.8 | 1.3 |
| Advance Directives | 1.7 | 2.0 | 1.4 | Functional Status  | 1.7 | 1.7 | 1.4 | Plan of Treatment  | 2.5 | 2.6 | 2.1 |
| Allergies / Intolerances | 2.2 | 2.3 | 2.2 | History of Past Illness  | 1.3 | 1.3 | 1.6 | Problems | 2.2 | 2.3 | 1.9 |
| Encounters | 1.3 | 1.4 | 1.6 | History of Present Illness  | 2.2 | 2.1 | 2.1 | Procedures  | 2.3 | 2.4 | 2.1 |
| Chief Complaint / RfV | 2.3 | 2.3 | 2.3 | Hospital Consultation  | 2.3 | 2.4 | 2.0 | Results  | 2.4 | 2.4 | 2.2 |
| Discharge Diagnoses | 2.8 | 2.7 | 2.4 | Hospital Course  | 2.2 | 2.3 | 1.9 | Review of Systems  | 1.0 | 1.1 | 1.1 |
| Discharge Diet | 1.5 | 1.4 | 0.9 | Immunizations  | 2.0 | 1.9 | 1.0 | Social History  | 1.2 | 1.2 | 1.2 |
| Discharge Instruction  | 2.0 | 2.1 | 1.6 | Medical Equipment  | 1.5 | 1.5 | 0.9 | Vital Signs  | 1.7 | 1.6 | 1.4 |
| Discharge Medications  | 2.8 | 2.9 | 2.4 | Mental Status  | 1.7 | 1.8 | 1.5 |  |  |  |  |

Notes: Value: No Value = 0, Limited Value =1, Valuable = 2 and Necessary = 3

 Average of 573 respondents (PC= 205, IM= 68, SC= 275)

**DESCRIPTION**

These tables are similar to previous ones, except they stratify data between primary care (PC), Internal Medicine (IM), and Specialty Care (SC – everything else). To a large extent, PC and IM are similar, and many persons have an Internist as their PCP). Nevertheless, the data were separated because there are some subspecialties of Internal Medicine, and in case there were any significant differences. As it turns out, there were no noteworthy differences between PC and IM results.

**INTERPRETATION**

Comparing PC/IM vs specialists, there are a few noteworthy differences (>0.4 difference in weighted average) in level of interest in types of information. For example,

* **Immunizations, Medical Equipment, Advance Directives, Discharge Diet, Discharge Instructions** and **Plan of Treatment** are all viewed as much more valuable/necessary by PC/IM, vs specialists. These differences are highlighted in green above. These differences seem explainable. For example, immunizations are commonly managed by PC/IM providers. When patients have advance directives, they are typically discussed in more detail with PC/IM providers. Longer term nutrition management are handled by PC/IM providers. Follow-up on discharge instructions are done by PC/IM providers.
* **Encounters** are viewed as LESS valuable/necessary (though not by a lot) by PC/IM vs specialists. This may be because PC/IM are more likely than specialists to already know about encounters with other providers. Also, **Payer Information** was deemed more valuable by specialists than by PC/IM, though still a low average score. These differences are highlighted in dark green above. Specialists may be part of referrals by payers.
* Of the high value narrative summary sections previously mentioned as probably missing (**Chief Complaint/Reason for Visit, Hospital Course, History of Present Illness, Hospital Consultations, Plan of Care[[12]](#footnote-12)**) all were rated high across all types of providers.

**RECOMMENDATION**

The main conclusion from the stratified data: **keep in mind the intended purpose and recipients of the document, e.g., specialty, and understand what is most important to them in the context of the clinical use case of which the ToC is a part**, regardless of the overall average scores.

ToC from Ambulatory Visits

#### Preference vs Experience

Table 21: Preferences for ToC from Ambulatory Visit

Indicate your preference for ambulatory (e.g. referral/consult) ToC documents:

|  |  |  |
| --- | --- | --- |
|  | **Prefer** | **Disagree** |
| All information from the current ambulatory visit | 80 % | 20 % |
| Limited information from all ambulatory visits (e.g. new or changed information only) | 86 % | 14 % |
| All information from all ambulatory visits | 39 % | 61 % |

Notes: 1) Prefer includes Strongly Prefer, Prefer and Neutral

 2) Disagree includes Disagree and Strongly Disagree

 3) average of 542 respondents

Table 22: Experience with ToC from Ambulatory Visit

Indicate the percentage of ambulatory (e.g. referral/consult) ToC documents that have the following:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **None** | **<50 %** | **>50 %** |
| All information from the current ambulatory visit | 14 % | 42 % | 44 % |
| Limited information from all ambulatory visits (e.g. new or changed information only) | 21 % | 62 % | 17 % |
| All information from all ambulatory visits | 46 % | 41 % | 13 % |
| Missing Important information for patient care | 17 % | 51 % | 33 % |

Notes: 1) excludes blank and N/A responses; 2) average of 423 respondents

**DESCRIPTION**

In contrast to the Hospital Discharge experience, the “preference” question pertains to ToC documents received by one provider from another ambulatory provider after a visit, such as from a referral or after a consult.

80% of respondents preferred to receive “all” information from the current ambulatory visit . In addition, 86% of providers want “limited, such as new or changed information, from all ambulatory visits.” Note: “current” really means “after the visit that the provider is summarizing,” since the patient is no longer in the visit being summarized.

The actual experience, compared to the preference, shows that the desire for all information from the latest ambulatory visit is often **not** met, as only 44% say they receive it most of the time. Correspondingly, the last question says that 84% of respondents they are missing important information for patient care at least some of the time (33% say more than half the time).

**INTERPRETATION**

In contrast to a hospitalization, there will generally be much less voluminous data for an ambulatory visit, so the preference for “all” from the current visit, and for limited information from previous visits, is not surprising, whereas it would be too overwhelming to do likewise for hospitalizations.

While the last two questions were worded as “all ambulatory visits”, we suspect that respondents did not literally mean that they wanted information from every visit over the patient’s lifetime! Rather, we interpret that they were interested in information from multiple visits relevant to the care they are delivering. Common sense indicates that providers would not be interested in the routine physical exams, or the flu shot, or the sore throat visit from 10 years ago! Of course, in situations such as a referral from a PCP to a specialist, it is understandable that the PCP would want the full reports from multiple visits to that specialist. Thus the volume of data, and the significance, should be context-dependent.

As with hospital discharges, we try to understand what is this missing information? There is no clear indication, except for the general issue of “Needs summary” as also mentioned for hospital discharges, supplemented by comments provided in response to the “[long survey](#LongSurvey).” In broad terms, the information could be characterized as “provider notes.” But since C-CDA does not have specific sections with that title, we need to postulate the equivalent in C-CDA terms. Comparing the sections that are REQUIRED in ToC documents, and comparing them to the “Value” statements that come up in the following tables, we gain insight. If a section is deemed “Valuable” but is not included, it is a partial answer to the question: “What is the important information for patient care that is missing?”

#### Value of Data from Ambulatory Visit

Table 23: Value of Sections from Ambulatory Visit (Consult Note, Progress Note, CCD)
– Percentage Considered “Valuable” or “Necessary”

Please indicate for each category of information the value to your practice from ambulatory visit ToC documentation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Section** | **Valuable** | **Section** | **Valuable** | **Section** | **Valuable** |
| Advance Directives | 47 % | Immunizations  | 47 % | Plan of Treatment  | 88 % |
| Allergies / Intolerances | 78 % | Instructions | 60 % | Problems | 81 % |
| Assessment | 85 % | Interventions | 74 % | Procedures  | 83 % |
| Chief Complaint / Reason for Visit | 86 % | Medical Equipment  | 38 % | Results  | 86 % |
| Diagnosis | 94 % | Medications | 93 % | Review of Systems  | 31 % |
| Encounters | 50 % | Mental Status  | 52 % | Social History  | 36 % |
| Family History  | 33 % | Nutrition/Diet | 36 % | Subjective | 50 % |
| Functional Status  | 50 % | Objective | 52 % | Vital Signs  | 56 % |
| History of Past Illness  | 47 % | Payer Information  | 31 % |  |  |
| History of Present Illness  | 81 % | Physical Exam | 64 % |  |  |

Notes: 1) Valuable includes Valuable and Necessary Responses; 2) average of 573 respondents

3) Green highlighting indicates narrative sections that are not required in CCD but were of high value to respondents.

Table 24: Value of Sections from Ambulatory Visit (Consult Note, Progress Note, CCD)
– Weighted Average Score

Please indicate for each category of information the value to your practice from ambulatory visit ToC documentation

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Section** | **Value** | **Section** | **Value** | **Section** | **Value** |
| Advance Directives | 1.4 | Immunizations  | 1.5 | Plan of Treatment  | 2.4 |
| Allergies / Intolerances | 2.1 | Instructions | 1.7 | Problems | 2.1 |
| Assessment | 2.3 | Interventions | 2.0 | Procedures  | 2.2 |
| Chief Complaint / Reason for Visit | 2.3 | Medical Equipment  | 1.2 | Results  | 2.3 |
| Diagnosis | 2.6 | Medications | 2.6 | Review of Systems  | 1.1 |
| Encounters | 1.5 | Mental Status  | 1.5 | Social History  | 1.2 |
| Family History  | 1.2 | Nutrition/Diet | 1.2 | Subjective | 1.5 |
| Functional Status  | 1.5 | Objective | 1.5 | Vital Signs  | 1.6 |
| History of Past Illness  | 1.4 | Payer Information  | 1.0 |  |  |
| History of Present Illness  | 2.1 | Physical Exam | 1.7 |  |  |

Notes: Value: No Value = 0, Limited Value =1, Valuable = 2 and Necessary = 3; Average of 573 respondents

Table 25: Value of Sections from Ambulatory Visit – Rank Ordered

Please indicate for each category of information the value to your practice from ambulatory visit ToC documentation

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Section** | **All** | **Exp** |  | **Section** | **All** | **Exp** |  | **Section** | **All** | **Exp** |  |
| Diagnosis | 94% | 96% |  | Interventions | 74% | 79% |  | History of Past Illness  | 47% | 46% |  |
| Medications | 93% | 96% |  | Physical Exam | 64% | 66% |  | Immunizations  | 47% | 55% |  |
| Plan of Treatment  | 88% | 91% |  | Instructions | 60% | 66% |  | Medical Equipment  | 38% | 44% |  |
| Chief Complaint / RfV | 86% | 88% |  | Vital Signs  | 56% | 59% |  | Nutrition/Diet | 36% | 39% |  |
| Results  | 86% | 88% |  | Mental Status  | 52% | 53% |  | Social History  | 36% | 36% |  |
| Assessment | 85% | 91% |  | Objective | 52% | 54% |  | Family History  | 33% | 31% |  |
| Procedures  | 83% | 86% |  | Encounters | 50% | 45% |  | Payer Information  | 31% | 28% |  |
| History of Present Illness  | 81% | 82% |  | Functional Status  | 50% | 51% |  | Review of Systems  | 31% | 30% |  |
| Problems | 81% | 83% |  | Subjective | 50% | 50% |  |  |  |  |  |
| Allergies / Intolerances | 78% | 78% |  | Advance Directives | 47% | 53% |  |  |  |  |  |

Notes: 1) Percentage include responses of Necessary and Valuable

 2) All is an average of 583 respondents, Exp is based on the 255 with ToC experience

 3) Stop light coding is based on responses – green: highly relevant, yellow: relevant, red: less relevant

From the tables above, which present the responses first as percentages, then as a weighted average, and lastly ordered from high to low value (as explained for Hospital Discharge), it is apparent that the following sections, which are typically narrative, may contain some or all of the desired summary that is deemed missing. **Chief Complaint (or Chief Complaint and Reason for Visit), Assessment**, **History of Present Illness**, and **Plan of Treatment.** These are four of the top nine most valuable sections, according to respondents. Some aspects of the Plan of Treatment (formerly called Plan of Care) were required in Stage 2 of Certification and Meaningful Use. **But it is still significant that probably three of the top nine value sections, ones that tell the patient story, were not usually included.**

**RECOMMENDATIONS**

1. **Include a narrative describing the patient story**, using one or more of the following sections: Chief Complaint and Reason for Visit, Assessment, History of Present Illness, and Plan of Treatment, to the extent that the information is available. These can be added to the summary documents (CCD, etc.) being generated.
2. Note to ONC: **we recommend allowing more document types to be used to fulfill the certified Health IT requirements and the Advancing Care Information usage requirements of MACRA.** Of the three document types permitted in 2015 edition certification, only Referral Note and CCD apply to an ambulatory ToC. Referral Note is only for the “front end” of the referral loop. Consultation Note, Progress Note, and/or History and Physical would all be valid responses from a consulting provider for the “back end” of the referral loop. Furthermore, as long as an EHR can demonstrate the capability of sending the full CCDS in one or more documents (e.g., the CCD), it should not be required to include the full CCDS in every document type it certifies. For example, suppose a PCP refers the patient for a neurologist consultation, sending a CCD supplemented by a Referral Note explaining the reason why the patient is being sent. After the consultation, the neurologist returns a Consultation Note. The PCP would probably be most interested in the neurologist’s assessment, plan, and important changes in treatment (e.g., new or discontinued medications, new diagnoses). The PCP would probably prefer to have that relevant information presented prominently and succinctly, rather than “buried” among the full CCDS, most of which had not changed.

#### Amount of Data from Ambulatory Visit

Table 26: Preferred Amount of Data from Current Ambulatory Visit

Please indicate the amount of data you wish to receive for each category

|  |  |  |  |
| --- | --- | --- | --- |
| **Section** | **Current visit only** | **Current and x prior visits** | **All visits** |
| Functional Status | 77 % | 17 % |  6 % |
| Plan of Treatment | 72 % | 16 %  | 12 % |
| Problems | 62 % | 21 %  | 17 % |
| Procedures | 50 % | 23 %  | 27 % |
| Results | 62 % | 22 % | 16 % |
| Review of Systems | 85 % | 10 % |  5 % |
| Vital Signs | 79 % | 14 % |  7 % |

Average of 551 respondents

There are different preferences regarding the inclusion of historical data for different sections. Since anecdotal evidence and testimony often referred to “too much information” or “bloated, overly long documents,” we asked specifically about a few types of sections that could potential generate many pages. Some could be voluminous because there really can be large volumes of data generated (e.g., laboratory results), especially if a long time period is included. Others might not be voluminous for a single visit, but might tend to be repetitive or irrelevant if older instances are superseded by newer ones (e.g., Review of Systems, Plan of Treatment). The results are summarized above. For all, data from the current visit was most often desired. **Procedures** were the one type of data that stood out as having relatively more value of older data (“all visits”).

**RECOMMENDATIONS**

1. **Consider the above preferences for the amount of each section to include**, since most providers wanted information from the current visit only, not prior visits.

#### Differences Depending on Specialty

The above three recommendations apply, regardless of whether the respondent is in Primary Care, Internal Medicine, or specialty care. However, there are a few interesting nuances from the survey results, shown in two views: percentages and weighted averages.

Table 27: Value of Sections from Ambulatory Visit
– Differences by Specialty -- Percentage Considered “Valuable” or “Necessary”

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** | **Section** | **PC** | **IM** | **SC** |
| Advance Directives | 49% | 63% | 40% | Immunizations  | 62% | 65% | 29% | Plan of Treatment  | 96% | 94% | 81% |
| Allergies / Intolerances | 72% | 75% | 81% | Instructions | 71% | 74% | 48% | Problems | 80% | 90% | 79% |
| Assessment | 92% | 90% | 78% | Interventions | 81% | 81% | 67% | Procedures  | 85% | 87% | 79% |
| Chief Complaint / RfV | 87% | 79% | 86% | Medical Equipment  | 50% | 51% | 23% | Results  | 89% | 88% | 84% |
| Diagnosis | 97% | 94% | 91% | Medications | 94% | 97% | 91% | Review of Systems  | 29% | 24% | 33% |
| Encounters | 48% | 40% | 53% | Mental Status  | 51% | 53% | 51% | Social History  | 35% | 31% | 36% |
| Family History  | 31% | 24% | 34% | Nutrition/Diet | 44% | 45% | 26% | Subjective | 53% | 48% | 47% |
| Functional Status  | 50% | 57% | 45% | Objective | 57% | 56% | 43% | Vital Signs  | 64% | 55% | 48% |
| History of Past Illness  | 38% | 42% | 52% | Payer Information  | 19% | 22% | 40% |  |  |  |  |
| History of Present Illness  | 83% | 75% | 79% | Physical Exam | 64% | 63% | 62% |  |  |  |  |

Average of 573 respondents

Table 28: Value of Sections from Ambulatory Visit
– Differences by Specialty – Weighted Average

Please indicate for each category of information the value to your practice from ambulatory visit ToC documentation

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Section | PC | IM | SC | Section | PC | IM | SC | Section | PC | IM | SC |
| Advance Directives | 1.4 | 1.8 | 1.3 | Immunizations  | 1.8 | 1.9 | 1.0 | Plan of Treatment  | 2.6 | 2.7 | 2.2 |
| Allergies / Intolerances | 2.1 | 2.1 | 2.2 | Instructions | 2.0 | 2.0 | 1.4 | Problems | 2.1 | 2.4 | 2.0 |
| Assessment | 2.5 | 2.5 | 2.1 | Interventions | 2.2 | 2.2 | 1.8 | Procedures  | 2.3 | 2.4 | 2.1 |
| Chief Complaint / RfV | 2.3 | 2.3 | 2.3 | Medical Equipment  | 1.5 | 1.5 | 0.9 | Results  | 2.4 | 2.4 | 2.2 |
| Diagnosis | 2.7 | 2.6 | 2.4 | Medications | 2.7 | 2.8 | 2.5 | Review of Systems  | 1.1 | 1.1 | 1.2 |
| Encounters | 1.5 | 1.4 | 1.4 | Mental Status  | 1.5 | 1.6 | 1.5 | Social History  | 1.2 | 1.1 | 1.2 |
| Family History  | 1.2 | 1.1 | 1.3 | Nutrition/Diet | 1.4 | 1.4 | 1.0 | Subjective | 1.6 | 1.5 | 1.4 |
| Functional Status  | 1.5 | 1.6 | 1.3 | Objective | 1.6 | 1.6 | 1.4 | Vital Signs  | 1.8 | 1.7 | 1.4 |
| History of Past Illness  | 1.3 | 1.4 | 1.5 | Payer Information  | 0.8 | 0.8 | 1.3 |  |  |  |  |
| History of Present Illness  | 2.1 | 2.1 | 2.0 | Physical Exam | 1.8 | 1.7 | 1.7 |  |  |  |  |

Notes: 1) Value: No Value = 0, Limited Value =1, Valuable = 2 and Necessary = 3

 2) Average of 573 respondents (PC= 205, IM= 68, SC= 275)

 3) PC – Primary Care, IM = Internal Medicine and SP = Specialty Care

**DESCRIPTION**

These tables are similar to previous ones, except it stratifies data between primary care (PC), Internal Medicine (IM), and Specialty Care (SC – everything else).

**INTERPRETATION**

Comparing PC/IM vs specialty, there are some significant differences (>0.4 difference in weighted average) in level of interest in types of information. For example,

* **Immunizations, Medical Equipment, Instructions, Nutrition/Diet,** and **Plan of Treatment,** are all viewed as more valuable/necessary by PC/IM, vs specialists.
* **Payer information** was deemed more valuable by specialists than by PC/IM, though still a low average score.
* Of the high value narrative summary sections previously mentioned as probably missing (**Chief Complaint/Reason for Visit, History of Present Illness, Assessment, Plan of Care**) all were rated high across all types of providers.

**RECOMMENDATION**

The main conclusion from these data: **keep in mind the intended purpose and recipients of the document, e.g., specialty, and understand what is most important to them**, regardless of the overall average scores.

Medications

#### Medications in Hospital Discharges

In terms of “value” of data sections, Discharge Medications were ranked as the #1 section for hospital discharges, and Medications were ranked as the #2 section for ambulatory ToC. But because of the importance of medication information to clinicians, and the variety of options by which medications can be included (or excluded) in medication lists, a specific set of questions was asked about preferences and experiences for medications. The hospital questions are shown below.

Table 29: Preferences for Medication Information from Hospital ToC

|  |  |  |  |
| --- | --- | --- | --- |
| **Preference** | **Necessary** | **Useful** | **Never Use** |
| Ambulatory medications a time of admission | 47 % | 41 % | 12 % |
| Medications administered during hospital stay | 26%  | 56 % | 19 % |
| Medications active or prescribed at discharge | 87 % | 11 % |  2 % |
| **Experience** | **Always Receive** | **Occasionally Receive** | **Never Receive** |
| Ambulatory medications a time of admission | 21 % | 52 % | 26 % |
| Medications administered during hospital stay | 19 % | 50 % | 30 % |
| Medications active or prescribed at discharge | 49 % | 37 % | 14 % |

Average of 566 respondents

As expected “medications active or prescribed at discharge) have 98% who consider them necessary or useful. This equates to the “Discharge Medications” section. However, some medications were active upon admission but then discontinued, and other medications were administered within the hospital and also not continued. As the table shows, both those are considered necessary or useful by 88% and 82% respectively. Yet they are not always received. While not considered as overwhelmingly “necessary” as discharge medications, they are still useful.

**RECOMMENDATION**

1. **Include Discharge Medications** in the Discharge Medications section (of a Discharge Summary), or in the Medications Section (of a CCD).
2. **Also consider including the Admission Medications Section and the Medications Administered Section where applicable.**
3. By using three distinct sections, information can be clearly displayed logically to improve visualisation and accurate processing by clinicians. The three categories of medications should not be intermixed in a single list that might make it difficult to tell which is which.

#### Medications in Ambulatory ToC

Five questions were asked about preferences and experiences with medications from ambulatory ToC, as shown in the table below.

Table 30: Preferences for Medication Information from Ambulatory ToC

|  |  |  |  |
| --- | --- | --- | --- |
| **Preference** | **Necessary** | **Useful** | **Never Use** |
| Active medications at time of visit | 65 % | 29 % |  5 % |
| New medications prescribed during visit | 83 %  | 14 % |  3 % |
| Medications discontinued during visit | 75 %  | 20 % |  5 % |
| Medications discontinued during last year | 13 %  | 56 % | 31 % |
| All previously discontinued medications |  9 % | 45 % | 47 % |
| **Experience** | **Always Receive** | **Occasionally Receive** | **Never Receive** |
| Active medications at time of visit | 34 % | 52 % | 14 % |
| New medications prescribed during visit | 40 % | 45 % | 14 % |
| Medications discontinued during visit | 23 %  | 56 % | 21 % |
| Medications discontinued during last year |  5 %  | 37 % | 59 % |
| All previously discontinued medications |  4 % | 31 % | 66 % |

Average of 560 respondents

The results show that clinicians consider necessary the active medications at the time of the visit, and also the changes that occurred, new prescriptions and discontinued medications. All of them were not always received, and discontinued medications was the area of largest gap between preference and experience.

Much less value was perceived in historical information such as “all previously discontinued medications,” though even there more than half found them useful.

**RECOMMENDATIONS**

1. **Ensure that medications lists include all medications that are active, that are newly prescribed, and that were discontinued. Each of these should be distinctly labeled and identified.** The question was not asked whether they should be separate lists, or a single list with new and discontinued medications distinguished somehow.
2. If any past medications (discontinued prior to the current visit) are included, separate them from those that were active, new, or discontinued as of the current visit.
3. Include the reasons for discontinuation (e.g., ineffective, condition resolved, superseded by different medication, adverse reaction, etc.), if available.

Alternative Approaches

While the original premise of the Relevant and Pertinent Project was focused on document **generation** (and avoiding sending “too much information”), it became apparent that there could be alternative approaches to meeting the needs of clinicians. It is not always feasible – due to lack of knowledge, lack of time, or other reasons -- for the sender to know what the receiver prefers and to modify the document accordingly. Some senders do not feel comfortable withholding information even that they *think* would not be relevant, at the risk of making the wrong decision. So an alternative question was asked: “Do you prefer to manage ToC content by receiving more information and having better presentation and incorporation capability in your EHR?” If yes, then they were asked about several potential alternatives, as shown in the table below.

Table 31: Interest in Alternative Approaches

|  |  |  |
| --- | --- | --- |
|  | **All** | **Currently receiving ToC** |
| Prefer sender to limit information | 264 | 43 % | 107 | 39 % |
| Prefer more information and better display/incorporation capability | 349 | 57 % | 168 | 61 % |
|  | **1** | **2** | **3** | **4** | **5** | **No Resp** |
| User defined summary | 2 % | 3 % | 7 % | 18 % | 25 % | 45 % |
| Table of contents with links | 2 % | 3 % | 9 % | 16 % | 23 % | 47 % |
| Drag and Drop | 2 % | 3 % | 6 % | 16 % | 27 % | 46 % |
| Automatic incorporation | 3 % | 3 % | 8 % | 15 % | 26 % | 46 % |
| Duplication detection | 1 % | 3 % | 5 % | 13 % | 33 % | 45 % |

55 respondents provided suggestions. Totals may not equal 100% due to rounding.

Interestingly, while 39% of receivers prefer to receive *less* information (limited by the sender), significantly more of them (61%) want to receive *more* information *if* they have better display and incorporation capability. A significant had a high degree of interest (score of 4 or 5) in all of the alternatives proposed: detection of duplicate data, drag and drop for incorporation of discrete data, user defined summaries, automated incorporation, and table of contents with links.

While specifics were not elicited in this question, we can infer from the “Amount of Data” findings in Sections 3.1.4.3 and 3.1.5.3 that more capability of selecting or filtering data *within* a section is important, not just the ability to show or hide an entire section. Since different C-CDA sections have varying structures and data elements which could be used for filtering, there is no singular way that can be applied to all sections, though certain concepts like date range, last value, first and last, and status (active, inactive) are applicable to multiple sections. Some selections may be specific to only one or a few sections, e.g., normal/abnormal for results. One challenge to overcome is that the narrative block for each section is created by the sender, and the base CDA r2 standard requires a receiver to fully render all the narrative blocks. If filtering capabilities are added, they would bypass the narratiive block and display based on the structured entries. The receiving EHR must *always* provide a default view of each document as it was sent (rendering all the narrative blocks), and filtered views should be offered in addition to, not instead of, the default view.

**RECOMMENDATIONS**

Specific recommendations on how to provide these alternatives was beyond the scope of the Relevant and Pertinent project. However, progress can be made by acknowledging and collaborating with other efforts that started after the Relevant and Pertinent survey was conducted.

1. **EHR developers should seek to innovate and provide features such as (but not limited to) flexible rendering, filtering, and incorporation features and other approaches mentioned above, to provide better tools for receivers of CDA documents**, so that they are not totally dependent on the decisions of senders.
2. **ONC** should seek to stimulate and incent innovative research and development of new *rendering, filtering, and incorporation* features, building upon the results and learnings from the [Consolidated CDA Rendering Tool Challenge](http://www.hl7.org/events/toolingchallenge.cfm) that ONC and HL7 co-sponsored in 2016. The new research should use real-world deindentified C-CDA documents containing typical amounts of data from a hospital stay instead of the example sample files used previously.
3. Regarding *incorporation* of clinical data into receiving systems, **ONC and EHR developers** should consider the recommendations of the [Interoperability Experience Task Force](https://www.healthit.gov/FACAS/health-it-joint-committee-collaboration/joint-hitpchitsc-task-forces/interoperability-experience) (an advisory committee to the HIT Joint Committees), including “Challenges” and “Pilots” for clinical information reconciliation, and prioritization of semantic elements that impact the interoperability experience, e.g., auto-reconcilable data elements.

Long Survey Results

As a supplement and complement to the short survey, which was sent to a large number of persons, who answered questions through the web (without discussion), a “long survey” was created to engage a small number of groups in interactive discussion of the issues. The short-answer, quantitative approach of the short survey was complemented by the more free-form, qualitative discussion engendered by the long survey. 3 Hospitals, 4 health systems, and 4 professional societies agreed to participate in the long survey.

The first two questions asked what percentage of documents received were **not** helpful, and then asked “why not?” In keeping with the premise of dissatisfaction among clinicians, based on public testimony, which spawned the RnP project.

Table 32: What makes Documents Unhelpful?

Of the clinical documents you receive from other healthcare provider organizations,
approximately what percentage are **not** helpful to you?



* Insufficient detail
* Minimal highlighting of key findings
* Laundry list
* Formatting: too hard to read
* Too much completeness, no clinical summary
* Undigested data dumps
* Noise
* Lack of data related to specialty

These results are very consistent with the those of the short survey, which said that there was both “too much information” and yet “missing information.” The comments of “too much completeness” and “no clinical summary” match the short survey’s findings, where we have made recommendations for inclusion of narrative and avoidance of excessive history from past (not current) hospitalizations or visits. However, we also pointed out that specialties varied in what they wanted to receive, and recommended that their preferences be taken into account.

The next question pertained to desired document size.

Table 33: Preferences for Document Size

As a rule of thumb, what is size (number of printed pages) that you
would consider to be a reasonable target for the average summary record?



While it is difficult to make specific recommendations as to what to include or not include in documents, based on these responses, it is a useful baseline to understand what is expected. A “page” is subjective (it may refer to a printed page, but might also refer to screens on a display). Nevertheless, we have anecdotal evidence that some CDA documents generate unnecessary pages through their formatting choices (e.g., one result per “page”), and the long survey suggests that it is desirable to keep the page count under 10.

The “value of data” question was addressed in the short survey. The following provides a different perspective on Data Element Relevance, and drills into more detail not just about the value of a “Section” (e.g., Medications, Problems), but about the status of that information, e.g., current/active, recent, planned, historical.

Table 34: Data Element Relevance



Not surprisingly, the “old” information was considered less relevant. Since there may have been many previous visits or hospitalizations, it can easily be inferred that inclusion of much “old” information can also create large documents and lead to the “undigested data dumps” criticism in response to Question #2.

## Comparison of Results against Meaningful Use Requirements

Most of the clinicians’ experiences reported in this survey were based on their use of EHRs implemented under Meaningful Use Stage 1 (2011 Edition Certification), which had a smaller set of data requirements than Meaningful Use Stage 2 (2014 Edition Certification). However, any changes to EHR capabilities developed in response to these RnP recommendations will be applied no earlier than 2017 to systems based either on MU2 or MACRA’s Advancing Care Information requirements (optional in 2017 but required in 2018). The recommendations are equally valid to systems implemented for MU2 or MACRA. As explained in the detailed recommendations, clinicians are generally not satisfied with documents that merely meet the “letter of the law” (containing only the data required by regulation): they say that important information that they need is missing. Regulatory requirements are a “floor, not a ceiling,” and additional sections or data elements should be added to meet clinicians’ needs. Likewise, in the process of selecting data to fulfill regulations for required sections, developers should avoid including excessive amounts of historical data, or poorly organized data, that can generate excessive volume (e.g., results or vital signs from prior encounters) and make documents hard to use.

# Conclusions

In addition to the recommendations in section 5.1, which are derived from analysis of narrowly focused survey questions, the RnP project team offers in section 5.2 several general principles from their experience implementing CDA documents, or that can be inferred from a broad view of the survey data.

Clinical summaries using Consolidated CDA are and will continue to be a major vehicle for exchanging information among clinicians but there is much room for improvement. Other projects such as the C-CDA 2.1 Companion Guide will improve the technical correctness and consistency of C-CDA documents. EHR and other HIT developers, by following the recommendations of RnP in addition to the Companion Guide, have an opportunity to remove barriers that clinicians have experienced in trying to use clinical summary documents to date. As these barriers are removed, and as gaps in needed information are filled, clinician satisfaction and productivity should increase. As clinicians increasingly find C-CDA documents helpful to inform their clinical decision making, the ultimate benefits should accrue to the patients for whom the clinicians provide care.

Finally, as more HIT developers use the emerging FHIR standard for exchange of discrete data or documents, it is essential that they learn from clinician experiences with C-CDA by applying these recommendations to FHIR-based exchanges. To the extent that systems do so, their clinician users will be satisfied with their user experience, and will be much less likely to criticize these systems as being irrelevant or difficult to use.

## Summary of Recommendations

While there were many findings, there are a reasonably small set of recommendations. For convenience, the recommendations from previous chapters are consolidated and summarized here They are categorized for applicability to documents from Inpatient Discharges (IP) and Ambulatory visits (OP).

While there are no current plans for the RnP results to be incorporated into regulatory or certification programs, these recommendations can be asserted as conformance statements for programs that wish to undergo an additional level of C-CDA content testing, beyond ONC certification. The following conformance statements have been derived from the requirements in the table to which they are cross-referenced below.

* For a transition of care from a hospital, the system **SHALL** generate a ToC document containing a narrative summary of the patient story, by including the Hospital Course Section, and any of the following sections for which information is available: (Recommendation #1)
	+ Chief Complaint Section
	+ Chief Complaint and Reason for Visit Section
	+ History of Present Illness Section
	+ Hospital Consultations Section
	+ Plan of Treatment Section
* For a transition of care from a hospital, the system **SHALL** include the Discharge Medications Section or SHALL include discharge medications in the Medications Section. (Recommendation #8)
* For a transition of care from a hospital, the system **SHOULD** include the Admission Medications Section and Medications Administered Section (Recommendation #8)
* For a transition of care from an ambulatory visit, the system **SHALL** generate a ToC document containing a narrative summary of the patient story, by including at least one of the following sections for which information is available: (Recommendation #1)
	+ Chief Complaint and Reason for Visit Section
	+ Assessment Section
	+ History of Present Illness Section
	+ Plan of Treatment Section
* The system **SHALL** provide the capability for the user to modify content (e.g., include more or less data) of the generated C-CDA document to adjust for clinical context, intended recipients, and provider preferences such as by specialty. (Recommendations 3 through 7)
* For a transition of care from an ambulatory visit, the system **SHOULD** include a Medications Section, including all active medications, newly prescribed medications, and discontinued medications, each distinctly labeled and identified (Recommendation #9)
* For a transition of care from an ambulatory visit, the system **SHOULD** include the reason for discontinuation of each discontinued medication (Recommendation #10)
* The system receiving C-CDA documents **SHOULD** provide document consumption tools, such as flexible rendering, filtering, and incorporation features.

Recommendations specifically to ONC, rather than to EHR developers, are separately listed. The Section numbers are hyperlinked back to the detailed discussion of findings and recommendations.

|  |  |  |  |
| --- | --- | --- | --- |
| **Recommendation to EHR Developers** | **IP** | **OP** | **Section** |
| 1. Include a narrative summary of the patient story in one or more content sections.
 |  |  | [4.1.4.2](#ValueOfDataHosp), [4.1.5.2](#ValueOfDataAmbulatory) |
| 1. Consider generating the C-CDA Discharge Summary for hospital discharges
 |  |  | [4.1.4.2](#ValueOfDataHosp) |
| 1. Avoid detail from prior hospitalizations, and include only the relevant data from the current hospitalization
 |  |  | [4.1.4.2](#ValueOfDataHosp) |
| 1. Provide the capability to acccommodate specific preferences for amount of data in each section, including whether or not to include information from prior hospitalizations or visits
 |  |  | [4.1.4.3](#AmountOfDataHosp),[4.1.5.3](#AmountOfDataAmbulatory) |
| 1. Strongly consider including all invasive procedures performed during the hospitalization
 |  |  | [4.1.4.3](#AmountOfDataHosp) |
| 1. Provide the capability to include historical procedures relevant to the treatment given now
 |  |  | [4.1.4.3](#AmountOfDataHosp) |
| 1. Provide the capability for users to modify the content of the document according to **context,** which includes the patient’s clinical case, the intended purpose and recipients of the document, and provider preferences such as by specialty.
 |  |  | [4.1.4.4](#SpecialtyHosp), [4.1.5.4](#SpecialtyAmbulatory) |
| 1. Include Discharge Medications; also consider Admission Medications and Medications Administered, each in its own section
 |  |  | [4.1.6.1](#MedsHosp) |
| 1. Ensure that med lists include all active, newly prescribed, and discontinued medications, each distinctly labeled and identified
 |  |  | [4.1.6.2](#MedsAmbulatory) |
| 1. Include reason for discontinuation of medications
 |  |  | [4.1.6.2](#MedsAmbulatory) |
| 1. Provide better document consumption tools, such as flexible rendering, filtering, and incorporation features for those who receive CDA documents, so that they are not totally dependent on the decisions of senders. See also the discussion in 5.2, Using Relevance to Improve User Experience
 |  |  | [4.1.7](#AlternativeApproaches) |

|  |  |
| --- | --- |
| **Recommendations to ONC** | **Section** |
| 1. Allow more C-CDA document types than CCD and Referral Note to be used for ambulatory ToC, such as Consultation Note, Progress Note, History and Physical. Except for CCD, we recommend that the additional document types should not be required to contain the full Common Clinical Data Set.
 | [4.1.5.2](#ValueOfDataAmbulatory) |
| 1. Stimulate and incent innovative research and development of new rendering, filtering, and incorporation features (related to Recommendation #12 above)
 | [4.1.7](#AlternativeApproaches) |
| 1. Consider recommendations of Interoperability Experience Task Force regarding incorporation of clinical data
 | [4.1.7](#AlternativeApproaches) |

## Using Relevance to Improve User Experience

Relevance improves user experience when it is used to improve the visibility of relevant information. There are several ways to accomplish this:

* Make relevant content more visible.
	+ Presenting more relevant data before less relevant data.
	+ Highlighting relevant data
* Hide irrelevant content from the user’s view.

A clinical document, being persistent, will have many viewers, and thus many judges of relevance. An automated system producing clinical documents would be greatly challenged to produce a satistfactory experience among all possible future users of that document with regard to the relevance of the data. For any classification of relevance, we recommend that any assessment of relevance be focused on the current or intended viewer of the document, or if unknown the intended purpose of the document (i.e., the use case for it).

We recommend a four step process in using relevance to improve user experience:

1. Classify data with respect to its relevance.
2. Use heuristics based on these classifications to configure and automate system behavior, but
3. Allow for clinician overrides of these heuristics to improve downstream access, and finally
4. Learn from what clinicians do to improve automated processes.

Classification of Relevance

In developing a classification system for relevance, the first thing to address is how granular the classification system should be. The more granular it is, the less likely that there will be general agreement on where items should be classified. However, if grains are too large, nuances will not be able to be captured that might be useful for improving user experience.

Objectively, data that affects care, e.g., that require or suggest action on the part of the provider or patient, are highly relevant, data that does not affect care is irrelevant or of limited relevance, and data that might affect care is somewhere in between these two points. However, any assessment of data relevance depends upon the assessor’s viewpoint, and the purpose for which the assessor is examining the content. Essentially, relevance is in the eye of the beholder based on their context; the specific situation, expertise and reason for viewing or using the information contained within document. A team-based approach to determining relevance should also be considered.

Figure 1 below shows a different view of the data in Table 34. There are clusters around three different categories. The first cluster appears within the 5.4 ± 0.1 range on the scale, and includes current or active medications, problems and allergies, data usually considered to be highly relevant to treatment. A second cluster appears in the 4.5 ± 0.3 range, and includes other current data which may be relevant. The final grouping appears in the 3.5 ± 0.3 range and includes only historical data. Note that historical data does not appear in any of the other clusters.

Figure 1 Relevance by Category

This leads to a three tiered classification system for relevance as follows:

1. Highly Relevant
2. Relevant
3. Historical[[13]](#footnote-13)

NOTE: Historical data may be relevant based on user context. For example, a past medication that a patient either did not tolerate or which did not work could be relevant to treatment for a current condition. However, automatic classification for these cases is not usually feasible.

Apply Heuristics based on Classifications

There are two main ways to use a classification of relevance:

1. Increasing the visibility of more relevant data either by changing its order of appearance, putting those items considered to be more relevant first, or otherwise highlighting them.
2. Decreasing the visibility of less relevant data items by hiding them or putting them later in the view.

Some heuristics to consider:

1. Highly relevant data should receive special attention to make it more readily accessible.
2. If something has recently changed in a way that makes data less relevant (e.g., a problem is resolved, or a medication becomes inactive), consider treating it as if it had its former, higher relevance.
3. For relevant or historical data, consider exceptional or out of normal range values as being more relevant than unexceptional or normal values.
4. Present enough data to show important trends and patterns, but not so much as to overwhelm. Data necessary to treat a patient in an inpatient environment or through intensive therapy is often of greater volume than that needed for followup care. Consider the use case for the downstream user, rather than the original reason for capturing the data.
5. Set a time limit to distinguish between *recent* and *historical* data (e.g., laboratory results).
6. Consider setting reasonable time limits for how much historical data you will send.

If you are a generator: Sending Data

A concern of many physicians raised during this evaluation is related to lack of essential data. Information technology can readily customize views so as to avoid information overload, but nothing can be done to recover absent data. Many providers were generally opposed to not sending all data that is available. Even so, consider how sending a large volume of data might impact the end users of that data, especially with regard to less relevant information.

#### If you are a renderer: Viewing Data

The HL7 CDA Standard can be rendered in most software applications using HTML and stylesheets, and can include fairly complex dynamic behaviors that allow clinicians to customize the views of the information within those documents. HL7 International and the US Office of the National Coordinator for Healthcare IT recently held a C-CDA® Rendering Challenge in which many open source implementations were submitted which offer user customizable displays of information. Details about the winners is available at <http://www.hl7.org/events/toolingchallenge.cfm>.

While user customizable displays offer one way to support contextually relevant based viewing, presentation could also vary and be configured based on provider context in a receiving system. For example, for an oncologist, a cancer related diagnoses might be treated as being more relevant than other conditions which the oncologist does not usually treat.

Allow for Clinical Overrides and Learn

Any automated assessment of relevance should be considered as guidance, rather than absolute truth. Clinicians should be the final judge of what is relevant and should be able to override automatic assessments. Systems should be designed to learn from the experiences they have while interacting with clinicians. At the very least, data about what clinicians override should be captured to enable future implementations to be improved. Learning algorithms may also be applied to incorporate knowledge generated by these overrides into the assessment process.

FHIR Considerations

While this document is focused on Consolidated CDA documents, we recognize that Consolidated CDA content can also be exchanged using FHIR resources (e.g., bundles/compositions that create FHIR documents, or queries for sets of data that are essentially clinical summaries but not in document format). The implications of clinician preferences and experiences, regarding what is relevant and pertinent, may be useful to consider regardless of whether the content is delivered through C-CDA documents, FHIR documents, or FHIR queries.

If FHIR were to exactly reproduce the content that has been delivered in CDA, the results would likely be dissatisfaction similar to what was reported in the RnP survey. For example, the US Core FHIR profiles were defined for the Common Clinical Data Set (CCDS) defined in ONC 2015 certification. But the CCDS does not contain some of the data (e.g., narrative data) that was considered highly valuable or necessary by survey respondents. Therefore, FHIR developers are strongly encouraged to provide what providers are asking for, not only the CCDS defined in ONC regulations.

# References

* *HL7 CDA® R2 IG: C-CDA Templates for Clinical Notes R1 Companion Guide, Release 1*. <http://www.hl7.org/implement/standards/product_brief.cfm?product_id=447>
This guide provides additional technical clarification and practical guidance to assist implementers to meet requirements of the 2015 Edition Health Information Technology (Health IT) Certification Criteria, 2015 Edition Base Electronic Health Record (EHR) Definition, and ONC Health IT Certification.
* *CDA Examples.* http://hl7-c-cda-examples.herokuapp.com/Examples illustrating C-CDA best practices, created by the HL7 C-CDA Examples Task Force and approved by the HL7 Structured Documents Workgroup.
* *ONC Certification 2015 Edition Final Rule*. <https://www.healthit.gov/policy-researchers-implementers/2015-edition-final-rule>
While this is not the certification edition that governed the documents that clinicians were receiving as of the RnP survey, it is the most current edition that should govern the creation of documents by EHRs from this point forward.
* American Recovery And Reinvestment Act of 2009, US Public Law 111-5, 123 Stat. 115, 516 (Feb. 19, 2009). <http://www.gpo.gov/fdsys/pkg/PLAW-111publ5/content-detail.html>
* *HIT Standards Committee Implementation Workgroup Presentation, Constraining the C-CDA, August 20, 2014.* <https://www.healthit.gov/FACAS/sites/faca/files/HITSC_IWG_2014-08-20.pdf>
“Determine whether there are usability challenges with the C-CDA v1.1 specification and associated implementation guidance (currently adopted in ONC’s certification program) that hinder interoperability”
* *HIT Standards and Policy Committees Joint Meeting, October 15, 2014.* [*https://www.healthit.gov/FACAS/sites/faca/files/Joint\_HIT\_Summary\_Final\_2014-10-15.pdf*](https://www.healthit.gov/FACAS/sites/faca/files/Joint_HIT_Summary_Final_2014-10-15.pdf)p. 3 *“*Eric Rose referred to slide 7 and 2017. He suggested making summary documents useful to the next doctor. Physicians want summary narratives that communicate meaningful information.” This is typical of comments received in many hearings.
* *HIT Joint Committees meeting transcript, February 10, 2015.* <https://www.healthit.gov/FACAS/sites/faca/files/Joint_HIT_Transcript_Final_2015-02-10.pdf> Comments on autogenerated Consolidated CDA from Erica Galvez, John Halamka, David McCallie, Arien Malec.
* *American Hospital Association report, Achieving Interoperability that Supports Care Transformation, July, 2015.* <http://www.aha.org/content/15/1507-iagreport.pdf>“Further, the current iteration of content standards, such as the Consolidated Clinical Document Architecture (C-CDA), do not meet the needs of clinicians for relevant clinical data. The C-CDAs shared for meaningful use include large amounts of patient data, making it hard for clinicians to easily identify the information that is important.”
* *Clinical, Technical, Organization, and Financial Barriers to Interoperability Task Force Virtual Hearing, August 21, 2015.* <https://www.healthit.gov/facas/sites/faca/files/ITF_Transcript_Final_Virtual_Hearing_2015-08-21.pdf> .
Testimony by Steven Stack, President of AMA, p. 25 “In our Town Hall meeting, we solicited…on EHRs, we solicited feedback online and reams of feedback we received and some people had commented that the type of data that goes in C-CDAs or other documents that go out is a morass or a high-volume of information often that goes directly to the physician, but is not in a usable form for the receiving physician and which they don’t particularly appreciate getting because they don’t find it helpful.”
* *Data Update: Interoperability Among U.S. Non-federal Acute Care Hospitals, Vaishali Patel, Senior Advisor, ONC, presented to HIT Joint Committees on June 8, 2016.*Many barriers to interoperability were cited, related to clinical documents, starting at slide 10.
* *Interoperability Experience Task Force of the HIT Policy and HIT Standards Committees, Transmittal Letter to ONC, September 13, 2016.* <https://www.healthit.gov/FACAS/sites/faca/files/HITJC_Transmittal_Letter_IXTF_2016-09-13.pdf>
Recommendations are given regarding the need for improvements in effectively using health information, of information exchange, data reconciliation, and import.
* *Patient and clinician perspectives on the outpatient after-visit summary: a qualitative study to inform improvements in visit summary design*. Journal of American Medical Informatics Association, <http://jamia.oxfordjournals.org/content/early/2016/07/24/jamia.ocw106> published August 7, 2016.
This was similar to RnP, but was focused on patient preferences, rather than clinicians

# Acronyms and Abbreviations

C-CDA Consolidated CDA

CCD Continuity of Care Document

CCDS Common Clinical Data Set (required to be included in C-CDA documents for US-Realm ONC certification tests)

CDA, CDA R2 Clinical Document Architecture (Release 2)

CFR Code of Federal Regulations

DIR Diagnostic Imaging Report

DSTU Draft Standard for Trial Use (now STU)

EHR electronic health record

EMR electronic medical record

H&P History and Physical

HIT Healthcare Information Technology

HL7 Health Level Seven

HTML Hypertext Markup Language

LOINC Logical Observation Identifiers Names and Codes

NI No Information

ONC Office of National Coordinator

RFC Request for Comments

RnP Relevant and Pertinent (the project creating this guide)

STU Standard for Trial Use

XML eXtensible Markup language

XPath XML Path Language

# APPENDIX: C-CDA DISPLAY AND CLINICIAN VIEW

Clinicians who answered the RnP survey presumably answered the questions based on their experience receiving and reading/viewing the human readable text in transitions of care documents. Whether they spoke of “too much information” or “missing information” or “difficulty finding information,” those experiences were almost certainly based on the *rendering capabilities provided by the EHR*, whether on a computer screen or printout. Clinicians most likely did *not* see the content encoded in the structured XML machine processable entries in the C-CDA document, such as shown in the structured data example below (taken from the Consolidated CDA specification).

CDA Document as Displayed

The rendering must conform to basic CDA rules. When the document was created, the information was extracted from an EHR, and formatted in accordance with C-CDA templates, which contain conformance statements. Generally, that information is organized into Sections (e.g., Medications, Procedures), some of which contain structured “entries” (discrete data elements, e.g., Medication Start Date). **C-CDA requires that all clinically meaningful information that is meant for human viewing must be included in the narrative blocks, and that all narrative blocks (Section.text elements) must be displayed by the receiving system[[14]](#footnote-14).** That is basically what clinicians “see” in a C-CDA document and what leads to their opinions in the RnP survey. A partial example of a CCD, rendered using a default CDA.xsl stylesheet, is shown below.

* The first screen shot is a portion of the Header. Every CDA document includes a Header, which is metadata at the top of the documentthat establishes the context for the information contained in the body of the document. The header information is provided as highly prescribed machine processable data to allow the document to easily be indexed by document management systems that track documents.
* The second screen shot displays the first few sections’ narrative blocks: Allergies, Medications, Problems…
* Unlike the narrative block rendering requirements, the specific data elements to display from the header are not mandated by C-CDA or CDA but are “at the discretion of the recipient.” The sample below, using the default stylesheet, displays more header detail than would typically be shown.

 

 

However, the viewing of a document can be altered by using different stylesheets. Here is an alternative example,[[15]](#footnote-15) which has different visual appearance and also provides the option to only display those sections selected in the menu on the left.



CDA Document as Structured Data

Some information (“structured entries”) is meant primarily for machine processing (for example, importing discrete data into an EHR, and using for clinical decision support). While clinically meaningful structured information will have corresponding text in the narrative block, e.g.,

There may be information in the structured entries that is not explicitly displayed. For example, “Aspirin 81 MG Oral Tablet” may appear in the narrative block, whereas the structured entry contains code="243670" codeSystem="2.16.840.1.113883.6.88" which references a specific drug code for a baby aspirin tablet in the RxNorm code system. The clinician would usually not see the code or code system in the displayed CDA, but the receiving EHR could use them to assist in checking for drug interactions or drug duplicates. A brief excerpt from a structured entry in the Allergies Section of the CCD example above, is shown here. As is apparent, the structured entries are far more voluminous than the corresponding human-readable text.

…

 <!-- replaced Allergy Problem Act (R1.1) with

 Allergy Concern Act (V3) to meet R2.1 validation requirements -DB-->

 <entry typeCode="DRIV">

 <act classCode="ACT" moodCode="EVN">

 <!-- \*\* Allergy Concern Act (V3) \*\* -->

 <templateId root="2.16.840.1.113883.10.20.22.4.30" extension="2015-08-01"/>

 <!--Critical Change-->

 <templateId root="2.16.840.1.113883.10.20.22.4.30"/>

 <id root="36e3e930-7b14-11db-9fe1-0800200c9a66"/>

 <code code="CONC" codeSystem="2.16.840.1.113883.5.6"/>

 <!-- The statusCode represents the need to continue tracking the allergy -->

 <!-- This is of ongoing concern to the provider -->

 <statusCode code="active"/>

 <effectiveTime>

 <!-- The low value represents when the allergy was first recorded in the patient's chart -->

 <low value="19800501"/>

 </effectiveTime>

 <entryRelationship typeCode="SUBJ">

 <observation classCode="OBS" moodCode="EVN">

 <!-- \*\* Allergy observation (V2) \*\* -->

 <templateId root="2.16.840.1.113883.10.20.22.4.7" extension="2014-06-09"/>

 <templateId root="2.16.840.1.113883.10.20.22.4.7"/>

 <id root="4adc1020-7b14-12db-9fe1-0800200c9a66"/>

 <code code="ASSERTION" codeSystem="2.16.840.1.113883.5.4"/>

 <!-- Observation statusCode represents the status of the act of observing -->

 <statusCode code="completed"/>

 <effectiveTime>

 <!-- The low value reflects the date of onset of the allergy -->

 <low value="19800501"/>

 <!-- The high value reflects when the allergy was known to be resolved (and will generally be absent) -->

 </effectiveTime>

 <value xsi:type="CD" code="419511003"

 displayName="Propensity to adverse reaction to drug"

 codeSystem="2.16.840.1.113883.6.96"

 codeSystemName="SNOMED-CT">

 <originalText>

 <reference value="#reaction1"/>

 </originalText>

 </value>

 <participant typeCode="CSM">

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 codeSystemName="RxNorm">

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 </originalText>

 </code>

 </playingEntity>

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 <entryRelationship typeCode="MFST" inversionInd="true">

 <observation classCode="OBS" moodCode="EVN">

For more information about the clinical contents of C-CDA, as well as the technical representation of C-CDA, see these sources.

* ONC presentation on Implementing C-CDA for Meaningful Use Stage 2, including many slides about validating/testing C-CDAs for certification:
<https://www.healthit.gov/policy-researchers-implementers/consolidated-cda-overview>
* Overview of Consolidated CDA, with examples (starting on slide 43) for various transition of care scenarios, including selection of the “best fit” document types for each scenario.
<http://www.wedi.org/docs/presentations/an-explanation-of-what-is-cda---r2.pdf?sfvrsn=0>
* The CDA Book by Keith Boone.
[http://link.springer.com/book/10.1007%2F978-0-85729-336-7](http://link.springer.com/book/10.1007/978-0-85729-336-7)

Note: this is an illustrative but not nearly an exhaustive list. These materials are cited as potentially helpful to enhance understanding for those wanting to know more, though they are not necessary to understand the recommendations about Relevant and Pertinent documents. Referencing them in this guide does not imply endorsement of their entire contents.

1. C-CDA is also used for exchange with patients, payers, government agencies, and other entities, but the scope of this RnP study was on clinician-to-clinician exchanges for transitions of care. [↑](#footnote-ref-1)
2. The RnP survey did not collect data on how many hospital-to-hospital transfers were in the survey, but Table 5 indicates that less than 20% of the respondents were hospital-based, thus leading us to infer that the hospital-to-ambulatory ToC was much more frequent than hospital-to-hospital ToC in this survey. [↑](#footnote-ref-2)
3. Clinicians on the project team strongly agreed that most clinicians would not be aware of the specific C-CDA document types that they viewed. Document titles don’t always equal the doctype (e.g., “Summarization of Episode Note” and “Clinical Summary” might appear instead of “CCD”). Also, even if providers knew which document types they received, it would have been very difficult for them to itemize how many of each type they received. [↑](#footnote-ref-3)
4. See slide 3 in the presentation at <https://www.healthit.gov/FACAS/sites/faca/files/Joint_Data_Updates_2015-10-06.pdf> [↑](#footnote-ref-4)
5. While “enhanced Stage 1” documents, using C-CDA 1.1, were later permitted, we do not have information on how many vendors or providers used them as of late 2015 when the survey was taken. [↑](#footnote-ref-5)
6. It is possible that, in addition to documents sent to fulfill Meaningful Use objectives, that other documents were also received by respondents. These documents might even have included PDF or other formats. We do not know how many such documents there were, but still believe there is evidence that Meaningful Use incentives stimulated providers to send most of the documents in C32 or C-CDA formats. [↑](#footnote-ref-6)
7. The total number who *received* the survey is unknown, because distribution was done through organizational liaisons, who were not expected to share their mailing lists with us. [↑](#footnote-ref-7)
8. CDC “Family History is Important for your Health” (<http://www.cdc.gov/genomics/public/file/print/FamHistFactSheet.pdf> ) [↑](#footnote-ref-8)
9. Outside the US realm, different local requirements may cause different sections to be more or less likely to be included. [↑](#footnote-ref-9)
10. \* From <http://www.ahrq.gov/downloads/pub/advances2/vol2/advances-kind_31.pdf> “Hospital course (a description of the events occurring to a patient during his/her hospital stay)” [↑](#footnote-ref-10)
11. Common Clinical Data Set (CCDS) defined in US Realm by Office of the National Coordinator for certification purposes, <https://www.healthit.gov/sites/default/files/commonclinicaldataset_ml_11-4-15.pdf> [↑](#footnote-ref-11)
12. While the Plan of Care/Plan of Treatment Section may contain structured entries, they are not required by C-CDA or 2011 or 2014 edition Certifications. For the ToC documents for MU1 and MU2, [↑](#footnote-ref-12)
13. Terms were not strictly defined in the original survey, so “past,” “recent,” “historical” were subject to interpretation by the respondents. [↑](#footnote-ref-13)
14. CDAr2 standard, section 1.2.3 and 4.3.5 [↑](#footnote-ref-14)
15. Taken from ONC certification test data, which required current name and previous (birth) name. [↑](#footnote-ref-15)