# Content Coding for Contextualization of Care

# ("4C")

# Training and Coding Manual

**© 2012**

**Latest update: June 22, 2024**

**Saul J. Weiner, MD [1,3,4]**

**Naomi Ashley, BA [1,3,4]**

**Amy Binns-Calvey, BA [2,3,4]**

**Brendan Kelly, BA [2,3,4]**

**Gunjan Sharma, PhD [1,3,4]**

**Alan Schwartz, PhD [4]**

**1. Jesse Brown VA Medical Center, Chicago IL**

**2. Hines VA Hospital, Hines IL**

**3. Center of Innovation in Complex Chronic Healthcare (CINCCH), Hines and Chicago IL**

**4. University of Illinois at Chicago, Chicago, IL**

**Contextualizing Care is the process of adapting research evidence to individual patient life context. It entails answering the question: "What is the best next thing for *this* patient at *this* time." 4C is a process for assessing clinician performance at contextualizing care.**

**Acknowledgement:** We thank and acknowledge Simon Auster, MD, JD (1932-2020) for helpful insights, including "Simon's Rule," and for the formulation of the question, "What is the best next thing for *this* patient at *this* time?"

For questions, contact Saul Weiner at sweiner@uic.edu

# Contents

**Introduction** ..... **5**

Contextualizing Care: An Overview ..... 5

Identifying Contextual Factors ..... 6

Brief Overview of 4C Process ..... 6

The coding process: ..... 7

Composition of Coding Team ..... 9

**Chapter 1: Identifying Red Flags** ..... **10**

Definition ..... 10

Chart Red Flags ..... 10

Chart Red Flags that are nullified ..... 11

Inventory Red Flags ..... 12

Audio Red Flags ..... 12

When contextual red flags originate from biomedical conditions ..... 13

More than One Red Flag per Encounter ..... 13

**Chapter 2: Coding Encounters** ..... **14**

Definitions (See glossary for precise definitions. These are intended to simplify concepts to facilitate an understanding of how coding works): ..... 15

Contextual Probe ..... 15

Contextual Factor ..... 15

Domains of Context ..... 15

Contextualized Plan of Care ..... 18

Coding Algorithm ..... 19

Examples ..... 21

Coding Principles: ..... 26

Awareness ..... 26

Benefit of the Doubt ..... 27

Simon's Rule ..... 27

Probing Guidelines: ..... 28

"Why" and the "Implied Why" ..... 28

Contextual vs. Conversational Probes ..... 30
Contextual vs. Biomedical Probes ..... 30
Contextual vs. Standard Practice Probe ..... 31
Depression, Anxiety, Substance Abuse, and involuntary behavior ..... 31
Contextual factors directly impact health care, not health: ..... 32
Poor Contextual Probes ..... 32
Probing contextual red flags doesn't always turn up underlying contextual factors: ..... 32
Cascading Red Flags ..... 34
Guidelines for Coding Plan of Care: ..... 35
Contextual POC without a Contextual Probe ..... 35
Contextual vs. Biomedical POC ..... 35
Contextual vs. Standard Practice POC ..... 35
Plan of Care must be related to Contextual Factor in order to count. ..... 36
Distinguishing a Contextual Factor Revealed by a Patient vs. a New Red Flag ..... 37
Proactive Planning ..... 37
Recording Coded Data: ..... 38
**Chapter 3: Tracking Outcomes ..... 39**
Why Track Outcomes? ..... 39
Protocol for Good vs. Poor Outcomes: ..... 39
OUTCOMES TABLE listing red flags and good vs. poor outcomes ..... 40
Tracking outcomes for cascading red flag ..... 41
Tracking outcomes when patient sees more than one clinician ..... 42
**Chapter 4: Recording Data – The Master Spreadsheet ..... 43**
General Information and Assigning Clinician/Patient ID's ..... 43
Red Flag Recording ..... 43
Coding RED FLAGS ..... 44
Resolving Coder Discrepancies ..... 46
Outcome Tracking ..... 46
Adapting the Coding MASTERLIST to track other items ..... 47
Using REDCap to capture data ..... 47
**Glossary ..... 48**
**Appendix A – Alternate Coding Team ..... 50**

**Appendix B – Red Flag Numbers** ..... **51**

**References** ..... **56**

# Introduction

## Contextualizing Care: An Overview

Contextualizing care is the process of adapting care to the relevant circumstances and behaviors of individual patients.[1,2] Content Coding for Contextualization of Care, or "4C," is a tool for assessing how effectively clinicians provide care that is contextualized.[3] Whereas other instruments focus on the *process* of clinician-patient interactions ("Did the clinician encourage questions?"), 4C focuses on specific events and behaviors ("Did the clinician ask why *this* patient recently missed two appointments?").[4] When inattention to patient context results in an inappropriate plan of care, the oversight is coded as a "*contextual error*."*

While the relevance of patient context should be considered in all care planning, not all care planning requires adapting care to context. For instance, consider the case of a well-insured hypertensive patient with a history of excellent medication adherence on a single once-a-day pill that no longer is sufficient to control his blood pressure. Before adding a second medication, the clinician should assess and address any impact to the patient. However, in most cases – particularly if the second pill is also once daily and can be given at the same time as the first pill – the patient's environment and behavior are not likely to be obstacles. Any major issues affecting care planning for this patient are likely to be biomedical – such as side effects of a new medication.

On the other hand, suppose the patient's deteriorating blood pressure control is related to losing their job and their health insurance, or to worsening cognitive status and a loss of ability to keep track of the dosing regimen, or depression leading to apathy. Each of these variables, termed "*contextual factors*" would constitute the context in which the patient's condition is getting worse. Failure to address the context, and automatically adding a second medication (as above), would be inappropriate. It would be a contextual error.

Contextual factors can be spotted by the attentive clinician who is attuned to them, particularly if he/she has developed the habit of always considering them in the "differential" for a patient with a need. Sometimes there are obvious hints, such as a patient who seems to have stopped taking his medications saying, "Boy it's been tough since I lost my job," (loss of health insurance); or sometimes it's subtler, such as a patient appearing confused about his medication when asked (cognitive loss). In the absence of such hints – hints that we have termed "*contextual red flags*" – the clinician can simply ask a direct question: "I notice your blood pressure is no longer well-controlled. This could be just the natural progression of your condition, but I want to be sure. Are you having any trouble taking your medication as prescribed? Can you tell me exactly how you take it and when? Did you miss any dosages recently?" Pursuing these clues, or contextual red flags, is termed "contextual probing."

* See glossary for all terms, particularly "contextual factor," "contextual red flag," "contextual probe," "contextualized care plan," and "contextual error" as these are used repeatedly and have essential meanings.

*This coding manual is about tracking a process of identifying and incorporating contextual factors into clinical decision-making by recognizing contextual red flags when present, probing them, eliciting contextual factors if present, and contextualizing care by taking those factors into account. When this process is incomplete, leading to a plan of care that is inappropriate given the patient's context, the result is a contextual error.*

## Identifying Contextual Factors

Just as health care professionals can be trained to spot and address contextual factors essential to patient care, non-clinician coders can be trained to spot them, as recognizing them does not require biomedical and/or clinical knowledge. When spotted, coders can track a clinician's behavior to see if he/she has also identified the contextual factors and, if so, determine if the factors have been addressed. In this manual the term "clinician" is used to refer to any health care professional providing direct patient care and is empowered to assist the patient with planning their care.

The following coding manual describes the process of assessing whether care plans, when appropriate, are contextualized. It is a process of classifying encounters into one of seven patient presentations and clinician responses:

A. Neither the patient themselves nor the patient's medical record presented any information suggesting *contextual factors* may be affecting care (no *contextual red flags*).

B. The patient presented a contextual red flag, but the clinician did not *probe* it.

C. The patient presented a contextual red flag, the clinician probed it, but no contextual factor was discovered.

D. The patient presented a contextual red flag, the clinician probed it, a contextual factor was discovered, but the clinician did not incorporate the contextual factor into the plan of care.

E. The patient presented a contextual red flag, the clinician probed it, a contextual factor was discovered and the clinician incorporated the contextual factor into the plan of care.

F. The patient presented a contextual red flag, revealed the contextual factor without probing, and the clinician did not incorporate the contextual factor into the plan of care.

G. The patient presented a contextual red flag, revealed the contextual factor without probing, and the clinician incorporated the context into the plan of care.

Presentations in categories A and C do not require contextualization of care. Presentations in categories E and G represent contextualized care. Presentations in categories B, D, and F represent missed opportunities to contextualize care.

## Brief Overview of 4C Process

4C may be conducted by as few as one individual or as many as five, with the additional personnel required to verify inter-rater reliability, other sources of evidence for validity, or to track outcomes of

successes or failures to contextualize care. In a study of trained 4C coders, inter-rater reliability was 85%.[3] 4C is based both on audio recordings of clinician-patient encounters and review of the medical records of visits preceding those encounters. While a detailed description of how patients and clinicians are engaged to participate is outside of the scope of this manual, in brief it consists of one of the two following approaches:

- *Recruitment of clinicians and patients for research:* Following an informed consent process for each participating clinician, patients in their practice are contacted prior to their appointment (either by letter or upon signing in for the visit) to see if they are interested in speaking to a research assistant about voluntarily assisting with a project to evaluate their care. This assent process precedes the consent process. The consent process is structured to minimize self-selection bias, as patients are not given specifics about what aspects of the encounter will be assessed. Those who enroll (40% on average based on our experience across multiple settings) agree to carry a small digital audio-recorder into the encounter and return the device to the research assistant (RA) when they leave. A similar, IRB-approved strategy is employed for recruiting clinicians. Successful recruitment generally requires demonstrating how audio recorded data will be securely stored and never disclosed with identifiers that could be linked to a particular patient or clinician.

- *Recruitment of clinicians and patients for quality improvement:* When 4C is employed for the purposes of collecting data on physician performance as a part of a QI initiative, rather than research, patients are not research subjects, but they are still volunteers. The staff audio recording the visits are not research assistants; they are a part of a QI program. While patients volunteer, clinicians will ideally all participate, consistent with most QI programs. A description of the principles that guide the design of a successful patient-collected audio program with audit-and feedback to contextualize care is published elsewhere.[5]

### The coding process:

Coding consists of identifying contextual red flags, contextual probes, contextual factors, and contextualization of the care plan. An additional optional step, also described in this manual, tracks the impact of contextualization of care on outcomes. *The specific purpose of 4C coding, however, is to assess whether the clinician is identifying contextual factors and addressing them in the care plan.* A contextual factor is defined as any factor "expressed outside of the boundaries of a patient's skin that is relevant to planning their care," including their life circumstances and behaviors. The assessment process proceeds as follows:

1) *Contextual red flag identification:* Following an encounter, the first step for coders is to determine if there were any indicators that a contextual factor may be impacting the patient's health care, which is called a "contextual red flag**." A contextual red flag is defined as: anything a patient says or that is observed about their situation or behavior that suggests unaddressed contextual factors may be contributing to problems with their care.** The search for contextual red flags begins with a structured chart (i.e., medical record) review by a contextual red flag coder looking for evidence of preventable deterioration of a chronic condition (such as poor

diabetes or blood pressure control), missed appointments, non-adherence with medications, follow-through on tests or labs, or repeated visits to the emergency department (ED) or an urgent care clinic. In some cases, patients may be asked to complete a pre-visit inventory that is shared with the clinician on which they can identify contextual red flags and factors.[6,7] If a patient has endorsed a red flag or a contextual factor on an inventory, the audio coder will treat those the same as chart red flags (listening for probes and plans as appropriate.) After the chart and/or inventory is reviewed for these red flags, a coder listens to the audio-recording to determine if the patient made statements indicative of underlying contextual factors essential to their care.

Examples:

a. Contextual red flag identified from chart review: Rising glycated hemoglobin (Hgb A1c) which has been previously well-controlled in a patient with diabetes.

b. Contextual red flag identified from audio-recording: Visually impaired veteran with diabetes mentions that his daughter, who assists him with his insulin dosing, is relocating to another city to maintain her employment.

c. Contextual red flag identified from an inventory: Patient indicates that they are not taking their medications as prescribed.

2) *Coder(s) formulate an unambiguous direct probe of red flag:* Once a contextual red flag has been identified, the coder(s) compose an unambiguous clinician probe of the identified contextual red flag, e.g. "I notice that your diabetes used to be well controlled, but your sugars have been very high over the last couple of months. What do you think is going on in your life that might be a factor in this problem?" This "ideal" probe is always in the form of a question by the clinician in response to a contextual red flag. The purpose of this exercise is to clearly frame in the coder's mind what they should be listening for to indicate that the clinician has noticed and is pursuing the contextual red flag.

3) *Coder listens for clinician probe*: The coder then listens for whether the clinician pursued the contextual red flag in a manner that substantively approximates their "ideal" probe.

4) *Coder listens for a contextual factor revealed either in response to a probe or spontaneously offered by the patient:* The coder determines whether the patient revealed a contextual factor that is relevant to care, such as "I've been moved to the night shift and it's a lot more difficult for me to take my medication when I'm supposed to."

5) *Coder formulates an unambiguous direct response to the contextual factor revealed:* If the patient reveals contextual factors in response to the probe, *or* provides information regarding a contextual factor without being prompted by the clinician, the coder formulates an unambiguous response to the contextual factor revealed that indicates the clinician recognized

the need to contextualize the care plan, e.g. “Let’s talk about how you could adapt your medication schedule to fit your new work schedule.”

6) *Coder listens for contextualization of care plan:* The coder then listens for whether the clinician recommends a plan of care that substantively approximates their direct probe.

These six steps are the framework for Content Coding for Contextualization of Care. The findings from steps 1, 3, 4 and 6 generate the data by providing answers to several questions: 1 -- Is there an indication that a contextual factor may be present? 3 -- Did the clinician explore it? 4 -- Did the patient reveal contextual factors that need to be addressed? 6 -- Did the clinician incorporate the contextual factor into the plan of care and avoid a contextual error? The findings are entered for each encounter into a database. If there is no contextual red flag, the encounter is notated as having “no contextual chart or audio red flag.”

Coding can be quite nuanced. The nuances of 4C coding pertain to the variation in how clinicians demonstrate their attention to context. In the examples above, clinicians directly question patients about red flag issues. But what about instances in which clinicians demonstrate from their behaviors that they are attending to context, even if they never probe? Our coding instructions are designed to always give the clinician the benefit of the doubt (see “Awareness”, “Benefit of the Doubt” and “Simon’s Rule” coding principles). The instructions are also designed to minimize uncertainty for well-trained coders by providing multiple examples of how to code ambiguous situations. Inter-rater agreement for an experienced coding team is about 90%.

## Composition of Coding Team

As noted, 4C can be conducted by as few as one coder and as many as five with greater numbers providing greater opportunities for measurement of inter-rater agreement and evidence of validity. This manual describes the process with two coders. (Please see Appendix A for a recommendation on using more coders for inter-rater tracking.):

1. *Chart coder* – identifies chart red flags (described below) from medical record, or inventory, and later reviews the medical record to score outcomes

2. *Audio coder* – listens to and codes audio encounters

In this manual, 4C Analysis is divided into three phases: Identifying Red Flags, Coding the Encounters, and Tracking Outcomes (optional). Each is described in the following sections. The last chapter, Chapter 4, describes the step-by-step process of entering data into spreadsheets or databases. A video illustrating the 4C coding process is publicly available on YouTube.[8]

# Chapter 1: Identifying Red Flags

## Definition

The first step in 4C is screening for contextual red flags. A **contextual red flag** is defined as anything a patient says or that is observed about their situation or behavior that suggests unaddressed contextual factors may be contributing to problems with their care. Red flags can be found in the medical chart, a patient-completed inventory, or by listening to issues brought up in the audio recording.

## Chart Red Flags

The chart coder begins the coding process by accessing the patient's medical record to look for red flags. The chart coder follows an algorithm and adheres to a data extraction instrument to confirm a chart red flag or flags have been found. This algorithm is based on predetermined criteria using chart extraction instruments. The chart coder first looks for high impact red flags that are quantifiable and large enough such that that the statistical significance of interventions to improve outcomes can be demonstrated with a reasonable sample or effect size. For instance, addressing the underlying cause of a patient's missing 16 appointments in a year should result in a statistically measurable improvement.

The following protocol may be adapted based on the characteristics of the selected patient population. For instance, other medical conditions such as COPD or asthma could be substituted for the chronic conditions below.

The chart coder checks for:

1. Diabetes – To be considered as a red flag the patient's Hemoglobin A1c must be greater than 9.0.

2. Hypertension – To be considered as a red flag, the patient's systolic blood pressure (SBP) must be greater than 160 OR the diastolic blood pressure (DBP) must be greater than 100.

The chart coder then checks for the following:

3. Appointment Adherence – Patient must have had 16 or more scheduled visits in the past 12 months. To count as a red flag, the patient's Scheduled Appointment Adherence (SAA) rate must be less than 75%. The SAA rate is calculated by dividing the number of attended appointments by the total number of appointments scheduled. The appointments include clinic visits, scheduled labs, imaging, tests, screenings, and surgeries.

*Note that there may be more than one Chart Red Flag for each patient.*

If the chart coder finds nothing in the medical record that fits the criteria for a high impact red flag, he/she will look for more modest but also quantifiable chart red flags that consist of the following:

1. Diabetes - Patient's A1c is greater than 8.0

2. Hypertension - Patient's SBP greater than 140 OR the DBP greater than 90
3. Patient misses or cancels TWO or more appointments in the past 4 months
4. Patient misses ONE or more medication fill/refill in the past 4 months
5. Patient misses ONE or more lab tests or procedures in the past 4 months
6. Patient has TWO or more visits to the Urgent Care Clinic or Emergency Room in the past 4 months

Note: The list of red flags above is unlikely to be useful for demonstrating statistical significance of an intervention that appears to resolve them. For instance, addressing the underlying cause of missed appointments in a patient who has missed just two appointments in the last 4 months should result in no further missed appointments, but – absent a large sample size -- this effect is not statistically significant.

When the chart coder finds a chart red flag(s), he/she adds the information to a Master List of Coded Encounters in Excel or database software such as REDCap (see Chapter 4 below, and accompanying Master Coding Spreadsheet).

## Chart Red Flags that are nullified

Occasionally, encounters will have chart red flags that the clinician might not have an opportunity to address because the patient is being seen for an emergent/urgent condition or for an in-office procedure. If, for example, a patient is in respiratory distress, the clinician would probably not have the opportunity to address whether the patient had missed appointments. In these encounters, the chart red flag is withdrawn, but the coder still listens to the encounter in case audio red flags emerge. For example, a patient in respiratory distress might not have been using their albuterol inhaler because they could no longer afford it.

Chart red flags are not counted if:

- a patient is sent directly to the ER after/during the visit (an emergent condition eclipses the chart red flag(s))

- the patient is in exclusively for a procedure like suture removal, ear cleaning, blood pressure check, endoscopy, cardiac stress (for specialty care)

- the visit is listed as an urgent care visit

Another reason a chart red flag could be nullified is if, before the clinician has an opportunity to probe, the patient says that they prefer to leave the red flag unaddressed. An example of this would be if the chart red flag were that the patient's blood pressure was elevated (140/87) but the patient started the encounter by stating, "I know my blood pressure is a bit high, but I've been over this a dozen times. I have all the information, and I feel better with slightly elevated blood pressure." In such a scenario, the chart red flag would be withdrawn, but again, the coder still listens to the encounter in case audio red flags emerge.

## Inventory Red Flags

An inventory or questionnaire can be developed for patients to complete for clinicians to review prior to the medical encounter.[6] This inventory or questionnaire can be tailored to gather information on common red flags such as missed appointments or issues taking medications. This inventory is then reviewed by the chart coder who then adds the information to a Master List of Coded Encounters in Excel or the database software.

## Audio Red Flags

After the chart coder looks for red flags in the patient's chart and/or inventory, the audio coder will listen to the encounter and proceed with 4C coding. There may be additional red flags found within the dialog of the encounter. An audio red flag has the characteristics of a chart red flag, except the information is revealed during the encounter rather than noted in the record prior to the encounter. Examples of audio red flags are listed below.

1. It is revealed (by a clinician or patient) that a previously managed hypertensive patient's blood pressure is running high during visit.
2. It is revealed (by a clinician or patient) that the patient has modified or stopped taking medications without consulting with their clinician.
3. It is revealed (by a clinician or patient) that the patient has run out of medications or medication has expired.
4. Patient reveals an inability to follow general procedures for making appointments or scheduling labs.
5. Patient reveals a discrepancy such as getting good blood sugar or blood pressure readings at home, but poor readings in the clinic (or vice-versa).
6. Patient declines procedure, such as a colonoscopy.
7. Patient declines flu, pneumonia, or tetanus vaccine.
8. Patient reveals there is a problem with following a clinician's orders (adhering to medications, exercise, diet, appointments, labs, etc.)

*Proactive Red Flag:* A proactive red flag is a type of audio red flag that refers to contextual issues that arise during an encounter that signifies a potential emerging challenge to a patient's ability to manage their care. This contrasts with the examples above, in which the red flag suggests the presence of a contextual factor adversely impacting a patient's current management of their care. For instance, a patient may volunteer that they are experiencing financial problems without apparent evidence that it is currently impacting his or her healthcare. However, because the patient brought it up during the medical encounter, the proactive clinician will consider the possibility that the patient is concerned that this contextual issue has implications for their health care.

| RED FLAG | IDEAL PROBE |
|---|---|
| Pt states things have been tight since he lost his job (but there is no indication he is not refilling his meds) | Is this affecting your ability to take care of your diabetes? |

## When contextual red flags originate from biomedical conditions

Recall that a contextual red flag is anything a patient says or that is observed about their situation or behavior that suggests unaddressed contextual factors may be contributing to problems with their care. A contextual factor, in turn, is any factor "expressed outside of the boundaries of a patient's skin that is relevant to planning their care."

Sometimes factors expressed outside the skin originate under the skin. Three are depression, anxiety, and substance abuse. All manifest biochemical changes in the brain, but once they are expressed outside of the body as behaviors that impact an individual's health and health care, they also become part of the patient's context.

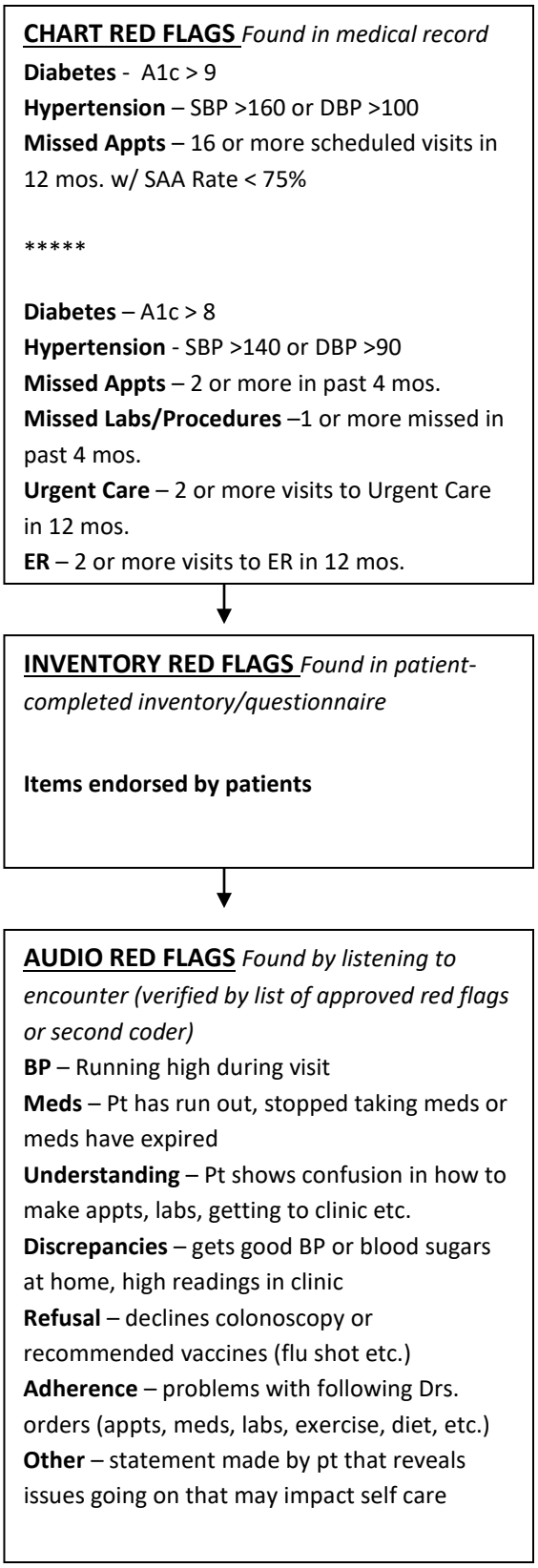
A substance abuse problem is not, in and of itself, a contextual red flag but the behaviors it generates can be. If a patient with a known substance abuse problem loses control of their diabetes and is no longer taking insulin as needed due to the behavioral effects of substance abuse, the erratic behavior is a red flag. This substance abuse may be a contextual factor accounting for their poorly controlled diabetes. Further elaboration on the contextual dimensions of these biomedical conditions is provided below in the section on Probing Guidelines, sub-section, Depression, Anxiety and Substance Abuse.

A compendium of red flags identified by the audio coders is organized in a list of contextual red flags (see Appendix B). If a coder thinks they have identified an audio-recorded red flag that is not on the list in appendix B, a second coder should confirm that it is a contextual red flag. Once confirmed, the audio red flag is added to the Master List of Coded Encounters.

## More than One Red Flag per Encounter

While reviewing the chart and/or listening to audio of the encounter, a coder may find more than one contextual red flag. If an encounter has more than one red flag, an additional line is added to the Master List for each subsequent red flag. The new red flag is indicated by numbering the red flags, 1, 2, 3, etc. in the RED FLAG cell of the Master Spreadsheet (or in the database software), and the type of red flag is noted (chart, inventory, or audio).

The following flow diagram illustrates the processes described above: **IDENTIFYING RED FLAGS**



# Chapter 2: Coding Encounters

Once a contextual red flag has been identified, an encounter is coded to determine whether the clinician noticed it too and, if so, what followed. This all requires a tracking system. Participants are assigned an ID. These IDs and the date of the encounter are captured on the Master List spreadsheet or in the database software. The chart coder will indicate if a chart red flag is present. The coders then listen to the encounter and code for audio red flags, contextual probes, contextual factors identified (through probing or as revealed by the patient) and contextual plans of care (POC).

**Definitions** (See glossary for precise definitions. These are intended to simplify concepts to facilitate an understanding of how coding works):

### Contextual Probe

A **contextual probe** is defined as anything a clinician says that indicates that they are investigating *contextual* reasons, i.e., looking for contextual factors, for problem(s) with a patient's care.

*I see your blood pressure is out of control. Are you having trouble taking your meds?*
*You've missed 7 out of 10 of your last appointments. Can you share with me why?*
*You haven't refilled your asthma meds, and the record shows they have expired. What happened?*
*You mentioned losing your job. Is that affecting your ability to take care of your condition?*

Note that ideal contextual probes generally begin with an observation followed by a question about what was observed.

### Contextual Factor

A **contextual factor** may be thought of as the underlying situation that determines why a patient's care plan is not or will not likely be effective until it is addressed. Patient context is everything relevant to a clinical situation of interest or health concern.

### Domains of Context

The contextual factors that cause problems for care planning fall into one of the following twelve **domains of context**:

| | |
|---|---|
| **1.** | **Access to Care**<br>The patient's ability to receive care in a timely manner. |
| **2.** | **Competing Responsibility**<br>An obligation or commitment the patient has that impacts their ability to manage their health care. |
| **3.** | **Social Support**<br>The patient's access to a supportive network of individual(s) able to assist if needed. |
| **4.** | **Financial Situation**<br>The patient's ability to afford health and health care needs. |
| **5.** | **Environment**<br>The physical and social setting that encompasses a patient. |

| | |
|---|---|
| **6.** | **Resources**<br>The possessions and materials available to a patient that can facilitate a person's ability to manage their care. |
| **7.** | **Skills, Abilities and Knowledge**<br>A patient's intellectual understanding and physical ability to manage health care. |
| **8.** | **Emotional State**<br>The emotional condition of a patient as it relates to their ability to manage their health care. |
| **9.** | **Cultural Perspective/Spiritual Beliefs**<br>The customs or a faith-based practice a patient has that impacts health care. |
| **10.** | **Attitude Towards Illness**<br>The feelings a patient has towards their condition that impacts their ability to manage it. |
| **11.** | **Attitude Towards Health Care Provider and System**<br>The patient's feelings and attitudes towards their providers and the health care system that impact their ability to manage their health care. |
| **12.** | **Health Behavior**<br>The patient's actions and lifestyle choices that impact their health care. |

Note that the first six pertain to the patient's circumstances (i.e. are literally "outside" the patient's skin), and the last six drive behaviors (i.e. are *expressed* outside the patient's skin).

**Example:**

Red Flag: The patient declines to take a medication.

Ideal Probe: "Why aren't you taking the medication?"

The following chart illustrates a patient's response to the ideal probe in each of 12 domains and an ideal plan of care that incorporates that patient's contextual factor:

| **Domain of Context** | **Patient Contextual Factor** | **Contextual Plan of Care *(more about contextual POC in the next section)*** |
|---|---|---|
| Access to Care | "That medication isn't carried at the pharmacy by my house." | Arrange for the medication to be mailed. |
| Competing Responsibility | "I have to take care of my daughter and that med makes me sleepy, so I don't take it." | Prescribe a medication that does not have drowsiness as a side effect. |

| | | |
|---|---|---|
| Social Support | "I used to have someone help measure the dosage, but I now live alone." | See if there's a version of the medication that does not have to be measured (pre-filled syringes); see if patient is eligible for home health care. |
| Financial Situation | "I can't afford the co-pay." | See if there is a cheaper option/refer to social worker. |
| Environment | "I can't have any pain meds in my house, my roommate will take them." | Strategize to see if there is a safe place for the patient to store his medication (perhaps a locker at work,) or see if it's possible to prescribe a different medication that the roommate would not be interested in. |
| Resources | "I was told I had to order the medication online and I don't have a computer." | Strategize other ways for the patient to order the medication. |
| Skills, Abilities and Knowledge | "Ever since my vision got bad, I've become uncomfortable giving myself injections." | See if there is a version of the medication that does not have to be measured (pre-filled syringes); see if patient is eligible for home health care. |
| Emotional State | "I am afraid of having any meds in the house, I'm afraid I'll become addicted." | Prescribe a medication that is non-addictive, or inform patient if they are on a non-addictive medication. |
| Cultural Perspective/Spiritual Beliefs | "I believe God gave me this condition for a reason." | Ask patient if they can discuss this with someone from their religious institution to see if they agree. |
| Attitude Towards Illness | "I'm a man – I'm going to tough out this pain. Painkillers are for weaklings" | Counsel the patient that taking medication for pain is not a sign of weakness and that some very strong men have occasionally used pain medicines as a tool. |

| | | |
|---|---|---|
| Attitude Towards Health Care Provider and System | "I'm not taking anything you prescribe for me; I don't trust you." | See if patient would prefer to see another clinician whom they trust. Explore the reasons for trust issues. |
| Health Behavior | "I'm a rock climber and that's not going to change. I was told I couldn't take a blood-thinner and continue to climb." | See if there's a medication that would be safe for the patient's lifestyle. Explore other treatment options besides the medication. |

The patient's reason may fall into the category of patient preference which is NOT one of the 12 Domains of Context.

| | | |
|---|---|---|
| Patient Preference **not one of the 12 domains* | "Ever since my vision got bad, I've become uncomfortable giving myself insulin injections. They offered to give me pre-filled syringes, but I'm just not comfortable with them. I'd prefer to stick with pills even though my sugar runs a little higher than it should." | The patient is informed, and free from any contextual issues; his or her decision not to take the medication should be respected. |

**Note:** The following three terms are easy to confuse. The first, *patient preference*, is not a contextual domain. Patient preference represents the values of the patient, how they wish to live their life, and the risks they are willing to take under conditions of uncertainty (e.g. whether to have an elective surgery to gain some benefit, but at some risk). Respecting patient preference, however, does not mean overlooking life challenges (contextual factors) that a patient thinks they have to live with. A clinician can still respect preference while probing for what can be addressed.

- **Patient preference** – An informed choice a patient makes among two or more options for evaluation or treatment after any contextual factors have been addressed.
- **Health Behavior** – lifestyle decisions and actions that have health implications
- **Attitude Towards Illness** – The patient's perspective that guides how they integrate their medical condition into their daily life.

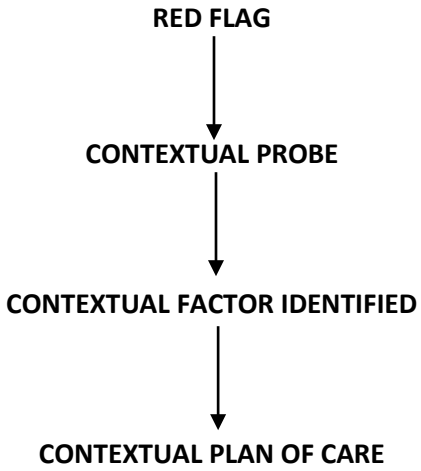
## Contextualized Plan of Care

A **contextualized plan of care (POC)** considers contextual factors to resolve obstacles to a patient benefiting from a plan of care.

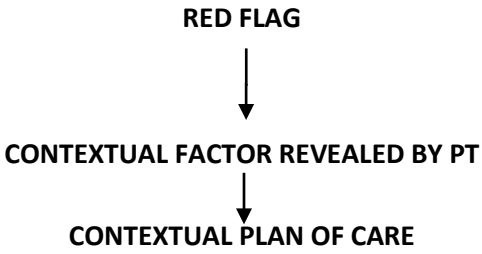
- *I'll write down each of your meds, as well as when to take them. Put this on your refrigerator.*

- *There is a clinic closer to where you live, would you like to switch your care over there?*
- *There is a generic available that is much cheaper. I will prescribe it for you.*

Content coding requires the coder to follow the actual logic of the discussion: the contextual probe must include a statement by the clinician about the red flag. The contextual factor must be the information either uncovered by the contextual probe or incidentally revealed by the patient – see below. * The contextual POC must also be a logical way of addressing the contextual factor. Here is the sequence:




*Sometimes patients reveal a contextual factor before a clinician has probed. In these cases, the coder skips over coding for a contextual probe, records the problems, and listens for a contextual POC. In these cases, the sequence is as follows:




## Coding Algorithm

The coding algorithm consists of a series of questions each coder asks themselves to identify the presence or absence of a contextual probe, a contextual factor, and a contextual POC. The algorithm always begins with the contextual red flag.

An essential task for the coder in steps 1 and 9 below is generating an unambiguous "ideal probe" and an unambiguous "ideal plan of care." These are, respectively, questions and statements that – if they were to come from the clinician – would indicate indisputably that the clinician is addressing the contextual factor. They serve as an anchor, or point of comparison, for the clinician's actual behaviors. We have found that this approach leads to high inter-rater agreement across multiple coders. In other words, coders independently agree on what would constitute an ideal response to a red flag or a contextual factor.

Once an ideal probe is generated, the coder listens for the clinician's probe (if any) and then makes a judgment call about whether the clinician's probe is close enough to the ideal probe to count. Again, while this is a judgment call, we've found that trained coders tend to agree independently.

***The Algorithm***

*RED FLAG:*

1. *Coder Formulated Ideal Probe:*
2. *Probe heard:*
3. *Was it a contextual probe?*
4. *Is it close enough to the Ideal Probe to be credited?*
5. *Contextual Factor identified*
   *- How was it identified? (response to a probe, spontaneously revealed, selected on inventory)*
6. *Domain of the Factor (choose from list of 12 Domains)*
7. *Is it possible this factor is actually patient preference?*
8. *Because there is a factor identified, what is the ideal outcome?*
9. *Coder Formulated Ideal Contextual POC:*
10. *POC heard:*
11. *Was it contextual?*
12. *Is it close enough to the Ideal POC to be credited?*

## Examples

| Example of coding algorithm with contextual probe, problem and POC: | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | **Question** | **Response** | **Notes** |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | An ideal probe is simply a direct question about the red flag. |
| 2 | Probe heard: | Your A1c is really high. What's happening? | |
| 3 | Was it a contextual probe? | Yes | If in doubt (when probe heard is not as direct as the coder probe) reference Coding Principles below. |
| 4 | Is it close enough to the ideal probe to be credited? | Yes | |
| 5 | Contextual factor identified: | Pt. has eye problems and can't read the small numbers on his insulin syringe | |
| | How was it identified? | In response to a probe | |
| 6 | Domain of the factor identified: | Skills, Abilities and Knowledge | |
| 7 | Is it possible this factor is actually patient preference? | No | |
| 8 | Because there is a factor, what is the ideal Outcome? | A1c < 9.1 | |
| 9 | Coder formulates an ideal contextual POC: | Find another method for pt. to get his insulin that doesn't involve reading small numbers | An ideal POC is any strategy to address the contextual factor that is impeding the patient's care. |
| 10 | POC heard: | I'll have you meet with the pharmacist after your visit so you can get a pre-filled syringe. You won't have to measure it then. | |
| 11 | Was it contextual? | Yes | |
| 12 | Is it close enough to the ideal POC to be credited? | Yes | |

| **Example of coding algorithm with contextual factor revealed by patient:** | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | **Question** | **Response** | **Notes** |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | |
| 2 | Probe heard: | None | The clinician did not ask about possible contextual factor(s.) |
| 3 | Was it a contextual probe? | NA | |
| 4 | Is it close enough to the ideal probe to be credited? | NA | |
| 5 | Contextual factor identified: | The patient tells the clinician his eyes are "bad" and can't read the small numbers on his insulin syringe. | |
| | How was factor identified? | Spontaneously revealed by pt. without a probe. | The patient brings up the contextual factor independent of clinician behavior. |
| 6 | Domain of the factor identified: | Skills, Abilities and Knowledge | |
| | | | |
| 7 | Is it possible this factor is actually patient preference? | No | |
| 8 | Because there is a factor, what is the ideal Outcome? | A1c < 9.1 | |
| 9 | Coder formulates an ideal contextual POC: | Find another method for pt. to get his insulin that doesn't involve reading small numbers. | |
| 10 | POC heard: | I'll have you meet with the pharmacist after your visit so you can get a pre-filled syringe. You won't have to measure it then. | The clinician picks up on the patient's comment and addresses it appropriately. |
| 11 | Was it contextual? | Yes | |
| 12 | Is it close enough to the ideal POC to be credited? | Yes | |

| **Example of coding algorithm with contextual probe made but NOT considered close enough to be counted:** | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | **Question** | **Response** | **Notes** |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | |
| 2 | Probe heard: | So, you live alone? | The clinician asks a contextual question but it's not about the red flag. |
| 3 | Was it a contextual probe? | Yes | |
| 4 | Is it close enough to the ideal probe to be credited? | No | Question was contextual but was conversational in nature and did not get at why the patient's sugars were high. |
| 5 | Contextual factor identified: | NA | |
| 6 | Domain of the factor identified: | NA | |
| 7 | Is it possible this factor is actually patient preference? | NA | |
| 8 | Because there is a factor, what is the ideal Outcome? | NA | Coder can't formulate an ideal outcome because possible contextual factor was never identified. |
| 9 | Coder formulates an ideal contextual POC: | NA | Coder can't formulate an ideal plan of care because possible contextual factor was never identified. |
| 10 | POC heard: | NA | |
| 11 | Was it contextual? | NA | |
| 12 | Is it close enough to the ideal POC to be credited? | NA | |

| **Example of coding algorithm with a biomedical probe made:** | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | Question | Response | Notes |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | |
| 2 | Probe heard: | You are prescribed metformin and insulin for your diabetes? | Clinician's question is bio medically focused. Does not consider contextual factors. |
| 3 | Was it a contextual probe? | No | |
| 4 | Is it close enough to the ideal probe to be credited? | No | |
| 5 | Contextual factor identified: | NA | |
| 6 | Contextual factor revealed by pt. without specific probing by clinician: | None | |
| 7 | Is it possible this factor is actually patient preference? | NA | |
| 8 | Because there is a factor, what is the ideal Outcome? | | Coder can't formulate an ideal outcome because possible contextual factor was never identified. |
| 9 | Coder formulates an ideal contextual POC: | NA | Coder can't formulate an ideal plan of care because a contextual factor was never identified. |
| 10 | POC heard: | NA | |
| 11 | Was it contextual? | NA | |
| 12 | Is it close enough to the ideal POC to be credited? | NA | |

| **Example of coding algorithm contextual POC but NOT considered close enough to an ideal POC to count:** | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | **Question** | **Response** | **Notes** |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | |
| 2 | Probe heard: | Why are your sugars out of control? | |
| 3 | Was it a contextual probe? | Yes | |
| 4 | Is it close enough to the ideal probe to be credited? | Yes | |
| 5 | Contextual factor identified: | Patient has bad eyesight and can't read small numbers on his insulin syringe. | |
| | How was the factor identified? | In response to a probe | |
| 6 | Domain of factor | Skills, Abilities and Knowledge | |
| 7. | Is it possible this factor is actually patient preference? | No | |
| 8 | Because there is a factor, what is the ideal Outcome? | A1c<9.1 | |
| 9 | Coder formulates an ideal contextual POC: | Find another method for patient to administer his insulin, such as pre-loaded syringes. | |
| 10 | POC heard: | We'll arrange for you to get travel reimbursement so you can come see me more regularly. | This would constitute a contextual POC if the contextual factor was ability to get to the clinic, but the factor is the patient's eyesight. |
| 11 | Was it contextual? | Yes | |
| 12 | Is it close enough to the ideal POC to be credited? | No | It doesn't address the contextual factor which is poor eyesight. |

| Example of coding algorithm with biomedical POC: | | | |
|---|---|---|---|
| ***Red Flag: High A1c 9.1*** | | | |
| | Question | Response | Notes |
| 1 | Coder formulates an ideal probe: | Why are your blood sugars out of control? | |
| 2 | Probe heard: | Why are you sugars out of control? | |
| 3 | Was it a contextual probe? | Yes | |
| 4 | Is it close enough to the ideal probe to be credited? | Yes | |
| 5 | Contextual factor identified: | Patient has bad eyesight and can't read insulin syringe. | |
| | How was factor identified? | In response to a probe | |
| 6 | Domain of the factor identified | Skills, Abilities and Knowledge | |
| 7 | Is it possible this factor is actually a patient preference? | No | |
| 8 | Because there is a factor, what is the ideal Outcome? | A1c<9.1 | |
| 9 | Coder formulates an ideal contextual POC: | Find another method for patient to get his insulin. | |
| 10 | POC heard: | Increase insulin dosage. | The clinician has missed the boat here. The patient indicated the contextual factor, but the clinician ignored it in planning care. |
| 11 | Was it contextual? | No | |
| 12 | Is it close enough to the ideal POC to be credited? | No | The contextual factor was mishandled. The condition of high A1c was addressed as if it was only a biomedical problem. |

Categorizing statements and questions by clinicians and patients is not always as straightforward as the example above. We have developed principles and guidelines for assisting with coding complex or ambiguous interactions.

## Coding Principles:

There are three general principles that guide coding decisions in ambiguous situations when it is not clear whether to give a clinician credit for probing a contextual factor: the *awareness principle*, the *benefit of the doubt principle*, and *Simon's rule*. Each is discussed here.

### Awareness

Sometimes it is ambiguous as to whether a clinician's statement or question is in fact a probe in response to a contextual red flag. In such instances, the coder looks for evidence that the clinician is

aware of the contextual red flag that needs to be explored based on the clinician's subsequent comments and questions.

| Awareness is demonstrated | Why does it count? | Awareness is NOT Demonstrated | Why doesn't it count? |
|---|---|---|---|
| RED FLAG: Missed appts.<br><br>PROVIDER: "Looks like you've missed a lot of appts."<br><br>*Followed by…*<br>"Do you have any trouble getting to the VA?" | The two comments taken together indicate the clinician is aware of the red flag and is looking specifically for underlying contextual causes. | RED FLAG: Missed appts.<br><br>Clinician: "Do you have any trouble getting to the VA? I want you to come back next week and get your BP rechecked with the nurse." | The clinician starts out with a question that sounds like a probe in response to the contextual red flag, but the subsequent comment indicates he/she is not aware that the patient has a history of missed appointments. |

## Benefit of the Doubt

Coders should give the clinician the benefit of the doubt in cases where it is difficult to determine whether or not awareness is demonstrated. The point of giving clinicians the "benefit of the doubt" is that it avoids situations in which 4C evidence of poor performance is deemed unreasonable. Err on the side of assuming the clinician has noticed a contextual red flag unless it is evident they have not.

| Benefit of the doubt is given | Why does it count? | Benefit of the doubt is NOT given | Why doesn't it count? |
|---|---|---|---|
| RED FLAG: Missed appts.<br><br>Clinician: "I haven't seen you in over a year. That's a long time. Can you come back in a month?" | It's not clear whether the clinician's question represents awareness of possible obstacles as to why pt. has specifically missed past appointments. But the clinician DOES express awareness of the patient's history of not coming to the clinician, so it can be inferred the clinician may well be asking this question in terms of the patient's ability to adhere to upcoming appointments. | RED FLAG: Missed appts.<br><br>Clinician: "I want you to come back next week and get your BP rechecked with the nurse. Can you make it in then?" | The clinician is referring to a different issue (pt.'s BP) when asking about pt.'s transportation issues. Also, this appears to be a routine inquiry about patient's future schedule, not their past missed appts. The clinician shows no awareness to RED FLAG so in this case Benefit of Doubt would not be given. |

## Simon's Rule

If the clinician makes a statement (rather than asking a question) that demonstrates awareness of the red flag and the patient responds by revealing a contextual factor relating to the red flag, the clinician would be given credit for a contextual probe. Awareness MUST be present for the clinician to be given credit for a probe under Simon's Rule. The purpose of Simon's rule is to credit a clinician who may prefer

to make an observational comment as a way of prompting discussion about a contextual issue rather than asking a question, and whose approach yields the relevant information. (It is named after Simon Auster, MD, who observed that an indirect or unconventional approach should be credited if it has the desired effect. It may reflect the clinician's subtle appreciation of how most effectively to interact.)

| Simon's Rule is applied. | Why does it count? | Simon's Rule is NOT applied. | Why doesn't it count? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Clinician: "Your A1c has gone up since last time."<br><br>Pt: "I ran out of insulin! That new phone refill system is plain confusing." | Pt responded with contextual factor to the clinician's comment. Health care clinician's comment also demonstrated awareness of RED FLAG. | RED FLAG: High A1c<br><br>Clinician: "Your A1c is out of control."<br><br>Pt: "Yeah I know." | Pt did not respond with a contextual reason and clinician did not follow up. The clinician's statement in and of itself is not considered a contextual probe. |
| RED FLAG: High BP<br><br>Clinician: "Well, the holidays are upon us and it looks like your BP is going up."<br><br>Pt: "My wife is going through chemo and I don't have time to worry about taking my pills when caring for her." | Pt. responded with possible contextual reason to the clinician's comment. Health care clinician's comment also demonstrated awareness of RED FLAG. | RED FLAG: High BP<br><br>Clinician: "Have a seat. What can we do for you today?"<br><br>Pt: "Well, it's tough right now, my wife is going through chemo and I keep forgetting to take my BP meds." | The clinician's comment did not demonstrate awareness. In this case, pt.'s comment would be a contextual factor revealed by the pt.., but the clinician would not be credited with probing the contextual red flag. |

## Probing Guidelines:

### "Why" and the "Implied Why"

The word "why" is the stem of many if not most ideal probes. If a clinician asks "why" or another open-ended probe such as "how come" they are almost always given credit for a contextual probe.

| "Why" counts as Contextual: | Why is it considered a contextual probe? |
|---|---|
| RED FLAG: High A1c<br><br>Clinician: "Your A1c indicates your sugars are out of control. Why are your sugars so high?" | The clinician is probing for a possible contextual issue of why the patient's sugars are high. |

***Exception to the rule***: If the red flag is ER or urgent care visits, the clinician would not get credit for a contextual probe for asking why the patient was in the ER. In this case it would depend on what the patient's answer was and would require an additional probe.

| "Why" counts as Contextual: | Why is it considered a contextual probe? |
|---|---|
| RED FLAG: 2 ER Visits in 4 months.<br><br>Clinician: "Why were you in the ER?"<br><br>Pt: "I had to get my meds refilled"<br><br>Clinician: "Why didn't you come to the clinic for that?" | The clinician continued to probe for a possible contextual issue. The probe "Why didn't you come to the clinic for that?" would be the contextual probe that is credited. |

**The *Implied* Why:**

Often a clinician might not be asking a direct question, but it is clear from the inflection of their voice that they are probing. To get credit, the clinician must demonstrate an awareness of red flag.

| Why counts as an "Implied Why": | Why is it considered a contextual probe? | NOT an "Implied Why": | Why doesn't it count? |
|---|---|---|---|
| RED FLAG: Missed appts.<br><br>Clinician: "You didn't go to the cardiologist?" | The clinician is asking a question that probes a possible contextual issue and is aware pt. has missed appt. | RED FLAG: Missed appts.<br><br>Clinician: "When is your next cardiology appt.?" | The clinician is talking about appointments but does not demonstrate awareness that pt. has missed prior appointments. Also, question does not probe for context. |
| RED FLAG: Clinician notices pt. missed his colonoscopy<br><br>Clinician: "Are you *willing* to get a colonoscopy?" | The word *willing* indicates that the clinician is probing for context. In other words, "why are you seemingly unwilling to get a colonoscopy?" | RED FLAG: The clinician notices pt. missed his colonoscopy<br><br>Clinician: "You are due for a colonoscopy; can we schedule one?" | The clinician asking, "can we schedule one" is a routine question that would require an additional probe, if pt. said no. |
| RED FLAG: High BP<br><br>Clinician: "Do you think your BP is high because you are in pain *or*…" | The open-endedness of this question indicates that the clinician is open to any response and is aware he/she can't assume the patient just needs a higher dosage of medication. | | |

## Contextual vs. Conversational Probes

In many cases clinicians ask contextual questions such as where a patient lives/works, who a patient is living with etc. These questions are not counted unless they can be clearly linked to the red flag.

| Contextual: | Why is it considered contextual? | Conversational: | Why is it considered conversational? |
|---|---|---|---|
| RED FLAG: Missed Appts:<br><br>Clinician: "How are you today?"<br><br>Pt: "Lousy, it's really tough to get here at this time of day."<br><br>Clinician: "Are you working?" | The clinician's question can be linked to the red flag. "Are you working" can be considered a probe for a pt.'s competing responsibilities. | RED FLAG: Missed Appts.<br><br>Clinician: "How are you today?"<br><br>Pt: "Things are great."<br><br>Clinician: "Are you working?" | This probe is considered conversational because it is not linked to red flag. |
| RED FLAG: High A1c<br><br>Clinician: "How are you today? I see your sugars are high."<br><br>Pt: "Yeah, I know."<br><br>Clinician: "Are you still living with your daughter?" | Health care clinician's question indicates that he is exploring contextual reasons for red flag. "Are you still living with your daughter" could be considered a probe for issues with pt.'s social support. | RED FLAG: High A1C<br><br>Clinician: "How are you today? Nice weather, huh?"<br><br>Pt: "Yes, I didn't have to wear my coat."<br><br>Clinician: "Are you still living with your daughter?" | This probe is considered conversational because it is not linked to red flag. |

## Contextual vs. Biomedical Probes

In some cases, coders must determine if the line of questioning from the clinician is contextual or biomedical.

| Contextual: | Why is it considered contextual? | Biomedical: | Why is it considered biomedical? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Clinician: "Are you taking your meds like you are supposed to?" | The clinician is considering a possible contextual issue as to why patient's A1c is high. | RED FLAG: High A1c<br><br>Clinician: "Are you taking your meds -- any bad reactions?" | Question is structured to elicit a response about drug reactions not adherence. |
| RED FLAG: High BP<br><br>Clinician: "Are you taking your blood pressure meds as prescribed?" | The clinician is considering a possible contextual issue (patient has lack of control over diet). | RED FLAG: High BP<br><br>Clinician: "Does anyone in your family have high blood pressure?" | The clinician is not exploring possible contextual ("outside of the skin") issues. Question is a narrow, bio medically based inquiry about a possible cause of high BP. |

### Contextual vs. Standard Practice Probe

In some cases, a probe made by a clinician that could be contextual is actually a standard question that is intended to elicit biomedical information and is utilized regardless of the patient's context.

To be considered contextual, in such cases, a contextual factor must be revealed for the clinician's question to count as a contextual probe.

| Contextual: | Why is it considered contextual? | Standard Practice: | Why is it considered standard practice? |
|---|---|---|---|
| RED FLAG: High BP<br><br>Clinician: "What medications are you taking? How are you taking them?" | The clinician took the extra step of asking *how* a patient is taking medications. It is a probe for a contextual reason that could account for the red flag. | RED FLAG: High BP<br><br>Clinician: "What medications do you take?" | The question in and of itself "What medications do you take?" is standard question asked to patients with elevated blood pressure. |

### Depression, Anxiety, Substance Abuse, and involuntary behavior

Depression, anxiety, and substance abuse, or any involuntary behavior such as overeating, are considered biomedical problems unless they are part of the context of another problem. If a patient tells a clinician "I am here because I am feeling down" or "anxious," the presentation is biomedical (e.g. depression is a medical condition). These conditions should be considered contextual ONLY if they are part of the context of another problem. Examples:

| Contextual: | Why is it considered contextual? | Biomedical: | Why is it considered biomedical? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Pt: "I've been so depressed lately."<br><br>Clinician: "Are you motivated to still take your meds every day?" | The clinician is considering the depression as a possible contextual factor relevant to why patient's A1c is high. | RED FLAG: High A1c<br><br>Pt: "I've been so depressed lately."<br><br>Clinician: "Do you think you would like to try anti-depressants?" | The clinician is not showing awareness that patient's depression is a reason his A1c is high. He/she is just treating the depression. |
| RED FLAG: High BP<br><br>Clinician: "Your BP is high today?<br><br>Pt: "Yeah I've been feeling anxious lately."<br><br>Clinician: "So anxious that you aren't taking your medication?" | The clinician is considering the depression as a possible contextual issue as to why patient's BP is high. | RED FLAG: High BP<br><br>Clinician: "Your BP is high today?"<br><br>Pt: "Yeah I've been anxious lately."<br><br>Clinician: "Yeah, that can affect your blood pressure." | The clinician is only considering the direct biomedical effect of anxiety on BP, not the contextual impact of anxiety on behavior (e.g. not taking medication). |

### Contextual factors directly impact health care, not health:

This subtle distinction comes up frequently when a patient has depression or anxiety. Depression and anxiety are atypical among biomedical conditions in that they are often triggered by and resolve with changes in life circumstances, such as the loss and regain of employment. Hence, losing a job can adversely impact a patient's health. That does not make it a contextual issue, but rather a direct cause of a health problem. In contrast, contextual factors are considered contextual because they impact on *health care (*outside the skin*)* not directly on *health (*under the skin*)*. Their adverse impact on health is mediated through their adverse impact on health care.

Example:

| Contextual | Why is it considered contextual? | Not Contextual: | Why it is not considered contextual? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Pt.: "I'm so depressed, I lost my job."<br><br>Clinician: "Can you afford your medication?" | The clinician is probing for impact on pt.'s health care. Financial Situation is effecting pt.'s abilities to afford medication. | RED FLAG: High A1c<br><br>Pt.: "I'm so depressed, I lost my job."<br><br>Clinician: "Are you looking for work?" | The clinician's question is not linked to the contextual red flag. Rather he/she is focused on the cause of the patient's depression. |

### Poor Contextual Probes

Coders do not judge the quality of the probe made by the clinician. If the probe is contextual and related to the red flag, the clinician is given credit for a contextual probe.

| Poor Contextual Probe | Why it counts | Poor Probe Not Contextual: | Why it doesn't count |
|---|---|---|---|
| RED FLAG: Pt. recently had foot amputated due to frostbite<br><br>Clinician: "Do you have a place to live?" Asked during a frigid winter season. | The clinician is considering a contextual reason (homelessness) for why pt. got frostbite. Ideal probe would be "WHY were you out in the cold so long?" | RED FLAG: Pt. recently had foot amputated due to frostbite<br><br>Clinician: "Are your sugars now better controlled?" | The clinician's question not relevant to frostbite. It is focused on another condition. |

### Probing contextual red flags doesn't always turn up underlying contextual factors:

Not all contextual red flags have underlying contextual factors. For instance, a patient with poor medication adherence may say, "Boy, it's been tough since I lost my job" (a contextual red flag). The clinician might probe with "How is it tough? Are having trouble affording your medication?" (an ideal probe) and the patient may reply "No, I'm on my wife's insurance. I just meant that I spend a lot of time trying to find work." In these cases, the clinician gets credit for the probe but there will be no opportunity to assess contextualized planning of care.

Sometimes contextual red flags are indicators not of contextual factors but of patient's preferences. We consider a patient's preferences to be a reflection of their personal values. They are not a "problem" to be overcome. Example:

| Contextual Probe w/Non-Contextual factor | Why? | Contextual Probe w/Contextual factor | Why? |
|---|---|---|---|
| RED FLAG: Pt. declines to get a colonoscopy<br><br>Clinician: "Why don't you want to get a colonoscopy"<br><br>Pt: "I've decided, given my other medical issues, and my age, I wouldn't be a candidate for treatment even if they found something."" | This is a case of patient preference. Preferences are to be respected, not regarded as problems to be circumvented. | RED FLAG: Pt. declines to get a colonoscopy<br><br>Clinician: "Why don't you want to get a colonoscopy?"<br><br>Pt.: "I was dropped from my wife's insurance and can't afford it." | Pt. has a contextual reason (financial) as to why he is not getting a colonoscopy. |

In some instances, the patient may at first present with a contextual factor, but when the clinician tries to address it, the patient indicates that they also have a preference that is impacting the resolution of the red flag. In such an instance, the coder would indicate that the clinician made a contextual plan of care, but then note in the coding that the patient's preference might override the stated contextual factor and impact their following the plan of care. The coder would also indicate the patient's response to the contextual plan of care (explicitly agreed, explicitly disagreed, no response). For instance, a patient who wants to lose weight states that he is unable to attend a weight loss program provided by his clinician. When the clinician asks, "Why not?" the patient responds that he lives too far away from the facility. The clinician then offers a telehealth option for the program, but the patient goes on to say, "Thanks but I don't think I want to after all." In this case, the clinician accurately made a contextual plan of care based on the factor the patient revealed, but the patient actually prefers *not* to go to the program.

Indicating preferences that contradict a contextualized care plan is important if you are tracking outcomes. While a patient's contextual factor was appropriately addressed, their conflicting preference implies they are not going to follow the plan of care. In such instances a contextualized care plan is not likely to lead to the originally intended outcome because it's not what the patient actually wants. When assessing outcomes, one can filter out these encounters as they are, paradoxically, no longer "desirable" or expected.

The coder would code our example as shown below:

| Coding Algorithm | Coding Algorithm ANSWERS |
|---|---|
| RED FLAG | **Pt. unable to attend weight loss program.** |
| 1. Coder Formulated Ideal Probe: | **1. Why don't you want to attend the program?** |
| 2. Probe heard: | **2. Why not?** |
| 3. Was it a contextual probe: | **3. Yes** |
| 4. Is it close enough to the Ideal Probe to be credited? | **4. Yes** |
| 5. Contextual Factor identified: | **5. The pt. must travel a far distance to the program** |
| How was it identified? | **In response to a probe** |
| 6. Domain of the Factor: | **6. Access** |
| 7. Is it possible this factor is actually patient preference? | **7. Yes** |
| 8. Because there is a factor identified, what is the ideal outcome? | **8. Pt. attends weight loss program** |
| 9. Coder Formulated Ideal Contextual POC: | **9. See if there are closer options/or online** |
| 10. POC heard: | **10. Dr. offered a telehealth option** |
| 11. Was it contextual? | **11. Yes** |
| 12. Is it close enough to the Ideal POC to be credited? | **12. Yes** |

*NOTE: A good habit when considering whether a patient's answer is a contextual factor is to review the 12 domains of context. If the answer fits into one of those domains, then it is a contextual factor. If it does not, it is most likely not a contextual factor.*

## Cascading Red Flags

When a clinician probes an existing red flag and a patient response reveals another red flag, the latter is called a **cascading red flag.** In such cases the clinician is given credit for a probe and a new red flag is created and coded. The clinician will get credit for a POC only if a contextual factor is revealed and addressed for the new red flag.

| Example of Cascading Red Flag | Patient's statement becomes new red flag |
|---|---|
| RED FLAG: Pt. has BP 165/90<br><br>Clinician: Why is your BP so high?<br><br>Patient: I haven't been taking my medicines | The patient's statement "I haven't been taking my medicines" would become the new red flag.<br><br>The clinician is given credit for the original probe and the "new red flag" is coded separately. |

## Guidelines for Coding Plan of Care:

### Contextual POC without a Contextual Probe

Sometimes clinicians recognize contextual factors and how to address them simply based on a patient's comment or behavior, and don't need to ask questions. Hence, we credit clinicians for contextualizing care as long as the plan of care is contextualized, regardless of whether the issue of concern was discussed. For example:

| Contextual: | Why is it considered contextual? |
|---|---|
| Factor revealed by Pt.: "I keep all my pills on my nightstand. I can't keep track of all my meds. I don't even know what I'm taking anymore.<br><br>Clinician: "A lot of patient's find pill boxes handy. I'll have my nurse give you one."<br><br>Pt.: "That would be great." | The clinician did not probe for a contextual factor; however, his plan of care addresses patient's skills and abilities for taking his meds. The clinician is addressing contextual issue with the plan of care. |

### Contextual vs. Biomedical POC

Coders must determine if the plan of care is really contextual rather than just biomedical. Again, consider whether the plan of care addresses one or more of the twelve domains of context.

| Contextual: | Why is it considered contextual? | Biomedical: | Why is it considered biomedical? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Patient revealed he is confused about medications.<br><br>Clinician: "I am going to make you an appt. with the pharmacist who can help you learn how to take your meds properly." | The clinician is considering contextual issue (Skills, Abilities, and Knowledge) when making the plan of care. | RED FLAG: High A1c<br><br>Clinician: "I'm going to increase your insulin." | No contextual issues (domains of context) are being considered in this plan of care. |

### Contextual vs. Standard Practice POC

In some cases, coders must determine if the plan of care addresses contextual factors, or whether it simply reflects standard practice regardless of the patient's context.

| Contextual: | Why is it considered contextual? | Standard Practice: | Why is it considered standard practice? |
|---|---|---|---|
| RED FLAG: Missed Labs<br><br>Probe revealed that the patient thinks he needs an appt. at laboratory.<br><br>Clinician: "Once I reschedule your labs, just show up, you don't have to have an appt."* | The clinician is considering contextual issue (Skills, Abilities, and Knowledge) when making plan of care. | RED FLAG: Missed Labs<br><br>Probe revealed that the patient thinks he needs appt. at laboratory.<br><br>Clinician: "I'll reschedule your labs, and don't eat for 12 hours before." | The clinician is not addressing contextual issue. Rescheduling missed labs is standard practice. |

*Note that a care plan may be contextualized with a straightforward comment to a patient if it resolves the underlying contextual factors. In this example the comment "just show up, you don't have to have an appointment" is itself a facet of the plan of care. Hence, the comment itself, by addressing the misunderstanding that led to the patient missing labs, represents contextualized care planning.

### Plan of Care must be related to Contextual Factor in order to count.

If a clinician makes what could be considered a contextual plan of care but it is NOT related to the previously identified contextual factor, then the clinician is NOT given credit for a contextual plan of care.

| Plan of care that would count | Why does it count? | Plan of care that would NOT Count | Why doesn't it count? |
|---|---|---|---|
| RED FLAG: High A1c<br><br>Probe reveals that pt. has not been receiving his meds in the mail.<br><br>Clinician: "Let's make sure we have your correct address and phone number in the system so we can get you your meds." | Plan of care is appropriate to the contextual factor revealed by the patient. | RED FLAG: High A1c<br><br>Probe reveals that pt. doesn't know how to take his insulin.<br><br>Clinician: "Let's make sure we have your correct address and phone number in the system so we can get you your meds." | Plan of care does not correlate with contextual factor revealed by the patient. |

| | | | |
|---|---|---|---|
| RED FLAG: Missed Appts.<br><br>Probe reveals that pt. has transportation issues getting to the VA.<br><br>Clinician: "You can go to the transportation desk and get a travel voucher." | Plan of care is appropriate to the contextual factor revealed by the patient. | RED FLAG: Missed Appts.<br><br>Probe reveals that pt. has transportation issues getting to the VA.<br><br>Clinician: "If you need to cancel and reschedule your appt., call this number." | Plan of care does not correlate with the contextual factor revealed by the patient. |

### Distinguishing a Contextual Factor Revealed by a Patient vs. a New Red Flag

Occasionally the audio coders will hear a patient statement that could either be a contextual factor underlying an identified red flag being revealed, or a new red flag.

| Contextual Factor Revealed by Pt. for established red flag | Why is it considered a contextual factor revealed by the patient? | New red flag | Why is it considered a new red flag |
|---|---|---|---|
| RED FLAG: Patient not refilling a costly medication but is taking all the others.<br><br>Contextual Factor Revealed: "Boy it's tough to not have a job." | The mention of job loss reveals the contextual factor underlying the red flag. | The clinician mentions to patient that he is going to need an MRI.<br><br>Pt replies: "Boy its tough not having a job." | The mention of job loss is a red flag that the patient cannot afford needed care when it's a response to a proposal to get a costly exam. |

## Proactive Planning

Often a clinician and patient have an ongoing relationship where a clinician may already have information on contextual issues going on in a patient's life. **Proactive planning** happens when the clinician anticipates a contextual factor because of their knowledge of the patient.

While a "contextualized care plan" typically requires adapting the plan to a revealed contextual factor, it may also be coded as a contextualized care plan if the clinician addresses a presumed contextual factor in the proposed care plan, and the patient confirms that the contextual factor is in fact present.

| Proactive Planning: | Pt response confirms contextual factor present factor | Pt response confirms no factor present | Proactive plan becomes a POC when the factor is confirmed |
|---|---|---|---|
| RED FLAG: Patient has toddlers at home (based on previous knowledge) and upcoming appts.<br><br>Probe/Proactive Plan: "I know you have appointments coming up and you have a toddler at home. We can schedule you for a Saturday if that works better for you." | Pt: "That would be great. My husband is home on the weekends, and he can watch the kids." | Pt: "No, my mom can watch them anytime." | In either case the proactive plan constitutes a probe, but it only becomes an official POC if there is factor present which is based on the patient's response. |

## Recording Coded Data:

The audio coders record their results into a Master List of Coded Encounters or a database such as REDCap.

# Chapter 3: Tracking Outcomes

## Why Track Outcomes?

The underlying premise of 4C is that it differentiates appropriate (contextualized) from inappropriate approaches to care (the latter resulting in contextual errors) that matter in terms of some meaningful outcome. For instance, the failure to recognize that a patient's diabetes is out of control (contextual red flag) because of untreated depression and poor medication adherence (contextual factors) increases the likelihood of a poor outcome as the treatment (simply increasing their medication) is not contextually appropriate.[9] Conversely, recognizing and treating the depression is likely to have a better outcome as the patient's mental state improves and he begins to take his medication again. Note, in the examples above, that the outcome variable of interest is simply the original contextual red flag. Outcomes variables are always the same as the original red flag. (In the case of a "cascading red flag" all red flag outcomes are considered.) If the original contextual red flag is an elevation in a patient's HgB A1c, the outcome of interest will be the change in HgB A1c over time. If the original contextual red flag is missing appointments, the contextual red flag with be the missed appointment rate over time. For a cascading red flag, if a new red flag was discovered, and a contextual factor was discovered for that second red flag then the outcome for the initial red flag and the second red flag would be tracked. This section provides a protocol for tracking the outcomes, if doing so is desired, to determine whether contextualization of care is improving relevant patient outcomes.

Note that contextualization of care can only occur when a contextual factor is present. In the example above, if there were no depression or medication adherence issues or other contextual factors, then the clinical situation would be biomedical (e.g. patient needs more insulin) rather than contextual. Hence, there would be no contextual factors to address in the care plan.

## Protocol for Good vs. Poor Outcomes:

As noted, the outcome of interest is the disposition of the original contextual red flag when followed over time. The criteria for a good or poor outcome are prospectively determined to avoid any bias resulting from knowledge of how the encounter gets coded. The audio coder determines an ideal outcome for the future chart coder to track. A good outcome marks an improvement in the patient's condition as reflected in the contextual red flag. A poor outcome indicates no improvement in the contextual red flag.

The process is as follows: When the audio coder listens to an encounter and indicates that a contextual factor has been discovered (either by a probe or spontaneously by the patient) they then indicate what would be an ideal outcome. For example, if the red flag was elevated blood pressure (150/90) the ideal outcome would be an improvement in the blood pressure reading (<150/90). Four months to 9 months after the encounter, the chart coder will review the patient's medical record to code for "Good" or "Poor" outcomes and note these outcomes in the Master List of Coded Encounters.

In some instances, the outcome cannot be assessed because the data is not available, in which case the chart coder will indicate that the outcome was not applicable ("NA"). For example, the ideal outcome

might be that the patient is able to exercise more consistently, but the clinician does not mention anything about exercise in the notes in subsequent visits. Since the chart coder cannot ascertain if the red flag resolved, the outcome will be "NA."

In some cases, a contextual POC is heard on the audio that requires the clinician placing orders in order for the POC to be enacted. In these instances, the audio coder will notate in a separate column the specific orders so the chart coder can confirm that the contextual plan of care was, in fact, implemented (e.g. the POC included the clinician placing an order for a referral, and the referral was in fact placed). When the audio coder writes a note indicating that the discussed plan of care should be confirmed by reviewing the orders, this column in the spreadsheet is "hidden" so the chart coder remains blinded as to which clinicians have made contextual plans of care.

The chart coder will the indicate if the planned order was missing so that any subsequent analysis takes into account the fact that the plan of care was never fully implemented.

## OUTCOMES TABLE listing red flags and good vs. poor outcomes

| CHART RED FLAGS | GOOD OUTCOME | POOR OUTCOME |
|---|---|---|
| **Diabetes** - A1c > 9 | Any improvement in A1c | No improvement or A1c is worse |
| **Hypertension** – SBP >160 or DBP >100 | Any improvement in BP* | No improvement or BP is worse |
| **Missed Appts.** – 16 or more visits in 12 mos. w/ SAA Rate < 75% | Any improvement in SAA % Rate | No improvement or SAA % Rate is worse |
| **Medication adherence 4 or more prescriptions in 12 mos. w/MA Rate < 75%** | Any Improvement in MA % Rate | No improvement or MA % Rate is worse |
| **Diabetes** – A1c > 8 | Any improvement in A1c | No improvement or A1c is worse |
| **Hypertension** – SBP > 140 or DBP > 90 | Any improvement in SBP or DBP | No improvement or BP is worse |
| **Missed Appts.** – 2 or more in past 4 mos. | Pt. makes it to next scheduled appt. | Pt. misses next scheduled appt. |
| **Missed Meds** –1 or more missed fill/refills in past 4 mos. | Pt. gets medications filled or refilled | Pt. does not get medication filled or refilled |
| **Missed Labs/Procedures** –1 or more missed in past 4 mos. | Pt. gets lab tests or recommended procedures | Pt. does not get lab tests or recommended procedures |
| **Urgent Care** – 2 or more visits to Urgent Care in 12 mos. | Pt. has fewer visits to Urgent Care | Pt. has the same or more visits to urgent care |
| **ER** – 2 or more visits to ER in 12 mos. | Pt. has fewer visits to the ER | Pt. has the same or move visits to the ER |

| AUDIO RED FLAGS | GOOD OUTCOME | POOR OUTCOME |
|---|---|---|
| **BP** – Running high during visit | Any improvement in pt.'s BP | No improvement or BP is worse |
| **Meds** – Pt. has run out, stopped taking, or has expired medications | Pt. is adherent with their medications | Pt. is non-adherent with their medications |
| **Understanding** – Pt. shows confusion in how to make appts., labs, getting to clinic etc. | Pt. completes appt., lab. | Pt. misses appts., labs |
| **Discrepancies** – Pt. gets different BP or blood sugars than at clinic | Pt. reports BP or blood sugar levels consistent with readings at clinic | Pt. continues to report different levels at home |
| **Refusal** –Pt. declines colonoscopy or recommended vaccines (flu shot etc.) | Pt. gets recommended vaccines or procedures. | Pt. does not get recommended vaccines or procedures. |
| **Adherence** – Pt. has problems with following clinician's orders (appts., meds, labs, exercise, diet, etc.) | Pt. adheres to clinician's orders. | Pt. does not adhere to clinician's orders. |

*In cases where there is improvement in one number but an increase in another, Mean Arterial Pressure should be calculated and used for comparison. Mean Arterial Pressure is calculated by the formula (2(DBP) + SBP)/3. Example: 160/100 = (200 + 160)/3 = 120

## Tracking outcomes for cascading red flag

Example:

**Red Flag: A1c =9.5**
**Probe:** "Has anything changed in your life that's impacting your ability to manage your diabetes?"
Patient responds: "Yeah, I'm not taking my insulin." (This is now a new red flag.)

**Red Flag:** Patient not taking insulin.
**Probe:** "Why aren't you taking your insulin?"
**Contextual Factor:** "I can't afford it."

The contextual factor, "Patient can't afford insulin," would now be tracked for outcomes. The "Good Outcome" would be defined as EITHER "Patient is taking insulin," OR "A1c <9.5.

In some cases, specifically for audio red flags, there may be insufficient information to determine a good or poor outcome based on what is in the medical record alone. In such cases the chart coder notates "Outcome Not Available" or "NA" in the Master List of Coded Encounters.

## Tracking outcomes when patient sees more than one clinician

If a patient sees more than one clinician for the same red flag, during the same visit, the outcomes coder will only count one outcome (deferring to the outcome with a contextual plan of care if present), and indicate “NA” for the other clinicians.

For example:

The patient sees a nurse for vitals and then a primary care clinician. The patient’s blood pressure is elevated. The nurse asks the patient if he took his blood pressure medication that morning and he said no. She asks why and he says that he often forgets when he’s rushing out the door in the morning. She then tells him to put an extra dose of blood pressure meds in his wallet for times when he forgets. The patient agrees. (This would be a probe and a plan of care.)

The clinician then sees the patient, doesn’t ask why his blood pressure is elevated, but the patient spontaneously tells the doctor that he didn’t take his blood pressure medication because he often forgets in the morning when he’s rushing out the door. The clinician says, “Well, that explains why it’s elevated.” (There would be: no probe, one factor revealed, no plan of care.)

When the outcomes coder looks at the patient in four months, if the blood pressure improved – the vitals nurse would get credit for a “good” outcome and the primary care clinician would get scored “NA,” because another clinician made a plan of care.

# Chapter 4: Recording Data – The Master Spreadsheet

Below is a step-by-step guide on how to record 4C data for analysis. In accompanying documents, you will find a formatted Master List of Coded Encounters (aka "Master spreadsheet) that can be simplified or expanded as needed.

## General Information and Assigning Clinician/Patient ID's

The first ten columns of the Master List of Coded Encounters are provided to record identifying information for the encounter. Whenever 4C is conducted for research purposes, it is necessary to de-identify clinician and patient information. In the following example, there are columns for a "Patient ID" and a "Clinician ID." A column is also included for the type of clinician so that reports can be generated for different types. A column is also provided for "Audio Coded by:", which is helpful if you are using more than one audio coder to listen to the encounter. You may also want to record information about whether or not the recorder was revealed during the encounter.

| **Record ID** | **Instrument** | **Audio coded by (initials)** | **Date of encounter** | **Patient ID** | **Did the patient see the wrong clinician?** | **Provider ID** | **Type of provider** | **Was the recorder revealed?** | **Did the recorder fail?** |
|---|---|---|---|---|---|---|---|---|---|
| 11 | Encounter info | abc | 5/13/2023 | 111 | No | 111 | Attending | No | No |

## Red Flag Recording

1. R**ed flags** are notated. The type of red flag (chart, inventory, audio) is indicated, as well as a red flag code. The Red Flag Code is found in the key (appendix B). The more significant, quantifiable, red flags can be identified for outcomes measures by sorting on the red flag codes of interest (i.e. AIC > 9).

| **Red Flag instance** | **Type of coding** | **Is there a red flag?** | **Red flag type/Chart** | **Red flag type/ Audio** | **Red flag type/ Inventory** | **Red Flag description** | **Red Flag Code:** |
|---|---|---|---|---|---|---|---|
| 1 | Chart | Yes | 1 | 0 | 0 | A1c = 9.7 | 1.01 |

2. If there is more than one red flag for a patient, a row is added beneath the first red flag and the column "Red flag #" is marked accordingly. (See Template.4C Coded Encounters.MASTERLIST for examples.)

| Red Flag instance | Type of coding | Is there a red flag? | Red flag type/Chart | Red flag type/Audio | Red flag type /Inventory | Red Flag description | Red Flag Code: |
|---|---|---|---|---|---|---|---|
| 2 | Audio | 1 | 0 | 1 | 0 | Pt. declines vaccine | 5.05 |

## Coding RED FLAGS

1. After red flags are identified, audio coder(s) fills out next items/columns regarding the probe and any factors revealed:

| Ideal PROBE | Was a probe heard? | Probe heard | Was it contextual? | Was it close enough to ideal probe to count? |
|---|---|---|---|---|
| What's going on with your diabetes? | Yes | What's happening with your diabetes? | Yes | Yes |

| Was a contextual factor identified? | How was the factor identified? | Describe the contextual factor |
|---|---|---|
| Yes | In response to a probe | Can't afford insulin |

2. If a factor is identified, the **DOMAIN OF CONTEXT** for that factor is identified by placing a 1 in the column of the domain the contextual factor belongs (e.g. if the problem was that the pt.'s BP was out of control because he couldn't afford his meds, the domain would be *4. Financial Situation*). (See Appendix C for definitions of Domains of Context.)

| Domain Access | Domain Competing Responsibility | Domain Social Support | Domain Financial Situation | Domain Environment | Domain Resources |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 |

| Domain Skills, Abilities, & Knowledge) | Domain Emotional State | Domain Cultural Perspective/ Spiritual Beliefs | Domain Attitude Towards Illness | Domain Attitude Towards Health Care Provider and System | Domain Health Behavior |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |

3. The coder then continues on:

| Factor is possibly patient preference? | Ideal OUTCOME for this red flag? | Ideal PLAN OF CARE to address the factor | Was a plan of care made? | Plan of care heard |
|---|---|---|---|---|
| No | A1C < 9.7 | Help affording insulin | Yes | Referred to clinic's medication financial assistance office. |

| Was the POC contextual? | Was the POC close enough to the ideal to count? | POC was carried out during visit - no order necessary. | Coder Comments (If there is another red flag - select 'Save and Add New Instance.') |
|---|---|---|---|
| Yes | Yes | Yes | Good example of contextualized care! |

## Resolving Coder Discrepancies

1. When two audio coders reach different conclusions about whether a contextual red flag was probed, a third party trained in 4C – such as a chart coder --, if available, will then listen to the audio recording and code it using the rules above. Otherwise, the two coders will resolve through consensus.

2. When a 3rd individual agrees with either one coder or the other, he/she moves the final data for that encounter to Master List of Coded Encounters.

## Outcome Tracking

1. If there is a plan to track outcomes, when an audio coder identifies a contextual factor, the audio coder then also fills out the **RED FLAG ideal outcome description** cell. (*See outcomes table in chapter 3).*
    a. If the contextual plan of care addressing the factor involves an action that can be tracked in the medical record (e.g. an order placed for a referral), then the audio coder indicates that in a column in the spreadsheet. This column is hidden when the chart coder initially looks for outcomes to prevent un-blinding as to which encounters ended with a contextualized POC and which did not.

2. Four to nine months from the date of the initial encounter, the chart coder will look in the medical record to assess the status of the red flag at a future visit.

3. The chart coder will then review the medical record and look for outcomes. He/she will indicate if the outcome was good, poor or not available and indicate it in the appropriate cells.

4. The chart coder will then describe the actual outcome in **Actual Outcome Description** cell.

5. Finally, the chart coder will look to see if the audio coder indicated that the POC should be confirmed by checking the orders in the medical record. If the intended orders were never placed, the chart coder will notate that finding in the appropriate column.

| **Return visit date or the date the record was checked for outcomes** | **What was the actual outcome?** | **Please choose the type of outcome for the patient** | **Upon reviewing records, were orders for POC placed?** |
|---|---|---|---|
| 9/8/2023 | A1C = 8.1 | Good | Yes |

## Adapting the Coding MASTERLIST to track other items

The MASTERLIST can be adapted to track other items of interest. For instance, coders can keep track of the time the clinician spends with the patient, or the time difference between the patient's appointment time and the time they saw the clinician. Coders can also track how many interruptions occurred during the visit. These columns can be added to the MASTERLIST for a particular project.

The template provided has a couple of rows of coding examples.

## Using REDCap to capture data

The authors have developed a REDCap project template that is available for upload if you would like to capture your 4C data in that format. The XML file is located in the same online location as this manual. A video, Content Coding for Contextualization of Care, illustrating how to 4C code in REDCap is available on YouTube or at contextualizingcare.org.

## Glossary

**Awareness:** Line of questioning that indicates the clinician is aware of the contextual red flag.

**Benefit of the Doubt:** Practice of coders erring on the side of the clinician contextualizing care when it is difficult to determine whether or not a clinician has probed a red flag or made a plan of care incorporating a discovered contextual factor.

**Biomedical Factor:** Factor relevant to care that is physiologic, i.e. they occur inside or on the body (including the skin).

**Chart Probe:** Examination of the medical record for contextual factors which may be reflected therein (meds re-ordered but not released, etc.).

**Coding Algorithm:** A series of questions each coder asks themselves to identify the presence or absence of a contextual probe, a contextual factor, and a contextual POC in response to an identified contextual red flag.

**Contextual Error:** Occurs when inattention to patient context results in a wrong plan to achieve an aim. It is the result of a failure to contextualize care.

**Contextual Factor:** Any patient life circumstance or behavior that is relevant to planning their care.

**Contextualizing Care**: The process of adapting care to the relevant circumstances and behaviors of individual patients.

**Contextualized Plan of Care:** A plan of care that is not only evidence based, but also addresses identified contextual factors.

**Contextual Probe:** Anything a clinician asks or states that indicates they are aware of a contextual red flag and is exploring whether there are underlying contextual factors.

**Contextual Red Flag:** Anything a patient says or that is observed about their situation or behavior that suggests unaddressed contextual factors may be contributing to problems with their care.

**Context Revealed by Patient/Not Prompted by Health care clinician:** Anything a patient says that is not prompted by a clinician probe that reveals contextual factors adversely impacting patient's care.

**Domains of Context:** Twelve identified areas in patients' lives where contextual factors most often occur. The twelve domains include: competing responsibilities, social support, access to care, financial situation, skills/abilities/knowledge, emotional state, cultural perspective/spiritual beliefs, environment, attitude towards illness and relationship with health care provider and system, resources and health behavior.

**Ideal Plan of Care:** An unambiguous statement that – if it were to come from the clinician – would indicate indisputably that the clinician is addressing a contextual factor. It is formulated by the audio coder and serves as an anchor, or point of comparison, for the clinician's actual behaviors.

**Ideal Probe:** An unambiguous question that – if it were to come from the clinician – would indicate indisputably that the clinician is exploring possible contextual issues related to the red flag. It is

formulated by the audio coder and serves as an anchor, or point of comparison, for the clinician's actual behaviors.

**Implied Why:** A statement made by a clinician which either through inflection, intent, or structure indicates the clinician is probing for context in the absence of direct questioning.

**Patient Preference:** An informed choice a patient makes among two or more options for evaluation or treatment after any contextual factors have been addressed.

**Proactive Planning:** Situations where the clinician anticipates a contextual factor because of their knowledge of the patient.

**Simon's Rule:** Rule of coding that states if a clinician makes a statement (rather than asking a question) that demonstrates awareness of a red flag and the patient responds by revealing a contextual factor relating to the red flag, the clinician gets credit for a contextual probe.

## Appendix A – Alternate Coding Team

A coding team could consist of 5 people (listed in the order that they review a recorded encounter):

1. *Chart Coder* – identifies red flags from medical record, scores for outcomes
2. *Audio Coding Supervisor* –compares codings by Audio coders, verifies audio red flags identified by audio coders, notates inter-rater agreement, breaks ties in coding when there is a discrepancy between audio coders
3. *Audio Coder 1* – codes all audio encounters, identifies possible audio red flags
4. *Audio Coder 2* – codes all audio encounters, identifies possible audio red flags
5. *Project Director* – Verifies the Audio Coding Supervisor's red flags, oversees coding process

## Appendix B – Red Flag Numbers

| | |
|---|---|
| **Uncontrolled Chronic Conditions (not new diagnosis)** | |
| 1.01 | Glycosylated hemoglobin (A1C) > 9 (High impact) |
| 1.02 | A1C > 8 (Standard) |
| 1.03 | A1C greater than goal |
| 1.04 | High/low blood glucose readings |
| 1.05 | Blood Pressure (BP): Systolic Blood Pressure (SBP) >160 or Diastolic Blood Pressure (DBP) > 100 (if patient is on blood pressure medication) (High impact) |
| 1.06 | BP SBP>140 or DBP > 90 (if patient is on blood pressure medication) (Standard) |
| 1.07 | BP higher/lower than goal (if patient is on blood pressure medication) |
| 1.08 | Unexpected increase in symptoms or signs of a medically treated condition (Asthma, Thyroid Stimulating Hormone, International Normalized Ration etc.) |
| 1.09 | No expected improvement in currently treated condition (e.g. Patient's broken arm not healing; suspect patient may be taking arm out of sling for work.) |
| 1.10 | Issues managing condition (e.g. Patient states, "I just can't get a handle on my blood pressure.") |
| **Appointment Adherence (clinic visits, scheduled labs, imaging, tests, screenings, surgeries)** | |
| 2.01 | Missed* or canceled appointments: Scheduled Appointment Adherence (SAA)** <75% (at least 16 appointments in 12 mos.) (High impact) |
| 2.02 | Missed or canceled appointments: 2 or more in past 4 mos. (Standard) |
| 2.03 | Missed or canceled appointment (e.g. Patient states, "I didn't go to podiatry.") |
| 2.04 | ≥30 minutes late for appointment (registrar/clerk only) |
| 2.05 | Patient at the wrong appointment (scheduled for pharmacy but shows up for primary care) (registrar/clerk only) |
| 2.06 | Unable/declines to schedule recommended appointment (includes follow-up appointments with primary care, specialists, surgery) |
| 2.07 | Issues keeping appointments (e.g. Patient states, "I can't do these appointments.") |

| | |
|---|---|
| 2.08 | Patient over 50 never had a colonoscopy |
| 2.09 | Unable/declines colonoscopy |
| 2.10 | Unable/declines stool card test for colon cancer |
| 2.11 | Unable/declines HIV testing |
| 2.12 | Unable/declines mammogram |
| 2.13 | Unable/declines pap smear |
| 2.14 | Unable/declines cardiac tests |
| 2.15 | Unable/declines recommended tests or screenings (not listed above) |
| **Resource Utilization** | |
| 3.01 | 2 or more trips to Emergency Department ED/Urgent care in 4 mos. (Standard) |
| 3.02 | Did not contact doctor for emerging/worsening condition (e.g. Patient had severe chest pain and shortness of breath but didn't seek medical help.) |
| 3.03 | Provider/facility and patient have communication problems (e.g., messages not returned, unable to get someone on the phone, letters don't arrive) |
| 3.04 | Utilizes ED/Urgent care for med refills, and finding out about lab/test results |
| 3.05 | Requests unnecessary test (e.g. Patient with no symptoms requests an MRI.) |
| **Medication Adherence** | |
| 4.01 | Unable/declines to take meds (includes "not taking," "stopped taking," "ran out,") |
| 4.02 | Unable/declines take meds **as prescribed** (taking too much/too little/at wrong times) |
| 4.03 | Taking a medication NOT prescribed (another's prescription or a prescription that was stopped) |
| 4.04 | Unable/declines to refill meds as expected (usually record review shows patient should have run out) |
| 4.05 | Patient has too many meds "left over" at home |
| 4.06 | Issues taking meds (e.g. Patient states, "I'm having a hard time taking these meds.") |
| | |

| | |
|---|---|
| **Plan of Care Adherence** | |
| 5.01 | Unable/declines to monitor blood sugar readings at home (if previously instructed to do so) |
| 5.02 | Unable/declines to monitor blood pressure readings at home (if previously instructed to do so) |
| 5.03 | Unable/declines to follow recommended diet (includes diabetic patient who states they aren't eating) |
| 5.04 | Unable/declines to follow exercise recommendations |
| 5.05 | Unable/declines recommended vaccine(s) |
| 5.06 | Unable/declines recommended injected medications |
| 5.07 | Unable/declines to participate in weight loss program/education (if interested in weight loss) |
| 5.08 | Unable/declines to participate in smoking cessation clinic (if interested in quitting smoking) |
| 5.09 | Unable/declines to participate in addiction programs (if interested in addressing addiction) |
| 5.10 | Unable/declines to see primary care on recommended schedule (e.g. yearly, 6 mos., etc.) |
| 5.11 | Unable/declines to see eye doctor on recommended schedule (yearly if diabetic) |
| 5.12 | Unable/declines to check feet (if diabetic) |
| 5.13 | Unable/declines to follow other plan of care instructions not listed above (e.g. elevate feet, fast for labs) |
| 5.14 | Unable/declines to treat condition (e.g. Patient states, "I don't want to do anything about my diabetes.") |
| 5.15 | Issues following plan of care (e.g. Patient states, "I can't do what the pharmacist told me.") |
| **Significant Weight Loss/Gain** | |
| 6.01 | Significant weight gain (at least 10 lbs.) since last appointment |
| 6.02 | Significant weight loss (at least 10 lbs.) since last appointment |
| 6.03 | Issues with weight fluctuation |
| | |
| **Patient Knowledge of Health or Health Care Status** | |
| 7.01 | Unaware of diagnosis/test results that should have been communicated to Patient |

| | |
|---|---|
| 7.02 | Unaware of scheduled appointments (including having wrong time) |
| 7.03 | Unaware of previously agreed upon plan of care |
| **Medical Equipment/Supplies Adherence** | |
| 8.01 | Unable/declines to use mobility devices (e.g. walker, scooter, cane, etc.) |
| 8.02 | Unable/declines to use prosthetics (e.g. compression stockings, braces, shoe inserts, dentures, etc.) |
| 8.03 | Unable/declines to wear eye glasses |
| 8.04 | Unable/declines to wear hearing aids |
| 8.05 | Unable/declines to use CPAP as recommended |
| 8.06 | Unable/declines to use Oxygen/nebulizer (breathing equipment) as recommended |
| 8.07 | Unable/declines to use equipment not listed above |
| 8.07 | Unable/declines order for recommended equipment (e.g. Patient states, "I don't want a glucometer.") |
| 8.08 | Using someone else's equipment/supplies |
| 8.09 | Readings from home equipment do not correlate with readings in the clinic |
| 8.10 | Does not have needed supplies (e.g. glucometer, blood pressure machine, glucose strips, needles) |
| 8.11 | Patient is having trouble with equipment |
| **Other** | |
| 9.01 | (General statements made by the patient that are concerning, such as "I'm not eating." "I'm not doing what I'm supposed to do." "I'm the least healthy person there is.") |

* "missing/unable/declines" includes patient statements: "I didn't," "I'm not..." "I won't…." "I can't..."

** SAA is calculated by dividing the number of attended appointments by the total number of appointments scheduled.

## Appendix C – Domains of Context

| | |
|---|---|
| 1 | **Access to Care -** The patient's ability to receive care in a timely manner. |
| 2 | **Competing Responsibility** - An obligation or commitment the patient has that impacts their ability to manage their health care. |
| 3 | **Social Support -** A patient's access to a supportive network of individual(s) able to assist if needed. |
| 4 | **Financial Situation -** The patient's ability to afford health and healthcare needs. |
| 5 | **Environment -** The physical and social setting that encompasses a patient. |
| 6 | **Resources -** The possessions and materials available to a patient that can facilitate a person's ability to manage their care. |
| 7 | **Skills, Abilities and Knowledge -** A patient's intellectual understanding and physical ability to manage health care. |
| 8 | **Emotional State -** The emotional condition of a patient as it relates to their ability to manage their health care. |
| 9 | **Cultural Perspective/Spiritual Beliefs -** The customs or a faith-based practice a patient has that impacts health care. |
| 10 | **Attitude Towards Illness** - The feelings a patient has towards their condition that impacts their ability to manage it. |
| 11 | **Attitude Towards Health Care Provider and System** - The patient's feelings and attitudes towards their providers and the health care system that impact their ability to manage their health care. |
| 12 | **Health Behavior** - The patient's actions and lifestyle choices that impact their health care. |

## References


1. Weiner SJ. Contextualizing care: An essential and measurable clinical competency. *Patient Educ Couns.* 2021.

2. Weiner SJ, Schwartz A. *Listening for What Matters: Avoiding Contextual Errors in Health Care, 2nd Edition.* Oxford: New York: Oxford University Press; 2023.

3. Weiner SJ, Kelly B, Ashley N, et al. Content coding for contextualization of care: evaluating physician performance at patient-centered decision making. *Med Decis Making.* 2014;34(1):97-106.

4. Weiner SJ SA, Cyrus K, Binns-Calvey A, Weaver FM, Sharma G, Yudkowsky R Unannounced Standardize Patient Assessment of the Roter Interaction Analysis System: The Challenge of Measuring Patient-Centered Communication. *Journal of General Internal Medicine.* 2012:In Press.

5. Weiner SJ, Schwartz A, Sharma G, et al. Patient-collected audio for performance assessment of the clinical encounter. *Jt Comm J Qual Patient Saf.* 2015;41(6):273-278.

6. Weaver FM, Binns-Calvey A, Gonzalez B, et al. Alerting Doctors About Patient Life Challenges: A Randomized Control Trial of a Previsit Inventory of Contextual Factors. *MDM Policy Pract.* 2019;4(1):2381468319852334.

7. Weiner SJ, Schwartz A, Weaver F, et al. Effect of Electronic Health Record Clinical Decision Support on Contextualization of Care: A Randomized Clinical Trial. *JAMA Netw Open.* 2022;5(10):e2238231.

8. Weiner, SW, Binns-Calvey A. Content Coding for Contextualization of Care ("4C"). *YouTube*. uploaded May 27 2021 https://www.youtube.com/watch?v=fBFmHk8n3FU.

9. Weiner SJ, Schwartz A, Sharma G, et al. Patient-centered decision making and health care outcomes: an observational study. *Ann Intern Med.* 2013;158(8):573-579.