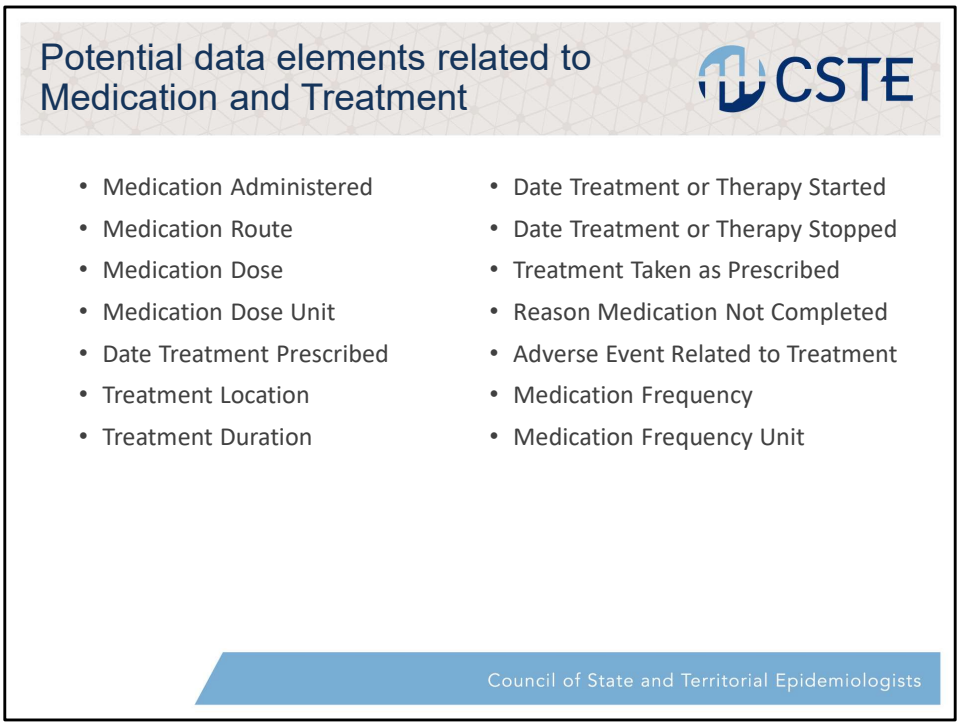
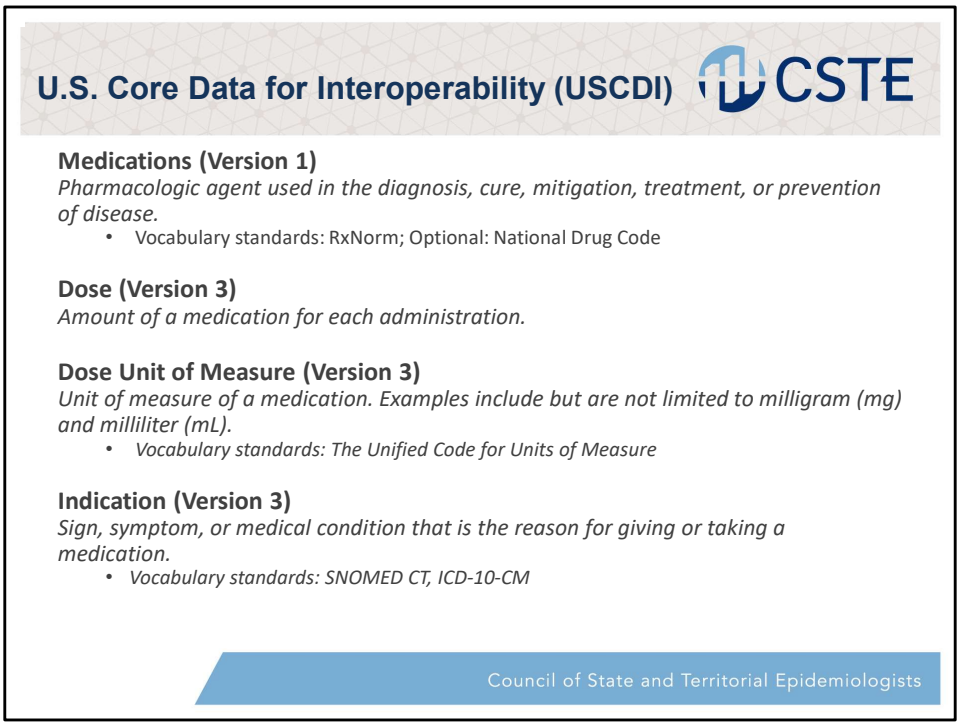
Good morning and welcome to the background presentation for the Medication and Treatment data-element specific team.

Today we will be learning about how current standards capture information related to medication.



Here is a brief overview of many of the data elements and concepts related to medication and treatment used either in Message Mapping Guides or in other established standards. In addition to identifying which medications a patient may have been administered, it is common to capture information on dosage, route, when medication was taken, and whether the medication was taken as prescribed.

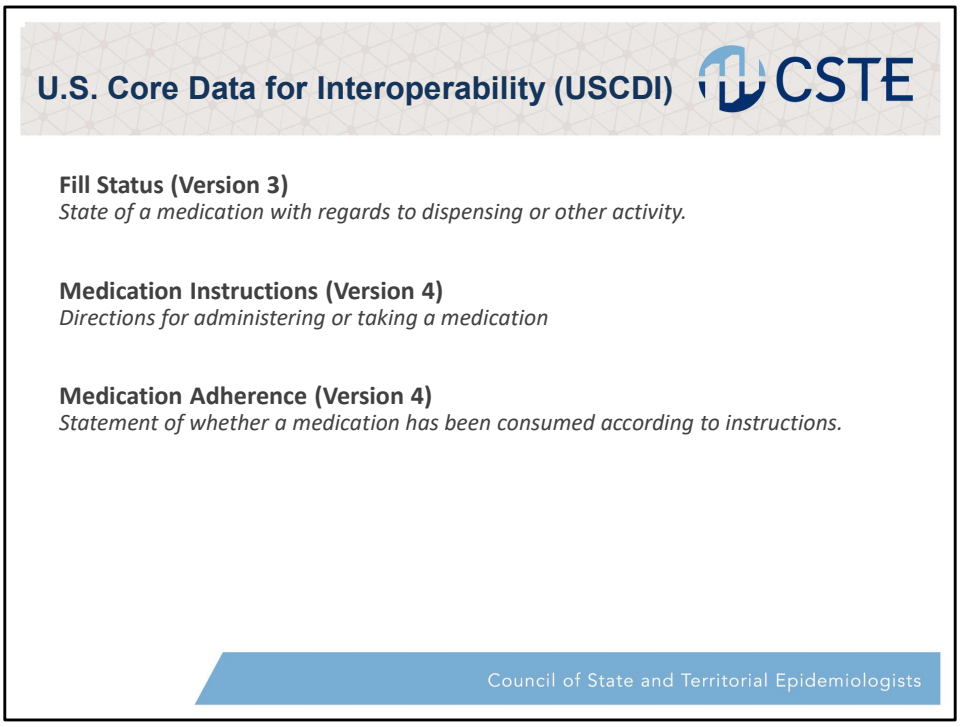


Medication was first included as a data class in USCDI version 1. In this version, it contained only one data element to capture the medication prescribed. In USCDI version 4, there are 7 data elements within the medication data class. The first four are shown here.

Medications refers to the pharmacologic agent used in the diagnosis, cure, mitigation, treatment, or prevention of disease. USCDI uses RxNorm as the code set for medications.

Dose and Dose Unit of Measure – refer to the amount and unit of medication for each administration.

Indication – captures the sign, symptom, or medical condition that is the reason for giving or taking the medication. It uses SNOMED CT or ICD-10-CM as the vocabulary standards.

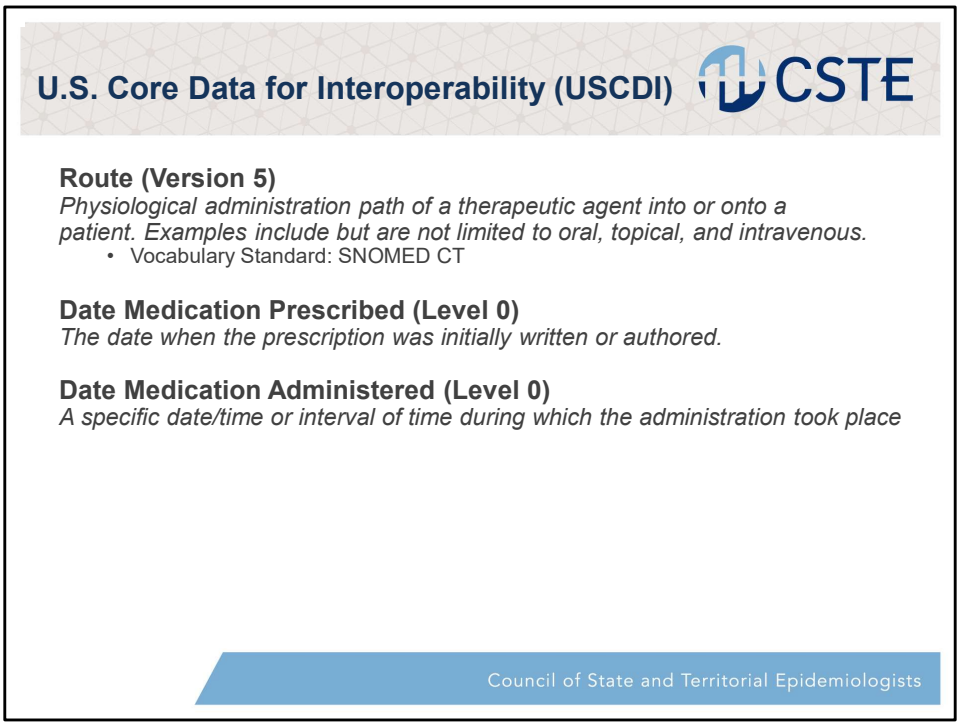


The remaining three data elements in the medications data class in version 4 of USCDI are shown here.

Fill status captures whether medication was dispensed. This is typically used by pharmacy systems to track the status of a prescription. *Examples include dispensed, partially dispensed, and not dispensed.*

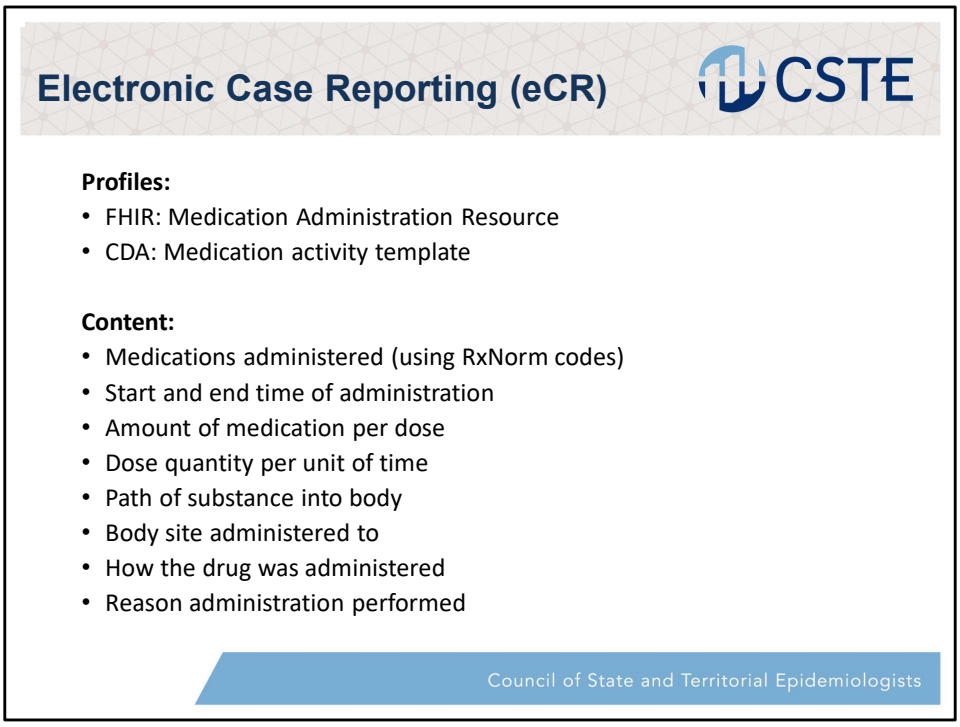
Medication Instructions captures directions for administering or taking the medication. *Examples include prescription directions for taking a medication with meals, and package instructions for over-the-counter medications.*

Medication Adherence captures whether the medication was taken according to the instructions. *Examples include taking as directed, taking less than directed, and not taking.*



The USCDI version 5 draft adds Route to capture the path of administration of the therapeutic agent.

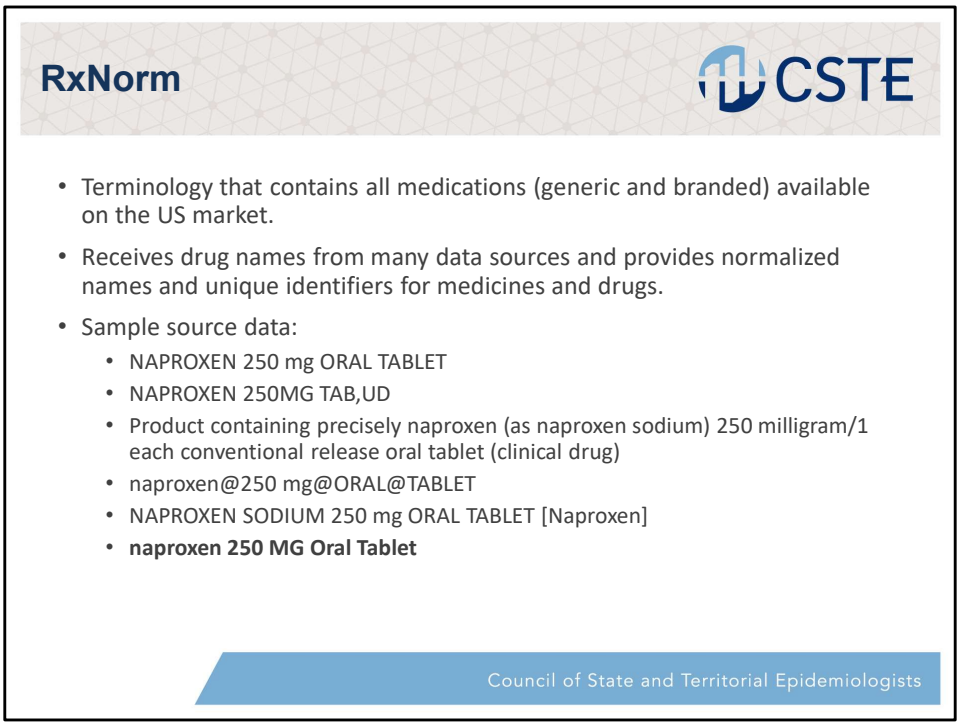
Among the additional 27 data elements identified in the medication data class across Levels 0, 1, or 2, there are two more data elements that represent concepts routinely used in MMGs – date medication prescribed, and data medication administered, both of which are level 0 meaning they are in the most rudimentary stages of standardization and are not used in most settings.



Electronic lab reporting does not capture medications but electronic case reporting does capture medications relevant to the reportable event. The FHIR eICR Implementation Guide contains the Medication Administration Resource which indicates when a medication is consumed by the patient or administered to the patient. Similarly, the CDA eICR has a Medication Activity template which describes medication administrations that have occurred or are intended to occur

The content captured in FHIR and CDA is similar and contains information that is of interest to public health, including

- Which medications were administered, using RxNorm codes.
- The start and end time of administration.
- The amount of medication per dose
- the dose quantity per unit of time (the rate)
- The path of the substance into body (the route)
- The body site to which the medication was administered
- How the drug was administered (the method)
- And the reason for administration



RxNorm was created by the National Library of Medicine to provide a single system for unambiguously identifying brand-name and generic drugs. This allows hospitals, clinics, pharmacies, health systems, and payers to communicate and integrate even if using different drug identification and classification systems. RxNorm contains information for drugs only; it does not include dietary supplements, medical devices, radioactive agents, or food items.

RxNorm is referenced within USCDI, and EHR certification criteria require that EHRs be capable of electronically creating and transmitting prescription information, with medications represented in RxNorm. RxNorm is also currently used in MMGs to capture medications.

RxNorm functions by looking across 14 source vocabularies including CVX and SNOMEDCT-US and groups the data into concepts. As an example, RxNorm might collect all these Naproxen concepts from it's source vocabularies and group these as synonyms of one single concept, which they define as the concept indicated in bold, assigning a unique code to that concept, and linking all the synonyms to that single code.

RxNorm

RXNORM uses term types (TTYs) to indicate generic and branded drug names at different levels of specificity.

Name	Description	Example
Ingredient	A compound or moiety that gives the drug its distinctive clinical properties.	Fluoxetine
Semantic Clinical Drug	Ingredient + Strength + Dose Form	Fluoxetine 4 MG/ML Oral Solution
Semantic Brand Drug	Ingredient + Strength + Dose Form + Brand Name	Fluoxetine 4 MG/ML Oral Solution [Prozac]
Generic Pack	{# (Ingredient + Strength + Dose Form) / # (Ingredient + Strength + Dose Form)} Pack	{11 (varenicline 0.5 MG Oral Tablet) / 42 (varenicline 1 MG Oral Tablet) } Pack
Brand Name Pack	{# (Ingredient Strength Dose Form) / # (Ingredient Strength Dose Form)} Pack [Brand Name]	{12 (Ethinyl Estradiol 0.035 MG / Norethindrone 0.5 MG Oral Tablet) / 9 (Ethinyl Estradiol 0.035 MG / Norethindrone 1 MG Oral Tablet) / 7 (Inert Ingredients 1 MG Oral Tablet) } Pack [Leena 28 Day]

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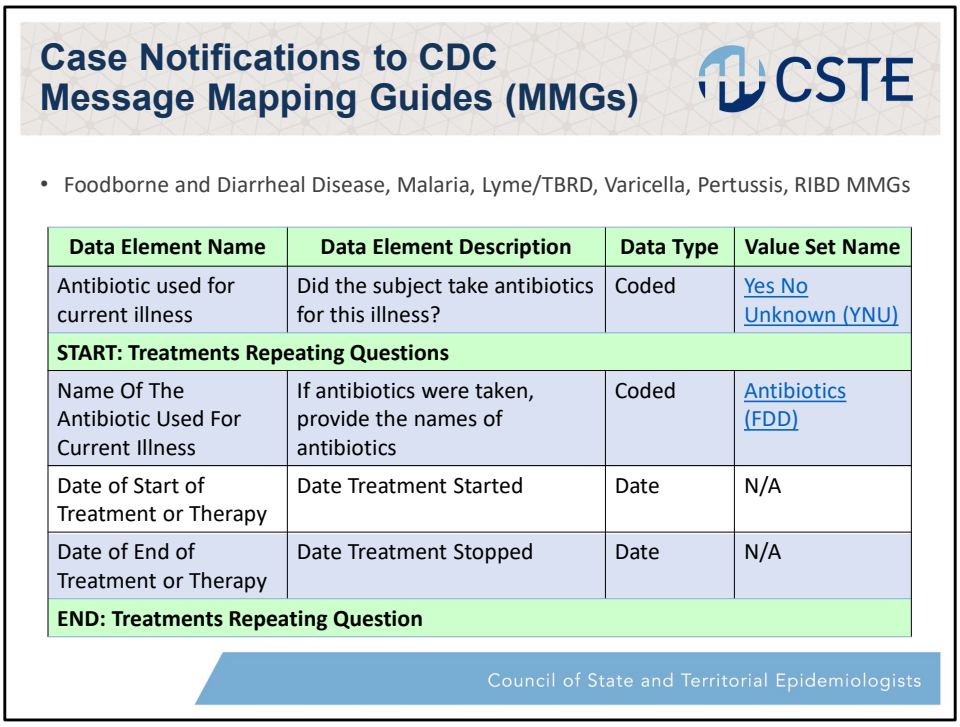
An important concept within RxNorm is term types. RXNORM uses term types to indicate generic and branded drug names at different levels of specificity. The "ingredient" term type captures just the ingredient that gives the drug its distinct clinical properties, such as Fluoxetine. However, other term types, including semantic clinical drug, semantic brand drug, generic pack, and brand name pack include the ingredient, strength, and dose form, such as “Fluoxetine 4 MG/ML Oral Solution”

This is relevant because what is currently requested in MMGs can be different than what is included in eCR.

To-date, when capturing information on medications, MMGs value sets have included RxNorm codes with a term type of ingredient. However, the eICR IG says, “A medication should be recorded as a pre-coordinated ingredient + strength + dose form where possible. This includes RxNorm codes whose Term Type is semantic clinical drug, semantic brand drug, generic pack, or Brand Name Pack. Moving forward, it is likely that health departments will be receiving RxNorm codes in these term types and will need to be ready to capture it.



Case Notifications to CDC Message Mapping Guides (MMGs)

CSTE

- Foodborne and Diarrheal Disease, Malaria, Lyme/TBRD, Varicella, Pertussis, RIBD MMGs

Data Element Name	Data Element Description	Data Type	Value Set Name
Antibiotic used for current illness	Did the subject take antibiotics for this illness?	Coded	Yes No Unknown (YNU)
START: Treatments Repeating Questions			
Name Of The Antibiotic Used For Current Illness	If antibiotics were taken, provide the names of antibiotics	Coded	Antibiotics (FDD)
Date of Start of Treatment or Therapy	Date Treatment Started	Date	N/A
Date of End of Treatment or Therapy	Date Treatment Stopped	Date	N/A
END: Treatments Repeating Question			

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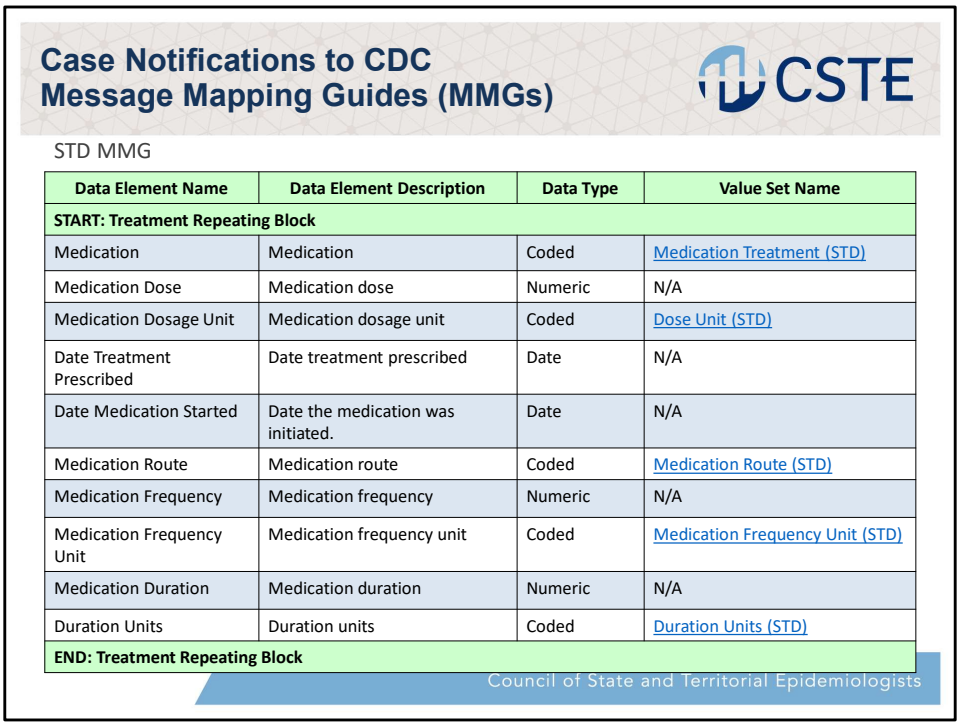
Many MMGs ask about medication, including those listed on this slide. For case notifications, the most important information being collected for medication or treatment includes:

- If medications are given
- What medications are given
- When the medication was started, stopped, and the duration of administration

The most common approach uses a repeating group with a parent data element that has the medication as well as some combination of start date, stop date, or duration of treatment.

Shown here is the repeating group from the Cholera and Vibriosis page of the Foodborne and Diarrheal Disease MMG, and all the MMGs listed above use a similar group. The name of the antibiotic is captured using an RxNorm code, and the treatment start and end dates are also requested.

Currently, public health gets most of this information from case interviews, provider reports, or review of EHRs, but not typically from eCR.



Case Notifications to CDC Message Mapping Guides (MMGs)

CSTE

STD MMG

Data Element Name	Data Element Description	Data Type	Value Set Name
START: Treatment Repeating Block			
Medication	Medication	Coded	Medication Treatment (STD)
Medication Dose	Medication dose	Numeric	N/A
Medication Dosage Unit	Medication dosage unit	Coded	Dose Unit (STD)
Date Treatment Prescribed	Date treatment prescribed	Date	N/A
Date Medication Started	Date the medication was initiated.	Date	N/A
Medication Route	Medication route	Coded	Medication Route (STD)
Medication Frequency	Medication frequency	Numeric	N/A
Medication Frequency Unit	Medication frequency unit	Coded	Medication Frequency Unit (STD)
Medication Duration	Medication duration	Numeric	N/A
Duration Units	Duration units	Coded	Duration Units (STD)
END: Treatment Repeating Block			

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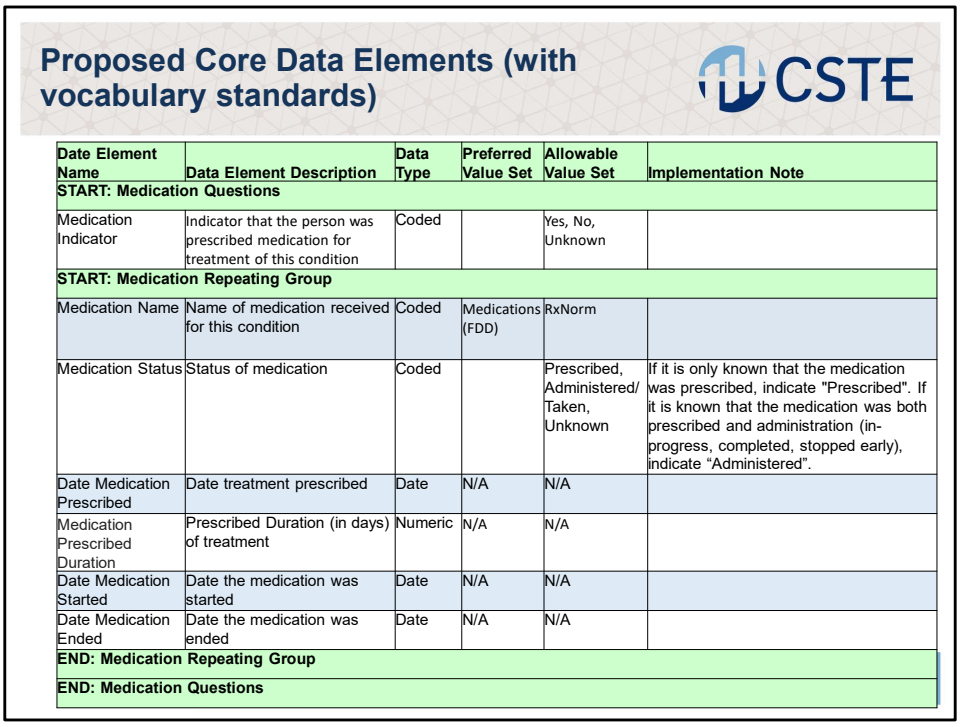
Similarly, the STD MMG asks about which medication was administered, the start date, and the duration. It then goes beyond the other MMGs and captures additional information on date treatment was prescribed, and the dosage, route, and frequency.



Proposed Core Data Elements (with vocabulary standards)

CSTE

Date Element Name	Data Element Description	Data Type	Preferred Value Set	Allowable Value Set	Implementation Note
START: Medication Questions					
Medication Indicator	Indicator that the person was prescribed medication for treatment of this condition	Coded		Yes, No, Unknown	
START: Medication Repeating Group					
Medication Name	Name of medication received for this condition	Coded	Medications (FDD)	RxNorm	
Medication Status	Status of medication	Coded		Prescribed, Administered/ Taken, Unknown	If it is only known that the medication was prescribed, indicate "Prescribed". If it is known that the medication was both prescribed and administration (in-progress, completed, stopped early), indicate "Administered".
Date Medication Prescribed	Date treatment prescribed	Date	N/A	N/A	
Medication Prescribed Duration	Prescribed Duration (in days) of treatment	Numeric	N/A	N/A	
Date Medication Started	Date the medication was started	Date	N/A	N/A	
Date Medication Ended	Date the medication was ended	Date	N/A	N/A	
END: Medication Repeating Group					
END: Medication Questions					

The proposed **Medication** section begins with a **Medication Indicator**, a coded data element used to signify whether a person received any medication for the condition. This indicator serves as an essential flag to quickly identify the presence of medication therapy.

Following this, we have **a Repeating Group**, which includes multiple data elements to capture detailed information about each specific medication. The proposal is to use a repeating group to capture medication. This would be the base, and other medication-related data elements could be added when needed by specific programs (for example, data elements such as route, dose), but the additional information would need to align with standards and not modify/shorten this proposed group.

Within this group, the **Medication Name** is recorded as a coded data element, referencing standardized medication terminology. This data element allows for capturing both generic medication concepts (e.g., amoxicillin) and more specific medication details (e.g., amoxicillin 400mg/5mL suspension) without requiring jurisdictions to map between them. We are proposing a new approach in an attempt to balance the need for detailed medication data and practical implementation. The proposal includes allowing all RxNorm codes as the set of allowable values. This

approach means any valid RxNorm code could be sent to the Medication Value Processing System (MVPS), enabling comprehensive data capture. Example value sets may be provided by CDC programs to indicate which medications are of specific interest for that condition, ensuring targeted data collection without overwhelming surveillance systems.

The **Medication Status** data element indicates whether the medication was prescribed, or administered, using a coded format. Here are definitions pulled from FHIR resources to describe each value.
•Prescribed: An order for both supply of the medication and the instructions for administration of the medicine to a patient.
•Administered: When a patient actually consumes a medicine, or it is otherwise administered to them. The word "Taken" has also added to this term for clarity of users.
- If a medication is just known to be prescribed, medication status would be "prescribed". If the medication was prescribed and administered or taken, the status would be "administered/taken". A status of "prescribed" does not necessarily mean that the medication was not administered, just that it is only known that the medication was prescribed, and whether it was actually consumed is unknown.

Medication Duration captures how long the medication was to be taken.

During the Medication Data-element specific team call, we will discuss these proposed data elements and value sets as well as whether a repeating group such as this one should be considered as a core surveillance data element group. Thank you for your time and we look forward to the discussion on July 12th.