Integrating the Healthcare Enterprise

IHE Quality, Research and Public Health Technical Framework Supplement

Quality Outcome Reporting for EMS (QORE)

HL7® FHIR® R4

Using Resources at FMM Level 0-5

Revision 1.2 – Trial Implementation

Date: October 1, 2021

Author: QRPH Technical Committee

Email: qrph@ihe.net

Please verify you have the most recent version of this document. See here for Trial Implementation and Final Text versions and here for Public Comment versions.

Foreword

This is a supplement to the IHE Quality, Research and Public Health (QRPH) Technical Framework. Each supplement undergoes a process of public comment and trial implementation before being incorporated into the volumes of the Technical Frameworks.

This supplement is published on October 1, 2021 for Trial Implementation and may be available for testing at subsequent IHE Connectathons. The supplement may be amended based on the results of testing. Following successful testing it will be incorporated into the QRPH Technical Framework. Comments are invited and may be submitted at http://www.ihe.net/QRPH_Public_Comments.

This supplement describes changes to the existing technical framework documents.

"Boxed" instructions like the sample below indicate to the Volume Editor how to integrate the relevant section(s) into the relevant Technical Framework volume.

Amend Section X.X by the following:

Where the amendment adds text, make the added text **bold underline**. Where the amendment removes text, make the removed text ~~**bold strikethrough**~~. When entire new sections are added, introduce with editor's instructions to "add new text" or similar, which for readability are not bolded or underlined.

General information about IHE can be found at www.ihe.net.

Information about the IHE Quality, Research and Public Health domain can be found at ihe.net/IHE_Domains.

Information about the organization of IHE Technical Frameworks and Supplements and the process used to create them can be found at http://ihe.net/IHE_Process and http://ihe.net/Profiles.

The current version of the IHE Quality, Research and Public Health Technical Framework can be found at http://ihe.net/Technical_Frameworks.

CONTENTS

Introduction to this Supplement

Whenever possible, IHE profiles are based on established and stable underlying standards. However, if an IHE domain determines that an emerging standard has high likelihood of industry adoption, and the standard offers significant benefits for the use cases it is attempting to address, the domain may develop IHE profiles based on such a standard. During Trial Implementation, the IHE domain will update and republish the IHE profile as the underlying standard evolves.

Product implementations and site deployments may need to be updated in order for them to remain interoperable and conformant with an updated IHE profile.

This QORE Profile incorporates content from Release 4 of the HL7® FHIR® specification. HL7 describes FHIR Change Management and Versioning at https://www.hl7.org/fhir/versions.html.

HL7 provides a rating of the maturity of FHIR content based on the FHIR Maturity Model (FMM): level 0 (draft) through N (Normative). See http://hl7.org/fhir/versions.html#maturity.

The FMM levels for FHIR content used in this profile are:

FHIR Content (Resources, ValueSets, etc.)	FMM Level
MeasureReport	2
Composition	2
Patient	5
AllergyIntolerance	3
Procedure	3
Medication Statement	3
Medications Administration	2
Clinical Impression	0
Diagnostic report	3
Encounter	2
Observation	5
Condition	3
Location	3
Document Reference	3
Device	2

This transaction profile will facilitate electronic data capture of quality measure data to enable automated data capture and streamline quality measure analysis. This will improve the timeliness and accuracy of the information used to compute EMS quality measures.

Open Issues and Questions

1. Whether or not the EMR can support a multi patient query for quality.
2. The committee has elected to model these use cases as two transactions and three actors. We are seeking feedback on this approach from the IHE FHIR Task Force.
3. There are a number of issues relating to the FHIR mapping and resources needed to support this profile:
    a. Investigate the FHIR process for defining the resources required to fulfill NEMSIS.
    b. The injury information may need to be more extensive modeling in FHIR.
    c. There is no value set in FHIR relating to the level of care of ambulance units.
    d. Extensions in FHIR need to be made to help include some of the needed attributes.
    e. IHE has filed a ticket against the FHIR specification #16237 to allow for EMS events to be recorded in a status history without the use of the extension
    f. IHE has filed a ticket against the FHIR specification #16238 to allow for there to be an outcome element for the end of the encounter.
    g. Document reference for Advanced Directives in the FHIR mapping table can support the use case as it exists today. Currently there are ongoing efforts within HL7 to make available the clauses of an advanced directives available in coded form.
    h. There is no mapping available in FHIR for indicating the mechanism of injury.
4. LOINC code concepts for EMS indicate NEMSIS even where not US specific concepts. May need new LOINC codes.
5. Need a LOINC for Last Known Well
6. Need value set for Hospital Capability
7. This profile specifies patient-level quality data (individual) to be sent to optimize the ability of the quality measurement organization to perform analysis. Aggregate reporting is not specified in scope at this time.

Closed Issues

1. Whether or not the EMR can support a multi patient query for quality.

    (2/15/2018) The committee has decided to make both the Data consumer transactions required, however we are seeking feedback from early adopters for any challenges with this approach. The rationale with supporting both transactions supports the notion that there will never be a situation where two implementers are conformant to the profile and not able to interoperate.

IHE Technical Frameworks General Introduction

The IHE Technical Frameworks General Introduction is shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to this document where appropriate.

9 Copyright Licenses

IHE technical documents refer to, and make use of, a number of standards developed and published by several standards development organizations. Please refer to the IHE Technical Frameworks General Introduction, Section 9 - Copyright Licenses for copyright license information for frequently referenced base standards. Information pertaining to the use of IHE International copyrighted materials is also available there.

10 Trademark

IHE® and the IHE logo are trademarks of the Healthcare Information Management Systems Society in the United States and trademarks of IHE Europe in the European Community. Please refer to the IHE Technical Frameworks General Introduction, Section 10 - Trademark for information on their use.

IHE Technical Frameworks General Introduction Appendices

The IHE Technical Framework General Introduction Appendices are components shared by all of the IHE domain technical frameworks. Each technical framework volume contains links to these documents where appropriate.

Update the following appendices to the General Introduction as indicated below. Note that these are not appendices to this domain's Technical Framework (TF-1, TF-2, TF-3 or TF-4) but rather, they are appendices to the IHE Technical Frameworks General Introduction located here.

Appendix A – Actors

*Add the following **new or modified** actors to the IHE Technical Frameworks General Introduction Appendix A:*

New (or modified) Actor Name	Description
Data Sender	Sends the measurement data

The table below lists *existing* actors that are utilized in this profile.

Complete List of Existing Actors Utilized in this Profile

Existing Actor Name	Definition
Data Responder	A Data Responder is a system that may have information that can be used by a Form Manager in preparation of form data. It is available to respond to RESTful queries from trusted Form Manager systems.
Data Consumer	The Data Consumer is responsible for initiating a query to a Data Responder for resource information, and receiving the result of the query

Appendix B – Transactions

*Add the following **new or modified** transactions to the IHE Technical Frameworks General Introduction Appendix B:*

New (or modified) Transaction Name and Number	Definition
Query for EMS Quality Data [QRPH-55]	Query request for EMS quality measure data.
Send Quality Measure Data [QRPH-56]	Sends a Report with data needed to compute EMS Quality Measures

Appendix D – Glossary

*Add the following **new or modified** glossary terms to the IHE Technical Frameworks General Introduction Appendix D:*

New (or modified) Glossary Term	Definition	Synonyms	Acronym/ Abbreviation
No new terms			

Volume 1 – Profiles

Copyright Licenses

N/A

Domain-specific additions

N/A

Add new Section X

X Quality Outcome Reporting for EMS (QORE) Profile

New approaches to improvement to Emergency Medical Services (EMS) include leveraging clinical and process quality measures, including patient outcomes. EMS is unique to medicine as it is impossible to separate administration/operations from clinical care. EMS is the only component of the healthcare system that brings the care to the patient. All other components require the patient to come to the care provider. These efforts are often manual and entail manual data collection, rather than utilizing electronic information that is already collected in EMS electronic Patient Care Record (ePCR) systems and provider electronic health records systems. This profile will facilitate electronic data capture of quality measure data to enable automated data capture and streamline quality measure analysis. This will improve the timeliness and accuracy of the information used to compute EMS quality measures.

This profile is constrained to the quality measure sets that support Stroke, CPR, and STEMI, which include measures that need both hospital and EMS sourced data. The exchange of the patient identifier is out of scope for this profile. This must be determined by the implementation (e.g., out of band, PIX, PDQ).

X.1 QORE Actors, Transactions, and Content Modules

This section defines the actors, transactions, and/or content modules in this profile. General definitions of actors are given in the Technical Frameworks General Introduction Appendix A. IHE Transactions can be found in the Technical Frameworks General Introduction Appendix B. Both appendices are located at http://ihe.net/Technical_Frameworks/#GenIntro

Figure X.1-1 shows the actors directly involved in the QORE Profile and the relevant transactions between them. If needed for context, other actors that may be indirectly involved due to their participation in other related profiles are shown in dotted lines. Actors which have a required grouping are shown in conjoined boxes (see Section X.3).

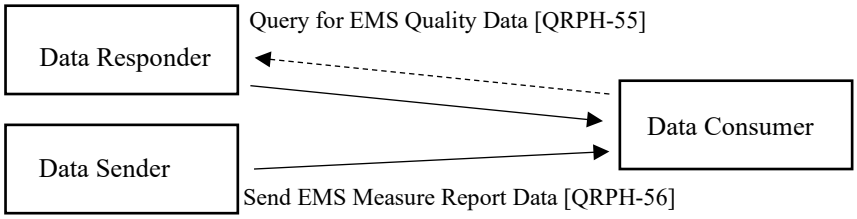

Figure X.1-1: QORE Actor Diagram

Table X.1-1 lists the transactions for each actor directly involved in the QORE Profile. To claim compliance with this profile, an actor shall support all required transactions (labeled "R") and may support the optional transactions (labeled "O").

Table X.1-1: QORE Profile - Actors and Transactions

Actors	Transactions	Initiator or Responder	Optionality	Reference
Data Responder	Query for EMS Quality Data [QRPH-55]	Responder	R	QRPH TF-2: 3.55
Data Consumer	Query for EMS Quality Data [QRPH-55]	Initiator	R	QRPH TF-2: 3.55
	Send EMS Measure Report Data [QRPH-56]	Responder	R	QRPH TF-2: 3.56
Data Sender	Send EMS Measure Report Data [QRPH-56]	Initiator	R	QRPH TF-2: 3.56

X.1.1 Actor Descriptions and Actor Profile Requirements

Transactional requirements are documented in QRPH TF-2 Transactions. This section documents any additional requirements on profile's actors.

FHIR resource requirements are documented in QRPH TF-3 Content Modules. This section documents any additional requirements on profile's actors.

X.1.1.1 Data Responder

The Data Responder shall be responsible for the creation of content and the transmission of a QORE document to a Data Consumer.

X.1.1.2 Data Consumer

The Data Consumer is responsible for initiating a query to the Data Responder system for documents meeting certain criteria and can retrieve selected documents supplied by the Data Responder. Data Consumer is also responsible for receiving EMS quality data needed to compute EMS measures from the Data Sender.

X.1.1.3 Data Sender

The Data Sender is responsible for sending EMS quality data needed to compute EMS measures to the Data Consumer.

X.2 QORE Actor Options

Options that may be selected for each actor in this profile, if any, are listed in the Table X.2-1. Dependencies between options, when applicable, are specified in notes.

Table X.2-1: Quality Outcome Reporting for EMS– Actors and Options

Actor	Option Name	Reference
Data Responder	No options	--
Data Consumer	No options	--
Data Sender	No options	--

X.3 QORE Required Actor Groupings

There are no required actor groupings for this profile

X.4 QORE Overview

The retrieval of EMS quality measures is shown with a query exchange. This will represent the process of a query request for EMS quality measures if this profile were to be implemented. The use case will show the use of EMS registry quality measures (e.g., STEMI) to show the importance they have to patient care and measuring outcomes.

This profile assumes that all of the data needed to be queried is always available within the infrastructure available to the querying system.

The data elements relating to paramedicine care used in measuring quality data are described in Appendix A. The quality measures that are used and referencing this profile are described in Appendix B.

X.4.1 Concepts

Quality measures can be used to analyze scene data and patient outcomes providing the potential to improve patient care. EMS providers are beginning to establish quality measures of emergency medical services system performance. These quality measures are limited due to lack access to the patient outcome information after the patient is transferred to hospital care. Quality measure programs are important to EMS systems to identify opportunities for process and clinical intervention improvements in pre-hospital care.

X.4.2 Use Cases

X.4.2.1 Use Case #1: Query for EMS Data using an HIE

X.4.2.1.1 Query for EMS Data using an HIE Use Case Description

A health information exchange has incorporated a quality measurement program for the EMS providers in its region. The HIE information includes data from EMS and hospital discharges. The quality management service queries the HIE for patient level EMS quality data and uses this to compute EMS CPR measures. The performance measures show one community with higher survival rates at discharge than the remainder of the region. Further analysis provides an opportunity to learn from that region ways to improve survival rates across the whole region.

X.4.2.1.2 Send EMS Quality Data Process Flow

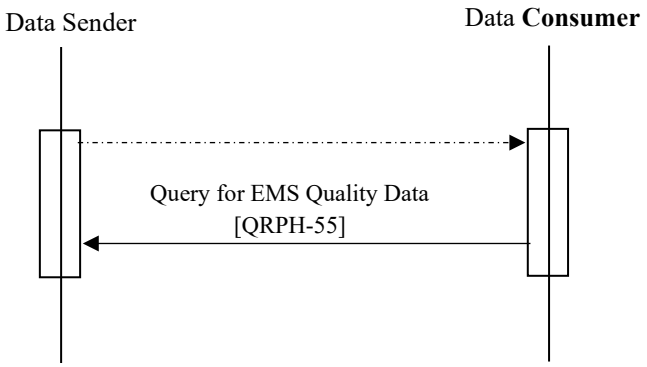

Figure X.4.2.1.2-1: Basic Process Flow in QORE Profile

Pre-conditions:

1. The health information exchange has information from both EMS and hospitals sufficient to compute the EMS quality measures.
2. The HIE has a relationship with a quality measurement organization.

Main Flow:

1. EMS and hospitals routinely share patient care information with the HIE.
2. The quality measurement organization routinely queries the HIE for patient level quality data and uses it to compute the EMS quality measures.

Post-conditions

1. The Quality measures are computed and information is available to inform improvements, care quality, and efficiency in the region.

X.4.2.2 Use Case #2: Emergency Response for Heart Attack

This use case describes how EMS quality measure data can be retrieved from an HIE for computation of EMS quality measures.

X.4.2.2.1 Emergency Response for Heart Attack Use Case Description

A fifty-year-old man develops heart attack symptoms. He calls 911 for an emergency transport to a hospital. EMS responds, and their interventions include defibrillation, chest compressions, and a 12-lead ECG. The patient is taken to the nearest hospital ED and is evaluated in the emergency department and catheterization lab for a percutaneous coronary intervention (PCI) associated with a ST elevation myocardial infarction (STEMI) before being admitted to the hospital. The patient is discharged from the hospital with a good cerebral performance score, indicating a positive outcome from the STEMI episode. Relevant hospital-sourced quality measure information is provided to the HIE they are participating in, from the hospital from both the ED and main EHR systems. The ambulance system is then able to query the HIE using the Query for

EMS Quality Data [QRPH-55] to retrieve their patients' hospital outcomes, for quality care analysis and self-assessment in accordance with their EMS performance measurement program.

X.4.2.2.2 Emergency Response for Heart Attack Process Flow

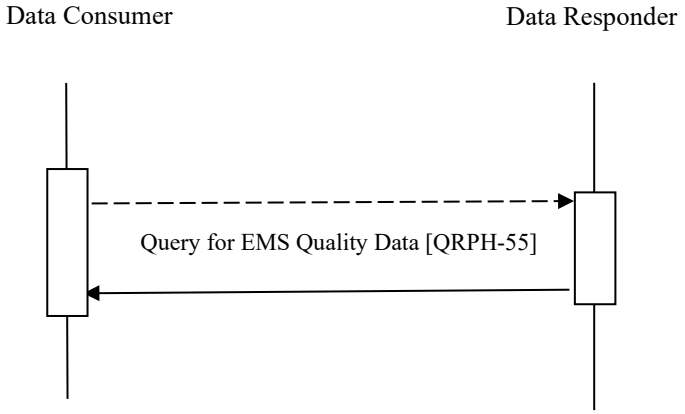

Figure X.4.2.2.2-1: Basic Process Flow in QORE Profile

Pre-conditions:

1. The person calling 911 is suffering from an emergent issue.
2. An EMS response team is sent out for the call.
3. The EMS team identifies this as a STEMI patient and performs the necessary interventions.
4. Patient condition is assessed and resolved in the hospital.
5. The hospital has provided the patient's health record to an HIE.

Main Flow:

1. EMS Quality measures data is requested from the HIE by the EMS entity that carried out this patient's transport
2. The query and is able to provide the hospital-sourced EMS quality measure data to the Ambulance system that initiated the query.
3. The Ambulance system consumes the information provided in the query.

Post-conditions:

1. The EMS quality measures are used to assess the quality of care provided by EMS based on the data that was queried and used to make improvements in patient care and processes.

X.4.2.3 Use Case #3: Send EMS Quality Data to a Quality Measure Organization

This use case describes how EMS quality measures data is sent to the quality measure entity by the hospital or by an EMS that are not participants in an HIE.

X.4.2.3.1 Send EMS Quality Data Use Case Description

A hospital receives a 79-year-old man who came in via ambulance for a stroke from a 911 request. The patient was treated for the stroke and then discharged to a rehab facility. The hospital participates in a quality management program for Stroke that includes EMS measures. The hospital sends the patient level quality measure data to a stroke quality measurement organization. Once the quality measure entity receives the information for the stroke patients for the defined reporting period, it can carry out quality measure analysis. It is determined that improved education in stroke assessments are needed for EMS employees in the local area.

X.4.2.3.2 Send EMS Quality Data Process Flow

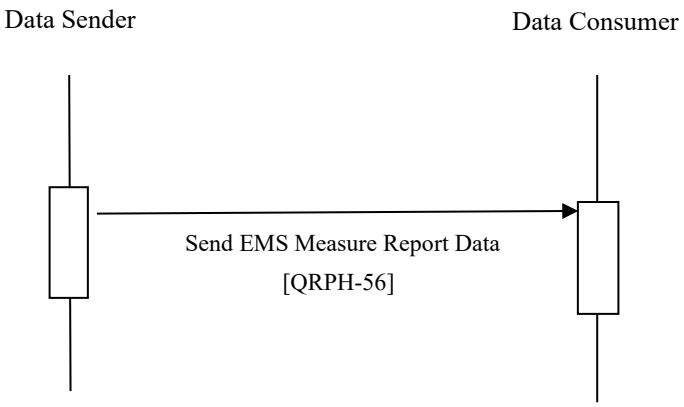

Figure X.4.2.3.2-1: Basic Process Flow in QORE Profile

Pre-conditions:

1. The hospital has imported the relevant EMS quality data. This can be done via query of the EMS system or the Hospital.
2. The information from the hospital has recorded the patient care information.
3. The Hospital is unable to participate in an HIE.

Main Flow:

1. The hospital sends the quality measure entity the required quality measure data (including what was imported from the EMS transport).
2. The quality measure entity receives the quality measure data and is able to use the data to carry out quality measures analysis.

Post-conditions:

1. The quality measure entity determines that education of EMS providers in the area are needed.

X.5 QORE Security Considerations

There should be a trusted connection between the hospital system and the EMS system to ensure the safety of the patient information. This profile assumes either implied or explicit data sharing agreements between the data exchange entities. In the instance where a quality measurement entity needs de-identified data, the IHE ITI Handbook on De-identification should be referenced.

Actors in the QORE Profile consume patient demographics, clinical and administrative information which may include personally identifiable health information. This information must be protected against unauthorized access, modification or tampering. This profile recommends but does not require that connections between actors be grouped with the Secure Node or Secure Application Actors from the IHE ITI ATNA Profile.

These actors should ensure appropriate user authentication and authorization to access the application and protect personally identifiable health information against unauthorized access, modification or tampering while the information is in transit. This profile recommends but does not require the implementers to use the IHE ITI XUA Profile.

X.6 QORE Cross Profile Considerations

The information that is imported by the IHE PCC Paramedicine Care Summary (PCS) Profile Content Consumer implementing the Quality Data Import Option should be leveraged to support content needed for the Quality Outcome Reporting for EMS (QORE) Data Sender or Data Responder Actors.

X.6.1 QORE Audit Message

X.6.1.1 Data Responder Actor audit message:

	Field Name	Opt	Value Constraints
Event **AuditMessage/ EventIdentification**	EventID	M	EV(110106, DCM, “Export”)
	EventActionCode	M	“C” (create) for QRPH-55 (Query for EMS Quality Data)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV(“QRPH-55”, “IHE Transactions”, “Query for EMS Quality Data”)
Source (Data Responder Actor) (1)			
Human Requestor (0..n)			
Destination (Data Consumer Actor) (1)			
Audit Source (Data Responder Actor) (1)			
Patient (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Responder facility and responder application; concatenated together, separated by the | character.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Destination AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and responder application; concatenated together, separated by the | character.
	AlternativeUserID	*M*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC3881.

Audit Source AuditMessage/ AuditSourceIdentification	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

X.6.1.2 Data Consumer Actor audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (create) for QRPH-55 (Query for EMS Quality Data)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("QRPH-55", "IHE Transactions", "Query for EMS Quality Data")
Source (Data Consumer Actor) (1)			
Destination (Data Responder Actor) (1)			
Audit Source (Data Consumer Actor) (1)			
Patient(1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and consumer application; concatenated together, separated by the | character
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Destination AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and responder application; concatenated together, separated by the | character
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

Audit Source AuditMessage/ AuditSourceIdentification	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

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Patient (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

X.6.1.3 Data Sender Actor audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110106, DCM, "Export")
	EventActionCode	M	"C" (create) for QRPH-56 (Send EMS Measure Report Data)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("QRPH-56", "IHE Transactions", "Send EMS Measure Report Data")
Source (Data Responder Actor) (1)			
Human Requestor (0..n)			
Destination (Data Consumer Actor) (1)			
Audit Source (Data Responder Actor) (1)			
Patient (1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Sender facility and responder application; concatenated together, separated by the | character.
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

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Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Destination AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and responder application; concatenated together, separated by the | character.
	AlternativeUserID	*M*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address, as specified in RFC3881.

Audit Source AuditMessage/ AuditSourceIdentification	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

X.6.1.4 Data Consumer Actor audit message:

	Field Name	Opt	Value Constraints
Event AuditMessage/ EventIdentification	EventID	M	EV(110107, DCM, "Import")
	EventActionCode	M	"C" (create) for QRPH-56 (Send EMS Measure Report Data)
	EventDateTime	*M*	*not specialized*
	EventOutcomeIndicator	*M*	*not specialized*
	EventTypeCode	M	EV("QRPH-56", "IHE Transactions", "Send EMS Measure Report Data")
Source (Data Consumer Actor) (1)			
Destination (Data Responder Actor) (1)			
Audit Source (Data Consumer Actor) (1)			
Patient(1)			

Where:

Source AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and consumer application; concatenated together, separated by the | character
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110153, DCM, "Source")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

Human Requestor (if known) AuditMessage/ ActiveParticipant	UserID	M	Identity of the human that initiated the transaction.
	AlternativeUserID	*U*	*not specialized*
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	U	Access Control role(s) the user holds that allows this transaction.
	NetworkAccessPointTypeCode	NA	
	NetworkAccessPointID	NA	

Destination AuditMessage/ ActiveParticipant	UserID	M	The identity of the Data Consumer facility and responder application; concatenated together, separated by the | character
	AlternativeUserID	M	The process ID as used within the local operating system in the local system logs.
	UserName	*U*	*not specialized*
	UserIsRequestor	*M*	*not specialized*
	RoleIDCode	M	EV(110152, DCM, "Destination")
	NetworkAccessPointTypeCode	M	"1" for machine (DNS) name, "2" for IP address
	NetworkAccessPointID	M	The machine name or IP address

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Audit Source AuditMessage/ AuditSourceIdentification	*AuditSourceID*	*U*	*not specialized*
	AuditEnterpriseSiteID	*U*	*not specialized*
	AuditSourceTypeCode	*U*	*not specialized*

Patient (AuditMessage/ ParticipantObjectIdentification)	ParticipantObjectTypeCode	M	"1" (person)
	ParticipantObjectTypeCodeRole	M	"1" (patient)
	ParticipantObjectDataLifeCycle	*U*	*not specialized*
	ParticipantObjectIDTypeCode	M	EV(2, RFC-3881, "Patient Number")
	ParticipantObjectSensitivity	*U*	*not specialized*
	ParticipantObjectID	M	The patient ID in HL7 CX format.
	ParticipantObjectName	*U*	*not specialized*
	ParticipantObjectQuery	*U*	*not specialized*
	ParticipantObjectDetail	M	Type=MSH-10 (the literal string), Value=the value of MSH-10 (from the message content, base64 encoded)

Appendices to Volume 1

Appendix A – Quality measures

Table A-1: Quality Measures

Quality Data Element	Data Description
Emergency Department Discharge Disposition	The patient condition and disposition upon discharge from the Emergency Department
Hospital Discharge Disposition	The patient condition and disposition upon discharge from the Hospital
External Report ID/Number Type	The report ID/Number type of the emergency encounter report sent to the hospital describing the emergency transport event.
External Report ID/Number	The report ID/Number of the emergency encounter report sent to the hospital describing the emergency transport event.
Emergency Department Chief Complaint	The chief complaint of the patient during the time spent in the Emergency Department.
First ED Systolic Blood Pressure	The first systolic blood pressure obtained when the patient entered the Emergency Department.
Emergency Department Recorded Cause of Injury	The cause of injury to the patient recorded by the emergency department.
Emergency Department Procedures (code)	The codes of the procedures that took place while the patient was in the Emergency Department.
Date/time first patient contact	The date/time the responding unit arrived at the patient's side.
Emergency Department Diagnosis	The diagnosis of the patient's condition given during their stay in the emergency department.
Date/Time of Hospital Admission	The date and time that the patient was admitted into the hospital.
Hospital Procedures	The procedures that took place during the patient's hospital stay.
Hospital Diagnosis	The diagnosis given to the patient during their stay in the hospitals.
Total ICU Length of Stay	The length of the patient's stay in the Intensive Care Unit (ICU).
Total Ventilator Days	The total days that the patient has been on a ventilator.
Date/Time of Hospital Discharge	The date and time of a patient's discharge from a hospital.
Outcome at Hospital Discharge	The outcome/condition of the patient during their stay in the hospital.
EMS Organization Identifier	The assigned provider number of the responding agency.
Hospital Admitting Diagnosis	The diagnosis given to the patient when the patient was admitted into the hospital.
Hospital Neurological assessment: Cerebral Performance Category Observation	The neurological assessment / Cerebral performance score of the patient during their stay in the hospital.
Type of service requested	The type of service or category of service requested of the EMS Agency responding for this specific EMS event
Level of care for this unit	The level of care (BLS or ALS) the unit is able to provide based on the units' treatment capabilities for this EMS response.
Additional Response Mode Descriptors	The documentation of response mode techniques used for this EMS response.
Date/Time Procedure Performed	The date/time the procedure was performed on the patient.
Procedure	The procedure performed on the patient.
PSAP Call Date/Time	The date/time the phone rings (911 call to public safety answering point or other designated entity) requesting EMS services.

Quality Data Element	Data Description
Unit Arrived on Scene Date/Time	The date/time the responding unit arrived on the scene; that is, the time the vehicle stopped moving at the scene.
Complaint	The statement of the problem by the patient or the history provider.
Primary Symptom	Primary Symptom
Other Associated symptoms	Other symptoms identified by the patient or observed by EMS personnel
Provider's Primary Impressions	The EMS personnel's impression of the patient's primary problem or most significant condition which led to the management given to the patient (treatments, medications, or procedures).
Provider's Secondary Impressions	The EMS personnel's impression of the patient's secondary problem or most significant condition which led to the management given to the patient (treatments, medications, or procedures).
Date/Time Last Known Well	The estimated date and time the patient was last known to be well or in their usual state of health. This is described or estimated by the patient, family, and/or bystanders.
Destination/Transferred To, Name	The destination the patient was delivered or transferred to.
Destination/Transferred To, Code	The code of the destination the patient was delivered or transferred to.
Incident/Patient Disposition	Type of disposition treatment and/or transport of the patient by this EMS Unit.
Type of Destination	The type of destination the patient was delivered or transferred to
Hospital Capability	The primary hospital capability associated with the patient's condition for this transport (e.g., Trauma, STEMI, Peds, etc.).
Destination Team Pre-Arrival Alert or Activation	Indication that an alert (or activation) was called by EMS to the appropriate destination healthcare facility team. The alert (or activation) should occur prior to the EMS Unit arrival at the destination with the patient.
Resuscitation Attempted By EMS	Indication of an attempt to resuscitate the patient who is in cardiac arrest (attempted, not attempted due to DNR, etc.)
Arrest Witnessed By	Indication of who the cardiac arrest was witnessed by
CPR Care Provided Prior to EMS Arrival	Documentation of the CPR provided prior to EMS arrival
Who Provided CPR Prior to EMS Arrival	Documentation of who performed CPR prior to this EMS unit's arrival.
AED Use Prior to EMS Arrival	Documentation of AED use Prior to EMS Arrival
Who Used AED Prior to EMS Arrival	Documentation of who used the AED prior to this EMS unit's arrival.
Type of CPR Provided	Documentation of the type/technique of CPR used by EMS.
Any Return of Spontaneous Circulation	Indication whether there was any return of spontaneous circulation.
Neurological Outcome at Hospital Discharge	The neurological assessment / Cerebral performance score of the patient at the time of their discharge from the hospital.
Date/Time of Initial CPR	The initial date and time that CPR was started by anyone.
Advanced Directives	The presence of a valid DNR form, living will, or document directing end of life or healthcare treatment decisions.
SBP (Systolic Blood Pressure)	The patient's systolic blood pressure.
DBP (Diastolic Blood Pressure)	The patient's diastolic blood pressure.
Heart Rate	The patient's heart rate expressed as a number per minute.
Pulse Oximetry	The patient's oxygen saturation.
Respiratory Rate	The patient's respiratory rate expressed as a number per minute.

Quality Data Element	Data Description
Blood Glucose Level	The patient's blood glucose level.
Cardiac Rhythm / Electrocardiography (ECG)	The cardiac rhythm / ECG and other electrocardiography findings of the patient as interpreted by EMS personnel.
Stroke Scale Score	The findings or results of the Stroke Scale Type (eVitals.30) used to assess the patient exhibiting stroke-like symptoms.
Pain Scale Score	The patient's indication of pain from a scale of 0-10.
Medication Given	The medication given to the patient
Age	The patient's age (either calculated from date of birth or best approximation)
Age Units	The unit used to define the patient's age
Date of Birth	The patient's date of birth
Cause of Injury	The cause of the event which caused the injury
Mechanism of Injury	The mechanism of the event which caused the injury
Mass causality	Indicator if this event would be considered a mass casualty incident (overwhelmed existing EMS resources)

Appendix B – Sample EMS Measures

The following table elements are example measures that can be supported by this profile. These example measures are taken from multiple quality measure initiatives. These are only intended as examples. The profile can support the variations that can differ between jurisdictions.

Table B-1: Sample EMS Measures

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Hypoglycemia-01	Hypoglycemia	Treatment Administered for Hypoglycemia	Measure of patients who received treatment to correct their hypoglycemia	Displays the number of patients who received EMS intervention that is intended to correct hypoglycemia	Process	Patients receiving treatment intended to correct hypoglycemia (food, administration of oral glucose, dextrose, or glucagon)	Patients identified as being hypoglycemic with a blood sugar of <60mg/dl originating from a 911 request
Hypoglycemia-02	Hypoglycemia	Improved Post-Treatment Condition	Improved blood glucose level after treatment	After treatment is administered and prior to transport or refusal and release, reevaluation of blood sugar is appropriate	Outcome	Not defined at this time	Not defined at this time
Hypoglycemia-03	Hypoglycemia	Hypoglycemic Patients Treated and not Transported	Number of hypoglycemic patients who were treated by EMS and not transported	Hypoglycemic patients have a proportionately high occurrence of being treated without being transported	Outcome	Not defined at this time	Not defined at this time
Hypoglycemia-04	Hypoglycemia	Repeat Response for Patient Previously Not Transported	The number of patients who were treated but not transported and required an additional response within a 24-hour period	Responses to patients who were treated and released or refused transport often need more attention for potential feedback to previous EMS responders	Outcome	Not defined at this time	Not defined at this time
Patients <15 years old that received medication originating from a 911 request	N/A	N/A	N/A	N/A	N/A	N/A	N/A

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
PEDS-03	Pediatric Medication Error	Documentation of estimated weight in kilograms - pediatric	Frequency that weight or length-based estimate are documented in kilograms	Medication errors are common in pediatric patients and are often based on wrong weight	Process	Weight value in kilograms or length-based weight entered	Patients <15 years old that received medication originating from a 911 request
PEDS-04	Medication Error	Medication error rate	Medication error to be drafted by AG	Medication error to be drafted by AG	Process	Number of errors (from chart audit)	Patients <15 years old that received medication originating from a 911 request
PEDS-01	Pediatric Respiratory	Respiratory Assessment - Pediatric	Documented evidence that a respiratory assessment was performed on pediatric patients	Detection of respiratory distress has been shown to be challenging in pediatric patients. Assessment of the pediatric respiratory patient is critically important. Pediatric respiratory distress is a frequent cause for emergency care.	Process	Pediatric patients with SpO2 AND RR measurement	Patients <15 years AND PRI/SEC Impression with (Dyspnea, unspecified, Orthopnea, Shortness of breath, or Other forms of dyspnea) originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
PEDS-02	Pediatric Respiratory	Administration of beta agonist for pediatric asthma	Administration of beta agonist for pediatric asthma	Evidence shows administration of beta agonist improves outcomes for pediatric asthma	Process	Pediatric patients administered (Albuterol, Accuneb, Combivent, DuoNeb, ProAir, Proventil, Ventolin or Vospire) by any means	Patients 2-15 years AND PRI/SEC Impression "Asthma with exacerbation" or "Acute bronchospasm" originating from a 911 request
Seizure-01	Seizure	Blood Glucose Evaluation	Measure of seizure patients who received an evaluation of their blood glucose	Blood glucose is an important diagnostic vital sign for determination of the cause of a seizure	Process	Patients receiving a blood sugar evaluation	Patients with ongoing status seizure activity (also known as status epilepticus, defined as seizing for 5 minutes or more or two or more status seizures in a 5-minute period without regaining consciousness) originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Seizure-02	Seizure	Patient Received Intervention	Measure of patients with ongoing seizure activity for 5 minutes or more or two or more seizures in a 5-minute period without regaining consciousness between them who received intervention (e.g., benzodiazepine) intended to stop the seizure	Patients experiencing status epilepticus are at risk for hypoxia but with benzodiazepines the seizure may be controlled	Process	Patients receiving EMS intervention (e.g., benzodiazepine) aimed at terminating their status seizure	Patients with ongoing status seizure activity (also known as status epilepticus, defined as seizing for 5 minutes or more or two or more status seizures in a 5-minute period without regaining consciousness) originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Seizure-03	Seizure	Patients with Terminated Seizures	Measure of patients with ongoing seizure activity for 5 minutes or more or two or more seizures in a 5-minute period without regaining consciousness between them who had seizures that terminated by any means	N/A	Outcome	Patients with prehospital termination of status seizures	Patients with ongoing status seizure activity (also known as status epilepticus, defined as seizing for 5 minutes or more or two or more status seizures in a 5-minute period without regaining consciousness) originating from a 911 request
Stroke-01	Stroke	Suspected Stroke Receiving Prehospital Stroke Assessment	To measure the percentage of suspected stroke patients who had a stroke assessment performed by EMS	Stroke assessments using prehospital stroke assessment tools can screen for stroke and affect patient destinations	Process	Number of suspected stroke patients who had a stroke assessment performed (CPSS, LAMS, etc.)	Patients with a provider impression of stroke originating from a 911 request
Stroke-02	Stroke	Blood Glucose Measurement for Patients with a Provider Impression of Stroke	Measure percentage of patients with a provider impression of stroke that have a documented blood glucose level	Hypoglycemia is a common stroke mimic and should be ruled out	Process	Patients receiving an evaluation of blood glucose level	Patients with a provider impression of stroke originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Stroke-03	Stroke	Prehospital Notification	Measure of the percentage of patients with a positive prehospital stroke scale and transported by EMS with prenotification of a hospital verified, designated or otherwise identified as Acute Stroke-Ready or higher	Early prenotification by EMS reduces facilities' door to intervention times. Shorter door-to-intervention times have been shown to improve outcomes	Process	Number of prenotifications prior to arrival at the hospital verified, designated or otherwise identified as Acute Stroke-Ready or higher	Patients with a provider impression of stroke originating from a 911 request
Stroke-04	Stroke	Positive Stroke Assessments Transported to a Hospital Verified, Designated or Otherwise Identified as Acute Stroke-Ready or Higher	Measure of the percentage of patients with a positive prehospital stroke assessment transported to a hospital verified, designated or otherwise identified as Acute Stroke-Ready or higher	Hospitals verified, designated or otherwise identified as Acute Stroke-Ready or higher are the proper destination for a suspected stroke. Transport to these facilities have been demonstrated to improve outcomes	Outcome	Patients with a positive stroke assessment transported to a hospital verified, designated or otherwise identified as Acute Stroke-Ready or higher	Number of suspected stroke patients who had a stroke assessment performed (CPSS, LAMS, RACE, etc.) originating from a 911 request
Stroke-05	Stroke	Provider Impression of Stroke with Last Known Well (LKW) Documented	Documented LKW times for patients with a provider impression of stroke	EMS can collect this information from witnesses and/or family on-scene. The LKW is critical for determining the correct and safe in-hospital intervention	Process	Patients with documented LKW time by EMS	Patients with a provider impression of stroke originating from a 911 request
Stroke-06	Stroke	Prehospital Stroke Care Bundle	Measures the percentage of patients that received stroke measures 1 to 5	Suspected stroke patients receiving all of the evidence-based processes may have an increased potential outcome	Outcome	Patients receiving stroke measures 1 to 5	Patients with a provider impression of stroke originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Stroke-07	Stroke	For Patients with Positive Stroke Assessment, Average Time from Last Known Well to Arrival at a Hospital Verified, Designated or Otherwise Identified as Acute Stroke-Ready or Higher	Measures the time from LKW to arrival at a receiving facility	Reducing time from LKW to a stroke center that can intervene increases the potential for intervention to have the biggest impact	Process	Cumulative sum of time from last known well to arrival at a hospital verified, designated or otherwise identified as Acute Stroke-Ready or higher in minutes for each patient	Patients with a provider impression of stroke originating from a 911 request
Stroke-08	Stroke	Emergency Department Diagnosed Stroke Identified by Prehospital Stroke Assessment	Measures the percentage of emergency department diagnosed stroke patients who had a positive stroke assessment by EMS	Stroke assessments using prehospital stroke assessment tools can screen for stroke and affect patient destinations. Using hospital data, this measure identified the number of actual strokes that were either falsely assessed or not assessed using a prehospital stroke scale	Process	Patients with a positive stroke assessment	Patients with emergency department diagnosed stroke transported by EMS originating from a 911 request
Trauma-04	Trauma	Trauma patients transported to trauma center	Trauma patients transported to trauma center	Evidence is strong that Step 1 and Step 2 and Step 3 trauma patients should go to a trauma center	Process	Patients transported to a trauma center	Patients meeting CDC Step 1 or 2 or 3 criteria originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Trauma-01	Trauma Pain	Pain assessment of injured patients	Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient is experiencing pain	Recognizing that pain is undertreated in injured patients	Process	Patients with pain scale value present	Patients with injury originating from a 911 request
Trauma-02	Trauma Pain	Pain re-assessment of injured patients	Recognizing that pain is undertreated in injured patients, it is important to assess whether a patient is experiencing pain	Pain control is an important component of prehospital care	Process	Patients with two or more pain scale values present	Patients with injury and pain scale value >0 originating from a 911 request
Trauma-03	Trauma Pain	Effectiveness of pain management for injured patients	Of injured patients reassessed, how many had less pain	Improving pain management is an important aspect of quality prehospital care	Outcome	Patients with a final pain value less than the maximum	Patients with injury and pain scale value >0 originating from a 911 request
Safety-01	Vehicle Operations Safety	Lights and Sirens Response to Scene Rate	A rate of emergency lights and sirens responses. This includes each vehicle responding to an incident.	Lights and siren responses are demonstrated to have a greater risk for patients, providers, and public. Assessing risk is an important EMS system issue. The intent of this measure is to allow an agency to assess the use of lights and sirens responses within the agency.	Process	Number of lights and sirens responses	Number of responses originating from a 911 request

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Safety-02	Vehicle Operations Safety	Lights and Sirens Transport Rate	A rate of emergency lights and sirens transports. This includes each vehicle transporting from an incident with one or more patients.	Lights and siren responses are demonstrated to have a greater risk for patients, providers, and public. Assessing risk is an important EMS system issue. The intent of this measure is to allow an agency to assess the use of lights and sirens transports within the agency.	Process	Number of lights and sirens used during transport	Number of patient transports by unit originating from a 911 request
Safety-03	Vehicle Safety	Number of crashes	Measure of the number of EMS vehicle involved crashes	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of crashes	Not defined at this time
Safety-04	Vehicle Safety	Number of crashes resulting in injury	Measure of the number of EMS vehicle involved crashes resulting in injury	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of crashes resulting in injury	Not defined at this time
Safety-05	Vehicle Safety	Number of fatal crashes	Measure of the number of EMS vehicle involved crashes involving a fatality	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of fatalities	Not defined at this time

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Safety-06	Vehicle Safety	Rate of crashes per 100,000mi	Measure of the number of EMS vehicle involved crashes	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of crashes	Agency total vehicle miles traveled per year per 100,000 miles originating from a 911 request
Safety-07	Vehicle Safety	Rate of crashes resulting in injury per 100,000mi	Measure of the number of EMS vehicle involved crashes resulting in injury	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of crashes resulting in injury	Agency total vehicle miles traveled per year per 100,000 miles originating from a 911 request
Safety-08	Vehicle Safety	Rate of fatalities per 100,000mi	Measure of the number of EMS vehicle involved crashes involving a fatality	Crashes are one of the leading causes of injury and fatality events in EMS that create unnecessary expense, and reduce resource availability	Process	Number of fatalities	Agency total vehicle miles traveled per year per 100,000 miles originating from a 911 request
CPR-1		Bystander Chest Compressions	Percentage of OHCA cases where a bystander performed chest compressions on a patient	Early chest compressions increase the potential for resuscitation	Process	Number of patients where Bystander CPR was being performed on arrival of first rescuer	All Medical OCHAs in the month

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
CPR-2		Dispatch coached chest compressions	Percentage of OHCA cases where a dispatcher or call taker coached a bystander in performing chest compressions	Early chest compressions increase the potential for resuscitation. Emergency Medical Dispatchers may provide over the phone CPR coaching to bystanders with the patient	Process	Number of patients where Dispatch Coached CPR Performed	All Medical OCHAs in the month
CPR-3		Time from PSAP to initial compressions	Elapsed time from PSAP notification of an OHCA and the first compression performed by a rescuer.	Early chest compressions increase the potential for resuscitation.	Process	Cumulative time from PSAP notification to first rescuer initiating compressions	All Medical OCHAs in the month
CPR-4		Time to initial shock	Elapsed time from arrival of a rescuer equipped with a defibrillator to the time when the first shock is delivered	Patients with a shockable rhythm require early defibrillation to enable resuscitation	Process	Cumulative time from first rescuer with a defibrillator arrival at the call address to delivery of the first shock	All Medical OCHAs in the month
CPR-5		Average chest compression rate	A measure of the average chest compression rate	Chest compressions of reliable rate and depth delivered with limited interruption increase potential for resuscitation.	Process	Average compression rate	All Medical OCHAs in the month
CPR-6		Average chest compression depth	A measure of the average chest compression depth	Chest compressions of reliable rate and depth delivered with limited interruption increase potential for resuscitation.	Process	Average compression depth	All Medical OCHAs in the month

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
CPR-7		Return of Spontaneous Circulation (ROSC)during EMS care	ROSC at handoff of care transition to the Emergency Department	ROSC at handoff is surrogate for survival in EMS systems unable to obtain hospital discharge data	Process	Number of patients with ROSC >30 seconds at ED handoff	All Medical OCHAs in the month
CPR-8		Survival of OHCA with all presenting rhythms	A measurement of survival to hospital discharge from OHCA with all presenting rhythms	Survival to discharge is the broadest definition of a positive patient outcome	Outcome	Number of patients discharged from the hospital alive.	All Medical OCHAs in the month
CPR-9		Survival of OHCA when witnessed by bystander	Survival among patients whose cardiac arrest was witnessed by a bystander, and were found in a shockable rhythm regardless of whether they received bystander intervention	Utstein is a narrower but more focused definition based on the patient population with the highest potential for resuscitation: witnessed with a VF rhythm.	Outcome	Number of patients discharged from the hospital alive	All witnessed Medical OCHAs with a presenting VF rhythm in the month
CPR-10		Cerebral Performance Criteria outcome	Patients discharged from hospital with moderate to good cerebral performance as displayed in a Cerebral Performance Criteria Score	The ultimate positive outcome for a patient is to be resuscitated with limited or no neurological deficit	Outcome	Number of patients assessed as a CPC 1 or 2	All Medical OCHAs survival to hospital discharge in the month
STEMI-1		Time to first EKG	Measurement of the time that it takes the first arriving 12-lead capable unit to acquire a 12-lead EKG on a patient	12-Lead is assessment required to identify pSTEMI candidates	Process	Cumulative time from Arrival on scene of the 1st 12-lead equipped unit to 12-lead assessment	Suspected STEMI patients in a month
STEMI-2		Time to receiving facility pre-notification	Measure of the STEMI patient encounters resulting in pre-notification of the receiving facility	Early notification of a PCI center reduces First medical contact to reperfusion time	Process	Number of cases with pre-notification of the PCI receiving facility	Suspected STEMI Patients in the Month

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
STEMI-3		Transport to PCI/Thrombolytic capable facilities	Measure of percentage of suspected STEMI patient transports to facilities capable of PCI/thrombolytic administration	PCI administration is proven to greatly increase odds of survival if administered within 2 hours. If unable to administer PCI within 2 hours, strong evidence supports the use of thrombolytic	Process	Number of cases transported to a designated receiving facility	Suspected STEMI Patients in the
STEMI-4		Time from First medical contact to receiving facility	Average time from first medical contact to arrival at the receiving facility for patients with a positive 12-lead assessment	Reducing time from FMC to designated receiving facility may reduce time to reperfusion	Process	Cumulative time from Arrival on scene of the 1st 12-lead equipped unit to patient arrival at a designated receiving facility.	Suspected STEMI Patients in the Month
STEMI-5		Patients with complete bundle of care	Measure of percentage of patients receiving complete bundle of care	Reliable delivery of the bundle ensures reliability in evidence-based care delivery	Process	Total Number of patients receiving STEMI 1 -4 in the month	Suspected STEMI Patients in the Month
STEMI-6		EMS correctly identified STEMI	Percentage of patients diagnosed with STEMI on initial presentation to the hospital and who were transported by EMS	Early recognition of a STEMI in the field contributes to shortening the time to reperfusion	Process	Number of patients identified by EMS as a STEMI	All ED diagnosed STEMI patients transported by EMS in the month
STEMI-7		Time to Reperfusion	Average time from 911 call to reperfusion	Reducing time to reperfusion improves outcomes	Outcome	Cumulative time from 911 call receipt to reperfusion per patient	All ED diagnosed STEMI patients transported by EMS in the month

Appendix C – Sample Opioid Measures

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Opioid-01	Opioid	Percentage of suspected opioid OD patients who received Narcan	Measures the percentage of suspected opioid OD patients who received Narcan	Narcan, an opioid antagonist, should be administered to patients with a suspected or confirmed opioid overdose	Process	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code who were given Narcan by EMS staff or prior to EMS arrival	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code
Opioid-02	Opioid	Percentage of suspected opioid OD patients transported to an ED.	Measures the percentage of suspected opioid OD patients who were transported to an ED.	Transport to an ED provides an opportunity for offering a treatment path and reduces the risk of repeat OD or re-sedation once Narcan is metabolized	Outcome	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan who were transported to a health care facility.	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan
Opioid-03	Opioid	Percentage of suspected opioid OD patients given multiple Narcan doses in case of an "Unchanged" response to the first dose	Measures the percentage of suspected opioid OD patients who were given multiple Narcan doses in case of an "Unchanged" initial response	High-potency opioids may require higher and/or more frequently administered doses of Narcan to reverse respiratory depression and/or to maintain adequate respirations	Outcome	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code, showed an "unchanged" response when given Narcan by EMS staff or prior to EMS arrival, and where given subsequent doses.	All patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code.

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Opioid-04	Opioid	Percentage of suspected opioid OD patients experiencing a repeat OD within a specified time period.	Measures the percentage of suspected opioid OD patients experiencing a repeat OD within a specified time period.	Patients with a non-fatal opioid OD are vulnerable to another overdose. Repeat ODs increase the risk of fatal ODs.	Outcome	All patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan who have 2 or more similar records within a specified time period.	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan
Opioid-05	Opioid	Percentage of suspected opioid OD patients with a recorded combination of altered mental status, poor respiratory effort (RR<12 per minute), and pin point pupils.	Measures the percentage of suspected opioid OD patients with a recorded combination of altered mental status, poor respiratory effort (RR<12 per minute), and pin point pupils.	These classical features of an opioid OD are key documentation elements	Outcome	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, who have a recorded combination of altered mental status, pinpoint pupils, and poor respiratory effort (RR<12).	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Opioid-06	Opioid	Percentage of suspected opioid OD patients with a specific opioid recorded	Measures the percentage of suspected opioid OD patients with a specific opioid recorded	Identifies patterns of opioid use (Rx vs. illicit) and helps guide management based on opioid potency	Outcome	All patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan who have a specific opioid recorded.	all patients with a provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan
Opioid-07	Opioid	Percentage of suspected opioid OD patients experiencing an Increase in pulse oximetry after EMS care.	Measures the percentage of suspected opioid OD patients experiencing an Increase in pulse oximetry after EMS care.	Indicates effectiveness of management	Outcome	All patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded pulse oximetry showing a higher pulse oximetry value when measured at facility.	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded pulse oximetry

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Opioid-08	Opioid	Percentage of suspected opioid OD patients experiencing an Increase in Glasgow Coma Scale (GCS) after EMS care.	Measures the percentage of suspected opioid OD patients experiencing an Increase in Glasgow Coma Scale (GCS) after EMS care.	Indicates effectiveness of management	Outcome	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded pulse oximetry showing a higher GCS level value when measured at facility	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded GCS level.
Opioid-09	Opioid	Percentage of suspected opioid OD patients experiencing an Increase in respiratory rate after EMS care.	Measures the percentage of suspected opioid OD patients experiencing an Increase in respiratory rate after EMS care.	Indicates effectiveness of management	Outcome	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded pulse oximetry showing a Respiratory rate =>12 when measured at facility.	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, and a recorded Respiratory rate<12.

ID	Bundle	Title	Description	Rationale	Measure Type	Numerator	Denominator
Opioid-10	Opioid	Percentage of suspected opioid OD patients who received ventilatory support within five minutes of first EMS unit's arrival on scene.	Measures the percentage of suspected opioid OD patients who received ventilatory support within five minutes of first EMS unit's arrival on scene.	Indicates effectiveness of management	Outcome	all patients with an EMS provider primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan.	all patients with a primary or secondary impression containing an opioid poisoning ICD-10 code or showed an "improved" response when given Narcan, who received ventilatory support within five minutes of first EMS unit's arrival on scene.
Opioid-11	Opioid	Percentage of suspected opioid OD patients experiencing who exhibit adverse effects after naloxone administration.	Measures the percentage of suspected opioid OD patients experiencing who exhibit adverse effects after naloxone administration.	Patients an opioid overdose may become agitated or violent following naloxone administration due to acute opioid withdrawal. Therefore, the goal is to use the lowest dose possible to restore spontaneous respirations but avoid precipitating withdrawal	Outcome	All patients who were given Narcan, and developed adverse effects.	All patients who were given Narcan.

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Volume 2 – Transactions

Add Section 3.55

3.55 Query for EMS Quality Data [QRPH-55]

The Data Consumer sends a query for an EMS Quality Data to the Data Responder.

3.55.1 Scope

This transaction is used to query an entity for information needed to compute EMS quality measures.

3.55.2 Actor Roles

Table 3.55.2-1: Actor Roles

Actor:	Data Responder
Role:	The Data Responder responds to a query for EMS quality data.
Actor:	Data Consumer
Role:	The Data Consumer sends a query for the EMS quality data and receives the response returned by the Data Responder.

3.55.3 Referenced Standards

- HL7 Version 3 Domain Analysis Model: Emergency Medical Services, Release 1 <http://www.hl7.org/implement/standards/product_brief.cfm?product_id=39>
- HL7 Version 3 Domain Information Model; Emergency Medical Services, Release 1 <http://www.hl7.org/implement/standards/product_brief.cfm?product_id=302>
- HL7 Version 3 Domain Analysis Model: Trauma Registry Data Submission, Release http://www.hl7.org/implement/standards/product_brief.cfm?product_id=363
- HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
- eMeasures References: https://www.heart.org/HEARTORG/Professional/MissionLifelineHomePage/Recognition/Mission-Lifeline-EMS-Recognition_UCM_308047_Article.jsp

3.55.4 Messages

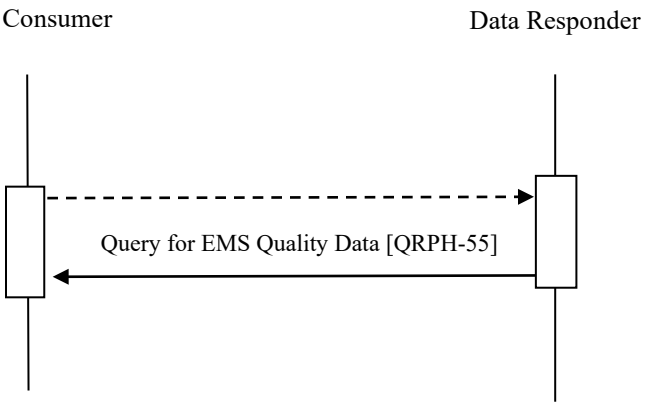

Figure 3.55.4-1: Interaction Diagram

3.55.4.1 Query for EMS Quality Data

The Data Consumer initiates a query to the Data Responder. The Data Responder returns the EMS quality measure report data to the Data Consumer that will use this data for quality outcomes measure analysis.

3.55.4.1.1 Trigger Events

When the organization is ready to measure EMS quality data, they would initiate a Query for EMS Quality Data [QRPH-55].

3.55.4.1.2 Message Semantics

The message is a FHIR transaction using a query action by sending an HTTP GET request composed of a FHIR Bundle Resource containing a measure report. This query uses the following semantics:

GET [base]/patient?condition.code:in=[Value set resource URL]&[other search criteria defined below]

GET [base]/patient?procedure.code:in=[Value set resource URL]&[other search criteria defined below]

GET [base]/patient?medicationAdministration.medicationCodableConcept:in=[Value set resource URL]&[other search criteria defined below]

The Value Set resource URL to be used in these queries is defined for each measure set or measure as determined by the quality measurement organization. The URL SHALL reference an active URL.

The following table defines additional search criteria that may be used to filter the query results:

Table 3.55.4.1.2-1: Additional Search Criteria

Attribute	Criteria
Age (as computed as encounter.period -patient.birthdate)	Patient age within a specified range. This may be in years, months, or days as defined by the measure or measure set
Encounter.period	Specify reporting period range
Resource.meta.lastUpdated	Date comparison to support updated information and polling mechanisms
Hospitalization.admitSource	Specify ambulance as the admit source (NOTE: pending value set expansion)
Encounter.hospitalization.origin.managingOrganization.identifier	Specify the specific EMS organization(s) that delivered the patient to the hospital
Encounter.type	Query may be constrained to inpatient or emergency patients

3.55.4.1.3 Expected Actions

The Data Consumer initiates a Query for EMS Quality Data [QRPH-55] to retrieve the measure report resource bundle that returns the resources specified in QRPH TF-3: 6.6.X FHIR Resource Bundle Content using the message semantics specified in Section 3.55.4.1.2. The Data Responder receives the query and responds with the resources specified in QRPH TF-3: 6.6.X FHIR Resource Bundle Content according to FHIR Search specification with the query response information or an error message. See: http://hl7.org/fhir/STU3/index.html.

3.55.5 Protocol Requirements

NA

3.55.6 Security Considerations

There must be a trusted connection between the Data Responder and Data Consumer. This will be carried out in implementation and can either be a business relationship or a secured connection done through ATNA. The Data Consumer has control of what information will be requested. The Data Responder has control of what information will be returned. This transaction may include identifiable health information, or it may leverage deidentification, see the ITI De-Identification White Paper for guidance. Depending upon the implementation and application, may constitute a disclosure of health information that requires audit, encryption, and authentication of the Data Consumer and Data Responder. For further guidance, see ITI TF-2.x: Appendix Z.8 “Mobile Security Considerations”

Note: This assumes the approval of the current ITI-CP-1036 regarding Appendix Z.8 “Mobile Security Considerations”.

3.56 Send EMS Measure Report Data [QRPH-56]

The Data Sender sends quality measure report data to the Data Consumer.

3.56.1 Scope

This transaction is used to send data needed to compute EMS quality measures to an entity that needs this information for quality outcome measures analysis.

3.56.2 Actor Roles

Table 3.56.2-1: Actor Roles

Actor:	Data Sender
Role:	The Data sender sends quality measure outcome data to the Data Consumer.
Actor:	Data Consumer
Role:	The Data Consumer consumes the quality measure outcome data sent by the Data Sender.

3.56.3 Referenced Standards

- HL7 FHIR standard STU3 http://hl7.org/fhir/STU3/index.html
- eMeasures References: https://www.heart.org/HEARTORG/Professional/MissionLifelineHomePage/Recognition/Mission-Lifeline-EMS-Recognition_UCM_308047_Article.jsp

3.56.4 Messages

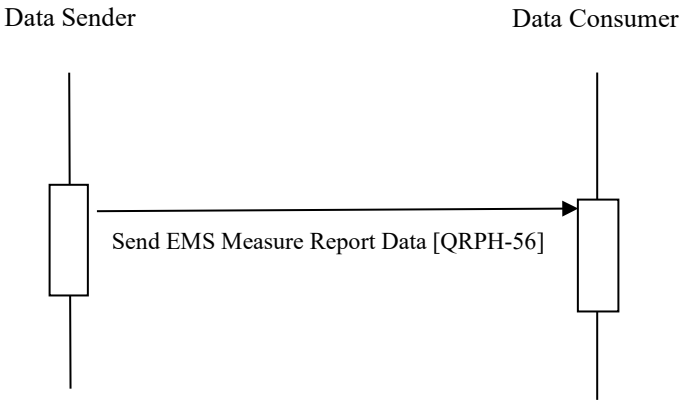

Figure 3.56.4-1: Interaction Diagram

3.56.4.1 Send EMS Quality Data

The Data Sender sends EMS quality measure report data to the Data consumer that will use this data for quality outcomes measurement or analysis.

3.56.4.1.1 Trigger Events

When the organization is ready to provide their quality measure data to the quality measurement organization, they would initiate a Send EMS Measure Report Data [QRPH-56] transaction.

3.56.4.1.2 Message Semantics

The message is a FHIR transaction using a create action by sending an HTTP POST request method composed of a FHIR Bundle Resource containing a Measure Report. The Measure Report is defined by the MeasureReport resource with content as constrained in QRPH TF-3: 6.6.Y Quality Measure Report Content.

3.56.4.1.3 Expected Actions

The Data Sender initiates a Send EMS Measure Report Data [QRPH-56] transaction to send the measure report resource bundle specified in QRPH TF-3: 6.6.Y Quality Measure Report Content using HTTP or HTTPS POST. The Data Consumer receives the Measure Report specified in QRPH TF-3: 6.6.Y Quality Measure Report Content and uses this data to compute the measures. This is received according to FHIR POST specification. See: http://hl7.org/fhir/STU3/index.html.

3.56.5 Protocol Requirements

NA

3.56.6 Security Considerations

There must be a trusted connection between the Data Sender and Data Consumer. This will be carried out in implementation and can either be a business relationship or a secured connection done through ATNA. The Data Sender has control of what information will be sent. This transaction may include identifiable health information, or it may leverage deidentification, see the ITI De-Identification White Paper for guidance. Depending upon the implementation and application, may constitute a disclosure of health information that requires audit, encryption, and authentication of the Data Consumer and Data Creator. For further guidance, see ITI TF-2.x: Appendix Z.8 “Mobile Security Considerations”

Note: This assumes the approval of the current ITI-CP-1036 regarding Appendix Z.8 “Mobile Security Considerations”.

Appendices to Volume 2

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Volume 2 Namespace Additions

The QRPH registry of OIDs is located at http://wiki.ihe.net/index.php/QRPH_Registry.

Additions to the QRPH OID Registry are:

No new Volume 2 OIDs.

Volume 3 – Content Modules

5 IHE Namespaces, Concept Domains and Vocabularies

Add to Section 5 IHE Namespaces, Concept Domains and Vocabularies

5.1 IHE Namespaces

The QRPH registry of OIDs is located at http://wiki.ihe.net/index.php/QRPH_Registry

Additions to the QRPH OID Registry are:

codeSystem	codeSystemName	Description
2.16.840.1.113883.6.90	ICD10	International Classification of Diseases, Clinical Modifiers, Version 10
2.16.840.1.113883.6.88	RxNorm	RxNorm
2.16.840.1.113883.6.96	SNOMED-CT	SNOMED Controlled Terminology
NA	NEMSIS	National EMS Information System
2.16.840.1.113883.6.1	LOINC	Logical Observation Identifier Names and Codes

5.2 IHE Concept Domains

None anticipated

5.3 IHE Format Codes and Vocabularies

5.3.1 IHE Format Codes

N/A

5.3.2 IHEActCode Vocabulary

N/A

5.3.3 IHERoleCode Vocabulary

N/A

6 Content Modules

6.3.1 CDA Document Content Modules

Not applicable

6.3.2 CDA Header Content Modules

No CDA Header Content Modules

6.3.3 CDA Section Content Modules

Not applicable

6.3.4 CDA Entry Content Modules

Not applicable

6.4 Section not applicable

Not applicable

6.5 QRPH Value Sets and Concept Domains

No new value sets or concept domains.

6.6 HL7 FHIR Content Modules

6.6.X Transport Content6.6.X.1 FHIR Resource Bundle Content

These are the FHIR resource locations and structure definitions of the resources where the data elements are located.

Table 6.6.X.1-1: FHIR Resource Bundle Structure Definitions

FHIR Resource location	Option ality	Cardinality	Structured Definition
Composition	R	1..1	See the QORE Profile Wiki page at https://wiki.ihe.net/index.php/Quality_Outcome_Reporting_for_EMS.
Patient	R	1..*	
Allergies and Adverse Events	RE	0..*	
Procedure	RE	0..*	
Medication Statement	RE	0..*	
Medications Administered	RE	0..*	
Clinical Impression	R	1..*	
Diagnostic report	R	1..1	
Encounter	R	1..*	
Observation	R	1..*	

FHIR Resource location	Option ality	Cardinality	Structured Definition
Condition	R	1..*	
Location	R	1..*	
Document Reference	RE	0..1	
Device	RE	0..*	

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6.6.X.1.2 FHIR Resource Data Specifications

The following table shows the mapping of the FHIR Resources supporting the content for Quality Measure Data Elements/Attributes. The Data Responder SHALL support the Resources identified by this table. The Data Consumer SHALL receive paramedicine content from the
680 specified resource for each attribute.

Table 6.6.X.2-1: FHIR Resource Data Specifications

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Emergency Department Discharge Disposition	Encounter.hospitalization.dischargeDisposition	RE [0..1]	Where encounter.class = EMER (emergency)
Hospital Discharge Disposition	Encounter.hospitalization.dischargeDisposition	RE [0..1]	Where encounter.class = IMP (inpatient encounter), ACUTE (inpatient acute), NONAC (inpatient non-acute), or SS (short stay)
External Report ID/Number Type	Resource.Composition	RE [0..1]	Where the External report is the report given to the hospital by the EMS organization
External Report ID/Number	Resource.Composition	RE [0..1]	Where the External report is the report given to the hospital by the EMS organization
Other Report Registry Type	Resource.Composition	RE [0..*]	N/A
Emergency Department Chief Complaint	Encounter.diagnosis.condition	RE [0..1]	N/A
First ED Systolic Blood Pressure	Encounter←Observation.value[x]	RE [0..1]	N/A
Emergency Department Recorded Cause of Injury	Encounter←Observation.value[x]	RE [0..1]	N/A
Emergency Department Procedures (code)	Encounter←Procedure.basedOn(Reference (procedure.code)	RE [0..*]	N/A

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Date/time first patient contact	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	N/A
Emergency Department Diagnosis	Encounter.diagnosis.code	RE [0..1]	Where encounter.class = ED (Emergency Department)
Date/Time of Hospital Admission	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	Where patient hospitalized the date and time SHALL be supported
Hospital Procedures	Encounter←Procedure.basedOn(Reference (procedure.code)	RE [0..1]	Where patient hospitalized procedures SHALL be supported
Hospital Diagnosis	Encounter.diagnosis.code	RE [0..1]	Where patient hospitalized diagnosis SHALL be supported
Date/Time of Hospital Discharge	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	Where patient hospitalized SHALL include discharge date and time
Outcome at Hospital Discharge	Encounter←Observation.value[x]	RE [0..1]	Where patient hospitalized SHALL include discharge disposition.
Date/Time of Emergency Department Admission	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	
Date/Time Emergency Department Procedure Performed	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	
Date/Time Hospital Procedure Performed	Encounter.statusHistory.code Encounter.statusHistory.period.start	RE [0..1]	
EMS Organization Identifier	Encounter. hospitalization.origin.managingOrganization.identifier	RE [0..1]	The EMS organization identifier
Hospital Admitting Diagnosis	Encounter.diagnosis.code	RE [0..1]	Where patient is hospitalized (patient type=IMP) admitted diagnosis SHALL be supported
Hospital Neurological assessment: Cerebral Performance Category Observation	Encounter←Observation.value[x]	RE [0..1]	Where code is neurological assessment nervous system, LOINC 67536-3
Type of service requested	Encounter.type	RE [0..1]	The service requested for the emergency transport where type= value
Level of care for this unit	HealthService.characteristic	RE [0..1]	The level of care offered in the EMS unit that carried out the emergency transport

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Additional Response Mode Descriptors	Encounter.encounter-responseModeDescriptor **IHE extension**	RE [0..*]	Identifies the documentation of response mode techniques used for this EMS response.
Date/Time Procedure Performed	Encounter←Procedure.performed[x].performed.dateTime	RE [0..1]	No additional Constraint
Procedure	Encounter←Procedure.code	RE [0..*]	No additional Constraint
PSAP Call Date/Time	Encounter.statusHistory.code Encounter.statusHistory.period.start Encounter.statusHistory – Type **IHE Extension*	RE [0..1]	See open issues
Unit Arrived on Scene Date/Time	Encounter.statusHistory.code Encounter.statusHistory.period.start Encounter.statusHistory – Type **IHE Extension**	RE [0..1]	See open issues
Complaint	Encounter.diagnosis.condition(Condition.note)	RE [0..1]	Where code="10154-3" Chief complaint Narrative - Reported droning EMS transport
Primary Symptom	Encounter.diagnosis.condition(Condition.evidence.code)	RE [0..1]	Where code="67774-0" Primary sign and symptom NEMSIS See open issues
Other Associated symptoms	Encounter.diagnosis.condition(Condition.evidence.code)	RE [0..*]	Where code="67776-5" Other symptoms NEMSIS See open issues
Provider's Primary Impressions	Encounter←Observation.value[x]	RE [0..*]	Where code="67492-9" Primary problem NEMSIS See open issues
Provider's Secondary Impressions	Encounter←Observation.value[x]	RE [0..*]	Where code="69542-9" Secondary problem NEMSIS See open issues
Date/Time Last Known Well	Encounter←Observation.value[x]	RE [0..1]	Where code = TBD
Destination/Transferred To, Name	Encounter.encounter- destinationName **IHE extension**	RE [0..1]	See open issues
Destination/Transferred To, Code	Encounter.encounter- destinationIdentifier **IHE extension**	RE [0..1]	See open issues
Incident/Patient Disposition	Encounter.encounter- treatment **IHE extension**	RE [0..1]	See open issues
Type of Destination	Encounter.encounter- destinationType **IHE extension**	RE [1..1]	See open issues

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Hospital Capability	HealthService.characteristic	RE [0..1]	See open issues
Destination Team Pre-Arrival Alert or Activation	Encounter.encounter- Pre-arrivalAlertActivated **IHE extension**	RE [0..1]	See open issues
Resuscitation Attempted By EMS	Encounter←Procedure.code	RE [0..1]	Code SHALL be drawn from value set CardiopulmonaryResuscitation Type - 2.16.840.1.113883.17.3.11.57 Code System LOINC
Arrest Witnessed By	Encounter.encounter – witness (Person) **IHE Extension**	RE [0..1]	See open issues
CPR Care Provided Prior to EMS Arrival	Encounter.encounter – priorCprProvided **IHE Extension**	RE [0..1]	See open issues
Who Provided CPR Prior to EMS Arrival	Encounter.encounter – priorCprProvidedRole **IHE Extension**	RE [0..1]	See open issues
AED Use Prior to EMS Arrival	Encounter.encounter – priorAedProvided **IHE Extension**	RE [0..1]	See open issues
Who Used AED Prior to EMS Arrival	Encounter.encounter – priorAedProvidedRole **IHE Extension**	RE [0..1]	See open issues
Type of CPR Provided	Encounter.encounter – priorCprProvidedType **IHE Extension**	RE [0..1]	See open issues
Any Return of Spontaneous Circulation	Encounter←Procedure.outcome	RE [0..1]	Where code= 67513-2" Return of spontaneous circulation NEMSIS (See open issues) Where value SHALL be drawn from value set ReturnOfSpontaneousCirculation - 2.16.840.1.113883.17.3.11.15 Code System LOINC
Neurological Outcome at Hospital Discharge	Encounter←Observation.value[x]	RE [0..1]	Where Observation type is discharge observation and value is drawn from value set NeurologicalAssessmentFinding 2.16.840.1.113883.17.3.11.40 Code System
Date/Time of Initial CPR	Encounter←Procedure.performedPeriod.start	RE [0..1]	Where code is drawn from value set CardiopulmonaryResuscitation Type - 2.16.840.1.113883.17.3.11.57 Code System LOINC

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Advanced Directives	DocumentReference	RE [0..1]	N/A
SBP (Systolic Blood Pressure)	Encounter←Observation.value[x]	RE [0..1]	Where code = 8480-6 Systolic blood pressure, LOINC
DBP (Diastolic Blood Pressure)	Encounter←Observation.value[x]	RE [0..1]	Where code = 8462-4 Diastolic blood pressure, LOINC
Heart Rate	Encounter←Observation.value[x]	RE [0..1]	Where code = 8867-4 Heart rate, LOINC
Pulse Oximetry	Encounter←Observation.value[x]	RE [0..1]	where code = 2710-2 Oxygen Saturation, LOINC
Respiratory Rate	Encounter←Observation.value[x]	RE [0..1]	where code = 9279-1 Respiration Rate, LOINC
Blood Glucose Level	Encounter←Observation.value[x]	RE [0..1]	where code = 2339-0 Blood Glucose Level, LOINC
Cardiac Rhythm / Electrocardiography (ECG)	Encounter←Observation.code	RE [0..1]	where code="67519-9" Cardiac rhythm, LOINC
	Encounter←Observation.method	RE [0..1]	Where method is in value set MethodOfECGInterpretation - 2.16.840.1.113883.17.3.11.20, LOINC
	Encounter←Observation.value[x]	RE [0..1]	where value set CardiacRhythmReading - 2.16.840.1.113883.17.3.11.16
Stroke Scale Score	Encounter←Observation.value[x]	RE [0..1]	where code = 72089-6 Stroke Scale Score, LOINC
Pain Scale Score	Encounter←Observation.value[x]	RE [0..1]	where code = 38208-5 Pain Scale Score, LOINC
Medication Given	Encounter←MedicationAdministration.resource	RE [0..*]	No Additional constraints
Age	Encounter.subject (Patient.identifier)	RE [0..1]	Where age is computed as Encounter.statusHistory.period.start-Encounter.subject (Patient.birthDate)
Age Units	Encounter.subject (Patient.identifier)	RE [0..1]	Where age units is expressed as years, months, or days
Date of Birth	Encounter.subject (Patient.birthDate)	RE [0..1]	No Additional constraints
Cause of Injury	Encounter.Observation.value	RE [0..1]	Where code="69543-7" Cause of injury NEMSIS See open issues Where Value is drawn from ICD 10
Mechanism of Injury	No Mapping Available	RE [0..1]	See open issues SHALL be populated with an ICD 10

Quality Data Element	FHIR Resource location	Cardinality	Constraint
Mass causality	Encounter.encounter- massCasualty **IHE extension**	RE [0..1]	Where code="67490-3" Mass casualty incident NEMSIS

6.6.Y EMS Quality Measure Report Content

Table 6.6.Y-1: Quality Measure Report FHIR Resource Bundle Content

FHIR Resource location	Cardinality	Structured Definition
MeasureReport	1..1	See the QORE Profile Wiki page at https://wiki.ihe.net/index.php/Quality_Outcome_Reporting_for_EMS.

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6.6.Y.1 EMS Measure Report Specification

The following table shows the constraints to the MeasureReport resource. Data Sender SHALL support the Resource constraints identified by this table. Data Consumers SHALL receive the MeasureReport and use relevant data for quality measurement and analysis.

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Measure Report Data Element	Measure Report Data Element FHIR Resource location	Optionality	Cardinality	Constraint
Identifier	MeasureReport.identifier	RE	0..1	NA
Type	MeasureReport.type	R	1..1	SHALL = the code for 'individual'
Measure	MeasureReport.measure	R	1..*	Allow for multiple as records may support multiple measures
Patient	MeasureReport.patient	RE	0..1	NA
Date	MeasureReport.date	RE	0..1	NA
reportingOrganization	MeasureReport.reportingOrganization	RE	0..1	Shall indicate the identity of the reporting organization.
Period	MeasureReport.period	R	1..1	Indicates the reporting period to which this record belongs
Group	Measure.Report.group	RE	0..*	NA

Measure Report Data Element	Measure Report Data Element FHIR Resource location	Optionality	Cardinality	Constraint
Evaluated Resources	Measure.Report.evaluatedResources	R	0..1	The MeasureReport SHALL include the evaluated resources, conforming to the resource bundle specified in QRPH TF-3.6.6.X EMS Quality Data Content

Volume 4 – National Extensions

Add appropriate Country section

3 National Extensions for the United States of America (USA)

The national extensions documented in this section shall be used in conjunction with the definitions of integration profiles, actors and transactions provided in Volumes 1 through 3 of the IHE Quality, Research and Public Health Technical Framework. This section includes extensions and restrictions to effectively support the regional practice of healthcare in the USA.

3.1 Comments

This national extension document was authored under the sponsorship and supervision of the IHE Quality Research and Public Health Technical Committee who welcome comments on this document and the IHE USA initiative. Comments should be directed to http://www.ihe.net/QRPH_Public_Comments.

3.X Quality Outcomes Reporting for EMS (QORE)

3.X.1 QORE US Volume 3 Constraints

3.X.1.1 QORE US Volume 3 Attribute Constraints

3.X.1.2 QORE US Volume 3 Element Constraints

The following additional cardinality constraints apply to the Paramedicine Care document specification and entries in Table 6.3.1.D.5-1 Quality Outcomes Reporting for EMS (QORE) Document Content Module Specification.

In the US, you SHALL use FHIR structure definition US-Core-Patient in place of the patient resource identified in the QORE bundle in Table 6.6.X.1-1.

Table 3.X.1.2-1: QORE US Element Constraints

Cardinality	Section Element	Constraint	Vocabulary Constraint
R [1..1]	Emergency Department Disposition	Where Code list = Patient Disposition (1.3.6.1.4.1.19376.1.7.3.1.1.31.1) When Emergency Department Disposition is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional).	Table 3.X.2-1

Cardinality	Section Element	Constraint	Vocabulary Constraint
R [1..1]	Hospital Disposition	Where Code list = Patient Disposition (1.3.6.1.4.1.19376.1.7.3.1.1.31.1) When Hospital Disposition is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional).	Table 3.X.2-1
RE [0..1]	External Report ID/Number Type	Where Code list = NEMSIS External Report ID/Number Type (1.3.6.1.4.1.19376.1.7.3.1.1.31.2)	Table 3.X.2-1
RE [0..1]	External Report ID/Number		
RE [0..1]	Other Report Registry Type		
R [1..1]	Emergency Department Procedures	Where Code list = ICD-10-CM: Diagnosis Codes When Emergency Department Procedures is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional).	Table 3.X.2-1
R [1..1]	Date/Time Emergency Department Procedure Performed	Must include the year, month, day, hour minutes, and time zone. Should include Seconds.	
R [1..*]	Emergency Department Diagnosis	Where Code list = ICD-10-CM: Diagnosis Codes When Emergency Department Diagnosis is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional). When Emergency Department Diagnosis has a Not Value, no other value should be recorded.	Table 3.X.2-1
R [1..1]	Date/Time of Hospital Admission	Must include the year, month, day, hour minutes, and time zone. Should include Seconds.	
R [1..1]	Hospital Procedures	Where Code list = ICD-10-PCS When Hospital Procedures is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional).	Table 3.X.2-1

Cardinality	Section Element	Constraint	Vocabulary Constraint
R [1..1]	Date/Time Hospital Procedure Performed	Must include the year, month, day, hour minutes, and time zone. Should include Seconds.	
R [1..*]	Hospital Diagnosis	Where Code list = ICD-10-CM: Diagnosis Codes When Hospital Diagnosis is empty, it should have a Not Value (Not Applicable, Not Recorded, or Not Reporting, if allowed for the element) or a Pertinent Negative (if allowed for the element), or it should be omitted (if the element is optional). When Hospital Diagnosis has a Not Value, no other value should be recorded.	
R [1..1]	Date/Time of Hospital Discharge	Must include the year, month, day, hour minutes, and time zone. Should include Seconds.	
R [1..1]	Date/Time of Emergency Department Admission	Must include the year, month, day, hour minutes, and time zone. Should include Seconds.	

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3.X.2 QORE Value Set Binding for US Realm Concept Domains

This section defines the actual value sets and code systems for any coded concepts that were described by concept domains in the main profile and binds the value set to the coded concepts.

Table 3.X.2-1: QORE Value Set Binding for US Realm Concept Domains

Value Set Name	Value Set Code	Value Set OID
Patient Disposition	NEMSIS_Patient_Disposition	1.3.6.1.4.1.19376.1.7.3.1.1.31.1
NEMSIS External Report ID/Number Type	NEMSIS_External_Report_Type	1.3.6.1.4.1.19376.1.7.3.1.1.31.2
Diagnosis (ICD-10 CM)	PHVS_AdministrativeDiagnosis_CDC_ICD-10CM	2.16.840.1.114222.4.11.7356
Procedure (ICD-10 PCS)	PHVS_AdministrativeProcedure_CDC_ICD-10PCS	2.16.840.1.114222.4.11.7371

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Appendices to Volume 4

Appendix A – Mapping of NEMSIS Data Elements to FHIR Locations

The Mapping of the NEMSIS data elements to the FHIR locations of the data in the measure report defined by the QORE Profile.

Table A-1: NEMSIS to FHIR Mappings

QORE Data Element	NEMSIS Mapping	FHIR Mapping
Emergency Department Disposition	eOutcome.01	Composition.encounter.hospitalization.dischargeDisposition
Hospital Disposition	eOutcome.02	Composition.encounter.hospitalization.dischargeDisposition
External Report ID/Number Type	eOutcome.03	Composition.type
External Report ID/Number	eOutcome.04	Composition.id
Other Report Registry Type	eOutcome.05	Composition.type
Emergency Department Procedures	eOutcome.09	Composition.encounter.diagnosis.condition.Reference(Procedure).code
Date/Time Emergency Department Procedure Performed	eOutcome.19	Composition.encounter.diagnosis.condition.Reference(Procedure).performed[x].performedDateTime
Emergency Department Diagnosis	eOutcome.10	Composition.encounter.diagnosis.condition.Reference(Condition)
Date/Time of Hospital Admission	eOutcome.11	Composition.encounter.period
Hospital Procedures	eOutcome.12	Composition.encounter.diagnosis.condition.Reference(Procedure).code
Date/Time Hospital Procedure Performed	eOutcome.20	Composition.encounter.diagnosis.condition.Reference(Procedure).performed[x].performedDateTime
Hospital Diagnosis	eOutcome.13	Composition.encounter.diagnosis.condition.Reference(Condition)
Date/Time of Hospital Discharge	eOutcome.16	Composition.encounter.period
Date/Time of Emergency Department Admission	eOutcome.18	Composition.encounter.period

